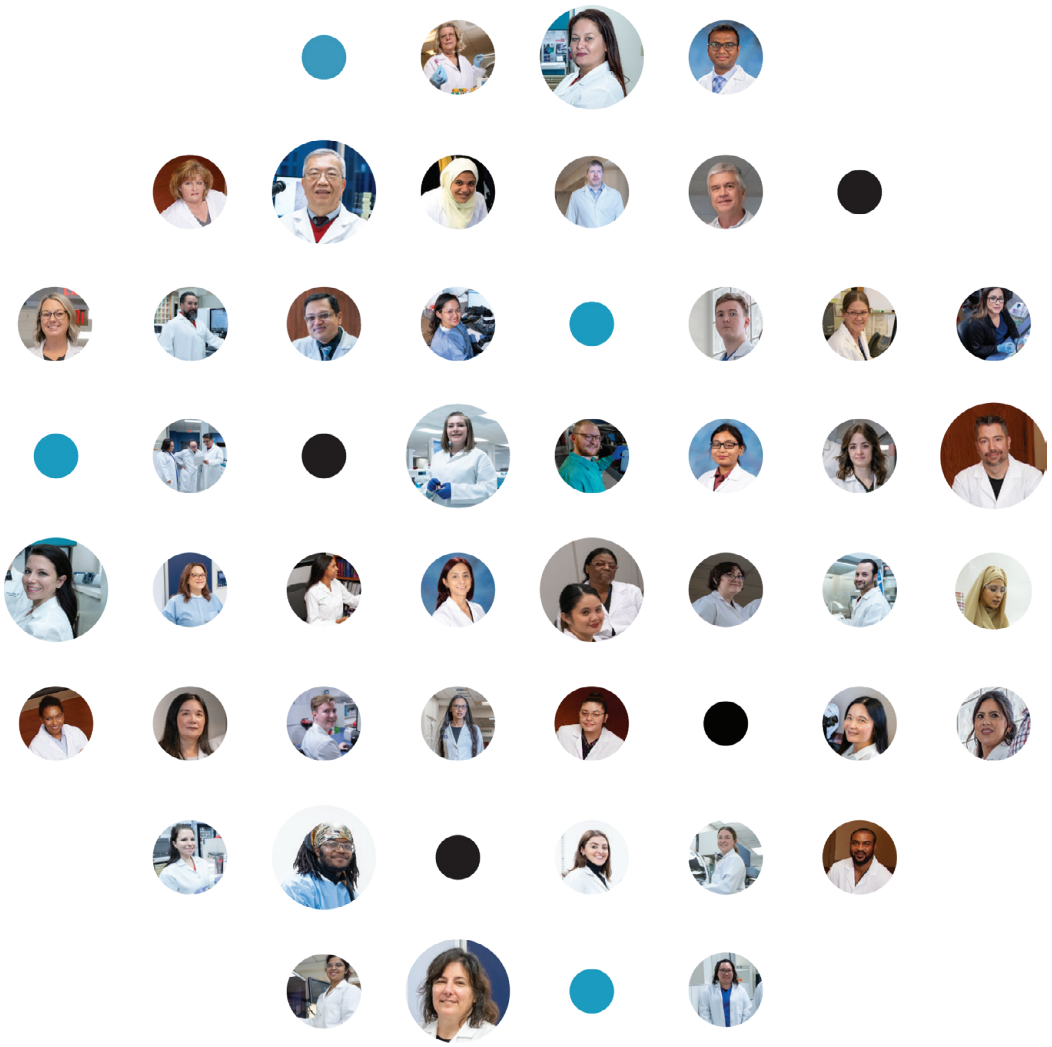
COLLEGE of AMERICAN PATHOLOGISTS

Laboratory Quality Solutions

Surveys and Anatomic Pathology Education Programs



Performance you can measure. **Accuracy** you can trust.

2026

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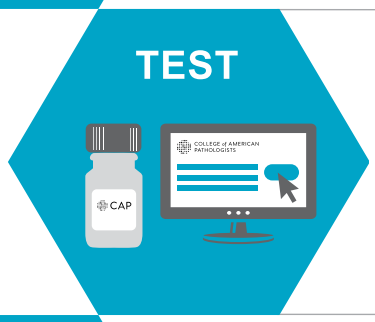
Enhance Lab Accuracy With Our PT/EQA Resources

Discover a wide range of online tools and support materials tailored to help laboratories succeed in proficiency testing/external quality assessment (PT/EQA). Find everything you need in one convenient location at cap.org.

Prepare to test as soon as your kit arrives

- My PT Kit: Key Activities
- PT/EQA Manual
- Current Shipping Calendar
- CMS Analyte Reporting Selections

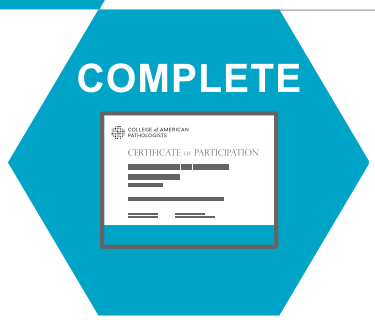


Master the essentials of running PT/EQA

- Kit Instructions and Result Form Resource
- Frequently Asked Questions
- Direct Transmission of PT Results

Harness the potential of your PT/EQA data

- Troubleshooting Guide for PT/EQA Data
- PT/EQA Exception Investigation Worksheet
- Performing a Self-Evaluation When PT Is Not Graded
- Proficiency Testing Participant Summary and Evaluation Resource



Claim CME/CE and proof of participation

- How to Claim CME/CE Credit for Faxed AP Results
- Certificate of Participation
- Performance Analytics Dashboard

Learn More

Discover the CAP's online PT/EQA resources now and unlock a wealth of valuable tools and insights!

1 New Developments

With the advancements in laboratory medicine, the CAP is dedicated to supporting you.

New for 2026:

- H5N1 Influenza A Detection and Subtyping program for US laboratories (FLUA)
- Calibration Verification/Linearity for Reticulocytes (LN53)
- Global program for Dengue Virus Serology (DENS)
- Optical Genome Mapping (OGM)

New Developments

2026 New Programs 4
2025 New Programs 5

2026 New Programs

Quality Management Tools

Subsection	Name	Program Code	Page
Short-Term Quality Sudies and Morphology/Competency Assessments	Comparative Inpatient Analyte Volumes for Individual and Integrated Laboratories	QPA5/QPA10	25

General Chemistry and Therapeutic Drug Monitoring

Subsection	Name	Program Code	Page
General Chemistry and Therapeutic Drug Monitoring	Point-of-Care High-Sensitivity Troponin I	PCHT	64
General Chemistry and Therapeutic Drug Monitoring	Waived Hematocrit, Hemoglobin, and Urinalysis/Urine hCG	HCC3	66
General Chemistry and Therapeutic Drug Monitoring	Waived Whole Blood Glucose	HCC4	66

Instrumentation Verification Tools

Subsection	Name	Program Code	Page
Calibration Verification/Linearity	Reticulocyte Calibration Verification/Linearity	LN53	127

Microbiology

Subsection	Name	Program Code	Page
Bacteriology	Shiga Toxin, Extra Volume	STX	188
Virology	H5N1 Influenza A Detection and Subtyping	FLUA	204
Virology	HIV-1/HIV-2 Qualitative Detection and Differentiation, Molecular	HVDD	204
Infectious Disease Serology	Dengue Virus Serology	DENS	216

Immunology and Flow Cytometry

Subsection	Name	Program Code	Page
Immunology	Thyroid Stimulating Hormone (TSH) Receptor Binding Antibody	TSHR	224

Transfusion Medicine, Viral Markers, and Parentage Testing

Subsection	Name	Program Code	Page
Transfusion Medicine	Weak RHD Genotyping	WRHG	237
Transfusion Medicine	Red Blood Cell Antigen Typing—Automated	ARCT	237
Viral Markers	Nucleic Acid Testing, *Babesia*	NAT1	247

Genetics and Molecular Pathology

Subsection	Name	Program Code	Page
Cytogenetics	Optical Genome Mapping	OGM	258

Anatomic Pathology			
Subsection	**Name**	**Program Code**	**Page**
Immunohistochemistry Interpretation Only Programs	Gastric, Pan Tumor HER2, Interpretation Only	GPH/GPH1	305
Immunohistochemistry Interpretation Only Programs	HER2 and ER Immunohistochemistry, Interpretation Only	HERI/HERI1	305
Immunohistochemistry Interpretation Only Programs	PD-L1 Tumor Proportion Score IHC, Interpretation Only	TPS/TPS1	306
Cytopathology	Human Papillomavirus (High Risk) for Cytopathology	CHPV	313

2025 New Programs

Name	Program Code	Page
General Chemistry and Therapeutic Drug Monitoring		
Waived Hemoglobin	HCC1	65
Endocrinology		
Parathyroid Hormone	PTH	85
Instrumentation Verification Tools		
Factor VIII Calibration Verification/Linearity	LN51	131
HBV Viral Load Calibration Verification/Linearity	LN52	131
Thyroid Panel Calibration Verification/Linearity	LN50	134
Microbiology		
Trichomonas vaginalis, Molecular, 5 Challenge	TVG5	195
Rapid Malaria, 5 Challenge	RML5	196
Gastrointestinal Panel, Global	GIPN	213
Transfusion Medicine, Viral Markers, and Parentage Testing		
Transfusion Medicine With Electronic Crossmatch	JXM	234
Transfusion Medicine—Automated With Electronic Crossmatch	JATXM	235
Histocompatibility		
HLA Crossmatching, Antibody Screen, and Antibody Identification (Class I/Class II), Extra Plasma	MXEP	250
HLA Antibody Screen (Class I/Class II) Only	MXS	250
Anatomic Pathology		
CAP/NSH HistoQIP Pediatric Program	HQPED	296

During your inspection, if it's not documented, it's not compliant.

CLIA and your accreditor's standards haven't changed: You need to have complete and accurate records at inspection or you'll receive a deficiency. The CAP's Competency Assessment Hub offers tools to satisfy regulatory record-keeping requirements and meet your staff's CE needs.

The 2026 Competency Assessment Hub subscription includes:

- Hundreds of prewritten questions to customize assessments
- Tools and resources to build assessment and training activities
- Auto-assignment of competency activities so you never miss an assessment
- Reporting tools to ensure your staff meet deadlines
- 67 CE courses in 11 laboratory disciplines

Improve your laboratory's readiness for inspection. Add the appropriate Competency Assessment Hub subscription to your order.

Learn More

2 Continuing Education

We support laboratory professionals. Maintain your certification with Surveys continuing education (CE).

- Offer your staff more than 100 CE credits.
- Advance skills with education activities developed by more than 600 physicians and doctoral scientists with expertise in pathology and laboratory medicine.
- Meet certification and licensure requirements with CE across multiple disciplines.

Continuing Education

Continuing Education Programs 8
Competency Assessment Hub 15
QM*Ed*™ Online Educational Courses 18

New Programs NEW

Change Management (*QMEDCHNG*) 18

Continuing Education Programs

Your laboratory demonstrates its commitment to quality by choosing CAP Surveys programs. You'll find the same level of quality in the CAP Continuing Education Programs.

CME (Continuing Medical Education for Physicians)

Accreditation

The College of American Pathologists (CAP) is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

CME Category 1

The CAP designates these educational activities for a maximum of the stated number of *AMA PRA Category 1 Credits*™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

CE (Continuing Education for Nonphysicians)

The CAP designates these educational activities for a maximum of the stated number of credits of continuing education. Participants should claim only the credit commensurate with the extent of their participation in the activity.

The American Society for Clinical Pathology (ASCP) Board of Certification (BOC) Certification Maintenance Program (CMP) accepts these activities to meet its continuing education requirements.

These activities are approved for continuing education credit in California and Florida.

Cytotechnologists may apply the credits from the PAP Education (PAPCE/PAPJE/PAPKE/PAPLE/PAPME), NGC, FNAG, and FNA programs toward the required educational activities for the American Society of Cytopathology (ASC) Continuing Education Credit Program (CECC) and the International Academy of Cytology (IAC).

These activities are eligible for continuing medical education (CME) or continuing education (CE) credit.

Surveys Continuing Education Activities

When your laboratory participates in CAP Surveys, every member of your team can enroll in education activities and earn continuing education (CE) credit at no additional charge. Simply follow these steps:

1. Establish a free online account.
2. Complete a reading provided in the Participant Summary or Final Critique.
3. Answer online learning assessment questions.
4. Claim CE certificate.

Each member of your staff can access the Surveys education activities for a maximum of 12 months.

Surveys Educational Activities

Program Name	Program Code	Discipline	Catalog Page(s)
General Chemistry	C1, C3/C3X, C4, CZ/CZX/CZ2X, Z	Chemistry	54–56
Blood Gas	AQ, AQH, AQIS		90–91
Endocrinology	K/KK		82
Quality Cross Check—Whole Blood Glucose	WBGQ	Chemistry/Quality Cross Check	37
Coagulation—Limited	CGB, CGDF, CGL	Coagulation	164
Blood Cell Identification, Photographs Blood Cell Identification, Virtual	BCP, BCPV	Hematology and Clinical Microscopy	140
Bone Marrow Cell Differential	BMD		142
Hematology Automated Differential Series	FH1–FH4, FH9–FH10, FH13, FH16–FH17		138
Hematology—Basic	HE		138
Virtual Peripheral Blood Smear	VPBS		147
Immunology	FL3, FL5, PCNEO	Immunology and Flow Cytometry	226–227, 230
Bacteriology	D	Microbiology	175
Mycology and Aerobic Actinomycetes	F		192
Infectious Disease Respiratory Panel	IDR		210
Parasitology	P		195
Ticks, Mites, and Other Arthropods	TMO		196
Tick-Transmitted Diseases	TTD		215
Vector-Borne Disease Molecular	VBDM		206
Limited Bacteriology	D1, D2, D3, D5, D6, D8, MC3, MC4, RMC		177–178, 180–181
Embryology	EMB	Reproductive Medicine	161
Sperm Count, Motility, Morphology, and Viability	SMCD, SM1CD, SM2CD		160
Semen Analysis	SC, SC1, PV, PV1, SM, SV		160
Toxicology	FTC, THCB, T, UT, VF	Toxicology	96, 102, 105, 107
Transfusion Medicine	J, JXM, JE1, JAT, JATXM, JATE1, J1	Transfusion Medicine	234–235

Surveys Self-Reported Training Opportunities

When your laboratory participates in CAP Surveys, every member of your team can receive self-reported training opportunities.

Self-Reported Training Opportunities*

Program Name	Program Code	Source	Catalog Page(s)
Quality Management Tools			
Comparative Inpatient Analyte Volumes for Individual and Integrated Laboratories	QPA5/QPA10	Data Analysis and Critique	25
Assessment of Consistency of Body Fluid Morphologic Observations	QPB10/QPB25	Data Analysis and Critique	26
Assessment of Consistency of Peripheral Blood Morphologic Observations	QPC10/QPC25	Data Analysis and Critique	27
Assessment of Consistency of Gram Stain Morphologic Observations	QPD10/QPD25	Data Analysis and Critique	28
Hematology and Clinical Microscopy			
Blood Cell Identification, Photographs/Virtual	BCP, BCPV	Participant Summary	140
Bone Marrow Cell Differential	BMD	Participant Summary	142
Expanded Virtual Peripheral Blood Smear	EHE1	Participant Summary	148
Hematology Automated Differential Series	FH1–FH4, FH9–FH10, FH13, FH16–FH17	Participant Summary	138
Hematology—Basic	HE	Participant Summary	138
Hemoglobinopathy	HG	Participant Summary	144
Virtual Body Fluid	VBF	Participant Summary	152
Virtual Peripheral Blood Smear	VPBS	Participant Summary	147
Clinical Microscopy	CMP, CMMP, CMP1	Participant Summary	150–151
Microbiology			
Blood Parasite	BP	Participant Summary/Final Critique	196
Expanded Bacteriology	DEX	Participant Summary/Final Critique	176
Yeast	F1	Participant Summary/Final Critique	192
Parasitology	P	Participant Summary/Final Critique	195
Ticks, Mites, and Other Arthropods	TMO	Participant Summary	196
Worm Identification	WID	Participant Summary	197
Toxicology			
Drug Monitoring for Pain Management	DMPM	Participant Summary	108

*Notes:

- CAP Self-Reported Training Opportunities do not offer CE credit, but can be used toward fulfilling requirements for certification maintenance by agencies such as the American Society for Clinical Pathology (ASCP). Please verify with your certifying agency to determine your education requirements.
- These opportunities are subject to change. Refer to the Participant Summary/Final Critique for availability.

Continuing Certification (CC)

Continuing Certification (CC) is the board certification program that involves continuous professional development and ensures that an American Board of Pathology (ABPath) board-certified pathologist is committed to lifelong learning and competency in a specialty and/or subspecialty.

There are six competency categories defined by the American Board of Medical Specialties (ABMS) and endorsed by the ABPath to fulfill specific CC requirements. They are listed below with their descriptions.

All CAP education activities providing CME credits meet the CC Part II: Lifelong Learning requirements. Some programs will meet the requirements for CC Improvement in Health and Health Care (IHHC) (formerly Part IV) at the laboratory or the individual level. Programs that meet IHHC are identified within the description of the program.

Interpersonal and Communication Skills
Demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, patients' families, and professional associates.

Medical Knowledge
Demonstrate knowledge of established and evolving biomedical, clinical, and cognate sciences and the application of this knowledge to pathology.

Practice-Based Learning and Improvement
Demonstrate ability to investigate and evaluate diagnostic and laboratory practices in your own laboratory, to appraise and assimilate scientific evidence, and to improve laboratory practices and patient care.

Patient Care
Demonstrate a satisfactory level of diagnostic competence and provide appropriate and effective consultation in the context of pathology services.

Professionalism
Demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to diverse patient population.

Systems-Based Practice
Demonstrate understanding of and contribution to local, regional, and national health care systems, and support health care in systems-based practice definition.

Education Programs

Program Name	Program Code	Maximum *AMA PRA CME Category 1 Credits* Annually	Maximum CE Credits Annually	Format	Catalog Page
Autopsy Pathology*	AUP/AUP1	12.5	12.5	Online (DigitalScope®)	307
Clinical Pathology Improvement Program*	CPIP/CPIP1	15	NA	Online	14
Digital Slide Program—Dermatopathology*	DPATH/DPATH1	15	NA	Online (DigitalScope)	308
Digital Slide Program in FNA*	FNA/FNA1	10	10	Online (DigitalScope)	315
Fine-Needle Aspiration Glass Slide	FNAG/FNAG1	10	10	Glass Slides	316
Forensic Pathology*	FR/FR1	12.5	12.5	Online	318
Hematopathology Online Education*	HPATH/HPATH1	12.5	12.5	Online (DigitalScope)	149
Nongynecologic Cytopathology Education**	NGC/NGC1	25	25	Glass Slides With Online Cases (DigitalScope)	314
Navigating Multimodality Biomarker Assessment*	NMBA/NMB1	5	5	Online (DigitalScope)	303
Neuropathology Program*	NP/NP1	10	NA	Online (DigitalScope)	310
Gynecologic Cytopathology PAP Education Program***	PAPCE/APAPCE PAPJE/APAPJE PAPKE/APAPKE PAPLE/APAPLE PAPME/APAPME Series 1 or 2	8	8	Glass Slides	312
Glass Slide Cytopathology PAP PT Program (With Glass Slide PAP Education)***	PAPCPT/APAPCPT PAPJPT/APAPJPT PAPKPT/APAPKPT PAPLPT/APAPLPT PAPMPT/APAPMPT	8	8	Glass Slides	311
Performance Improvement Program in Surgical Pathology	PIP/PIP1	40	NA	Glass Slides With Online Cases (DigitalScope)	287
Online Performance Improvement Program in Surgical Pathology*	PIPW/PIPW1	40	NA	Online (DigitalScope)	286
Virtual Biopsy Program*	VBP/VBP1	25	NA	Online (DigitalScope)	288

*Program is available for purchase online. Go to cap.org and choose the Education tab.
**NGC provides up to 20 CME/CE credits for the glass slides and five CME/CE credits for the online slide portion of the program.
***PAP provides up to eight CME/CE credits for the glass slides.

System Requirements

DigitalScope is a web-based whole slide image (WSI) retrieval and viewing system. **The current version, DSv6.0, does not require Microsoft Silverlight.** DigitalScope is supported by the latest Chrome and Firefox releases, and the last two major Edge and Safari versions.

Find current information on system requirements on cap.org; click **Browser and Operating System Requirements** at the bottom of the homepage. Download speeds and appearance will vary depending on your internet connection, browser, and computer power.

Navigating Multimodality Biomarker Assessment NMBA/NMB1

Program Name	Program Code	Cases per Mailing
	NMBA/NMB1	
Multimodality biomarker assessment case analysis	▮	2

Biomarkers can be tested through a variety of methodologies (eg, flow cytometry, immunohistochemistry, next-generation sequencing, PCR-based testing, karyotype, FISH, clinical chemistry). Each modality has different technical strengths and weaknesses, along with varied analytical and clinical specifications such as sensitivity and specificity. Results may not be clearly concordant across the modalities. This program will challenge pathologists to resolve discrepancies between different methods or "multimodality" biomarker testing.

Program Information

- NMBA - Online program, whole slide images powered by DigitalScope technology (if available); NMBA provides CME or CE credit for one pathologist or laboratory professional.
- NMB1 - Reporting option with CME or CE credit for each additional pathologist or laboratory professional (within the same institution); must order in conjunction with program NMBA.
- Two mailings per year with two cases each mailing
- Earn a maximum of five CME credits (*AMA PRA Category 1 Credits™*) per pathologist and a maximum of five CE credits per laboratory professional per year.
- This activity meets the ABPath CC requirements for Improvement in Health and Health Care (IHCC).
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

Access CPIP cases when and where it's convenient using a PC or mobile device.

Pathologists can keep abreast of current scientific knowledge with interactive, case-based learning addressing common issues faced in the laboratory.

CPIP supports clinical pathologists as well as anatomic pathologists who cover clinical pathology. A diverse portfolio of real-life case scenarios, including images and clinical background, helps pathologists to stay current on issues and advances in the laboratory.

CPIP is designed for pathologists, by pathologists. Each case is developed and peer-reviewed, ensuring learning is practical and easily applied to work. Thought-provoking questions with feedback and multiple-choice knowledge checks assess and confirm diagnostic skills. Participants may apply 1.25 CME credits for each CPIP toward the ABPath's Continuing Certification (CC) requirements.

Clinical Pathology Improvement Program CPIP/CPIP1

Program Name	Program Code	Cases per Year
	CPIP/CPIP1	
Online cases in clinical pathology	∎	12

Consider CPIP for:

- Medical directors seeking to continuously improve the collective skills and clinical pathology knowledge of their team
- Pathologists with clinical and/or laboratory management responsibilities
- Pathologists seeking CME CC credits in clinical pathology
- Subspecialty clinical pathologists who need to keep current

Program Information

- CPIP - One online clinical laboratory case per month
- CPIP1 - Additional pathologist (within the same institution) reporting option with CME credit; must order in conjunction with CPIP.
- Earn a maximum of 15 CME credits *(AMA PRA Category 1 Credits™)* per year.
- Twelve cases per year; your CAP shipping contact will be notified via email when the activity is available.

Discipline	Case Schedule (subject to change)	Month 2026
Cytogenetics	Update and Testing Algorithms for Plasma Cell Disorders	January
Microbiology	HIV Testing	February
Hematology	Reactive Lymphocytoses	March
Transfusion	Indeterminate RhD Typing	April
Hematology	Red Cell Membrane and Enzymatic Defects	May
Molecular	Next Generation Sequencing & Molecular Basics	June
Chemistry	Westgard Rules Application in Quality Control	July
Transfusion	Patient Blood Management	August
Immunology	Syphilis Serology	September
Laboratory Management	Root Cause Analysis	October
Microbiology	Appropriate Microbiology Sample Collection	November
Hematology	Evaluation for Leukopenia	December

To learn more, visit cap.org and search for CPIP.

Competency Assessment Hub

A single platform for maintaining your staff competency and training records and providing CE credits

Presented in partnership with MediaLab, the CAP Competency Assessment Hub helps individual laboratories and entire health care networks ensure they meet CLIA competency assessment requirements and fulfill laboratory professional continuing education (CE) needs. Built on MediaLab's platform, the CAP's Competency Assessment Hub helps you stay in compliance and avoid being cited for a deficiency by managing your personnel's training and competency assessment performance and records.

- **System/network subscriptions now available—**Enroll your entire system and participate as individual, linked sites. Standardize your competency assessments across the system and provide centralized documentation.
- **Customizing tools—**The question bank lets you design your own assessment quizzes to match your laboratory's written procedures. The checklist tool, CourseBuilder, and Compass competency assessments can ensure convenient documentation for all six areas of competency as defined by CLIA and the CAP Laboratory Accreditation Program.
- **Auto-assignment of assessments and reminder emails—**Never forget your staffs' next assessments.
- **Intuitive reporting—**With just a few clicks, administrators can stay on top of documentation and records to track progress toward required dates and training for all staff members.
- **Instrument-specific checklists—**More than 130 standard checklists help you meet your laboratory's documentation needs.
- **High-quality Pro courses—**Your laboratory staff can earn PACE CE credits in a variety of disciplines and courses.
- **Easy online access—**The Competency Assessment Hub is cloud-based, so it's available 24/7 from any PC, laptop, or tablet—wherever you have an internet connection.

Add Safety & Compliance Courses especially developed for the laboratory

As an add-on option, the Competency Assessment Hub offers a package of nine complementary safety and compliance courses with PACE CE credits. The package is appropriate for annual laboratory-specific compliance training and for clinical laboratory science students prior to clinical rotations. These courses include:

- OSHA Bloodborne Pathogens
- OSHA Hazard Communication and Chemical Hygiene
- OSHA Electrical Safety
- OSHA Fire Safety
- OSHA Formaldehyde
- Tuberculosis Awareness for Healthcare Workers
- Medical Error Prevention: Patient Safety
- Ethics and Code of Conduct in Healthcare
- HIPAA Privacy and Security Rules

With the Competency Assessment Hub, you can keep your laboratory and network organized and inspection-ready every day of the year. Choose the Competency Assessment Hub subscription that best fits your needs. Please refer to the ordering information and course descriptions on the following pages. For more information, visit cap.org and choose Competency Assessment Hub from the Education Main Page via the Education tab.

Number of Users*	Competency Assessment Hub	Competency Assessment Hub With Optional Safety & Compliance Courses**
2 to 50	CA0050	CA0050 + XCA0050
51 to 250	CA0250	CA0250 + XCA0250

*For subscriptions for single users or more than 250 users and networks, please contact the CAP for more information.
**Safety & Compliance Course subscriptions require a standard Competency Assessment Hub subscription.

2026 Pro Courses

Blood Bank/Transfusion Medicine
- ABO typing discrepancies
- Antibody screen and identification
- Direct antiglobulin test
- Blood components—storage, handling, and selection
- Transfusion reactions
- Quality control in the blood bank laboratory

Chemistry
- Cardiac biomarkers
- Liver and renal testing
- Electrolytes, acid base, and anion gap
- Clinical toxicology
- Therapeutic drug monitoring
- Chemistry QC, calibration, and reportable range

Hematology/Coagulation
- Erythrocyte morphology
- Erythrocyte inclusions
- White blood cells (WBCs)
- WBC inclusions
- Common coagulation tests
- Platelet testing, morphology, and disorders

Histology
- Immunohistochemistry—part 1
- Immunohistochemistry—part 2
- Special stains
- Histology specimen handling
- Quality management in histology
- Safety issues in the histology laboratory

Immunology
- Hepatitis testing
- Qualitative HIV testing
- Human chorionic gonadotropin and fetal fibronectin
- Rapid serology kit tests
- Molecular amplification methods for detection of infectious diseases
- Monitoring the testing process in immunology

Microbiology
- Gram stain: organism detection and differentiation
- Urine and body fluid cultures
- Genital tract pathogens
- Blood cultures
- Microbiology of the gastrointestinal tract
- The microbiology of wounds

Phlebotomy/Specimen Processing
- Venipuncture
- Challenges of phlebotomy: pediatric blood collection, alternate sites, and difficult draws
- Phlebotomy professionalism and ethics
- Common pitfalls in specimen processing
- Specimen collection for workplace urine drug testing programs and forensic drug and alcohol testing
- General specimen handling and transportation requirements

Point-of-Care Testing CE credit
- Urine dipstick
- Whole blood prothrombin time and INR (PT/INR) testing
- Whole blood glucose testing
- Cardiac biomarkers
- Blood gas testing
- Provider-performed microscopy and limited waived testing

Quality Programs/Management
- New instrument method validation
- Monitoring the quality control program
- Document control
- Investigating occurrences (occurrence reports, root cause analysis, and corrective action)
- Competency evaluation
- Development and implementation of a quality management program

Safety
- General laboratory safety
- Bloodborne pathogens
- Laboratory waste and spill management
- Fire and electrical safety
- Hazardous chemicals
- SARS-CoV-2/COVID: biosafety precautions
- Ergonomics

Urinalysis/Body Fluids
- Physical and chemical urinalysis
- Microscopic urinalysis—part 1
- Microscopic urinalysis—part 2, crystals and casts
- Cerebrospinal fluid analysis
- Serous and synovial fluids
- Semen analysis

Safety & Compliance Courses

OSHA Bloodborne Pathogens—Addresses the OSHA Bloodborne Pathogens standard as it applies to clinical and medical laboratories. Covers major bloodborne pathogens, including hepatitis B and HIV. Focuses on proper handling of sharps, personal protective equipment (PPE), engineering controls such as microbiological safety cabinets, and proper work practices like handwashing.

OSHA Hazard Communication and Chemical Hygiene—Describes the OSHA Chemical Hygiene Standard and helps satisfy OSHA requirements for annual training. Explains Haz-Com, the National Fire Protection Agency diamond, the Safety Data Sheet, and common-sense laboratory safety rules applied to clinical laboratory practice.

OSHA Electrical Safety—Addresses electrical safety and electrical hazards commonly found in the clinical laboratory. Covers prevention and safety measures, fighting electrical fires, and treatment of electrical injuries.

OSHA Fire Safety—Teaches the basics of fire safety in the clinical laboratory, including classes of fire and key acronyms, such as PASS and RACE. Addresses fire prevention, drills, and firefighting techniques.

OSHA Formaldehyde—Covers essentials for any laboratory that uses formaldehyde or formalin. Shares facts about formaldehyde, safety risks, proper handling procedure, monitoring, spill cleanup, and PPE.

Tuberculosis Awareness for Health Care Workers—Provides background information about the spread of tuberculosis, purified protein derivative (PPD) testing procedures, CDC guidelines, and methods of control.

Medical Error Prevention: Patient Safety—Includes potential causes of medical errors in the clinical laboratory, important legislation and definitions, and steps laboratory professionals can take to reduce the impact of medical errors in their workplace. Serves as an ideal part of an effective medical error reduction program. Appropriate for both experienced and newer laboratory personnel.

Ethics and Code of Conduct in Health Care—Designed to guide health care employees on the importance of ethics and code of conduct by outlining privacy and patient health information regulations, conflict of interest, professional competence, effective communication, and more.

HIPAA Privacy and Security Rules—Addresses the Health Insurance Portability and Accountability Act of 1996 (HIPAA) privacy regulations and treatment of protected health information (PHI) in a succinct manner. Content is directed at laboratory staff, from desk personnel to phlebotomists to medical laboratory scientists. Includes technical and physical safeguards, minimum necessary standards, administrative requirements, and authorization.

Identify and control risks in your laboratory.

The Risk Management QM*Ed* online course provides a realistic case study as well as video commentary by CAP pathologists, inspectors, and ISO 15189 assessors. Learn how to:

- Find, prioritize, and control risks
- Use common tools
- Assess how your laboratory's culture is affecting risks

New video of laboratory huddles from Seattle Children's Hospital—a collaboration tool to reduce risk.

See the Continuing Education section.
Add QMEDRISK to your order.

"Managing risks is a mindset that needs to be present throughout the laboratory … This course will help you manage risk to a level that is acceptable to our physicians, our patients, and our administration."

Dr. Gaurav Sharma, MD, FCAP
Division Head of Regional Laboratories
Henry Ford Health System

QM*Ed*™ Online Educational Courses

Tailored education and quality tools developed with pathologist input

Quality Management Educational Resources (QM*Ed*) courses will help you:

- Build a quality management system (QMS)—one piece at a time—that sustains your continuous improvement and Lean efforts.
- Self-assess your current QMS against international quality standards.
- Interpret ISO 15189 requirements.
- Perform internal audits using tracer audit and process audit methods.
- Implement and refine occurrence management with root cause analysis.

Course Information

- Delivered on demand so you can pause, resume where you left off, and learn at your own pace
- Mobile-friendly so you can learn where and when you want
- Accessible for a minimum of twelve months
- Includes continuing education (CE) credit
- Individual learners use their own login with the ability to bookmark the course and continue where they left off.

About the Courses

Change Management *Order QMEDCHNG* NEW

Learn what drives a successful change project. Learn to anticipate and proactively address stakeholder resistance. Explore case studies of both small- and large-scale change initiatives in medical laboratories. Gain valuable insights from CAP member pathologists as they share their real-world experiences.

4 CE credits available

Risk Management *Order QMEDRISK*

Learn how different elements of the quality management system—internal audit, data analysis, daily meetings, etc—contribute to identifying and controlling risk. Learn best practices for managing risk, plus practical tools for all phases of the risk management process. This course features exemplary huddle meetings—both laboratory-wide and individual section huddles—from Seattle Children's Hospital, along with a case example showing how high-level risk assessment can be integrated into management review.

5 CE credits available

Quality Culture *Order QMEDQCUL*

This program—designed for laboratory medical directors, administrative directors, quality managers, and other leaders whose decisions affect the culture of their laboratory—provides an adaptable program for proactive culture change. Its unique Culture Assessment Tool helps laboratory leadership get a picture of where your organization is strong and where it needs to improve, then helps make culture change a reality. It also includes video commentary by CAP member pathologists.

4 CE credits available

Root Cause Analysis *Order QMEDROOT*

Designed for laboratory quality managers and implementation team members. Learn real-world methodology and tools to conduct and implement a root cause analysis, performing key steps based on a participant case study. Choose further examples based on your work setting (eg, hospital, reference laboratory, or contract research organization). Includes the RCA Performance and Feedback Toolkit, which an organization can use to guide and assess root cause analysis projects.

6 CE credits available

Mistake Proofing *Order QMEDMIST*

Learn to develop and revise processes, reduce errors, and handle risks. The course methodology is focused on five main categories of mistake-proofing tactics, with examples taken from laboratory medicine. It includes video commentary by CAP member pathologists who have experience using Lean and other process-improvement techniques.

4 CE credits available

Internal Auditing *Order QMEDAUDT*

Improve your internal audit capability with a proven methodology for process, tracer, and laser audits. Learn to prepare for interviews, communicate findings to your quality management team, and use audits to drive process improvements. Includes detailed, real-world examples you can use to build your own audit plans, plus multimedia presentations of key concepts.

3 CE credits available

Management Review *Order QMEDMGMT*

Understand the ISO 15189 requirements for management review. CAP ISO 15189 assessors cover structuring review meetings, communicating results, and prompting strategic management decisions—all to benefit your organization's health.

2 CE credits available

Quality Manual Development *Order QMEDMANL*

Go beyond a quality plan—develop a manual that organizes and communicates your laboratory's quality management system. The course materials include a well-written and effective sample manual, which you can use to organize and create your own. Plus, the CAP's ISO 15189 assessors demonstrate how to link your quality policy to quality objectives and metrics.

2 CE credits available

Document Control *Order QMEDDOCU*

This "how-to" course details how to control documents to meet ISO 15189 requirements, how to accomplish document control even with minimal resources (such as spreadsheets), and how document control contributes to cost containment. The CAP's ISO 15189 assessors provide commentary on common pitfalls and best practices.

2 CE credits available

QMS Implementation Roadmap *Order QMEDROAD*

Outlines the practical steps necessary to build, implement, and maintain a quality management system that meets the ISO 15189 standard. Video recordings of the CAP's ISO 15189 assessors provide perspective on best practices and pitfalls. Designed for laboratory quality managers and implementation team members.

2 CE credits available

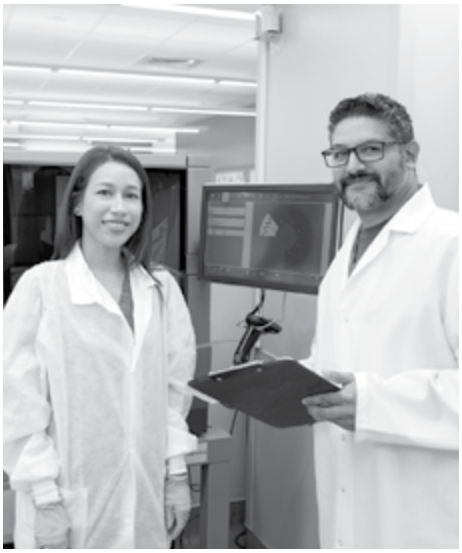
15189 Walkthrough *Order QMEDWALK*

This course summarizes each main clause of the ISO 15189 standard, clarifying its intent and key requirements. CAP assessors offer context in videos that also provide examples of how technical problems relate to fundamental deficiencies in the quality management system. This course, designed for laboratories considering implementation, is updated for the ISO 15189:2022 edition.

2 CE credits available

Make sure your laboratory team is ready to meet the challenges ahead. Add QM*Ed* courses to your order form. For more information, visit cap.org and search QM*Ed.*

3 Quality Management Tools



Easily integrate quality improvement into your daily work processes.

Measure and document your process improvements with these convenient tools:

- Analyze your test use and benchmark your results to other laboratories and/or systems (QPA5/QPA10).
- Meet requirements for competency element 5 and gain efficiency in your assessment of consistency for body fluid (QPB10/QPB25), peripheral blood smear (QPC10/QPC25), and Gram stain (QPD10/QPD25) morphologic observations.

Quality Management Tools

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Discontinued Programs

Laboratory Staffing Ratios QP251 (QPR-A)

Quality Management Tools

Benchmark outside your laboratory.

The CAP Quality Management Tools can improve your total testing process by providing a convenient solution to measure and document process improvements within your laboratory's quality management system.

- **Short-Term Quality Studies and Morphology/Competency Assessments** provide opportunities to benchmark performance indicators, compare normative rates, and assist your laboratory in meeting checklist requirements.
- **Continuous Quality Monitors** examine performance indicators such as turnaround time and specimen identification errors throughout the year, and meet checklist requirements.

Available for clinical pathology laboratories, Quality Management Tools examine preanalytic, analytic, and postanalytic phases, helping participants to:

- **Establish realistic goals** by comparing their performance against other institutions with comparable demographics.
- **Monitor progress** through unique and robust quality indicators on a periodic basis.
- **Make effective decisions** based on practical and in-depth quality management reports.
- **Improve efficiencies** to allow time for more patient-centric activities.
- **Easily integrate** quality improvement into their daily work processes.
- **Meet requirements** of the CAP Laboratory Accreditation Program checklists and The Joint Commission standards.

Purchase combination packages and save.

2026 Short-Term Quality Studies and Morphology/Competency Assessments	
Module/Package	**Program Code**
Individual Short-Term Quality Studies and Morphology/Competency Assessments	QPA5, QPA10, QPB10, QPB25, QPC10, QPC25, QPD10, QPD25
Four Quality Management Tools (QPA5, QPB10, QPC10, QPD10)	PRO

2026 Continuous Quality Monitors	
Module/Package	**Program Code**
Individual Continuous Quality Monitors	QT2, QT3, QT4, QT7, QT8, QT10, QT16, QT17
Clinical Pathology Module—includes all eight Continuous Quality Monitors	QTC

Complement your quality management program needs with these clinical pathology studies.

Clinical Pathology Study	Testing Phase			Purpose						
Select from the following studies to support your quality improvement initiatives.	Preanalytic	Analytic	Postanalytic	Clinical Pathology	Turnaround Time	Patient Safety	Microbiology	Transfusion Medicine	Chemistry/ Hematology	Customer Satisfaction
Comparative Inpatient Analyte Volumes for Individual and Integrated Laboratories (QPA5/QPA10)			■	■		■	■	■	■	
Assessment of Consistency of Body Fluid Morphologic Observations (QPB10/QPB25)		■	■	■		■			■	
Assessment of Consistency of Peripheral Blood Morphologic Observations (QPC10/QPC25)		■	■	■		■			■	
Assessment of Consistency of Gram Stain Morphologic Observations (QPD10/QPD25)		■	■	■		■	■			
Blood Culture Contamination (QT2)	■	■		■		■	■			■
Laboratory Specimen Acceptability (QT3)	■			■					■	■
In-Date Blood Product Wastage (QT4)			■	■		■		■		
Satisfaction with Outpatient Specimen Collection (QT7)	■			■		■				■
Stat Test Turnaround Time Outliers (QT8)		■		■	■	■			■	■
Critical Values Reporting (QT10)			■	■		■			■	■
Corrected Results (QT16)			■	■		■	■	■	■	■
Outpatient Order Entry Errors (QT17)	■			■		■	■		■	■

The CAP requires accredited laboratories to have a quality management plan that covers all areas of the laboratory and includes benchmarking key measures of laboratory performance (GEN.13806, GEN.20316, COM.04000). The Joint Commission requires accredited hospitals, laboratory staff, and leaders to regularly collect and analyze performance data (PI.01.01.01, PI.03.01.01, LD.03.06.01, LD.03.07.01). CLIA requires laboratories to monitor, assess, and correct problems identified in preanalytic, analytic, and postanalytic systems (§493.1200(b), §493.1239(c), §493.1249, §493.1289, §493.1299).

Short-Term Quality Studies and Morphology/Competency Assessments

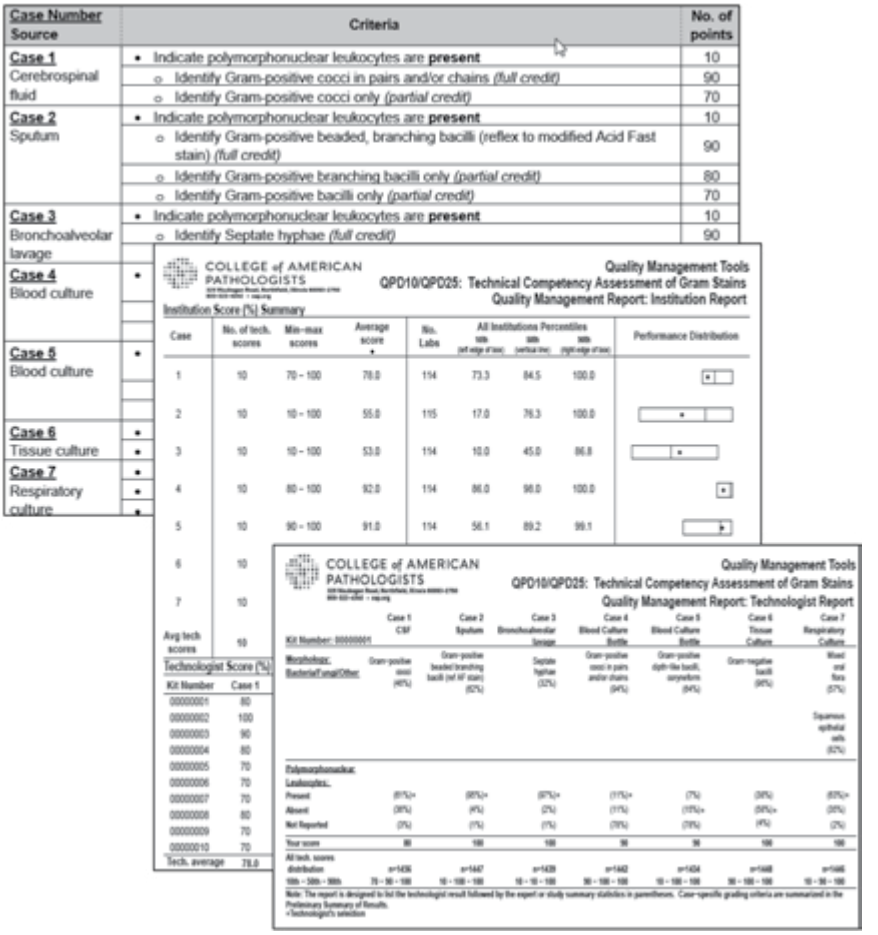
Implement quality monitoring—Use these comprehensive short-term quality studies and morphology/competency assessments to learn how to start monitoring and measuring key processes that may not be commonly monitored in your laboratory. These assessments also analyze emerging industry trends and topics to keep your laboratory ahead of the curve.

Gain experience in data collection and analysis—Based on data collected and submitted between predetermined dates, the CAP provides personalized reports with the individual participant's performance compared against peers.

Strengthen your quality assessment expertise—CAP pathologist experts provide in-depth discussions and identify best practices for laboratories to strive for. In addition, the studies' consolidated results are carefully reviewed and analyzed to be published in the form of scientific articles.

Participating laboratories receive:

- User Guides
- Templates and instructions for data collection
- Individual Participant Summaries and interpretation guides
- Data distributions and initial analysis of laboratory practices
- Data Analysis and Critiques with author commentaries on improvement opportunities, dependent on study type and complexity
- Morphology/Competency Program inclusions:
  - o Participant Summary Reports have institution and individual study results.
  - o Data Analysis and Critique has commentaries from subject matter experts on the importance of each case with links for viewing the online slides and annotations of significant morphology.



Case Number Source	Criteria	No. of points
Case 1 Cerebrospinal fluid	• Indicate polymorphonuclear leukocytes are **present**	10
	o Identify Gram-positive cocci in pairs and/or chains *(full credit)*	90
	o Identify Gram-positive cocci only *(partial credit)*	70
Case 2 Sputum	• Indicate polymorphonuclear leukocytes are **present**	10
	o Identify Gram-positive beaded, branching bacilli (reflex to modified Acid Fast stain) *(full credit)*	90
	o Identify Gram-positive branching bacilli only *(partial credit)*	80
	o Identify Gram-positive bacilli only *(partial credit)*	70
Case 3 Bronchoalveolar lavage	• Indicate polymorphonuclear leukocytes are **present**	10
	o Identify Septate hyphae *(full credit)*	90
Case 4 Blood culture	•	
Case 5 Blood culture	•	
Case 6 Tissue culture	•	
Case 7 Respiratory culture	•	

NEW

Comparative Inpatient Analyte Volumes for Individual and Integrated Laboratories QPA5/QPA10

Introduction

It is well established that test ordering practices vary widely between health care providers even when adjusted for similar patient populations and conditions. These practices may involve test menu configuration, ordering protocols, or restriction policies such as use of laboratory formularies. Similarly, ordering practices can vary between facilities within the same health care system. A method to evaluate potential gaps in test utilization practices is to compare the adjusted volume of specific tests ordered between facilities both within the same health care system of laboratories and between different health care systems of laboratories. Differences detected in the quantity of specific tests performed can be useful for laboratories to identify potential issues in test-ordering practices. Ultimately, these gaps can affect the appropriateness of testing and optimal diagnosis and treatment for patients.

Objectives

The purpose of this study is to provide laboratory management participants with comparative benchmarks of various annual inpatient test analyte volumes. Test volumes will be standardized to optimize comparability amongst facilities. Findings can assist participants with their laboratory test ordering stewardship programs, and in meeting CAP Laboratory Accreditation Program Checklist statements GEN.20316, QMS Indicators of Quality, to identify tests that are redundant, excessive, or noncontributory to good patient care, and evidence of compliance with DRA.10440 Effective Quality Management System, and DRA.10700 Director Responsibility—Consultations.*

In addition, associations between test volumes and ordering practices in use by participants, such as menu design, reflex testing, decision support, standing orders, and restriction policies, will be evaluated.

Performance Indicators

- Standardized annual inpatient test volumes

Your Reports – What to Expect

Your institution's standardized test volume results for each inpatient test studied in comparison to:

- Similar participating institutions
- Institutions within your integrated system, if applicable

If an institution reports a standardized inpatient test volume at higher or lower percentiles, the results can be seen on their Individual Report of Results for further examination.

Program Information

To meet your individual (single laboratory) or integrated system (more than one laboratory within a system) requirements, order as follows:

- Result forms for 1–5 laboratories (QPA5)
- Result forms for up to 10 laboratories (QPA10)
- Multiple orders may be purchased to accommodate a higher quantity of sites.

***Applicable requirements:**

- CLIA requirements: Collection of data and performance improvement, test appropriateness: §493.1200(b), §493.1200(c), §493.1239(c)
- CAP Laboratory Accreditation Program Checklist statements: GEN.20316, QMS Indicators of Quality; DRA.10440 Effective Quality Management System (QMS): The laboratory director ensures an effective QMS for the laboratory; DRA.10700 Director Responsibility—Consultations: The laboratory director provides for intralaboratory consultations and clinical consultations regarding the ordering of appropriate tests and the medical significance of laboratory data.
- Joint Commission Standards,: LD.03.01.01 (EP 1, EP 2), LD.03.02.01 (EP 1, EP 2): leaders create and maintain a culture of safety and quality throughout the laboratory, collect and use data and information to guide decisions... in the performance of processes supporting safety and quality; LD.03.03.01 (EP 1), LD.03.05.01; PI.01.01.01 (EP 2, EP 18): the laboratory collects data to determine whether tests it offers meet the needs of the clinical staff and the population served.

This is a one-time study conducted in the first quarter.

Assessment of Consistency of Body Fluid Morphologic Observations QPB10/QPB25

Introduction

Laboratories receive a variety of body fluids for evaluation that technologists review. Technical staff must maintain their identification skills of these specimens, and laboratories are required to provide education and assess consistency of reporting morphology among staff and competency of body fluid cell identification on an annual basis.

Objectives

This study will assess the effectiveness of educational and practical experience policies and procedures dedicated to the laboratory's efforts in maintaining technologist skills in the performance of accurate body fluid cell counts and identification of other body fluid features. Results of this study will assist individuals, the laboratory director, and the manager with areas to focus on for improvement and education.

The study will help management meet applicable CLIA, CAP Laboratory Accreditation Program, and The Joint Commission laboratory requirements for consistency of reporting morphology among staff and personnel competency requirements (testing previously analyzed specimens).*

Data Collection

Technologists will access a series of online, whole slide images to assess their ability to perform cell differentials on Wright-stained body fluids and to identify miscellaneous cells and inclusions in cytocentrifuged preparations using their own kit and result form. Participants will provide additional information about their competency assessment programs, continuing education, and professional background. Information will be collected from each site regarding their institution's minimum continuing education programs and requirements for their technologists in who review body fluids, and relevant procedures and policies related to body fluid review assessment.

Information will be collected from each site regarding their institution's minimum continuing education requirements for their technologists in hematology and relevant procedures and policies related to body fluid slide review.

Performance Indicators

- Individual technologist score based on a standardized competency assessment method to determine a technologist's ability to identify various white blood cell types, microorganisms, and other cells and inclusions present in normal and abnormal cases
- Overall laboratory score based on the facility's individual technologist performance(s)

Your Reports – What to Expect

- A participant summary explaining the grading criteria for each case and how to read the reports
- An institution report with your facility's score summary with comparison to other institutions and a technologist score summary by case for each participant
- An individual report for each participant listing their responses and score for each case
- A data analysis and critique with analysis of the institution and participant scores, author commentary about each case, and links to annotated slides

Program Information

To meet your technical staff morphology and competency assessment requirements:

- Result forms for up to 10 technologists (QPB10)
- Result forms for up to 25 technologists (QPB25)
- Multiple orders may be purchased to accommodate the quantity of technologist result forms needed.

***Participation in this study helps laboratories meet applicable requirements:**

- CLIA personnel requirements (Subpart M, 42 CFR §493.1)
- CAP Laboratory Accreditation Program Checklist statements: HEM.35566, consistency of morphologic observation among personnel performing body fluid cell differentials at least annually; GEN.55500, Competency Assessment of Testing Personnel (element 5); GEN.55525, Performance Assessment of Supervisors/Consultants; DRA.11425, functions or responsibilities are properly performed by a qualified individual
- The Joint Commission Standards HR.01.05.03, 01.06.01 (EPs 3, 18,19), HR.01.07.01, PI.03.01.01(EPs 3-5), and LD.04.05.01, 04.05.03 (EPs 1-6) regarding in-service training, continuing education, competency, and evaluation of staff members

This is a one-time study conducted in the second quarter.

Assessment of Consistency of Peripheral Blood Morphologic Observations QPC10/QPC25

Introduction

The widespread use of automated white blood cell (WBC) differential counts and computer-generated whole slide imaging has decreased the time that the medical laboratory scientist/technologist staff dedicate to morphological assessment of blood cells. However, these staff must maintain their morphological skills. Laboratories have an annual requirement to do a morphologic comparison of their technical staff's peripheral blood smear results, assess their competency on peripheral blood smears, and provide appropriate education.

Objectives

This study will help assess the effectiveness of educational and practical experience policies and procedures dedicated to the laboratory's efforts in maintaining technologist skills in the performance of accurate WBC differential counts and other peripheral blood smear morphological assessments. The evaluation provided will assist in the construction of individual educational programs for the technical staff and show areas that need focused review and improvement. The study will help management meet applicable CLIA, CAP Laboratory Accreditation Program, and The Joint Commission laboratory requirements for consistency of reporting morphology among staff and personnel competency requirements (testing previously analyzed specimens).*

Data Collection

A series of online, whole slide images of Wright or Wright-Giemsa-stained peripheral blood smears using DigitalScope® technology will be available to each participating institution to assess technologists' performance on WBC differential counts and morphology assessment. Each technologist will receive their own kit. Technologists will provide information about their continuing education and professional background. Information will be collected from each site regarding their institution's minimum continuing education requirements for their technologists in hematology and relevant procedures and policies related to peripheral blood smear assessment.

Performance Indicators

- Individual technologist score based on a standardized competency assessment method to determine a technologist's ability to identify various WBC types, red blood cell morphology, and platelet morphology in normal and abnormal cases
- Overall laboratory score based on the facility's individual technologist performance(s)

Your Reports – What to Expect

- A participant summary explaining the grading criteria for each case and how to read the reports
- An institution report with your facility's score summary with comparison to other institutions and a technologist score summary by case for each participant
- An individual report for each participant listing their responses and score for each case
- A data analysis and critique report with analysis of the institution and participant scores, author commentary about each case, and links to annotated slides

Program Information

To meet your staff comparative morphology and technical competency assessment requirements:

- Result forms for up to 10 technologists (QPC10)
- Result forms for up to 25 technologists (QPC25)
- Multiple orders may be purchased to accommodate the quantity of technologist result forms needed.

Preliminary study reports are provided at institution and technologist levels.

***Participation in this study helps laboratories meet applicable requirements:**

- CLIA personnel requirements (Subpart M, 42 CFR §493.1)
- CAP Laboratory Accreditation Program Checklist statements: HEM.34400, consistency of morphologic observation among personnel performing blood cell microscopy at least annually; GEN.55500, element 5, Competency Assessment of Testing Personnel; GEN.55525, Performance Assessment of Supervisors/Consultants; DRA.11425, functions or responsibilities are properly performed by a qualified individual
- The Joint Commission Standards HR.01.05.03, 01.06.01 (EPs 3, 18,19), HR.01.07.01, PI.03.01.01(EPs 3-5), and LD.04.05.01, 04.05.03 (EPs 1-6) regarding in-service training, continuing education, competency, and evaluation of staff members.

This is a one-time study conducted in the third quarter.

Assessment of Consistency of Gram Stain Morphologic Observations QPD10/QPD25

Introduction

Gram stain is a commonly performed bacterial stain in clinical microbiology laboratories. It is often the starting point guiding microbiological workup and initial clinical diagnosis and therapy. It is important for medical laboratory scientist/technologist staff who read Gram stains to provide an accurate interpretation based on reaction type and microscopic morphology, in order to provide presumptive identifications and quantification of bacteria and fungi in clinical specimens.

Objectives

This study will help assess the effectiveness of educational and practical experience policies and procedures dedicated to the laboratory's efforts in maintaining technologist skills in the morphological assessment of Gram stains. Participation in this study will help management assess the technologist's ability to evaluate Gram stains using online, whole slide images. These cases provide a standardized review and evaluation for each technologist. The study will help management meet applicable CLIA, CAP Laboratory Accreditation Program, and The Joint Commission laboratory requirements for morphology consistency of reporting among staff and personnel competency requirements (testing previously analyzed specimens).*

Data Collection

A series of online, whole slide images of Gram-stained smears using DigitalScope technology will be provided to each participating institution to assess technologists' ability to detect various microorganisms. Technologists will provide information about their work experience related to Gram stains, continuing education, and professional background. Information will be collected from each laboratory site about their continuing education requirements in microbiology and relevant laboratory procedures and policies related to Gram stain assessment. Each technologist will receive their own kit and result form.

Performance Indicators

- Individual technologist score for each Gram stain case, and overall based on a standardized competency assessment method
- Overall laboratory score based on the facility's individual technologist performance(s)

Your Reports – What to Expect

- A participant summary explaining the grading criteria for each case and how to read the reports
- An institution report with your facility's score summary with comparison to other institutions and a technologist score summary by case for each participant
- An individual report for each participant listing their responses and score for each case
- A data analysis and critique report with analysis of the institution and participant scores, author commentary about each case, and links to annotated slides

Program Information

To meet your staff comparative morphology and technical competency assessment requirements:

- Result forms for up to 10 technologists (QPD10)
- Result forms for up to 25 technologists (QPD25)
- Multiple orders may be purchased to accommodate the quantity of technologist result forms needed.

Preliminary study reports are provided at institution and technologist levels.

***Participation in this study helps laboratories meet:**

- CLIA personnel requirements (Subpart M, 42 CFR §493.1)
- CAP Laboratory Accreditation Program Microbiology Checklist statements: MIC.11060, Culture Result Reporting, personnel performing Gram stains for this purpose are subject to competency assessment; MIC.11350, Morphologic Observation Evaluation, the laboratory evaluates consistency of morphologic observation among personnel performing microscopic analysis (eg, stains, wet preparations) from direct specimens and cultured organisms at least annually. The laboratory director or designee must determine acceptability criteria for agreement.
- CAP Laboratory Accreditation Program Checklist items: GEN.55500, element 5, Competency Assessment of Testing Personnel; GEN.55525, Performance Assessment of Supervisors/Consultants; DRA.11425, functions or responsibilities are properly performed by a qualified individual.
- The Joint Commission Standards HR.01.05.03, 01.06.01 (EPs 3, 18,19), HR.01.07.01, PI.03.01.01(EPs 3-5), and LD.04.05.01, 04.05.03 (EPs 1-6) regarding in-service training, continuing education, competency, and evaluation of staff members

This is a one-time study conducted in the fourth quarter.

Continuous Quality Monitors

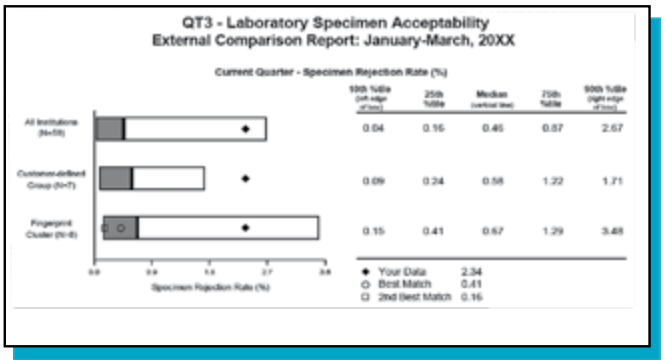
Use these programs to:

- Identify and continuously monitor quality improvement over time.
- Measure the effectiveness and impact of implemented changes in key processes.

How It Works

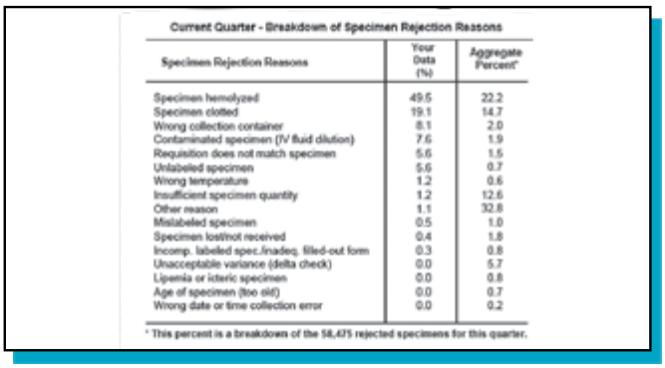
Step 1:

Establish realistic benchmarks by comparing your laboratory to others like yours.



Step 2:

Identify improvement opportunities.



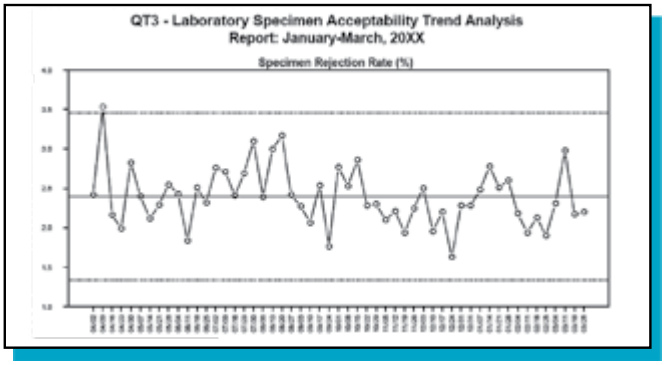
Current Quarter - Breakdown of Specimen Rejection Reasons

Specimen Rejection Reasons	Your Data (%)	Aggregate Percent*
Specimen hemolyzed	49.5	22.2
Specimen clotted	19.1	14.7
Wrong collection container	8.1	2.0
Contaminated specimen (IV fluid dilution)	7.6	1.9
Requisition does not match specimen	5.6	1.5
Unlabeled specimen	5.6	0.7
Wrong temperature	1.2	0.6
Insufficient specimen quantity	1.2	12.6
Other reason	1.1	32.8
Mislabeled specimen	0.5	1.0
Specimen lost/not received	0.4	1.8
Incomp. labeled spec./inadeq. filled-out form	0.3	0.8
Unacceptable variance (delta check)	0.0	5.7
Lipemia or icteric specimen	0.0	0.8
Age of specimen (too old)	0.0	0.7
Wrong date or time collection error	0.0	0.2

* This percent is a breakdown of the 58,475 rejected specimens for this quarter.

Step 3:

Monitor improvement over time to ensure accurate results, patient safety, and quality patient care.



The individual reports include performance of quality indicators over time, benchmarking information, trends, and suggested areas for improvement.

Participating laboratories receive:

- User Guide
- Templates and instructions for data collection
- Quarterly reports that include fingerprint clusters, customer-defined groups, and all-institution comparisons
- Access to the Peer Directory, allowing you to connect with your counterparts enrolled in the same program

Blood Culture Contamination QT2

Despite advances in blood culture practices and technology, false-positive blood culture results due to contaminants continue to be a critical problem. Blood culture contamination rate, the primary indicator of preanalytic performance in microbiology, is associated with increased length of hospital stay, additional expense, and inappropriate antibiotic usage. The results of this study may contribute to report findings to hospital/system antibiotic stewardship programs.

The CAP and other accrediting organizations require you to monitor and evaluate key indicators of quality for improvement opportunities. Use this monitor to help meet CAP Laboratory Accreditation Program Checklist statements MIC.22630 and MIC.22635: "The laboratory must determine and regularly review the number of contaminated cultures. Tracking the contamination rate and providing feedback to units and persons drawing cultures is one method that has been shown to reduce contamination rates." This will also help laboratories meet The Joint Commission Standard QSA 04.07.01 EP 3.

Objective

This study will determine the rate of blood culture contamination using standardized criteria for classifying contaminants.

Data Collection

On a monthly basis, participants will tabulate the total number of blood cultures processed and the total number of contaminated blood cultures. Blood cultures from neonatal patients are tabulated separately. For the purposes of this study, participants will consider a blood culture to be contaminated if they find one or more of the following organisms in only one of a series of blood culture specimens: *Aerococcus* spp., *Bacillus* spp. (excluding *Bacillus anthracis*) and related genera, *Corynebacterium* spp. and related Coryneform genera, *Cutibacterium* spp. or *Propionibacterium* spp., *Micrococcus* spp. and related genera; *Rothia mucilaginosa*, *Coagulase-negative staphylococci*, and *Streptococcus* spp. (viridans group only). Participants have the option to monitor institution-specific subgroups (for example, a specific department or patient population).

Performance Indicators

- Neonatal contamination rate (%)
- Other contamination rate (%)
- Overall contamination rate (%)

Laboratory Specimen Acceptability QT3

A substantial amount of rework, diagnostic and therapeutic delay, and patient inconvenience can result from specimen rejection. Patient redraws may result from unlabeled, mislabeled, and incompletely labeled specimens; clotted and/or hemolyzed specimens; or insufficient specimen quantity. By continuously monitoring specimen acceptability, collection, and transport, laboratories can promptly identify and correct problems. Enrollment in this study may assist the laboratory in monitoring compliance with CAP Laboratory Accreditation Program General Checklist statement GEN.40825: "There is a system to positively identify all patient specimens, specimen types, and aliquots at all times." The Joint Commission Standard PI.01.01.01, EP 17, is applicable: "The laboratory collects data to monitor its performance" including "processes or outcomes related to handling specimens, including specimen collection, labeling, preservation, transportation, and rejection.

Objective

This study will identify and characterize unacceptable blood specimens that are submitted to the chemistry and hematology/coagulation sections of the clinical laboratory for testing.

Data Collection

This monitor includes all blood specimens submitted for testing to the chemistry and hematology departments of the clinical laboratory. On a weekly basis, participants will record the total number of specimens received, the number of rejected specimens, and the primary reason each specimen was rejected.

Performance Indicator

- Specimen rejection rate (%)

Performance Breakdown

- Breakdown of reasons for rejection (%)

Look in e-LAB Solutions Suite for your input forms approximately two weeks before the start of the next quarter.

In-Date Blood Product Wastage QT4

Blood for transfusion is a precious resource. At a minimum, wastage of blood that is not out-of-date represents a financial loss to the health care system. More ominously, systemic wastage of blood may reflect an environment of care that is out of control and may pose risks to patient safety.

Enrollment in this program assists laboratories in meeting regulatory requirements as follows:

- CAP Laboratory Accreditation Program Checklist statements TRM.40875, which requires the transfusion service medical director to monitor and audit transfusion practices to ensure the appropriate use of blood; TRM.30800, Disposition Records; and TRM.32275, Component Records, regarding recording the use of each blood or component product from receipt to final disposition.
- The Joint Commission Standards QSA.05.02.01, adequate blood and blood components; QSA.05.03.03, requirements for policies and procedures for returning unused blood products to blood transfusion services; and QSA.05.22.01, records of blood product disposition.
- AABB Standards for Blood Banks and Transfusion Services assessment 8.2, which requires transfusing facilities to have a peer-review program that monitors transfusion practices for blood components.

Objective

This study will compare the rates of blood product wastage (ie, units discarded in-date) in participating hospitals and track rates of improvement over time.

Data Collection

On a monthly basis, participants will use blood bank records to obtain information on the total number of units transfused for each type of blood component. Participants will track the number and type of blood units that are wasted in-date and the circumstances of wastage. This monitor includes the following types of blood components: whole blood (allogeneic), red blood cells (allogeneic), frozen plasma, platelet concentrates, single donor platelets, and cryoprecipitate.

Performance Indicators

- Overall blood wastage rate (%)
- Wastage rates by blood component type (%)

Performance Breakdown

- Breakdown of circumstances of wastage (%)

Look in e-LAB Solutions Suite for your input forms approximately two weeks before the start of the next quarter.

Satisfaction With Outpatient Specimen Collection QT7

Specimen collection is one of the few areas of laboratory medicine that involves direct outpatient contact. As a result, patient satisfaction with this service is a vital indicator of quality laboratory performance. The CAP's Laboratory Accreditation Program requires measurement of patient satisfaction with laboratory services (Checklist statement GEN.20335). The Joint Commission Standard PI.01.01.01, EP 14 is applicable: "The laboratory collects data on the following: Patient perception of the safety and quality of laboratory services." Use this monitor to help meet this requirement.

Objective

This study will assess patient satisfaction with outpatient phlebotomy services by measuring patients' assessments of laboratory service hours, waiting time, comfort level, professionalism and courtesy, and privacy.

Data Collection

On a monthly basis, participants will provide copies of a standardized questionnaire in English and Spanish to a minimum of 25 outpatients (maximum of 99 outpatients) using predetermined data collection criteria. This monitor includes any outpatient undergoing venipuncture. It excludes patients seen in the emergency department, ambulatory surgery area, urgent care facility, chest pain center, 23-hour short-stay facility, employee health department, outpatient health screening fair/promotion, dialysis center, nursing home, or extended care facility.

Performance Indicators

- Satisfaction scores and satisfaction rates (% of patients rating 4 or 5) for the following categories:
  - Overall experience
  - Waiting time
  - Patient comfort
  - Professionalism and courtesy
  - Patient privacy
  - Laboratory hours of operation

Stat Test Turnaround Time Outliers QT8

The stat test turnaround time (TAT) outlier rate, expressed as a percentage of tests missing target reporting times, is a measure of outcomes that evaluates how well the laboratory meets patient and clinician needs. This monitor helps meet CAP Laboratory Accreditation Program Checklist statement GEN.20316: "The QM program includes monitoring key indicators of quality in the preanalytic, analytic, and postanalytic phases."

Objective

This study will monitor the frequency that stat test TAT intervals exceed institutional stat test TAT expectations.

Data Collection

Before beginning data collection, participants will establish a specimen receipt-to-report deadline for emergency department (ED) stat potassium tests. On six predetermined days per month, participants will monitor the TAT of up to 10 randomly selected ED stat potassium tests on each of the three eight-hour shifts (up to 180 tests per month) and track the number of ED stat potassium results reported later than the established reporting deadline. This monitor includes stat potassium tests ordered as part of a panel and excludes stat potassium levels that are requested on body fluids other than blood, as part of timed or protocol studies, or after the specimen arrives in the laboratory.

Performance Indicator

- Stat test TAT outlier rate (%)

Performance Breakdowns

- Breakdown of outliers by shift (%)
- Breakdown of outliers by day of week (%)

Look in e-LAB Solutions Suite for your input forms approximately two weeks before the start of the next quarter.

Critical Values Reporting QT10

Laboratories commonly refer to critical values as results requiring immediate notification to the physician or caregiver for necessary patient evaluation or treatment. Regulations from agencies and accreditors such as the CMS, The Joint Commission (National Patient Safety Goal NPSG.02.03.01 and DC.02.01.01, reporting patient results, including ...the process for reporting imminent life-threatening results, or panic or alert values), and the CAP Laboratory Accreditation Program (Checklist statement GEN.20316, COM.30000, COM.30100) mandate that laboratories develop and implement an alert system for critical values. Use this monitor to document compliance with your laboratory's alert plan.

Objective

This study will evaluate the documentation of successful critical values reporting in the general laboratory for inpatients and outpatients.

Data Collection

On a monthly basis, participants will evaluate 120 inpatient and 120 outpatient critical values. Data collection will include general chemistry, hematology, and coagulation analytes on the critical values list. Retrospectively, participants will record the total number of critical values monitored and the number with documentation of successful notification. In addition, participants will provide the number of critical values that were not communicated within three hours, the number of failed notifications due to laboratory oversight, and the number of successful notifications to licensed caregivers. This monitor will exclude critical values for cardiac markers, drugs of abuse, therapeutic drug levels, urinalysis, blood gases, point-of-care tests, and tests performed at reference laboratories.

Performance Indicators

- Total critical values reporting rate (%)
- Inpatient critical values reporting rate (%)
- Outpatient critical values reporting rate (%)
- Failed notification (< 3 hours) rate (%)

Look in e-LAB Solutions Suite for your input forms approximately two weeks before the start of the next quarter.

Corrected Results QT16

The CAP developed this monitor in recognition of the importance of timely detection and correction of erroneous laboratory results. Accuracy in laboratory results is critical to the effectiveness of a physician's plan of care for a patient. An erroneous result can delay or alter patient treatment; therefore, detection of erroneous results should be a priority in every laboratory and should be monitored as a key quality indicator. Use this monitor to help measure your compliance with CLIA 493.1299, Postanalytic Systems Quality Assessment, and help meet CAP Laboratory Accreditation Program Checklist statements GEN.20316, 41310, 41312, and The Joint Commission Standard 02.12.01, Elements of Performance 9 and 10.

Objective

This study will monitor the number of corrected test results within individual institutions and compare performance with that of all institutions and those institutions similar to yours.

Data Collection

On a monthly basis, participants will monitor the number of corrected test results and the total number of billable tests for that month. Include test results for all patients in all care settings with the following exclusions: anatomic pathology tests, narrative physician-interpreted tests (eg, bone marrow biopsies and peripheral smear reports), and point-of-care tests.

Performance Indicator

- Test result correction rate (per 10,000 billable tests)

Outpatient Order Entry Errors QT17

Order accuracy bears an obvious relationship to the quality of laboratory testing. When the laboratory fails to complete a requested test, it delays the diagnostic evaluation, consumes unnecessary resources, causes patient inconvenience, and may prolong therapy. When the laboratory completes a test that was not requested, the cost of care increases, patients may be subjected to unnecessary phlebotomy, and laboratory efficiency declines. Use this monitor to help meet CAP Laboratory Accreditation Program Checklist statements GEN.20316, 40700, 40725, 40750 for test order and related information accuracy, and The Joint Commission Standard DC.01.02.01: The laboratory performs testing based on written laboratory test orders.

Objective

This study will measure the incidence of incorrectly interpreted and entered outpatient physician test orders into the laboratory information system, compare performance across institutions, and track performance over time.

Data Collection

On six preselected weekdays per month, participants will compare eight outpatient requisitions or order sheets to the orders entered into the laboratory's information system to determine if any order entry errors occurred.

This monitor includes test order review from ambulatory outpatients seen in offices and clinics operated by laboratory services, private physician offices, nursing homes, extended care facilities, and free-standing phlebotomy areas. Also included are send-out tests, chemistry, hematology, microbiology, immunology, toxicology, and urinalysis tests on outpatients. Order entry error categories include requesting physician errors, incorrect and extra test orders, missing test orders and diagnosis codes, test priority errors, and copy or fax result errors.

This monitor excludes tests performed in transfusion medicine or anatomic pathology, and also excludes tests from the following patient care settings: inpatient, emergency department, ambulatory surgery, urgent care, chest pain center, 23-hour short-stay facility, employee health department, outpatient screening fair/promotion, and dialysis center.

Performance Indicators

- Overall outpatient order entry error rate (%)
- Order entry error rates by type (%)

Performance Breakdown

- Breakdown of error types (%)

Look in e-LAB Solutions Suite for your input forms approximately two weeks before the start of the next quarter.

4 Quality Cross Check

Test multiple instruments at one time—Quality Cross Check is not PT and not subject to CMS restrictions.

Simplify your semiannual instrument comparability studies. Our customized reports feature peer group evaluations and detailed instrument comparability statistics, all in compliance with CLIA and accreditor requirements.

Program Changes

Fibrin(ogen) Degradation Products, Serum has been removed from Quality Cross Check—Coagulation (CGLQ) 46

Discontinued Programs

Quality Cross Check—Activated Clotting Time (CTQ)
Quality Cross Check—Hematology (FH4Q)

Perform instrument comparability and stay in compliance

Quality Cross Check is a convenient solution to monitor instrument performance and assess comparability across multiple instruments in your laboratory and to identify potential issues before they affect patient results.

How It Works

- Receive three challenges in each of two mailings a year.
- Report up to three instruments for each challenge (and report up to 30 instruments for Quality Cross Check—Whole Blood Glucose).
- Receive a custom report package that includes peer group comparison and instrument comparability statistics for each reported analyte.

Stay in Compliance

In August 2015, the Centers for Medicare & Medicaid Services (CMS) reiterated that laboratories are not permitted to test proficiency testing (PT) samples on multiple instruments unless that is how the laboratory tests patient specimens.

The CMS interpretation was expanded beyond regulated analytes to include analytes not listed in Subpart I of the Clinical Laboratory Improvement Amendments regulations, including waived methods.

Quality Cross Check complements your existing CAP programs to monitor multiple instrument performance and is compliant with the CMS directive.

Monitoring Performance of Glucose Meters

Beginning in 2017, PT for waived whole blood glucose on glucose meters was no longer required for laboratories accredited by the CAP. Laboratories are required to perform alternative performance assessment.

In response to this change, the CAP introduced the Quality Cross Check—Whole Blood Glucose program (WBGQ). Participants in this program will enjoy the benefits of Quality Cross Check and have the ability to report up to 30 instruments for each challenge.

General Chemistry and Therapeutic Drug Monitoring

Quality Cross Check—Chemistry and Therapeutic Drug Monitoring CZQ

Analyte	Program Code	Challenges per Shipment
	CZQ	
See program CZ analytes on pages 54–56	▮	3

This program does not meet regulatory requirements for proficiency testing; see program CZ on pages 54–56. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 5.0-mL liquid serum specimens in duplicate
- Report up to three instruments.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Quality Cross Check—B-type Natriuretic Peptides BNPQ

Analyte	Program Code	Challenges per Shipment
	BNPQ	
BNP	▮	3
NT-proBNP	▮	3

This program does not meet regulatory requirements for proficiency testing; see program BNP5 on page 60. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 1.5-mL liquid specimens
- Report up to three instruments.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Quality Cross Check—Whole Blood Glucose WBGQ

Analyte	Program Code	Challenges per Shipment
	WBGQ	
Glucose	▮	3

The CAP Accreditation Programs require all accredited laboratories performing waived whole blood glucose testing using glucose meters to perform alternative performance assessment. This program can be used to meet alternative performance assessment requirements.

Program Information

- Three 2.0-mL whole blood specimens
- Report up to 30 instruments.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

CE credit

Quality Cross Check—Body Fluid Chemistry FLDQ

Analyte	Program Code	Challenges per Shipment
	FLDQ	
Albumin	▮	3
Amylase	▮	3
CA19-9	▮	1
Carcinoembryonic antigen (CEA)	▮	1
Cholesterol	▮	3
Creatinine	▮	3
Glucose	▮	3
Lactate	▮	3
Lactate dehydrogenase (LD)	▮	3
pH	▮	3
Protein, total	▮	3
Triglycerides	▮	3
Urea nitrogen	▮	1

This program does not meet regulatory requirements for proficiency testing; see program FLD on page 71. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 3.0-mL simulated liquid body fluid specimens in duplicate
- Report up to three instruments.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Quality Cross Check—Hemoglobin A1c GHQ

Analyte	Program Code	Challenges per Shipment
	GHQ	
Hemoglobin A1c	▮	3

This program does not meet regulatory requirements for proficiency testing; see program GH5 on page 62. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 0.8-mL previously frozen liquid specimens in triplicate
- Report up to three instruments.
- Two shipments per year

Quality Cross Check—Cardiac Markers CRTQ

Analyte	Program Code	Challenges per Shipment
	CRTQ	
CK-MB, immunochemical	▮	3
Myoglobin	▮	3
Troponin I	▮	3

This program does not meet regulatory requirements for proficiency testing; see program CRT on page 60. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 2.0-mL liquid serum specimens
- Report up to three instruments.
- Two shipments per year

Quality Cross Check—High-Sensitivity Cardiac Markers HCRQ

Analyte/Procedure	Program Code	Challenges per Shipment
	HCRQ	
CK-MB, immunochemical	▮	3
Myoglobin	▮	3
High-sensitivity troponin I	▮	3
High-sensitivity troponin T	▮	3

This program does not meet regulatory requirements for proficiency testing; see program HCRT on page 60. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 2.0-mL liquid specimens
- Report up to three instruments.
- Two shipments per year

Endocrinology

Quality Cross Check—Parathyroid Hormone PTHQ

Analyte	Program Code	Challenges per Shipment
	PTHQ	
Parathyroid hormone (PTH)	▮	3

This program does not meet regulatory requirements for proficiency testing; see program PTH on page 85. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 2.0-mL lyophilized serum specimens in duplicate
- Report up to three instruments.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Blood Gas, Critical Care, and Oximetry

Quality Cross Check—Critical Care Blood Gas AQQ, AQHQ, AQSQ

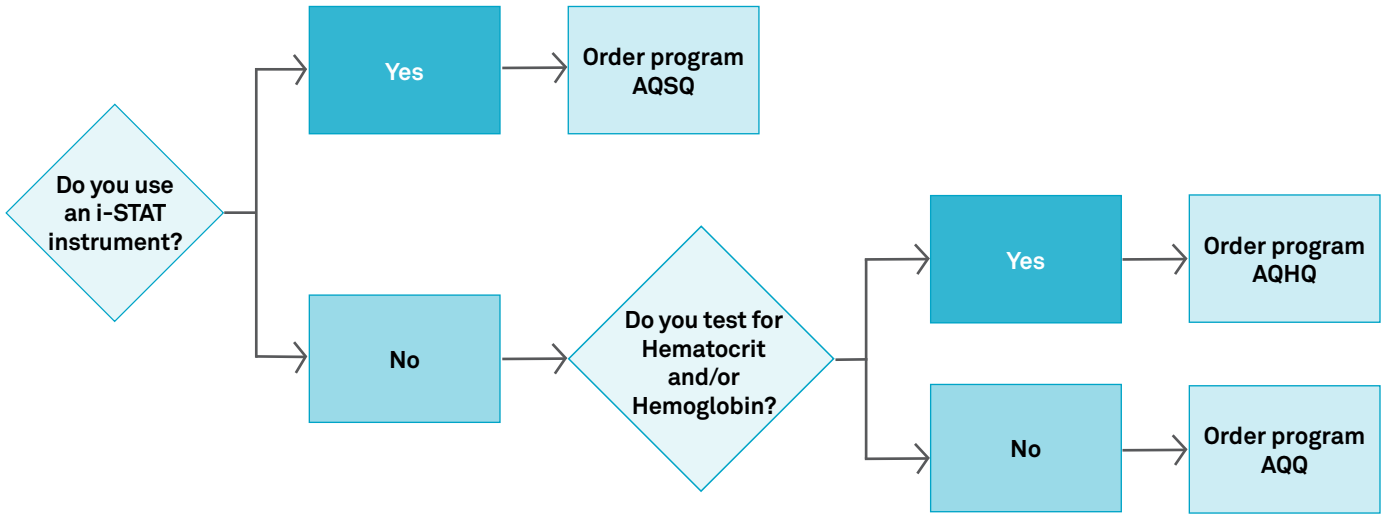
Analyte	Program Code			Challenges per Shipment
	AQQ	AQHQ	AQSQ	
Calcium, ionized	▮	▮	▮	3
Chloride	▮	▮	▮	3
Creatinine	▮	▮	▮	3
Glucose	▮	▮	▮	3
Hematocrit		▮	▮	3
Hemoglobin, estimated		▮	▮	3
Lactate	▮	▮	▮	3
Magnesium, ionized	▮	▮		3
pCO_2	▮	▮	▮	3
pH	▮	▮	▮	3
pO_2	▮	▮	▮	3
Potassium	▮	▮	▮	3
Sodium	▮	▮	▮	3
tCO_2 (measured)			▮	3
Urea nitrogen (BUN)	▮	▮	▮	3

Additional Information

- It is not appropriate to report hemoglobin and hematocrit results by co-oximetry in these programs.
- These programs do not meet regulatory requirements for proficiency testing; see programs AQ, AQH, and AQIS on pages 90–91. For additional information about the Quality Cross Check program, see page 36.

Program Information

- AQQ - Three 2.5-mL specimens in triplicate; appropriate for all methods except i-STAT
- AQHQ - Three 2.5-mL specimens in triplicate and three 2.5-mL specimens for hematocrit testing in triplicate; appropriate for all methods except i-STAT
- AQSQ - Three 1.7-mL specimens in triplicate for i-STAT methods only
- Report up to three instruments.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year



Quality Cross Check—Blood Oximetry SOQ

Analyte	Program Code	Challenges per Shipment
	SOQ	
Carboxyhemoglobin	▮	3
Hematocrit, estimated	▮	3
Hemoglobin, total	▮	3
Methemoglobin	▮	3
Oxyhemoglobin	▮	3

This program does not meet regulatory requirements for proficiency testing; see program SO on page 93. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 1.2-mL liquid specimens in triplicate
- Report up to three instruments.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Hematology and Clinical Microscopy

Quality Cross Check—Hematology FH3Q, FH9Q, FH13Q

Analyte/Procedure	Program Code			Challenges per Shipment
	FH3Q	FH9Q	FH13Q	
Hematocrit	▮	▮	▮	3
Hemoglobin	▮	▮	▮	3
Immature granulocyte (IG)		▮		3
Immature platelet fraction (IPF)%		▮		3
MCV, MCH, MCHC	▮	▮	▮	3
MPV	▮	▮	▮	3
Nucleated red blood cell (nRBC) count	▮	▮	▮	3
Platelet count	▮	▮	▮	3
RDW	▮	▮	▮	3
Red blood cell (RBC) count	▮	▮	▮	3
White blood cell (WBC) differential	▮	▮	▮	3
WBC count	▮	▮	▮	3

These programs do not meet regulatory requirements for proficiency testing; see the FH Series on page 138. For additional information about the Quality Cross Check program, see page 36.

Program Information

- FH3Q, FH9Q, FH13Q - Three 2.5-mL whole blood specimens in vials with pierceable caps
- Report up to three instruments.
- For method compatibility, see instrument matrix on page 139.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Quality Cross Check—Reticulocyte RTQ, RT3Q, RT4Q

Instrument/Method	Program Code			Challenges per Shipment
	RTQ	RT3Q	RT4Q	
Abbott Alinity hq, Abbott Cell-Dyn 4000, Sapphire, Siemens ADVIA 120/2120, and all other automated and manual methods	▮			3
Beckman Coulter, LH 500, LH 700 series, UniCel DxH series		▮		3
Mindray BC 760 CS, Sysmex XE-2100, XE-2100C, XE-2100D, XE-2100DC, XE-2100L, XE-5000, XN-L series, XN-series (includes RL App), XR-series, XT-2000i, XT-4000i			▮	3

These programs do not meet regulatory requirements for proficiency testing; see the RT Series on page 143. For additional information about the Quality Cross Check program, see page 36.

Program Information

- RTQ - Three 1.0-mL stabilized red blood cell (RBC) specimens
- RT3Q, RT4Q - Three 3.0-mL stabilized RBC specimens
- Includes percentage and absolute result reporting
- Report up to three instruments.
- Two shipments per year

Quality Cross Check—Urinalysis CMQ

Analyte	Program Code	Challenges per Shipment
	CMQ	
Bilirubin	▮	3
Blood or hemoglobin	▮	3
Glucose	▮	3
Human chorionic gonadotropin (hCG) urine, qualitative	▮	3
Ketones	▮	3
Leukocyte esterase	▮	3
Nitrite	▮	3
Osmolality	▮	3
pH	▮	3
Protein, qualitative	▮	3
Reducing substances	▮	3
Specific gravity	▮	3
Urobilinogen	▮	3

This program does not meet regulatory requirements for proficiency testing; see programs CMP and CMP1 on page 150. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 10.0-mL liquid urine specimens for use with all instruments
- Report up to three instruments.
- Two shipments per year

Quality Cross Check—Occult Blood OCBQ

Analyte	Program Code	Challenges per Shipment
	OCBQ	
Occult blood	▮	3

This program does not meet regulatory requirements for proficiency testing; see program OCB on page 157. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 2.0-mL simulated fecal specimens
- Report up to three instruments.
- Two shipments per year

Urinalysis Benchtop Reference Guide

- Thirty-four different cell identifications, including common and rare cells
- Detailed descriptions for each cell morphology
- Eight tabbed sections for easy reference
- A durable and water-resistant format to withstand years of benchtop use—5” x 6½”

Add it to your order, or view sample pages and purchase online.

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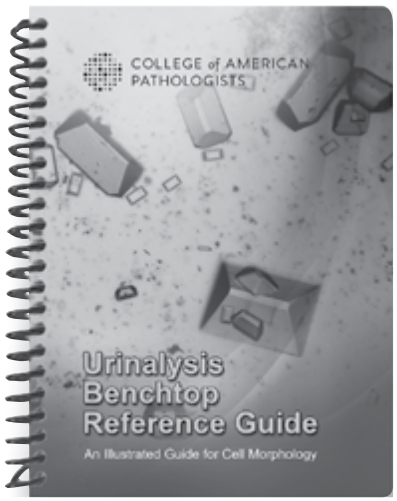

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Coagulation

Quality Cross Check—Coagulation CGLQ

Analyte	Program Code	Challenges per Shipment
	CGLQ	
Activated partial thromboplastin time	▮	3
Fibrinogen	▮	3
Prothrombin time	▮	3
D-dimer	▮	2
Fibrin(ogen) degradation products, plasma	▮	1

This program does not meet regulatory requirements for proficiency testing; see program CGL on page 164. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 1.0-mL lyophilized plasma specimens in triplicate and two 1.0-mL lyophilized plasma specimens
- Report up to three instruments.
- Two shipments per year

Quality Cross Check—Activated Clotting Time Series CT1Q, CT2Q, CT3Q, CT5Q

Instrument/Cartridge	Program Code				Challenges per Shipment
	CT1Q	CT2Q	CT3Q	CT5Q	
IL GEM Hemochron 100/ACT+			▮		3
IL GEM Hemochron 100/ACT-LR		▮			3
IL Hemochron Signature Elite/Hemochron Jr./ACT+			▮		3
IL Hemochron Signature Elite/Hemochron Jr./ACT-LR		▮			3
i-STAT Celite® and Kaolin ACT				▮	3
Medtronic Hemotec ACT/ACTII/ACT Plus® HR-ACT	▮				3
Medtronic Hemotec ACT/ACTII/ACT Plus LR-ACT	▮				3
Medtronic Hemotec ACT/ACTII/ACT Plus R-ACT	▮				3
Medtronic Hepcon HMS Plus	▮				3

These programs do not meet regulatory requirements for proficiency testing; see programs CT1, CT3, and CT5 on page 168. For additional information about the Quality Cross Check program, see page 36.

Program Information

- CT1Q - Three 1.7-mL lyophilized whole blood specimens in triplicate with corresponding diluents
- CT2Q - Three 0.5-mL lyophilized whole blood/diluent ampules in triplicate
- CT3Q - Three 0.5-mL lyophilized whole blood/diluent ampules in triplicate
- CT5Q - Three 1.7-mL lyophilized whole blood specimens in triplicate with corresponding diluents
- Report up to three instruments.
- Two shipments per year

Microbiology

Quality Cross Check—SARS-CoV-2 Molecular COV2Q

Analyte	Program Code	Challenges per Shipment
	COV2Q	
SARS-CoV-2	▮	3

This program does not meet regulatory requirements for proficiency testing; see program COV2 on page 201. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 3.2-mL non-infectious liquid specimens that contain the whole SARS-CoV-2 genome
- Designed for molecular techniques
- Report up to three instruments.
- Two shipments per year

Quality Cross Check—SARS-CoV-2 Antigen COVAQ

Analyte	Program Code	Challenges per Shipment
	COVAQ	
SARS-CoV-2 antigen	▮	3

This program does not meet regulatory requirements for proficiency testing; see program COVAG on page 202. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 0.5-mL simulated respiratory specimens in triplicate
- Report up to three instruments.
- Two shipments per year

Quality Cross Check—Nucleic Acid Amplification, Respiratory Limited ID3Q

Analyte	Program Code	Challenges per Shipment
	ID3Q	
Influenza A virus	▮	3
Influenza B virus	▮	3
Respiratory syncytial virus (RSV)	▮	3
SARS-CoV-2	▮	3

Additional Information

- This program does not contain human genome material or sequences from human RNase P gene.
- This program does not meet regulatory requirements for proficiency testing; see program ID3 on page 203. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 1.0-mL liquid specimens
- Designed for molecular multiplex panel users
- Report up to three instruments.
- Two shipments per year

Transfusion Medicine

Quality Cross Check—Transfusion Medicine JATQ		
Procedure	**Program Code**	**Challenges per Shipment**
	JATQ	
ABO grouping	▮	3
Antibody detection	▮	3
Rh typing	▮	3

This program does not meet regulatory requirements for proficiency testing; see program JAT on page 235. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 6.0-mL 13%–17% whole blood specimens
- May be used with automated and manual procedures
- Two shipments per year

Transfusion Medicine: A Compendium of Educational Cases

Based on more than 10 years of educational material used in proficiency testing from the CAP Transfusion, Apheresis, and Cellular Therapy Committee, this newest book on transfusion medicine covers 20 cases with multiple-choice questions and answers. The topics included reflect clinical cases as well as hot topics in transfusion medicine, and leverage the clinical experience of 19 highly regarded transfusion medicine experts, all leaders in the field.

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- Regulatory issues

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5 Point-of-Care Programs

Keep your point-of-care (POC) instruments and staff operating at peak performance.

- Improve waived test results with POC Competency Challenges that evaluate instrument and method performance, troubleshoot issues, assess staff competency, and provide training information.
- Gain insights with the Point-of-Care Testing Toolkit, an ebook resource for all members of the team.

Discontinued Programs

Hemochron Jr., Signature, IL GEM PCL ACT Competency (POC16)

Point-of-Care Programs

Point-of-care (POC) Competency Challenges help POC coordinators streamline operator education (initial training and ongoing competency). These programs include standardized specimens that can be used not only to train operators and assess competency, but also to evaluate/troubleshoot instrument and method performance for waived and non-waived tests.

Expected results will be provided. These programs are not proficiency testing programs, and participants will not return results to the CAP.

POC Competency Challenges have limited availability and stability. These programs must be purchased by May 1.

POC Competency Challenges POC1, POC2, POC3, POC4

Program Name	Program Code				Challenges per Shipment
	POC1	POC2	POC3	POC4	
Human chorionic gonadotropin (hCG) Competency	▮				10
Glucose Competency		▮			10
Urine Dipstick Competency			▮		10
Strep Screen Competency				▮	10

Program Information

- POC1 - One positive 10.0-mL liquid urine specimen
- POC2 - One abnormal 2.0-mL whole blood specimen
- POC3 - One abnormal 10.0-mL liquid urine specimen
- POC4 - One 1.0-mL positive liquid specimen
- Each program provides material to test up to 10 staff.

POC Competency Challenges POC6, POC7, POC8, POC9

Program Name	Program Code				Challenges per Shipment
	POC6	POC7	POC8	POC9	
PT/INR, Roche CoaguChek Pro II, XS Plus, and XS Pro Competency	▮				10
Waived Chemistry, Glucose, and Hemoglobin Competency		▮			10
Influenza A/B Antigen Detection Competency			▮		10
Fecal Occult Blood Competency				▮	10

Program Information

- POC6 - One abnormal 0.3-mL lyophilized plasma specimen (five vials) and five corresponding diluents
- POC7 - One abnormal 1.5-mL whole blood specimen compatible with the HemoCue® B, HemoCue 201, and Stanbio HemoPoint® H2 instruments
- POC8 - One 1.5-mL positive liquid specimen for influenza A; one 1.5-mL positive liquid specimen for influenza B
- POC9 - One positive 2.0-mL fecal specimen
- Each program provides material to test up to 10 staff.

POC Competency Challenges POC10, POC11, POC12

Program Name	Program Code			Challenges per Shipment
	POC10	POC11	POC12	
Blood Gases Competency	▮			10
Blood Gases, i-STAT Competency		▮		10
Point-of-Care Cardiac Markers Competency			▮	10

Program Information

- POC10 - One abnormal 2.5-mL aqueous blood gas specimen (10 vials) and one 2.5-mL hematocrit/hemoglobin specimen (10 vials)
- POC11 - One abnormal 2.5-mL aqueous specimen (10 vials) for blood gas and hematocrit/hemoglobin testing
- POC12 - One 1.5-mL plasma specimen (two vials); compatible with plasma-based tests, such as Alere Triage® and i-STAT instruments
- Each program provides material to test up to 10 staff.

POC Competency Challenges POC14, POC15

Program Name	Program Code		Challenges per Shipment
	POC14	POC15	
Medtronic ACT/ACT Plus®, i-STAT Competency	▮		5
Hemochron® Jr., IL GEM PCL ACT-LR Competency		▮	5

Program Information

- POC14 - Five abnormal 1.7-mL lyophilized whole blood specimens with five corresponding diluents and one calcium chloride diluent vial; compatible with Medtronic Hemotec ACT/ACTII/ACT Plus, Medtronic Hepcon HMS/HMS Plus, and i-STAT Celine and Kaolin ACT
- POC15 - Five abnormal 0.5-mL lyophilized whole blood/diluent ampules; compatible with IL GEM PCL Plus ACT-LR and ITC Hemochron Jr., Signature ACT-LR
- Each program provides material to test up to five staff.

Performance Analytics Dashboard: Bringing it all together

The CAP's Performance Analytics Dashboard provides valuable insights into your laboratory's performance with a single comprehensive view of your CAP PT results and accreditation status.

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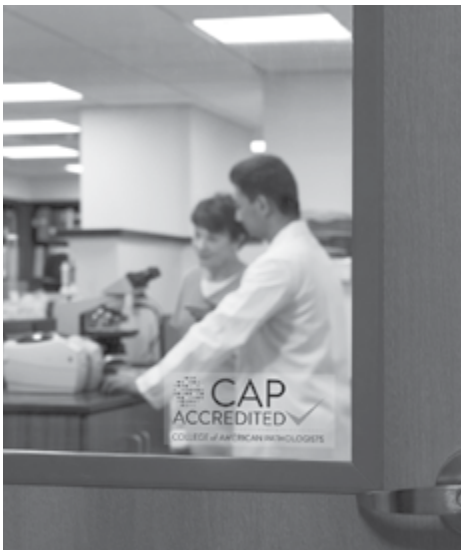
View your laboratory's Performance Analytics Dashboard by accessing e-LAB Solutions Suite (ELSS) from cap.org.

6 General Chemistry and Therapeutic Drug Monitoring



CAP Accreditation: Focused on the laboratory

CAP laboratory accreditation gives you and your staff the confidence of knowing that your laboratory is providing the highest-quality results and better patient outcomes.

All Centers for Medicare & Medicaid Services (CMS) regulated analytes are listed in **bold** type.

General Chemistry and Therapeutic Drug Monitoring

General Chemistry and Therapeutic Drug Monitoring 54
Urine Chemistry 68
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New Programs NEW

Point-of-Care High-Sensitivity Troponin I (PCHT) 64
Waived Hematocrit, Hemoglobin, Urinalysis/Urine hCG (HCC3) 66
Waived Whole Blood Glucose (HCC4) 66

New Analyte/Drug Additions NEW

Clobazam (ZE) 59

General Chemistry and Therapeutic Drug Monitoring

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

General Chemistry and Therapeutic Drugs C1, C3/C3X, C4, CZ/CZX/CZ2X, Z

Analyte	Program Code					Challenges per Shipment
	C1	C3/C3X	C4	CZ/CZX/ CZ2X	Z	
Alanine aminotransferase (ALT/SGPT)	▮	▮		▮		5
Albumin	▮	▮		▮		5
Alkaline phosphatase	▮	▮		▮		5
Amylase	▮	▮		▮		5
Aspartate aminotransferase (AST/SGOT)	▮	▮		▮		5
Bilirubin, direct	▮	▮	▮	▮		5
Bilirubin, total*	▮	▮	▮	▮		5
Calcium	▮	▮	▮	▮		5
Chloride	▮	▮	▮	▮		5
Cholesterol, total	▮	▮	▮	▮		5
Cortisol	▮	▮		▮		5
Creatine kinase (CK)	▮	▮		▮		5
Creatinine	▮	▮	▮	▮		5
Glucose	▮	▮	▮	▮		5
HDL cholesterol	▮	▮	▮	▮		5
Human chorionic gonadotropin (hCG), quantitative	▮	▮	▮	▮		5
Iron	▮	▮		▮		5
Lactate dehydrogenase (LD)	▮	▮		▮		5
LDL cholesterol, measured	▮	▮	▮	▮		5
Lipoprotein (a)	▮	▮		▮		5
Magnesium	▮	▮		▮		5
Pancreatic amylase	▮	▮		▮		5
Potassium	▮	▮	▮	▮		5
Protein, total	▮	▮		▮		5
Sodium	▮	▮	▮	▮		5
Triiodothyronine (T3), free	▮	▮		▮		5
Triiodothyronine (T3), total	▮	▮		▮		5
T3, uptake and related tests	▮	▮		▮		5

Continued on the next page

*General Chemistry and Therapeutic Drugs programs do not fulfill the neonatal bilirubin proficiency testing requirements for the CAP Laboratory Accreditation Programs. See programs NB, NB2, on page 64.

Program Information

- C1, C3, C4, CZ, Z - Five 5.0-mL liquid serum specimens
- C3X, CZX - Five 5.0-mL liquid serum specimens in duplicate
- CZ2X - Five 5.0-mL liquid serum specimens in triplicate
- Conventional and International System of Units (SI) reporting offered
- Three shipments per year
- For multiple instrument reporting options, see the Quality Cross Check program, CZQ, on page 56.

CE credit

General Chemistry and Therapeutic Drugs
C1, C3/C3X, C4, CZ/CZX/CZ2X, Z continued

Analyte	Program Code					Challenges per Shipment
	C1	C3/C3X	C4	CZ/CZX/ CZ2X	Z	
Thyroxine (T4), free	▮	▮		▮		5
Thyroxine (T4), total	▮	▮		▮		5
Thyroid-stimulating hormone (TSH)	▮	▮		▮		5
Triglycerides	▮	▮	▮	▮		5
Urea nitrogen (BUN)	▮	▮	▮	▮		5
Uric acid	▮	▮	▮	▮		5
Acid phosphatase		▮		▮		5
Ammonia		▮		▮		5
Apolipoprotein A1		▮		▮		5
Apolipoprotein B		▮		▮		5
Calcium, ionized		▮		▮		5
Carbon dioxide (CO_2)	▮	▮	▮	▮		5
Ferritin		▮		▮		5
Gamma glutamyl transferase (GGT)	▮	▮		▮		5
Iron binding capacity, total (measured)		▮		▮		5
Iron binding capacity, unsaturated (measured)		▮		▮		5
Lactate		▮		▮		5
Lipase		▮		▮		5
Osmolality		▮		▮		5
Phosphorus	▮	▮		▮		5
Prealbumin		▮		▮		5
Transferrin		▮		▮		5
Lithium	▮	▮		▮	▮	5
Acetaminophen				▮	▮	5
Amikacin				▮	▮	5
Caffeine				▮	▮	5
Carbamazepine				▮	▮	5
Carbamazepine, free				▮	▮	5
Digoxin				▮	▮	5
Digoxin, free				▮	▮	5
Disopyramide				▮	▮	5

Continued on the next page

Program Information

- C1, C3, C4, CZ, Z - Five 5.0-mL liquid serum specimens
- C3X, CZX - Five 5.0-mL liquid serum specimens in duplicate
- CZ2X - Five 5.0-mL liquid serum specimens in triplicate
- Conventional and International System of Units (SI) reporting offered
- Three shipments per year
- For multiple instrument reporting options, see the Quality Cross Check program, CZQ, on page 56.

CE credit

General Chemistry and Therapeutic Drugs C1, C3/C3X, C4, CZ/CZX/CZ2X, Z continued

Analyte	Program Code					Challenges per Shipment
	C1	C3/C3X	C4	CZ/CZX/ CZ2X	Z	
Ethosuximide				▮	▮	5
Gentamicin				▮	▮	5
Lidocaine				▮	▮	5
Methotrexate				▮	▮	5
N-acetylprocainamide (NAPA)				▮	▮	5
Phenobarbital				▮	▮	5
Phenytoin				▮	▮	5
Phenytoin, free				▮	▮	5
Primidone				▮	▮	5
Procainamide				▮	▮	5
Quinidine				▮	▮	5
Salicylate				▮	▮	5
Theophylline				▮	▮	5
Tobramycin				▮	▮	5
Valproic acid				▮	▮	5
Valproic acid, free				▮	▮	5
Vancomycin				▮	▮	5

Program Information

- C1, C3, C4, CZ, Z - Five 5.0-mL liquid serum specimens
- C3X, CZX - Five 5.0-mL liquid serum specimens in duplicate
- CZ2X - Five 5.0-mL liquid serum specimens in triplicate
- Conventional and International System of Units (SI) reporting offered
- Three shipments per year
- For multiple instrument reporting options, see the Quality Cross Check program, below.

CE credit

Quality Cross Check—Chemistry and Therapeutic Drug Monitoring CZQ

Analyte	Program Code	Challenges per Shipment
	CZQ	
See program CZ analytes on pages 54–56	▮	3

This program does not meet regulatory requirements for proficiency testing; see program CZ on pages 54–56. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 5.0-mL liquid serum specimens in duplicate
- Report up to three instruments.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Accuracy-Based Lipids ABL

Analyte	Program Code	Challenges per Shipment
	ABL	
Apolipoprotein A1	▮	3
Apolipoprotein B	▮	3
Cholesterol	▮	3
HDL cholesterol	▮	3
Non-HDL cholesterol	▮	3
LDL cholesterol	▮	3
Lipoprotein(a)	▮	3
Triglycerides	▮	3

To meet CMS and CAP-accredited laboratory regulatory requirements for these analytes, see C programs pages 54–56.

Program Information

- Three 1.0-mL human serum specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Harmonized Thyroid ABTH

Analyte	Program Code	Challenges per Shipment
	ABTH	
Triiodothyronine (T3), free	▮	3
Triiodothyronine (T3), total	▮	3
Thyroxine (T4), free	▮	3
Thyroxine (T4), total	▮	3
Thyroid-stimulating hormone (TSH)	▮	3

Additional Information

- Analytes will be evaluated using harmonization.
- Specimens are collected by a modified application of Clinical and Laboratory Standards Institute Guideline CLSI C37-A, *Preparation and Validation of Commutable Frozen Human Serum Pools as Secondary Reference Materials for Cholesterol Measurement Procedures; Approved Guideline.*
- To meet CMS and CAP-accredited laboratory regulatory requirements for these analytes, see C programs on pages 54–56 and K programs on page 82.

Program Information

- Three 1.0-mL frozen human serum specimens
- Two shipments per year

NEW

Thyroid Stimulating Hormone (TSH) Receptor Binding Antibody TSHR

Analyte	Program Code	Challenges per Shipment
	TSHR	
TSH receptor binding antibody	▮	3

This program is not appropriate for use with TSI assays, which specifically detect thyroid stimulating antibodies.

Program Information

- Three 0.5-mL serum specimens
- Two shipments per year

Thyroid Panel
Calibration Verification/Linearity LN50

Analyte	Program Code	
	LN50	LN50 Target Ranges
Triiodothyronine (T3), free	▮	1.0–18.0 pg/mL
Triiodothyronine (T3), total	▮	0.4–7.0 ng/mL
Thyroxine (T4), free	▮	0.7–7.0 ng/dL
Thyroxine (T4), total	▮	1.0–27.0 µg/dL
Thryoid-stimulating hormone (TSH)	▮	0.1–120.0 µIU/mL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information
- Eighteen 2.0-mL serum specimens
- Two shipments per year

CAP/ADLM Immunosuppressive Drugs CS

Analyte	Program Code	Challenges per Shipment
	CS	
Cyclosporine	▮	3
Sirolimus (rapamycin)	▮	3
Tacrolimus	▮	3

Program Information
- Three 5.0-mL whole blood specimens
- For laboratories monitoring cyclosporine, sirolimus, and tacrolimus in transplant patients
- Two shipments per year

ADLM Formerly AACC

Antifungal Drugs Monitoring AFD

Analyte	Program Code	Challenges per Shipment
	AFD	
Fluconazole	▮	3
Itraconazole	▮	3
Posaconazole	▮	3
Voriconazole	▮	3

Program Information
- Three 2.0-mL serum specimens
- For laboratories performing quantitative analysis of antifungal agents
- Two shipments per year

Everolimus EV

Analyte	Program Code	Challenges per Shipment
	EV	
Everolimus	▮	3

Program Information
- Three 4.0-mL whole blood specimens
- Two shipments per year

Mycophenolic Acid MPA

Analyte	Program Code	Challenges per Shipment
	MPA	
Mycophenolic acid	▮	3

Program Information
- Three 5.0-mL lyophilized serum specimens
- Two shipments per year

Therapeutic Drug Monitoring—Extended ZE

Analyte	Program Code	Challenges per Shipment
	ZE	
Clobazam NEW	▮	3
Clozapine	▮	3
Gabapentin	▮	3
Lacosamide	▮	3
Lamotrigine	▮	3
Levetiracetam	▮	3
Oxcarbazepine	▮	3
Oxcarbazepine metabolite	▮	3
Pregabalin	▮	3
Rufinamide	▮	3
Teriflunomide	▮	3
Topiramate	▮	3
Zonisamide	▮	3

Program Information
- Three 5.0-mL serum specimens
- Two shipments per year

Therapeutic Drug Monitoring—Special ZT

Analyte	Program Code	Challenges per Shipment
	ZT	
Amitriptyline	▮	3
Desipramine	▮	3
Imipramine	▮	3
Nortriptyline	▮	3
Tricyclics, total (qualitative/ quantitative)	▮	3

Program Information
- Three 5.0-mL lyophilized serum specimens
- Two shipments per year

B-type Natriuretic Peptides BNP5

Analyte	Program Code	Challenges per Shipment
	BNP5	
BNP	▮	5
NT-proBNP	▮	5

Additional Information

- For i-STAT, Quidel Triage, and Pathfast, use Point-of-Care Cardiac Markers programs PCARM or PCARMX.
- For second instrument reporting options, see the Quality Cross Check program, BNPQ, below.

Program Information

- Five 1.0-mL liquid plasma specimens
- Conventional and International System of Units (SI) reporting offered
- Three shipments per year

Quality Cross Check—B-type Natriuretic Peptides BNPQ

Analyte	Program Code	Challenges per Shipment
	BNPQ	
BNP	▮	3
NT-proBNP	▮	3

This program does not meet regulatory requirements for proficiency testing; see program BNP5 above. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 1.5-mL liquid specimens
- Report up to three instruments.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Cardiac Markers CRT, CRTI, HCRT, HCRTI

Analyte	Program Code				Challenges per Shipment
	CRT	CRTI	HCRT	HCRTI	
CK-MB, immunochemical	▮	▮	▮	▮	5
CK isoenzymes (CK-BB, **CK-MB**, CK-MM), electrophoretic		▮		▮	5
LD1, LD2, LD3, LD4, LD5, electrophoretic		▮		▮	5
LD1/LD2 ratio calculation and interpretation		▮		▮	5
Myoglobin	▮	▮	▮	▮	2
Troponin I	▮	▮			5
High-sensitivity troponin I			▮	▮	5
High-sensitivity troponin T			▮	▮	5

Program Information

- CRT - Five 2.0-mL liquid specimens
- CRTI - Ten 2.0-mL liquid specimens
- HCRT - Five 2.0-mL liquid specimens
- HCRTI - Ten 2.0-mL liquid specimens
- Three shipments per year

Quality Cross Check—High-Sensitivity Cardiac Markers HCRQ

Analyte/Procedure	Program Code	Challenges per Shipment
	HCRQ	
CK-MB, immunochemical	▮	3
Myoglobin	▮	3
High-sensitivity troponin I	▮	3
High-sensitivity troponin T	▮	3

This program does not meet regulatory requirements for proficiency testing; see program HCRT, on page 60. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 2.0-mL liquid specimens
- Report up to three instruments.
- Two shipments per year

Quality Cross Check—Cardiac Markers CRTQ

Analyte	Program Code	Challenges per Shipment
	CRTQ	
CK-MB, immunochemical	▮	3
Myoglobin	▮	3
Troponin I	▮	3

This program does not meet regulatory requirements for proficiency testing; see program CRT, on page 60. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 2.0-mL liquid serum specimens
- Report up to three instruments.
- Two shipments per year

Hemoglobin A1c, Waived Accuracy-Based GH2

Analyte	Program Code	Challenges per Shipment
	GH2	
Hemoglobin A1c	▮	3

Additional Information

- This program will be evaluated against the National Glycohemoglobin Standardization Program (NGSP) reference method.
- For multiple instrument reporting options, see the Quality Cross Check program, GHQ, on page 62.
- This program has limited stability. Laboratories outside the US or Canada should consider purchasing GH5I, which has longer stability.

Program Information

- Three 0.8-mL liquid human whole blood specimens
- Two shipments per year
- Designed for waived methods

Hemoglobin A1c, Accuracy-Based GH5

Analyte	Program Code	Challenges per Shipment
	GH5	
Hemoglobin A1c	▮	5

Additional Information

- This program will be evaluated against the National Glycohemoglobin Standardization Program (NGSP) reference method.
- For multiple instrument reporting options, see the Quality Cross Check program, GHQ, below.
- This program has limited stability. Laboratories outside the US or Canada should consider purchasing GH5I, which has longer stability.

Program Information

- Five 0.8-mL liquid human whole blood specimens
- Three shipments per year

Quality Cross Check—Hemoglobin A1c GHQ

Analyte	Program Code	Challenges per Shipment
	GHQ	
Hemoglobin A1c	▮	3

This program does not meet regulatory requirements for proficiency testing; see program GH5, above. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 0.8-mL previously frozen liquid specimens in triplicate
- Report up to three instruments.
- Two shipments per year

Hemoglobin A1c International GH5I

Analyte	Program Code	Challenges per Shipment
	GH5I	
Hemoglobin A1c	▮	5

This program will not be evaluated against the National Glycohemoglobin Standardization Program (NGSP) reference method. See program GH5, above, to be evaluated against the NGSP reference method.

Program Information

- Five 0.5-mL lyophilized specimens with a dropper-tipped vial of diluent
- Designed for laboratories outside the US that have experienced significant shipping and receiving issues and require longer specimen stability
- Three shipments per year

Glycated Serum Albumin GSA

Analyte	Program Code	Challenges per Shipment
	GSA	
Glycated serum albumin	▮	3

Program Information

- Three 1.0-mL liquid serum specimens
- Two shipments per year

High-Sensitivity C-reactive Protein HSCRP

Analyte	Program Code	Challenges per Shipment
	HSCRP	
High-sensitivity C-reactive protein	▮	5

Program Information
- Five 0.5-mL liquid serum specimens
- Three shipments per year

Homocysteine HMS

Analyte	Program Code	Challenges per Shipment
	HMS	
Homocysteine	▮	3

Program Information
- Three 1.0-mL serum specimens
- Two shipments per year

Ketones KET

Analyte	Program Code	Challenges per Shipment
	KET	
Beta-hydroxybutyrate	▮	2
Total ketones	▮	2

Program Information
- Two 2.0-mL serum specimens
- For semi-quantitative methods using the nitroprusside reaction for total ketones testing
- Two shipments per year

Chemistry—Limited, Waived LCW

Analyte	Program Code	Challenges per Shipment
	LCW	
Cholesterol	▮	3
Glucose	▮	3
HDL cholesterol	▮	3
LDL cholesterol	▮	3
Triglycerides	▮	3

Program Information
- Three 3.0-mL liquid serum specimens
- For use with waived methods such as the Cholestech LDX® and Roche Accu-Chek® Instant Plus
- The glucose specimens are not appropriate for use on other whole blood glucose meters.
- Two shipments per year

Neonatal Bilirubin NB, NB2

Analyte	Challenges per Shipment	
	Program Code	
	NB	NB2
Bilirubin, direct	2	2
Bilirubin, total	5	2

One human-based serum specimen will offer the value assigned using the reference method procedure (*Clin Chem.* 1985;31:1779-1789).

Program Information

- NB - Five 1.0-mL human serum specimens; three shipments per year
- NB2 - Two 1.0-mL human serum specimens; must order in conjunction with a five-challenge total bilirubin general chemistry proficiency testing program to meet regulatory requirements; two shipments per year
- Conventional and International System of Units (SI) reporting offered

Point-of-Care Cardiac Markers PCARM/PCARMX

Analyte	Program Code		Challenges per Shipment
	PCARM	PCARMX	
BNP	▮	▮	5
CK-MB	▮	▮	5
D-dimer	▮	▮	2
Myoglobin	▮	▮	2
NT-proBNP	▮	▮	5
Troponin I	▮	▮	5

Program Information

- PCARM - Five 1.5-mL liquid EDTA plasma specimens for point-of-care instruments such as Quidel Triage, Pathfast, and i-STAT
- PCARMX - All PCARM specimens in duplicate
- Three shipments per year

NEW

Point-of-Care High-Sensitivity Troponin I PCHT

Analyte	Program Code	Challenges per Shipment
	PCHT	
High-sensitivity troponin I	▮	5

Program Information

- Five 1.5-mL liquid specimens for point-of-care instruments such as i-STAT
- Three shipments per year

Whole Blood Chemistry Compatibility Matrix

Whole Blood Analyzer/Method	Analyte	Compatible Survey Programs	Page
HemoCue® Glucose 201 systems	Glucose	HCC	below
HemoCue Hb 201+ systems	Hemoglobin	HCC	below
HemoCue Hb 301 and 801 systems	Hemoglobin	HCC1	below
Roche Reflotron®	Cholesterol	C1, C4	54–56
	Glucose		54–56
Cholestech LDX®	Total cholesterol	LCW	63
	HDL cholesterol		63
	Triglycerides		63
	Glucose		63
Whole blood cholesterol meters	Cholesterol	C1, C4, LCW	54, 63
Whole blood glucose meters	Glucose	HCC2, HCC4, WBGQ	66–67
Nova StatSensor®/ StatSensor Xpress™	Creatinine	WBCR	67

Waived Combination HCC

Analyte	Program Code	Challenges per Shipment
	HCC	
Hemoglobin	▮	2
Whole blood glucose	▮	2

Program Information

- Two 1.5-mL whole blood specimens; two shipments per year
- Conventional and International System of Units (SI) reporting offered
- To identify instrument-specific programs, refer to the whole blood chemistry compatibility matrix above.

Waived Hemoglobin HCC1

Analyte	Program Code	Challenges per Shipment
	HCC1	
Hemoglobin	▮	2

Program Information

- Two 1.0-mL whole blood specimens; two shipments per year
- Conventional and International System of Units (SI) reporting offered
- To identify instrument-specific programs, refer to the whole blood chemistry compatibility matrix above.

Waived Combination HCC2

Analyte	Program Code	Challenges per Shipment
	HCC2	
Hematocrit	▮	2
Hemoglobin	▮	2
Urinalysis/urine human chorionic gonadotropin (hCG)	▮	2
Whole blood glucose	▮	3

Program Information

- Total of four shipments per year
- Hematocrit, hemoglobin, and urinalysis/urine hCG testing - Two 3.0-mL whole blood specimens and two 10.0-mL urine specimens; two shipments per year: A and C
- Whole blood glucose testing - Three 2.0-mL whole blood specimens; two shipments per year: B and D
- Conventional and International System of Units (SI) reporting offered
- To identify instrument-specific programs, refer to the whole blood chemistry compatibility matrix on page 65.

Waived Hematocrit, Hemoglobin, and Urinalysis/Urine hCG HCC3

NEW

Analyte	Program Code	Challenges per Shipment
	HCC3	
Hematocrit	▮	2
Hemoglobin	▮	2
Urinalysis/urine human chorionic gonadotropin (hCG)	▮	2

Program Information

- Two 3.0-mL whole blood specimens; two 10.0-mL urine specimens; two shipments per year
- Conventional and International System of Units (SI) reporting offered

Waived Whole Blood Glucose HCC4

NEW

Analyte	Program Code	Challenges per Shipment
	HCC4	
Whole blood glucose	▮	3

Program Information

- Three 2.0-mL whole blood specimens; two shipments per year
- Conventional and International System of Units (SI) reporting offered
- To identify instrument-specific programs, refer to the whole blood chemistry compatibility matrix on page 65.

Whole Blood Creatinine WBCR

Analyte	Program Code	Challenges per Shipment
	WBCR	
Creatinine	▮	5

Program Information

- Five 4.0-mL whole blood specimens
- For use with the Nova StatSensor/StatSensor Xpress
- Three shipments per year

Quality Cross Check—Whole Blood Glucose WBGQ

Analyte	Program Code	Challenges per Shipment
	WBGQ	
Glucose	▮	3

The CAP Accreditation Programs require all accredited laboratories performing waived whole blood glucose testing using glucose meters to perform alternative performance assessment. This program can be used to meet alternative performance assessment requirements.

Program Information

- Three 2.0-mL whole blood specimens
- Report up to 30 instruments.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

CE credit

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Use the same material that is sent in the Surveys program to:

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- Document correction of problems identified in Surveys.
- Use material with confirmed results as an alternative external quality control.
- Identify potential proficiency testing failures.

Each laboratory receives a Survey Participant Summary, which includes readily available results.

Chemistry/TDM, Validated Material

Validated Material	Program Code	Corresponding Program	Pages
Chemistry/TDM	CZVM	CZ	54–56

Program Information

- Five 5.0-mL liquid serum specimens

Urine Chemistry

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Urine Chemistry—General U

Analyte	Program Code	Challenges per Shipment
	U	
Amylase	▮	3
Calcium	▮	3
Chloride	▮	3
Creatinine	▮	3
Glucose	▮	3
Magnesium	▮	3
Nitrogen, total	▮	3
Osmolality	▮	3
Phosphorus	▮	3
Potassium	▮	3
Protein, total	▮	3
Sodium	▮	3
Urea nitrogen	▮	3
Uric acid	▮	3
Urine albumin, quantitative	▮	3
Urine albumin:creatinine ratio	▮	3

Program Information

- Six 15.0-mL urine specimens
- One mailing per year will include an additional educational specimen for uric acid testing, for a total of seven challenges per year.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Accuracy-Based Urine ABU

Analyte	Program Code	Challenges per Shipment
	ABU	
Calcium	▮	3
Creatinine	▮	3
Protein, total	▮	3
Urine albumin, quantitative	▮	3
Urine albumin:creatinine ratio	▮	3

Program Information

- Three 5.0-mL human urine specimens
- Two shipments per year

Kidney Stone Risk Assessment KSA

Analyte	Program Code	Challenges per Shipment
	KSA	
Citrate	▮	3
Cystine	▮	3
Oxalate	▮	3

Program Information
- Three 13.5-mL liquid urine specimens
- Two shipments per year

Urine Chemistry—Special N

Analyte	Program Code	Challenges per Shipment
	N	
3-methoxytyramines	▮	3
5-hydroxyindoleacetic acid	▮	3
17-hydroxycorticosteroids	▮	3
17-ketosteroids	▮	3
Aldosterone	▮	3
Coproporphyrins	▮	3
Cortisol, urinary free	▮	3
Dopamine	▮	3
Epinephrine	▮	3
Homovanillic acid	▮	3
Metanephrine	▮	3
Norepinephrine	▮	3
Normetanephrine	▮	3
Uroporphyrin	▮	3
Vanillylmandelic acid	▮	3

Program Information
- Six 10.0-mL lyophilized urine specimens and three 10.0-mL liquid urine specimens
- Two shipments per year

Myoglobin, Urine MYG

Analyte	Program Code	Challenges per Shipment
	MYG	
Myoglobin, urine, qualitative and quantitative	▮	2

Program Information
- Two 1.0-mL urine specimens
- Two shipments per year

Porphobilinogen, Urine UPBG		
Analyte	**Program Code**	**Challenges per Shipment**
	UPBG	
Porphobilinogen	▮	3

Program Information
- Three 5.0-mL urine specimens
- For use with qualitative and quantitative methods
- Two shipments per year

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- Correlate results with other laboratories or instruments.
- Document correction of problems identified in Surveys.
- Use material with confirmed results as an alternative external quality control.
- Identify potential proficiency testing failures.

Each laboratory receives a Survey Participant Summary, which includes readily available results.

Urine Chemistry—General, Validated Material

Validated Material	Program Code	Corresponding Program	Page
Urine Chemistry	UVM	U	68

Program Information
- Six 15.0-mL urine specimens
- One mailing per year will include an additional specimen for uric acid testing.

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See the Instrumentation Verification Tools section of this catalog to determine programs that best fit your laboratory's CVL needs.

Special Chemistry

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

1,5-Anhydroglucitol AG

Analyte	Program Code	Challenges per Shipment
	AG	
1,5-anhydroglucitol	▮	3

Program Information
- Three 1.0-mL liquid serum specimens
- Two shipments per year

Aldolase ADL

Analyte	Program Code	Challenges per Shipment
	ADL	
Aldolase	▮	2

Program Information
- Two 3.0-mL liquid serum specimens
- Two shipments per year

Angiotensin Converting Enzyme ACE

Analyte	Program Code	Challenges per Shipment
	ACE	
Angiotensin converting enzyme, quantitative	▮	2

Program Information
- Two 2.0-mL lyophilized serum specimens
- Two shipments per year

Body Fluid Chemistry FLD

Analyte	Program Code	Challenges per Shipment
	FLD	
Albumin	▮	3
Amylase	▮	3
CA19-9	▮	1
Carcinoembryonic antigen (CEA)	▮	1
Cholesterol	▮	3
Creatinine	▮	3
Glucose	▮	3
Lactate	▮	3
Lactate dehydrogenase (LD)	▮	3
pH	▮	3
Protein, total	▮	3
Triglycerides	▮	3
Urea nitrogen	▮	1

Program Information
- Three 3.0-mL simulated liquid body fluid specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

For multiple instrument reporting options, see the Quality Cross Check program, FLDQ, on page 72.

Quality Cross Check—Body Fluid Chemistry FLDQ

Analyte	Program Code	Challenges per Shipment
	FLDQ	
Albumin	▮	3
Amylase	▮	3
CA19-9	▮	1
Carcinoembryonic antigen (CEA)	▮	1
Cholesterol	▮	3
Creatinine	▮	3
Glucose	▮	3
Lactate	▮	3
Lactate dehydrogenase (LD)	▮	3
pH	▮	3
Protein, total	▮	3
Triglycerides	▮	3
Urea nitrogen	▮	1

This program does not meet regulatory requirements for proficiency testing; see program FLD, on page 71. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 3.0-mL simulated liquid body fluid specimens in duplicate
- Report up to three instruments.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Body Fluid Chemistry 2 FLD2

Analyte	Program Code	Challenges per Shipment
	FLD2	
Alkaline phosphatase	▮	3
Bilirubin	▮	3
Calcium	▮	3
Chloride	▮	3
Lipase	▮	3
Potassium	▮	3
Sodium	▮	3
Uric acid	▮	3

Program Information

- Three 3.0-mL liquid body fluid specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Cadmium CD

Analyte	Program Code	Challenges per Shipment
	CD	
Beta-2-microglobulin, urine	▮	3
Cadmium, urine	▮	3
Cadmium, whole blood	▮	3
Creatinine, urine	▮	3

This program meets the Occupational Safety and Health Administration (OSHA) guidelines for proficiency testing (OSHA standard-29 CFR 1910.1027AppF).

Program Information

- Three 6.0-mL whole blood specimens and three 12.0-mL urine specimens
- Conventional and International System of Units (SI) reporting offered
- Six shipments per year

Cerebrospinal Fluid Chemistry and Oligoclonal Bands M, OLI

Analyte	Program Code		Challenges per Shipment
	M	OLI	
Albumin, quantitative	▮	▮	3
Electrophoresis (albumin and gamma globulin)	▮	▮	3
Glucose	▮	▮	3
IgG, quantitative	▮	▮	3
Lactate	▮	▮	3
Lactate dehydrogenase (LD)	▮	▮	3
Protein, total	▮	▮	3
Oligoclonal bands		▮	3

Program Information

- M - Three 5.0-mL simulated liquid spinal fluid specimens
- OLI - Three 5.0-mL simulated liquid spinal fluid specimens and three 1.0-mL paired serum specimens; CSF IgG index and synthesis rate calculation challenges for each paired specimen and one online educational pattern interpretation per mailing
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Cystatin C CYS

Analyte	Program Code	Challenges per Shipment
	CYS	
Cystatin C	▮	2

Program Information

- Two 1.0-mL liquid serum specimens
- Two shipments per year

Fecal Calprotectin FCAL

Analyte	Program Code	Challenges per Shipment
	FCAL	
Fecal calprotectin	▮	3

Program Information

- Three 1.0-g simulated fecal specimens
- Two shipments per year

Fecal Fat FCFS

Analyte	Program Code	Challenges per Shipment
	FCFS	
Fecal fat, qualitative	▮	2

Program Information
- Two 10.0-g simulated fecal fat specimens
- For microscopic detection of neutral fats (triglycerides) and/or split fats (total free fatty acids)
- Two shipments per year

Fructosamine FT

Analyte	Program Code	Challenges per Shipment
	FT	
Fructosamine	▮	2

Program Information
- Two 1.0-mL liquid serum specimens
- Two shipments per year

Glucose-6-Phosphate Dehydrogenase G6PDS

Analyte	Program Code	Challenges per Shipment
	G6PDS	
G6PD, qualitative and quantitative	▮	2

Program Information
- Two 0.5-mL lyophilized hemolysate specimens
- Two shipments per year

H. pylori Breath Test HPBT

Analyte	Program Code	Challenges per Shipment
	HPBT	
H. pylori breath test	▮	2

Program Information
- Two gas bags for qualitative reporting with the Meridian BreathID
- Two shipments per year

Lipoprotein-Associated Phospholipase A_2 PLA

Analyte	Program Code	Challenges per Shipment
	PLA	
Lipoprotein-associated phospholipase (Lp-PLA_2) activity	▮	2

Program Information
- Two 2.0-mL lyophilized serum specimens
- Two shipments per year

Lipoprotein Electrophoresis LPE

Analyte/Procedure	Program Code	Challenges per Shipment
	LPE	
Lipoprotein electrophoresis	▮	2

Program Information
- Two 1.0-mL liquid specimens
- Two shipments per year

Protein Electrophoresis SPE, UBJP

Analyte	Program Code		Challenges per Shipment
	SPE	UBJP	
IgA, quantitation	▮		2
IgG, quantitation	▮		2
IgM, quantitation	▮		2
M-component (paraprotein) identification	▮		2
Protein, total	▮		2
Protein electrophoresis, serum	▮		2
Urine Bence Jones protein		▮	2

Program Information
- SPE - Two 1.0-mL lyophilized serum specimens; one online educational protein electrophoresis challenge per mailing
- UBJP - Two 10.0-mL urine specimens
- Two shipments per year

Lamellar Body Count LBC

Procedure	Program Code	Challenges per Shipment
	LBC	
Lamellar body count	▮	3

Program Information
- Three 2.0-mL simulated amniotic fluid specimens
- For use with LBC methods performed on all hematology analyzers
- Two shipments per year

Plasma Hemoglobin PHG

Analyte	Program Code	Challenges per Shipment
	PHG	
Plasma hemoglobin	▮	2

Program Information
- Two 2.0-mL liquid specimens
- Two shipments per year

Procalcitonin PCT

Analyte	Program Code	Challenges per Shipment
	PCT	
Procalcitonin	▮	3

Program Information
- Three 1.0-mL lyophilized serum specimens
- Two shipments per year

Pseudocholinesterase C7

Analyte	Program Code	Challenges per Shipment
	C7	
Pseudocholinesterase	▮	1

Program Information
- One 2.0-mL lyophilized serum specimen
- Three shipments per year

Salivary Cortisol SALC

Analyte	Program Code	Challenges per Shipment
	SALC	
Salivary cortisol	▮	3

Program Information

- Three 2.0-mL synthetic oral fluid specimens
- Two shipments per year

Accuracy-Based Testosterone, Estradiol ABS

Analyte	Program Code	Challenges per Shipment
	ABS	
Albumin	▮	3
Cortisol	▮	3
Estradiol	▮	3
Follicle-stimulating hormone (FSH)	▮	3
Luteinizing hormone (LH)	▮	3
Prostate-specific antigen (PSA), total	▮	3
Sex hormone-binding globulin (SHBG)	▮	3
Testosterone	▮	3
Thyroid-stimulating hormone (TSH)	▮	3

Program Information

- Three 1.0-mL human serum specimens
- Two shipments per year

Additional Information

- The Centers for Disease Control and Prevention (CDC) will set target values for testosterone and estradiol using the established reference methods.
- To meet CMS and CAP-accredited laboratory regulatory requirements for these analytes, see C programs on pages 54–56, K programs on page 82, and Y programs on page 83.

Total Bile Acids TBLA

Analyte	Program Code	Challenges per Shipment
	TBLA	
Total bile acids	▮	3

Program Information

- Three 5.0-mL liquid serum specimens
- Two shipments per year

Trace Metals R

Analyte	Program Code	Challenges per Shipment
	R	
Aluminum	▮	3
Chromium	▮	3
Copper	▮	3
Manganese	▮	3
Selenium	▮	3
Zinc	▮	3

Program Information

- Three 6.0-mL liquid serum specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Trace Metals, Urine TMU

Analyte	Program Code	Challenges per Shipment
	TMU	
Aluminum	▮	3
Arsenic	▮	3
Chromium	▮	3
Cobalt	▮	3
Copper	▮	3
Lead	▮	3
Manganese	▮	3
Mercury	▮	3
Selenium	▮	3
Thallium	▮	3
Zinc	▮	3

Program Information

- Three 12.0-mL urine specimens
- Conventional and International System of Units (SI) reporting offered
- For laboratories that monitor trace metals at normal and toxic levels
- Two shipments per year

Trace Metals, Whole Blood TMWB

Analyte	Program Code	Challenges per Shipment
	TMWB	
Arsenic, total	▮	3
Chromium	▮	3
Cobalt	▮	3
Copper	▮	3
Manganese	▮	3
Mercury	▮	3
Selenium	▮	3
Thallium	▮	3
Zinc	▮	3

Program Information

- Three 6.0-mL whole blood specimens
- Conventional and International System of Units (SI) reporting offered
- For laboratories that monitor trace metals at normal and toxic levels
- Two shipments per year

Sweat Analysis Series SW2, SW4

Analyte	Program Code	Challenges per Shipment
	SW2, SW4	
Chloride	▮	3
Conductivity	▮	3

For method compatibility, see chart below.

Program Information

- Three 5.0-mL simulated liquid human sweat specimens
- Two shipments per year

Sweat Analysis Series Compatibility Matrix

Method/Procedure	Program Code		Materials Included
	SW2	SW4	
ELITechGroup and Nanoduct® Systems	▮		22-gauge blunt-tipped needles
All other methodologies		▮	No additional materials provided

Viscosity V

Analyte	Program Code	Challenges per Shipment
	V	
Viscosity	▮	2

Program Information

- Two 10.0-mL serum specimens
- Two shipments per year

Soluble Transferrin Receptor STFR		
Analyte	**Program Code**	**Challenges per Shipment**
	STFR	
Soluble transferrin receptor (sTfR)	▮	3

Program Information
- Three 2.5-mL liquid human serum specimens
- Two shipments per year

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- Document correction of problems identified in Surveys.
- Use material with confirmed results as an alternative external quality control.
- Identify potential proficiency testing failures.

Each laboratory receives a Survey Participant Summary, which includes readily available results.

Cerebrospinal Fluid, Validated Material

Validated Material	Program Code	Corresponding Program	Page
Cerebrospinal Fluid	MVM	M	73

Program Information
- Three 5.0-mL simulated liquid spinal fluid specimens

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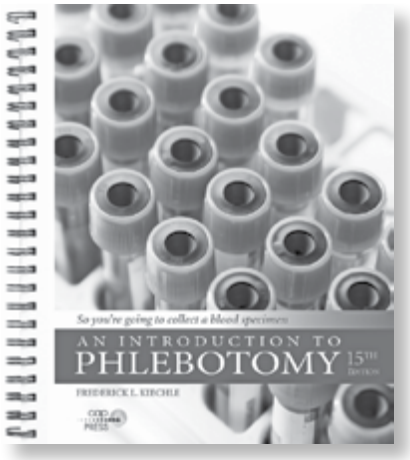

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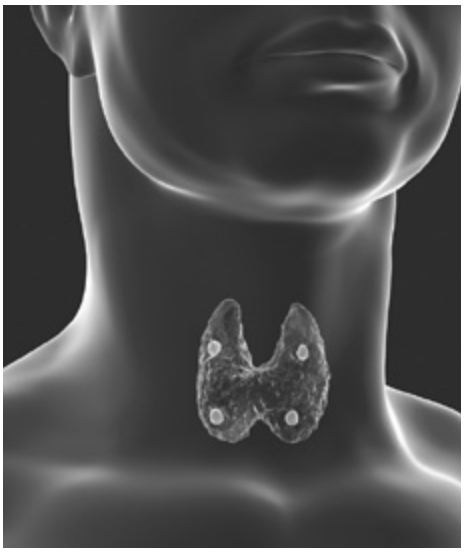
7 Endocrinology



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Test your laboratory's proficiency with our new PT/EQA program exclusively for parathyroid hormone levels.

All Centers for Medicare & Medicaid Services (CMS) regulated analytes are listed in **bold** type.

Program Changes

Testosterone, bioavailable (measured) has been removed from Sex Hormones (Y/YY)..... 83

Discontinued Programs

Insulin, Gastrin, and C-peptide (ING)
See program ABGIC

Endocrinology

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Ligand—General K/KK

Analyte	Program Code	Challenges per Shipment
	K/KK	
Alpha-fetoprotein (AFP)	▮	5
CA 125	▮	5
Carcinoembryonic antigen (CEA)	▮	5
Cortisol	▮	5
Ferritin	▮	5
Folate, serum	▮	5
Human chorionic gonadotropin (hCG), quantitative	▮	5
Immunoglobulin E (IgE)	▮	5
Prostate-specific antigen (PSA), total	▮	5
p2PSA	▮	5
Prostate-specific antigen, complexed (cPSA)	▮	5
Prostate-specific antigen (PSA), free	▮	5
Prostatic acid phosphatase (PAP)	▮	5
Triiodothyronine (T3), free	▮	5
Triiodothyronine (T3), total	▮	5
T3 uptake and related tests	▮	5
Thyroxine (T4), free	▮	5
Thyroxine (T4), total	▮	5
Thyroid-stimulating hormone (TSH)	▮	5
Vitamin B_{12}	▮	5

Program Information

- K - Five 5.0-mL liquid serum specimens
- KK - Five 5.0-mL liquid serum specimens in duplicate
- Conventional and International System of Units (SI) reporting offered
- Three shipments per year

CE credit

MMA and Active B_{12} MMA

Analyte	Program Code	Challenges per Shipment
	MMA	
Active vitamin B_{12}	▮	3
Methylmalonic acid	▮	3

Program Information

- Three 1.0-mL lyophilized serum specimens
- Two shipments per year

B-type Natriuretic Peptides BNP5

Analyte	Program Code	Challenges per Shipment
	BNP5	
BNP	▮	5
NT-proBNP	▮	5

Additional Information

- For i-STAT, Quidel Triage, and Pathfast, use Point-of-Care Cardiac Markers programs PCARM or PCARMX.
- For second instrument reporting options, see the Quality Cross Check program, BNPQ, below.

Program Information

- Five 1.0-mL liquid plasma specimens
- Conventional and International System of Units (SI) reporting offered
- Three shipments per year

Quality Cross Check—B-type Natriuretic Peptides BNPQ

Analyte	Program Code	Challenges per Shipment
	BNPQ	
BNP	▮	3
NT-proBNP	▮	3

This program does not meet regulatory requirements for proficiency testing; see program BNP5, above. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 1.5-mL liquid specimens
- Report up to three instruments.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Sex Hormones Y/YY

Analyte	Program Code	Challenges per Shipment
	Y/YY	
11-deoxycortisol	▮	5
17-hydroxyprogesterone	▮	5
Androstenedione	▮	5
DHEA sulfate	▮	5
Estradiol	▮	5
Estriol, unconjugated (uE3)	▮	5
Follicle-stimulating hormone (FSH)	▮	5
Growth hormone (GH)	▮	5
IGF-1 (somatomedin C)	▮	5
Luteinizing hormone (LH)	▮	5
Progesterone	▮	5
Prolactin	▮	5
Sex hormone-binding globulin (SHBG)	▮	5
Testosterone	▮	5
Testosterone, free (measured)	▮	5

Program Information

- Y - Five 5.0-mL liquid serum specimens in duplicate
- YY - Five 5.0-mL liquid serum specimens in triplicate
- Conventional and International System of Units (SI) reporting offered
- Three shipments per year

CE credit

Antimüllerian Hormone AMH

Analyte	Program Code	Challenges per Shipment
	AMH	
Antimüllerian hormone	▮	3

Program Information
- Three 1.0-mL lyophilized serum specimens
- Two shipments per year

25-OH Vitamin D, Total VITD

Analyte	Program Code	Challenges per Shipment
	VITD	
25-OH vitamin D, total	▮	3

Program Information
- Three 1.0-mL liquid serum specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Bone and Growth BGS

Analyte	Program Code	Challenges per Shipment
	BGS	
IGF-1 (somatomedin C)	▮	3
Osteocalcin	▮	3

Program Information
- Three 1.0-mL liquid serum specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Accuracy-Based Vitamin D ABVD

Analyte	Program Code	Challenges per Shipment
	ABVD	
25-OH vitamin D (D2 and D3)	▮	3
Calcium	▮	3

Program Information
- Three 1.0-mL liquid human serum specimens
- Serum is from multi-donor endogenous pools.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Additional Information
- The Centers for Disease Control and Prevention (CDC) will establish reference targets using isotope-dilution LC-MS/MS method.
- Specimens are collected by a modified application of Clinical and Laboratory Standards Institute Guideline CLSI C37-A, *Preparation and Validation of Commutable Frozen Human Serum Pools as Secondary Reference Materials for Cholesterol Measurement Procedures; Approved Guideline.*
- To meet CMS and CAP-accredited laboratory regulatory requirements for calcium, see C programs on pages 54–56.

Bone Markers and Vitamins BMV1, BMV2, BMV3, BMV4, BMV5

Analyte	Program Code					Challenges per Shipment
	BMV1	BMV2	BMV3	BMV4	BMV5	
1,25-dihydroxy vitamin D	▮					3
Bone-specific alkaline phosphatase		▮				3
Vitamin A			▮			3
Vitamin E (total, alpha tocopherol, and gamma tocopherol)				▮		3
C-telopeptide					▮	3

Program Information

- BMV1–4 - Three 5.0-mL liquid serum specimens for each program
- BMV5 - Three 1.0-mL liquid serum specimens
- Two shipments per year

Parathyroid Hormone PTH

Analyte	Program Code	Challenges per Shipment
	PTH	
Parathyroid hormone (PTH)	▮	5

Program Information

- Five 2.0-mL lyophilized serum specimens
- Conventional and International System of Units (SI) reporting offered
- Three shipments per year

Quality Cross Check—Parathyroid Hormone PTHQ

Analyte	Program Code	Challenges per Shipment
	PTHQ	
Parathyroid hormone (PTH)	▮	3

This program does not meet regulatory requirements for proficiency testing; see program PTH above. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 2.0-mL lyophilized serum specimens in duplicate
- Report up to three instruments.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Accuracy-Based Glucose, Insulin, and C-peptide ABGIC

Analyte	Program Code	Challenges per Shipment
	ABGIC	
C-peptide	▮	3
Gastrin	▮	3
Glucose	▮	3
Insulin	▮	3

Program Information

- Three 1.0-mL serum specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Additional Information

- Target values for glucose and C-peptide will be set using the established reference methods.
- To meet CMS and CAP-accredited laboratory regulatory requirements for glucose, see C programs on pages 54–56.

Second Trimester Maternal Screening FP/FPX

Analyte	Program Code	Challenges per Shipment
	FP/FPX	
Alpha-fetoprotein (AFP), amniotic fluid	▮	2
Alpha-fetoprotein (AFP), serum	▮	5
Dimeric inhibin A (DIA)	▮	5
Estriol, unconjugated (uE3)	▮	5
Human chorionic gonadotropin (hCG), quantitative	▮	5

Program Information

- FP - Five 1.0-mL serum specimens; two 1.0-mL simulated amniotic fluid specimens
- FPX - All program FP serum specimens in duplicate; two 1.0-mL simulated amniotic fluid specimens
- Conventional and International System of Units (SI) reporting offered
- Three shipments per year

The CAP designed these programs for laboratories using AFP and hCG for prenatal screening purposes only. For all other applications, see program K or KK on page 82.

First Trimester Maternal Screening FP1T, FP1B

Analyte	Program Code		Challenges per Shipment
	FP1T	FP1B	
Total hCG	▮		5
Free beta hCG		▮	5
PAPP-A	▮	▮	5

Program Information

- FP1T, FP1B - Five 1.0-mL serum specimens
- Conventional and International System of Units (SI) reporting offered
- Three shipments per year

The CAP designed these programs for laboratories using hCG for prenatal screening purposes only. For all other applications, see program K or KK on page 82.

Noninvasive Prenatal Testing NIPT

Analyte	Program Code	Challenges per Shipment
	NIPT	
Cell-free DNA screening for fetal aneuploidy	▮	3

Noninvasive prenatal testing is an exercise and is not considered proficiency testing. This exercise may be used to meet the requirements for alternative assessment.

Program Information
- Three liquid specimens
- Two shipments per year

Erythropoietin EPO

Analyte	Program Code	Challenges per Shipment
	EPO	
Erythropoietin	▮	2

Program Information
- Two 1.5-mL serum specimens
- Two shipments per year

Fetal Fibronectin FF

Analyte	Program Code	Challenges per Shipment
	FF	
Fetal fibronectin	▮	2

Program Information
- Two 1.2-mL liquid specimens
- Two shipments per year

Red Blood Cell Folate FOL

Analyte	Program Code	Challenges per Shipment
	FOL	
Red blood cell (RBC) folate	▮	3

Program Information
- Three 2.0-mL lyophilized whole blood specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Renin and Aldosterone RAP

Analyte	Program Code	Challenges per Shipment
	RAP	
Aldosterone	▮	3
Renin	▮	3

Program Information
- Three 2.0-mL liquid serum specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Tumor Markers TM/TMX

Analyte	Program Code	Challenges per Shipment
	TM/TMX	
Adrenocorticotropic hormone (ACTH)	▮	3
Beta-2 microglobulin	▮	3
CA 15-3	▮	3
CA 19-9	▮	3
CA 27.29	▮	3
CA 72-4	▮	3
Calcitonin	▮	3
Thyroglobulin	▮	3

Program Information

- TM - Three 2.0-mL liquid serum specimens
- TMX - All program TM specimens in duplicate
- Two shipments per year

Human Epididymis Protein 4 HUEP

Analyte	Program Code	Challenges per Shipment
	HUEP	
Human epididymis protein 4	▮	3

Program Information

- Three 1.0-mL lyophilized serum specimens
- Two shipments per year

Improve the reliability of your patient results with CAP Survey Validated Materials

Use the same material that is sent in the Surveys program to:

- Identify and troubleshoot instrument/method problems.
- Correlate results with other laboratories or instruments.
- Document correction of problems identified in Surveys.
- Use material with confirmed results as an alternative external quality control.
- Identify potential proficiency testing failures.

Each laboratory receives a Survey Participant Summary, which includes readily available results.

Endocrinology, Validated Materials

Validated Material	Program Code	Corresponding Program	Page
Ligand—General	KVM	K	82
Sex Hormones	YVM	Y	83

Program Information

- KVM - Five 5.0-mL liquid serum specimens; three shipments per year
- YVM - Five 5.0-mL liquid serum specimens in duplicate; three shipments per year

8 Blood Gas, Critical Care, and Oximetry

Our programs closely mimic patient testing to ensure accuracy.

- Test specimen levels that reflect clinical decision points.
- Our reconfigured programs better meet today's blood gas laboratory needs.

All Centers for Medicare & Medicaid Services (CMS) regulated analytes are listed in **bold** type.

Blood Gas, Critical Care, and Oximetry

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Critical Care Blood Gas AQ, AQH

Analyte	Program Code		Challenges per Shipment
	AQ	AQH	
Calcium, ionized	▮	▮	2
Chloride	▮	▮	5
Creatinine	▮	▮	5
Glucose	▮	▮	5
Hematocrit		▮	5
Hemoglobin, estimated		▮	5
Lactate	▮	▮	2
Magnesium, ionized	▮	▮	2
pCO_2	▮	▮	5
pH	▮	▮	5
pO_2	▮	▮	5
Potassium	▮	▮	5
Sodium	▮	▮	5
tCO_2	▮	▮	5
Urea nitrogen (BUN)	▮	▮	5

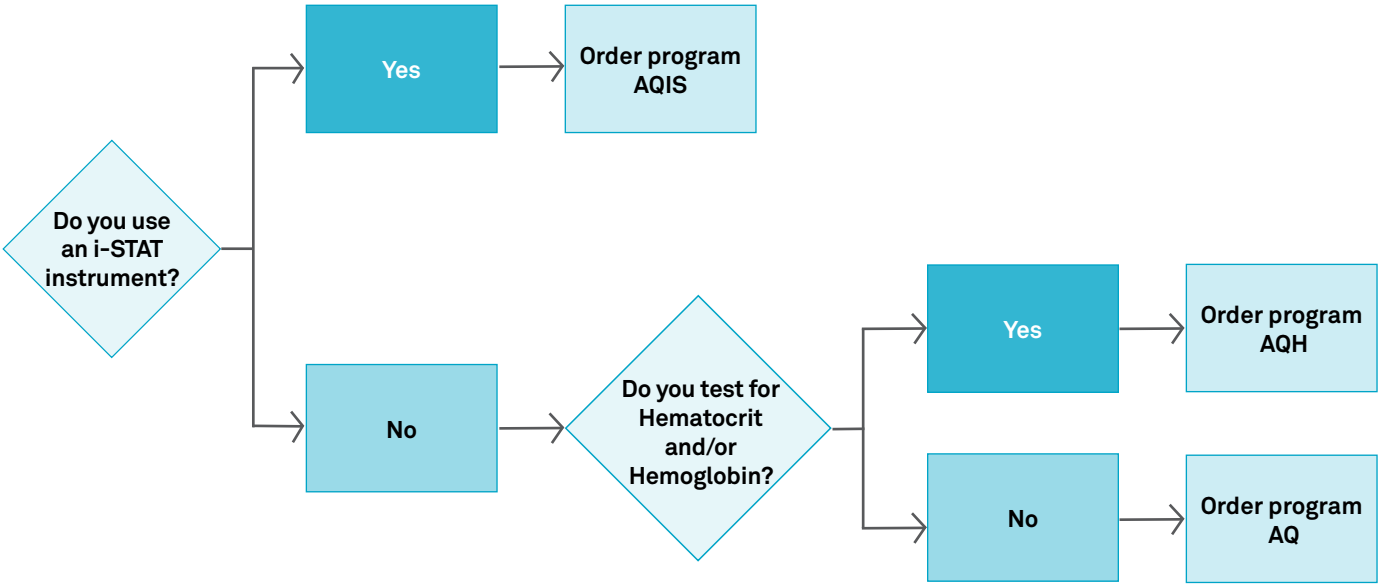
For multiple instrument reporting options, see the Quality Cross Check programs, AQQ and AQHQ, on page 92.

It is not appropriate to report hemoglobin and hematocrit results by co-oximetry in these programs.

Program Information

- AQ - Five 2.5-mL aqueous specimens in duplicate; appropriate for all methods except i-STAT
- AQH - Five 2.5-mL aqueous specimens in duplicate and five 2.5-mL specimens for hematocrit testing in duplicate; appropriate for all methods except i-STAT
- Conventional and International System of Units (SI) reporting offered
- Three shipments per year

CE credit



Critical Care Blood Gas, i-STAT AQIS

Analyte	Program Code	Challenges per Shipment
	AQIS	
Calcium, ionized	▮	2
Chloride	▮	5
Creatinine	▮	5
Glucose	▮	5
Hematocrit	▮	5
Hemoglobin, estimated	▮	5
Lactate	▮	2
pCO_2	▮	5
pH	▮	5
pO_2	▮	5
Potassium	▮	5
Sodium	▮	5
tCO_2	▮	5
Urea nitrogen (BUN)	▮	5

For multiple instrument reporting options, see the Quality Cross Check program, AQSQ, on page 92.

Program Information

- Five specimens in duplicate for i-STAT only
- Conventional and International System of Units (SI) reporting offered
- Three shipments per year

CE credit

Quality Cross Check—Critical Care Blood Gas AQQ, AQHQ, AQSQ

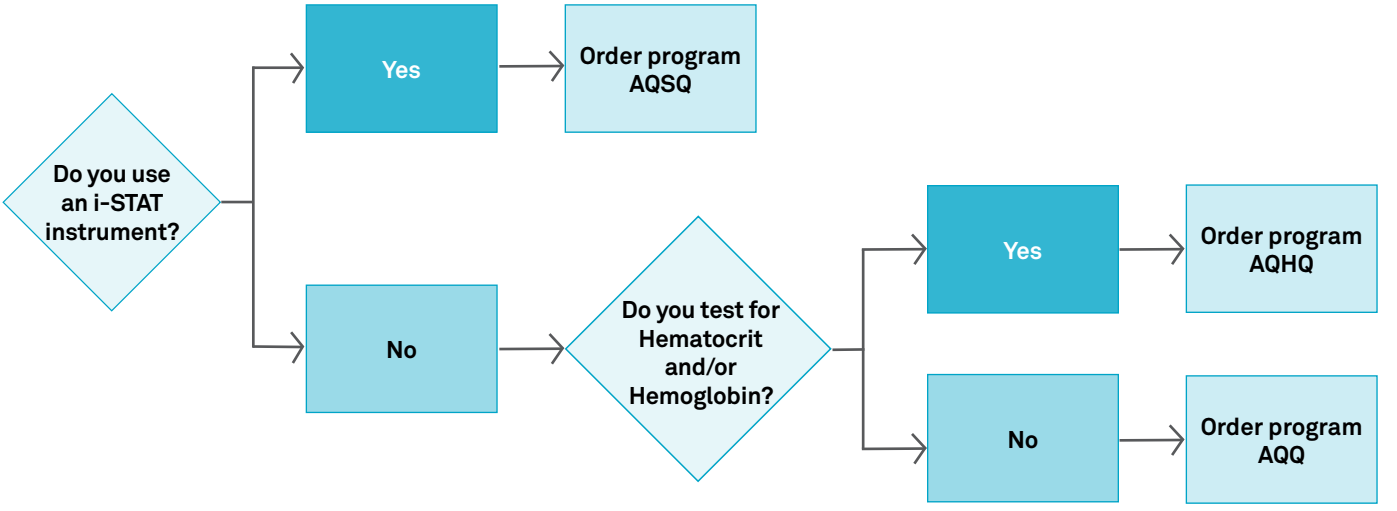
Analyte	Program Code			Challenges per Shipment
	AQQ	AQHQ	AQSQ	
Calcium, ionized	▮	▮	▮	3
Chloride	▮	▮	▮	3
Creatinine	▮	▮	▮	3
Glucose	▮	▮	▮	3
Hematocrit		▮	▮	3
Hemoglobin, estimated		▮	▮	3
Lactate	▮	▮	▮	3
Magnesium, ionized	▮	▮		3
pCO_2	▮	▮	▮	3
pH	▮	▮	▮	3
pO_2	▮	▮	▮	3
Potassium	▮	▮	▮	3
Sodium	▮	▮	▮	3
tCO_2 (measured)			▮	3
Urea nitrogen (BUN)	▮	▮	▮	3

Additional Information

- It is not appropriate to report hemoglobin and hematocrit results by co-oximetry in these programs.
- These programs do not meet regulatory requirements for proficiency testing; see programs AQ, AQH, and AQIS on pages 90–91. For additional information about the Quality Cross Check program, see page 36.

Program Information

- AQQ - Three 2.5-mL specimens in triplicate; appropriate for all methods except i-STAT
- AQHQ - Three 2.5-mL specimens in triplicate and three 2.5-mL specimens for hematocrit testing in triplicate; appropriate for all methods except i-STAT
- AQSQ - Three 1.7-mL specimens in triplicate for i-STAT methods only
- Report up to three instruments.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year



Blood Oximetry SO

Analyte	Program Code	Challenges per Shipment
	SO	
Carboxyhemoglobin	▮	5
Hematocrit, estimated	▮	5
Hemoglobin, total	▮	5
Methemoglobin	▮	5
Oxyhemoglobin	▮	5

Program Information

- Five 1.8-mL stabilized human hemoglobin solution specimens
- Conventional and International System of Units (SI) reporting offered
- Three shipments per year

Additional Information

- This program is not compatible with Oxicom-2000, -2100, or -3000 whole blood oximeters.
- For multiple instrument reporting options, see the Quality Cross Check program, SOQ, below.

Quality Cross Check—Blood Oximetry SOQ

Analyte	Program Code	Challenges per Shipment
	SOQ	
Carboxyhemoglobin	▮	3
Hematocrit, estimated	▮	3
Hemoglobin, total	▮	3
Methemoglobin	▮	3
Oxyhemoglobin	▮	3

Program Information

- Three 1.2-mL liquid specimens in triplicate
- Report up to three instruments.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

This program does not meet regulatory requirements for proficiency testing; see program SO, above. For additional information about the Quality Cross Check program, see page 36.

Professionalism in Pathology and Laboratory Medicine

This important resource provides a basic understanding of how ethics and professionalism impact pathology and laboratory medicine. Approaches and guidance to educational and assessment tools, including more than 100 case vignettes to guide discussion, are included. The book also discusses professionalism in the context of research, pathologist well-being and burnout, legal aspects, diversity, organizational leadership, and patient safety and quality of care. Also addressed are lapses in ethical and professional behavior as well as recommendations on future directions for research and education in professionalism.

Item number: PUB317
Softcover; 146 pages; 2020

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9 Toxicology

Elevate your laboratory standards with the CAP Forensic Drug Testing Accreditation Program, now including clinical toxicology.

Tailored for the specialized needs of forensic drug testing, this CAP accreditation program empowers forensic toxicology laboratories to be confident in the accuracy of their results.

All Centers for Medicare & Medicaid Services (CMS) regulated analytes are listed in **bold** type.

New Analyte/Drug Additions NEW

Naloxone (T, UT) 97
O-desmethylvenlafaxine (T) 97
Gabapentin (UDS, UDS6, UDSM) 98, 110
Cannabidiol (THCB) 107
Delta-8-THC-COOH (THCB) 107
Delta-10-THC (THCB) 107

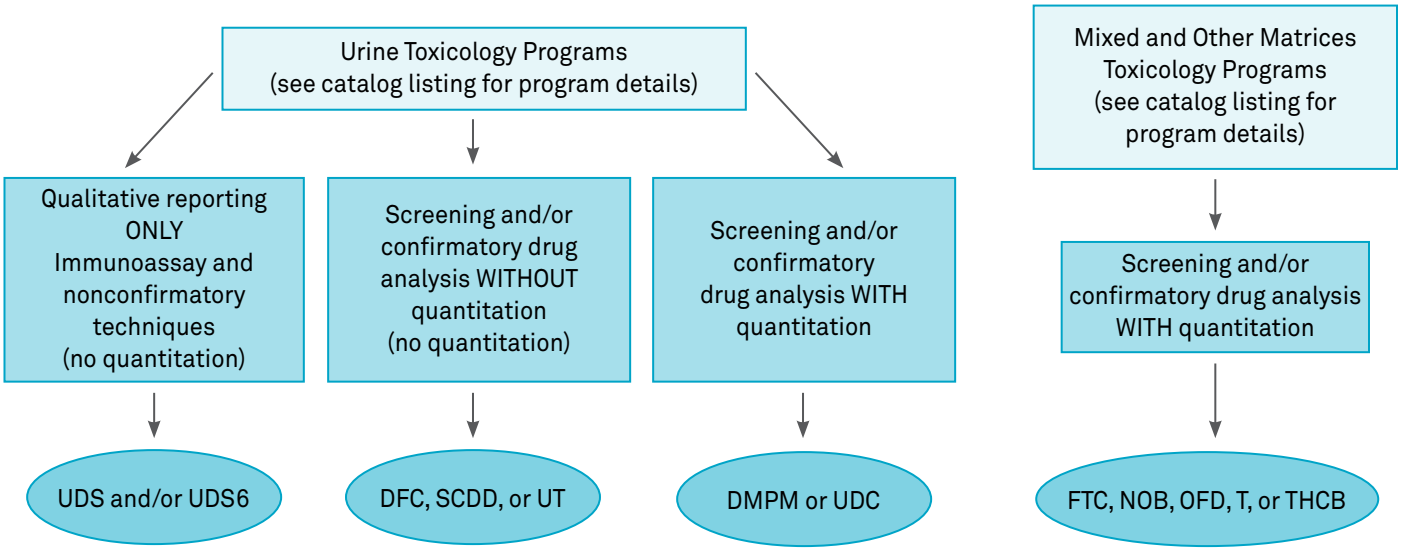
Analyte Changes

Acetaminophen removed from CAP/ADLM Urine Drug Testing, Screening (UDS, UDS6, UDSM) 98, 110
Aluminum removed from Trace Materials, Whole Blood (TMWB) 104

Toxicology

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Use this flowchart as a guide for ordering appropriate toxicology programs for your laboratory's testing menu.



Toxicology T

Analyte	Program Code	Challenges per Shipment
	T	
See drug listing on next page	▮	5

Program Information

- A total of five specimens consisting of 20.0-mL liquid serum and 50.0-mL liquid urine specimens
- For laboratories performing qualitative and quantitative drug analysis on serum and qualitative analysis on urine specimens
- Three shipments per year

CE credit

Urine Toxicology UT

Analyte	Program Code	Challenges per Shipment
	UT	
See drug listing on next page	▮	5

Program Information

- Five 50.0-mL liquid urine specimens
- For laboratories performing qualitative drug analysis with qualitative confirmatory testing
- Three shipments per year

CE credit

T and UT Programs Drug Listing

Challenges will include a mix of drugs from the list below.

6-acetylmorphine (6-AM)
7-aminoclonazepam
7-aminoflunitrazepam
7-hydroxymitragynine
Acetaminophen
Alpha-hydroxyalprazolam
Alprazolam
Amitriptyline
Amphetamine
Amphetamine group
Aripiprazole
Atenolol
Atropine
Barbiturate group
Benzodiazepine group
Benzoylecgonine
Brompheniramine
Buprenorphine
Bupropion
Butalbital
Cannabinoids
Carbamazepine
Carbamazepine-10, 11-epoxide
Carisoprodol
Chlordiazepoxide
Chlorpheniramine
Citalopram
Clomipramine
Clonazepam
Clozapine
Cocaethylene
Cocaine
Codeine
Cyclobenzaprine
Delta-9-THC (serum only)
Delta-9-THC-COOH
Demoxepam
Desipramine
Desmethylclomipramine
Desmethylcyclobenzaprine*
Dextromethorphan
Diazepam
Dihydrocodeine
Diltiazem
Diphenhydramine
Doxepin
Doxylamine
Duloxetine
Ecgonine methyl ester
Ephedrine
Etizolam
Fentanyl
Flunitrazepam
Fluoxetine
Gabapentin
Hydrocodone
Hydromorphone
Hydroxybupropion
Hydroxyzine
Ibuprofen
Imipramine
Ketamine
Lamotrigine
Levetiracetam
Levorphanol
Lidocaine
Lorazepam
Meperidine
Mephedrone
Meprobamate
Meta-chlorophenylpiperazine (m-CPP)
Methadone
Methadone metabolite (EDDP)
Methamphetamine
Methylenedioxy-amphetamine (MDA)
Methylenedioxy-methamphetamine (MDMA)
Methylenedioxy-pyrovalerone (MDPV)
Methylphenidate
Metoprolol
Mirtazapine
Mitragynine (Kratom)
Morphine
N-desmethyltramadol
Naloxone NEW
Naproxen
Norbuprenorphine
Norchlordiazepoxide
Norclomipramine
Norcodeine
Norcyclobenzaprine*
Nordiazepam
Nordoxepin
Norfentanyl
Norfluoxetine
Norketamine
Normeperidine
Normirtazapine
Nornaloxone
Noroxycodone
Norpropoxyphene
Norsertraline
Nortrimipramine
Nortriptyline
Norverapamil
O-desmethyltramadol
O-desmethylvenlafaxine NEW
Olanzapine
Opiate group
Oxazepam
Oxycodone
Oxymorphone
Paroxetine
Pentobarbital
Phencyclidine
Pheniramine
Phenobarbital
Phentermine
Phenylephrine
Phenytoin
Pregabalin
Propoxyphene
Propranolol
Pseudoephedrine
Quetiapine
Salicylates
Sertraline
Tapentadol
Temazepam
Topiramate
Tramadol
Trazodone
Tricyclic group
Trimipramine
Valproic acid
Venlafaxine
Verapamil
Xylazine
Zolpidem

*Same compound

CAP/ADLM Urine Drug Testing, Screening UDS, UDS6

Analyte	Program Code	
	Challenges per Shipment	
	UDS	UDS6 Limited
6-acetylmorphine (6-AM)	5	3
Amphetamine	5	3
Amphetamine/methamphetamine group	5	3
Barbiturate group	5	3
Benzodiazepine group	5	3
Benzoylecgonine/cocaine metabolites	5	3
Buprenorphine and metabolites	5	3
Cannabinoids	5	3
Ethanol	5	3
Fentanyl	5	3
Gabapentin NEW	5	3
Hydrocodone	5	3
Lysergic acid diethylamide (LSD)	5	3
Meperidine	5	3
Meprobamate/carisoprodol	5	3
Methadone	5	3
Methadone metabolite (EDDP)	5	3
Methamphetamine	5	3
Methaqualone	5	3
Methylenedioxymethamphetamine (MDMA)	5	3
Opiate group	5	3
Oxycodone	5	3
Phencyclidine	5	3
Propoxyphene	5	3
Tramadol	5	3
Tricyclic group	5	3

Program Information

- UDS - Five 10.0-mL liquid urine specimens; three shipments per year
- UDS6 - Three 10.0-mL liquid urine specimens; two shipments per year
- For laboratories performing drugs of abuse testing on urine specimens using immunoassay or other non-confirmatory techniques only
- Participants will have access to the ADLM quarterly newsletter, *Clinical & Forensic Toxicology News*.

ADLM Formerly AACC

Urine Drug Adulterant/Integrity DAI		
Analyte	**Program Code**	**Challenges per Shipment**
	DAI	
Creatinine	▮	3
Glutaraldehyde	▮	3
Nitrite	▮	3
Oxidants	▮	3
pH	▮	3
Specific gravity	▮	3

Program Information

- Three 25.0-mL urine specimens
- Two shipments per year

Clinical Toxicology Testing: A Guide for Laboratory Professionals, Second Edition

This book is a practical guide to directing hospital toxicology laboratory operations. This edition features expanded sections on testing in the clinical setting, methodologies, and more user-friendly information on specific analytes. It provides the reader with a comprehensive view of what is needed—and expected—when offering a clinical toxicology service.

Contents include:

- Toxicology testing in the clinical setting, including new chapters on pediatric testing and chronic opioid therapy
- Toxicokinetics and methodologies, with new and expanded information on laboratory-developed tests, screening assays, targeted tests, and oral fluids and alternative matrices
- Specific analytes, including novel psychoactive substances and the use of medical cannabis
- Appendices on such useful topics as urine and serum screens, therapeutic drug monitoring, and proficiency testing

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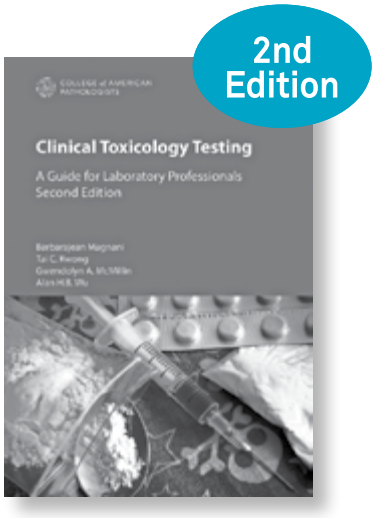

Item number: PUB227
Softcover; 368 pages; 2020

CAP/ADLM Forensic Urine Drug Testing, Confirmatory UDC

Analyte	Program Code	Challenges per Shipment
	UDC	
6-acetylmorphine (6-AM)	▮	10
Alpha-hydroxyalprazolam	▮	10
Amphetamine	▮	10
Benzoylecgonine	▮	10
Buprenorphine	▮	10
Butalbital	▮	10
Codeine	▮	10
Delta-9-THC-COOH	▮	10
Fentanyl	▮	10
Hydrocodone	▮	10
Hydromorphone	▮	10
Lorazepam	▮	10
Methadone	▮	10
Methadone metabolite (EDDP)	▮	10
Methamphetamine	▮	10
Methaqualone	▮	10
Methylenedioxyamphetamine (MDA)	▮	10
Methylenedioxyethylamphetamine (MDEA)	▮	10
Methylenedioxymethamphetamine (MDMA)	▮	10
Morphine	▮	10
Norbuprenorphine	▮	10
Nordiazepam	▮	10
Norfentanyl	▮	10
Norpropoxyphene	▮	10
Oxazepam	▮	10
Oxycodone	▮	10
Oxymorphone	▮	10
Phencyclidine	▮	10
Phenobarbital	▮	10
Propoxyphene	▮	10
Secobarbital	▮	10
Temazepam	▮	10
Adulterant/Integrity Indicator		
Creatinine	▮	10
pH	▮	10
Specific gravity	▮	10

Program Information

- Ten 50.0-mL liquid urine specimens
- For laboratories that perform both screening and confirmatory testing, including quantitation, for drugs of abuse in urine specimens; laboratories are asked to report creatinine, pH, and specific gravity for each specimen to ensure specimen adulteration has not occurred.
- Participants will have access to the ADLM quarterly newsletter, *Clinical & Forensic Toxicology News*.
- Four shipments per year

ADLM (Formerly AACC)

Oral Fluid for Drugs of Abuse OFD

Analyte	Program Code	Challenges per Shipment
	OFD	
Amphetamine Group	▮	5
Amphetamine	▮	5
Methamphetamine	▮	5
Methylenedioxyamphetamine (MDA)	▮	5
Methylenedioxymethamphetamine (MDMA)	▮	5
Benzodiazepine Group	▮	5
Alprazolam	▮	5
Diazepam	▮	5
Nordiazepam	▮	5
Oxazepam	▮	5
Temazepam	▮	5
Buprenorphine	▮	5
Buprenorphine and norbuprenorphine	▮	5
Cocaine and/or metabolite	▮	5
Benzoylecgonine	▮	5
Cocaine	▮	5
Cannabinoid	▮	5
Delta-9-THC	▮	5
Cotinine	▮	5
Fentanyl and/or metabolite	▮	5
Fentanyl	▮	5
Norfentanyl	▮	5
Methadone	▮	5
Opiate Group	▮	5
6-acetylmorphine (6-AM)	▮	5
Codeine	▮	5
Hydrocodone	▮	5
Hydromorphone	▮	5
Morphine	▮	5
Oxycodone	▮	5
Oxymorphone	▮	5
Phencyclidine (PCP)	▮	5

Program Information

- Five 2.0-mL oral fluid specimens
- For laboratories performing drug screening, confirmation, and quantitation
- Four shipments per year

Vitreous Fluid, Postmortem VF

Analyte	Program Code	Challenges per Shipment
	VF	
Acetone	▮	3
Chloride	▮	3
Creatinine	▮	3
Ethanol	▮	3
Glucose	▮	3
Potassium	▮	3
Sodium	▮	3
Vitreous urea nitrogen	▮	3

Program Information

- Three 5.0-mL synthetic vitreous fluid specimens
- For forensic and other toxicology laboratories that perform quantitative analysis of vitreous fluid
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

CE credit

Serum Drug Screening SDS

Analyte	Program Code	Challenges per Shipment
	SDS	
Acetaminophen, quantitative	▮	3
Acetone, semiquantitative and qualitative	▮	3
Barbiturate group, qualitative	▮	3
Benzodiazepine group, qualitative	▮	3
Salicylate, quantitative	▮	3
Total tricyclic antidepressants, qualitative	▮	3

This program does not meet the regulatory requirements for proficiency testing for laboratories that quantitate acetaminophen and/or salicylate for TDM purposes.

Program Information

- Three 2.0-mL serum specimens
- For laboratories that perform serum drug screening using immunoassay or other screening techniques
- Two shipments per year

CAP/ADLM Alcohol/Volatiles AL1, AL2

Analyte	Program Code		Challenges per Shipment
	AL1 Whole Blood	AL2 Serum	
Acetone, quantitative	▮	▮	5
Ethanol, quantitative	▮	▮	5
Ethylene glycol, qualitative and quantitative	▮	▮	5
Isopropanol, quantitative	▮	▮	5
Methanol, quantitative	▮	▮	5

Program Information

- AL1 - Five 5.0-mL liquid whole blood specimens; conventional reporting
- AL2 - Five 2.0-mL liquid serum specimens; conventional and International System of Units (SI) reporting offered
- Three shipments per year

ADLM

Ethanol Biomarkers ETB

Analyte	Program Code	Challenges per Shipment
	ETB	
Ethyl glucuronide (EtG), qualitative and quantitative	▮	3
Ethyl sulfate (EtS), quantitative	▮	3

Program Information

- Three 10.0-mL synthetic urine specimens
- Two shipments per year

CAP/ADLM Blood Lead BL

Analyte	Program Code	Challenges per Shipment
	BL	
Lead	▮	5

This program meets the Occupational Safety and Health Administration (OSHA) requirements for proficiency testing [OSHA lead standards-29 CFR 1910.1025(j)(2)(iii)].

Program Information

- Five 6.0-mL liquid nonhuman whole blood specimens
- Conventional and International System of Units (SI) reporting offered
- Three shipments per year

ADLM (Formerly AACC)

Cadmium CD

Analyte	Program Code	Challenges per Shipment
	CD	
Beta-2-microglobulin, urine	▮	3
Cadmium, urine	▮	3
Cadmium, whole blood	▮	3
Creatinine, urine	▮	3

This program meets the Occupational Safety and Health Administration (OSHA) guidelines for proficiency testing (OSHA standard-29 CFR 1910.1027AppF).

Program Information

- Three 6.0-mL whole blood specimens and three 12.0-mL urine specimens
- Conventional and International System of Units (SI) reporting offered
- Six shipments per year

Nicotine and Tobacco Alkaloids NTA

Analyte	Program Code	Challenges per Shipment
	NTA	
Cotinine	▮	3
Nicotine	▮	3

Program Information

- Three 25.0-mL urine specimens
- Designed for laboratories that qualitatively and/or quantitatively test for cotinine and/or nicotine in urine
- Two shipments per year

Trace Metals R

Analyte	Program Code	Challenges per Shipment
	R	
Aluminum	▮	3
Chromium	▮	3
Copper	▮	3
Manganese	▮	3
Selenium	▮	3
Zinc	▮	3

Program Information

- Three 6.0-mL liquid serum specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Trace Metals, Urine TMU

Analyte	Program Code	Challenges per Shipment
	TMU	
Aluminum	▮	3
Arsenic	▮	3
Chromium	▮	3
Cobalt	▮	3
Copper	▮	3
Lead	▮	3
Manganese	▮	3
Mercury	▮	3
Selenium	▮	3
Thallium	▮	3
Zinc	▮	3

Program Information

- Three 12.0-mL urine specimens
- Conventional and International System of Units (SI) reporting offered
- For laboratories that monitor trace metals at normal and toxic levels
- Two shipments per year

Trace Metals, Whole Blood TMWB

Analyte	Program Code	Challenges per Shipment
	TMWB	
Arsenic, total	▮	3
Chromium	▮	3
Cobalt	▮	3
Copper	▮	3
Manganese	▮	3
Mercury	▮	3
Selenium	▮	3
Thallium	▮	3
Zinc	▮	3

Program Information

- Three 6.0-mL whole blood specimens
- Conventional and International System of Units (SI) reporting offered
- For laboratories that monitor trace metals at normal and toxic levels
- Two shipments per year

Forensic Toxicology, Criminalistics FTC

Analyte	Program Code	Challenges per Shipment
	FTC	
See drug listing below	▮	5

Program Information

- Five 20.0-mL whole blood specimens
- For crime and hospital laboratories that have forensic toxicology divisions performing qualitative and quantitative analysis of drugs in whole blood specimens
- Three shipments per year

CE credit

FTC Program Drug Listing

Challenges will include a mix of drugs from the list below.

6-acetylmorphine (6-AM)
7-aminoclonazepam
7-aminoflunitrazepam
7-hydroxymitragynine
Acetaminophen
Alpha-hydroxyalprazolam
Alprazolam
Amitriptyline
Amphetamine
Aripiprazole
Atenolol
Atropine
Benzoylecgonine
Brompheniramine
Buprenorphine
Bupropion
Butalbital
Carbamazepine
Carbamazepine-10, 11-epoxide
Carisoprodol
Chlordiazepoxide
Chlorpheniramine
Citalopram
Clomipramine
Clonazepam
Clozapine
Cocaethylene
Cocaine
Codeine
Cyclobenzaprine*
Delta-9-THC
Delta-9-THC-COOH
Demoxepam
Desipramine
Desmethylclomipramine
Desmethylsertraline
Dextromethorphan
Diazepam
Dihydrocodeine
Diltiazem
Diphenhydramine
Doxepin
Doxylamine
Duloxetine
Ecgonine ethyl ester
Ecgonine methyl ester
Ephedrine
Fentanyl*
Flunitrazepam
Fluoxetine
Gabapentin
Gamma-hydroxybutyrate (GHB)
Hydrocodone
Hydromorphone
Hydroxybupropion
Hydroxyzine
Ibuprofen
Imipramine
Ketamine
Lamotrigine
Levetiracetam
Lidocaine
Lorazepam
Lysergic acid diethylamide (LSD)
Meperidine*
Mephedrone
Meprobamate
Methadone
Methadone metabolite (EDDP)
Methamphetamine
Methylenedioxyamphetamine (MDA)
Methylenedioxymethamphetamine (MDMA)
Methylenedioxypyrovalerone (MDPV)
Methylphenidate
Metoprolol
Midazolam
Mirtazapine
Mitragynine (Kratom)
Morphine*
N-desmethyltramadol
Naproxen
Norbuprenorphine
Norchlordiazepoxide
Norclomipramine
Norcodeine
Norcyclobenzaprine
Nordiazepam
Nordoxepin
Norfentanyl
Norfluoxetine
Norketamine
Normeperidine
Normirtazapine
Noroxycodone
Norpropoxyphene
Norsertraline
Nortrimipramine
Nortriptyline
Norverapamil
O-desmethyltramadol
Olanzapine
Oxazepam
Oxycodone
Oxymorphone
Paroxetine
Pentobarbital
Phencyclidine
Phenethylamine
Pheniramine
Phenobarbital
Phentermine
Phenylephrine
Phenytoin
Pregabalin
Propoxyphene
Propranolol
Pseudoephedrine
Quetiapine
Quinine
Ranitidine
Ritalinic acid
Salicylate
Sertraline
Strychnine
Tapentadol
Temazepam
Topiramate
Tramadol
Trazodone
Trimipramine
Valproic acid
Venlafaxine
Verapamil
Zolpidem

*and/or metabolite(s)

Synthetic Cannabinoid/Designer Drugs SCDD

Analyte	Program Code	Challenges per Shipment
	SCDD	
Synthetic cannabinoid/designer drugs	▮	3

Synthetic cannabinoids and designer drug stimulants are widespread and constantly changing in respect to the available chemical moieties. In order to stay contemporary, the CAP has decided to modify the compounds in this program in accordance with the appearance and prevalence of new compounds.

Program Information

- Three 10.0-mL urine specimens
- For laboratories that perform screening and confirmatory testing for the compounds found in this program
- Two shipments per year

SCDD Program Drug Listing

Challenges will include a mix of drugs.

For the most current list of drugs, please go to cap.org. Under the Laboratory Improvement tab, click on Catalog and Ordering Information. The list is located under the PT Order Supplements header.

Novel Opioids and Benzodiazepines NOB

Analyte	Program Code	Challenges per Shipment
	NOB	
Novel opioids and benzodiazepines	▮	3

Program Information

- Three 15.0-mL whole blood specimens
- For forensic and toxicology laboratories that perform qualitative and/or quantitative analysis of synthetic opioids and benzodiazepines
- Two shipments per year

NOB Program Drug Listing

Challenges will include a mix of drugs.

For the most current list of drugs, please go to cap.org. Under the Laboratory Improvement tab, click on Catalog and Ordering Information. The list is located under the PT Order Supplements header.

Blood Cannabinoids THCB

Analyte	Program Code	Challenges per Shipment
	THCB	
Cannabidiol (CBD) NEW	▮	3
Delta-8-THC	▮	3
Delta-8-THC-COOH NEW	▮	3
Delta-9-THC	▮	3
Delta-9-THC-COOH	▮	3
Delta-10-THC NEW	▮	3
11-hydroxy-THC	▮	3

Program Information

- Three 10.0-mL whole blood specimens
- For toxicology laboratories that perform qualitative and/or quantitative analysis of cannabinoids in blood
- Two shipments per year

CE credit

Antifungal Drugs Monitoring AFD

Analyte	Program Code	Challenges per Shipment
	AFD	
Fluconazole	▮	3
Itraconazole	▮	3
Posaconazole	▮	3
Voriconazole	▮	3

Program Information

- Three 2.0-mL serum specimens
- For laboratories performing quantitative analysis of antifungal agents
- Two shipments per year

Sample Exchange Registry for Alternative Assessment

When no formal proficiency testing is yet available, join the CAP's Sample Exchange Registry. After at least three laboratories are identified as testing for the same rare analyte, the CAP can anonymously deliver a sample from each laboratory to another participating facility, all of whom then report their results to us. We send each participant a custom result report, including an anonymous participant summary covering all the laboratories that took part.

Learn more at cap.org

Drug Monitoring for Pain Management DMPM

Analyte	Program Code	Challenges per Shipment
	DMPM	
See drug listing below	▮	3

Program Information

- Three 40.0-mL urine specimens
- For laboratories offering qualitative, confirmatory, and/or quantitative urine drug analysis for pain management
- Includes clinical cases and questions along with detailed descriptions of how to interpret test results
- Two shipments per year

DMPM Program Drug Listing

Challenges will include a mix of drugs from the list below.

Amphetamine group
6-acetylmorphine (6-AM)
7-aminoclonazepam
Alpha-hydroxyalprazolam
Alprazolam
Amphetamine
Barbiturate group
Benzodiazepine group
Benzoylecgonine
Buprenorphine
Buprenorphine and/or metabolites
Butalbital
Cannabinoids
Carisoprodol
Carisoprodol and/or metabolites
Clonazepam
Cocaine
Cocaine and/or metabolites
Codeine
Delta-9-THC-COOH
Diazepam
Fentanyl
Fentanyl and/or metabolites
Gabapentin
Hydrocodone
Hydromorphone
l-amphetamine
l-methamphetamine
Lorazepam
Meperidine
Meperidine and/or metabolites
Meprobamate
Methadone
Methadone metabolite (EDDP)
Methamphetamine
Methylenedioxyamphetamine (MDA)
Methylenedioxymethamphetamine (MDMA)
Morphine
N-desmethyltramadol
Naloxone
Norbuprenorphine
Nordiazepam
Norfentanyl
Norhydrocodone
Normeperidine
Noroxycodone
Noroxymorphone
Norpropoxyphene
O-desmethyltramadol
Opiate group
Oxazepam
Oxycodone
Oxymorphone
Phenobarbital
Pregabalin
Propoxyphene
Propoxyphene and/or metabolites
Tapentadol
Tapentadol-O-sulfate
Temazepam
Tramadol
Tramadol and/or metabolites

Drug-Facilitated Crime DFC		
Analyte	**Program Code**	**Challenges per Shipment**
	DFC	
See drug listing below	▮	3

Program Information

- Three 25.0-mL urine specimens
- For laboratories performing qualitative urine drug analysis with confirmation testing
- Designed for laboratories performing testing for drugs associated with drug-facilitated crimes, which target drugs at much lower concentrations than in other toxicology programs
- Two shipments per year

DFC Program Drug Listing

Challenges will include a mix of drugs from the list below.

4-hydroxytriazolam
7-aminoclonazepam
7-aminoflunitazepam
Alpha-hydroxyalprazolam
Amitriptyline
Amobarbital
Amphetamine
Benzoylecgonine
Bromazepam
Brompheniramine
Butalbital
Carisoprodol
Chlorpheniramine
Citalopram/escitalopram
Clobazam
Clonidine
Clozapine
Codeine
Cyclobenzaprine
Delta-9-THC-COOH
Desipramine
Dextromethorphan
Diphenhydramine
Doxepin
Doxylamine
Estazolam
Etizolam
Fentanyl
Fluoxetine
Gabapentin
Gamma hydroxybutyrate (GHB)
Hydrocodone
Hydromorphone
Hydroxyzine
Imipramine
Ketamine
Lorazepam
Meperidine
Meprobamate
Meta-chlorophenylpiperazine (m-CPP)
Methadone
Methadone metabolite (EDDP)
Methamphetamine
Methylenedioxyamphetamine (MDA)
Methylenedioxymethamphetamine (MDMA)
Midazolam
Morphine
Norbuprenorphine
Nordoxepin
Norfentanyl
Norfluoxetine
Norketamine
Normeperidine
Norpropoxyphene
Norsertraline
Nortriptyline
Norvenlafaxine
O-desmethyltramadol
Oxazepam
Oxycodone
Oxymorphone
Paroxetine
Pentobarbital
Phencyclidine (PCP)
Phenobarbital
Phenytoin
Promethazine
Propoxyphene
Quetiapine
Scopolamine
Secobarbital
Sertraline
Tapentadol
Temazepam
Tetrahydrozoline
Topiramate
Tramadol
Valproic acid
Venlafaxine
Zaleplon
Ziprasidone
Zolpidem
Zolpidem carboxylic acid
Zopiclone/Eszopiclone

Improve the reliability of your patient results with CAP Survey Validated Materials

Use the same material that is sent in the Surveys program to:

- Identify and troubleshoot instrument/method problems.
- Correlate results with other laboratories or instruments.
- Document correction of problems identified in Surveys.
- Use material with confirmed results as an alternative external quality control.
- Identify potential proficiency testing failures.

Each laboratory receives a Survey Participant Summary, which includes readily available results.

Toxicology, Validated Material

Validated Material	Program Code	Corresponding Program	Page
Urine Drug Testing, Screening	UDSM	UDS	98

Program Information

- Five 10.0-mL liquid urine specimens
- Three shipments per year

Urinalysis Benchtop Reference Guide

- Thirty-four different cell identifications, including common and rare cells
- Detailed descriptions for each cell morphology
- Eight tabbed sections for easy reference
- A durable and water-resistant format to withstand years of benchtop use—5” x 6½”

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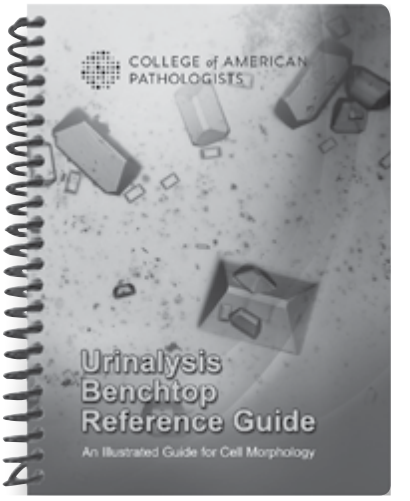

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Spiral bound; 38 pages; 2014

10 Accuracy-Based Programs

The CAP's Accuracy-Based Programs do what proficiency testing can't.

- Use the CAP's Accuracy-Based Programs to verify the accuracy of your test results against a gold standard.
- Accuracy-Based Programs use challenge specimens that are matrix-related, bias-free, and have target values traceable to certified reference materials.
- Only the CAP's Accuracy-Based Programs allow laboratories to compare their test results with reference method results.

Accuracy-Based Programs

Accuracy-Based Programs 112
Validated Materials 117

Accuracy-Based Programs

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Accuracy-Based Lipids ABL

Analyte	Program Code	Challenges per Shipment
	ABL	
Apolipoprotein A1	▮	3
Apolipoprotein B	▮	3
Cholesterol	▮	3
HDL cholesterol	▮	3
Non-HDL cholesterol	▮	3
LDL cholesterol	▮	3
Lipoprotein(a)	▮	3
Triglycerides	▮	3

To meet CMS and CAP-accredited laboratory regulatory requirements for these analytes, see C programs pages 54–56.

Program Information

- Three 1.0-mL human serum specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Accuracy-Based Vitamin D ABVD

Analyte	Program Code	Challenges per Shipment
	ABVD	
25-OH vitamin D (D2 and D3)	▮	3
Calcium	▮	3

Additional Information

- The Centers for Disease Control and Prevention (CDC) will establish reference targets using isotope-dilution LC-MS/MS method.
- Specimens are collected by a modified application of Clinical and Laboratory Standards Institute Guideline CLSI C37-A, *Preparation and Validation of Commutable Frozen Human Serum Pools as Secondary Reference Materials for Cholesterol Measurement Procedures; Approved Guideline.*
- To meet CMS and CAP-accredited laboratory regulatory requirements for calcium, see C programs on pages 54–56.

Program Information

- Three 1.0-mL liquid human serum specimens
- Serum is from multi-donor endogenous pools.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Accuracy-Based Testosterone, Estradiol ABS

Analyte	Program Code	Challenges per Shipment
	ABS	
Albumin	▮	3
Cortisol	▮	3
Estradiol	▮	3
Follicle-stimulating hormone (FSH)	▮	3
Luteinizing hormone (LH)	▮	3
Prostate-specific antigen (PSA), total	▮	3
Sex hormone-binding globulin (SHBG)	▮	3
Testosterone	▮	3
Thyroid-stimulating hormone (TSH)	▮	3

Program Information

- Three 1.0-mL human serum specimens
- Two shipments per year

Additional Information

- The Centers for Disease Control and Prevention (CDC) will set target values for testosterone and estradiol using the established reference methods.
- To meet CMS and CAP-accredited laboratory regulatory requirements for these analytes, see C programs on pages 54–56, K programs on page 82, and Y programs on page 83.

Accuracy-Based Urine ABU

Analyte	Program Code	Challenges per Shipment
	ABU	
Calcium	▮	3
Creatinine	▮	3
Protein, total	▮	3
Urine albumin, quantitative	▮	3
Urine albumin:creatinine ratio	▮	3

Program Information

- Three 5.0-mL human urine specimens
- Two shipments per year

Creatinine Accuracy
Calibration Verification/Linearity LN24

Analyte/Procedure	Program Code	
	LN24	LN24 Target Range
Creatinine	▮	0.6–4.0 mg/dL
Estimated glomerular filtration rate (eGFR)	▮	

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

eGFR results will be evaluated with a calculation verification comparison.

The CAP and the National Kidney Disease Education Program (NKDEP) have an initiative to harmonize clinically reported creatinine values. This initiative is analogous to what the federal health agencies and the clinical laboratory community did to improve the accuracy of cholesterol and glycohemoglobin testing.

Program Information

- Six 1.0-mL human serum specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Harmonized Thyroid ABTH

Analyte	Program Code	Challenges per Shipment
	ABTH	
Triiodothyronine (T3), free	▮	3
Triiodothyronine (T3), total	▮	3
Thyroxine (T4), free	▮	3
Thyroxine (T4), total	▮	3
Thyroid-stimulating hormone (TSH)	▮	3

Additional Information

- Analytes will be evaluated using harmonization.
- Specimens are collected by a modified application of Clinical and Laboratory Standards Institute Guideline CLSI C37-A, *Preparation and Validation of Commutable Frozen Human Serum Pools as Secondary Reference Materials for Cholesterol Measurement Procedures; Approved Guideline.*
- To meet CMS and CAP-accredited laboratory regulatory requirements for these analytes, see C programs on pages 54–56 and K programs on page 82.

Program Information

- Three 1.0-mL frozen human serum specimens
- Two shipments per year

Please note that the ranges listed are an estimate of the values recovered. Some instruments may recover lower or higher values than the ranges listed.

Hemoglobin A1c Accuracy Calibration Verification/Linearity LN15

Analyte	Program Code	
	LN15	LN15 Target Range
Hemoglobin A1c	▮	5%–12%

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

CAP-assigned target values are derived from Hemoglobin A1c measurements assayed by National Glycohemoglobin Standardization Program (NGSP) secondary reference laboratories.

Program Information

- Six 0.8-mL liquid human whole blood specimens
- Two shipments per year

Hemoglobin A1c, Waived Accuracy-Based GH2

Analyte	Program Code	Challenges per Shipment
	GH2	
Hemoglobin A1c	▮	3

Additional Information

- This program will be evaluated against the National Glycohemoglobin Standardization Program (NGSP) reference method.
- For multiple instrument reporting options, see the Quality Cross Check program, GHQ, on page 62.
- This program has limited stability. Laboratories outside the US or Canada should consider purchasing GH5I, which has longer stability.

Program Information

- Three 0.8-mL liquid human whole blood specimens
- Two shipments per year
- Designed for waived methods

Hemoglobin A1c, Accuracy-Based GH5

Analyte	Program Code	Challenges per Shipment
	GH5	
Hemoglobin A1c	▮	5

Additional Information

- This program will be evaluated against the National Glycohemoglobin Standardization Program (NGSP) reference method.
- For multiple instrument reporting options, see the Quality Cross Check program, GHQ, on page 62.
- This program has limited stability. Laboratories outside the US or Canada should consider purchasing GH5I, which has longer stability.

Program Information

- Five 0.8-mL liquid human whole blood specimens
- Three shipments per year

Please note that the ranges listed are an estimate of the values recovered. Some instruments may recover lower or higher values than the ranges listed.

Accuracy-Based Glucose, Insulin, and C-peptide ABGIC

Analyte	Program Code	Challenges per Shipment
	ABGIC	
C-peptide	▮	3
Gastrin	▮	3
Glucose	▮	3
Insulin	▮	3

Additional Information

- Target values for glucose and C-peptide will be set using the established reference methods.
- To meet CMS and CAP-accredited laboratory regulatory requirements for glucose, see C programs on pages 54–56.

Program Information

- Three 1.0-mL serum specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Validated Materials

Improve the reliability of your patient results with CAP Survey Validated Materials

Use the same material that is sent in the Surveys program to:

- Identify and troubleshoot instrument/method problems.
- Correlate results with other laboratories or instruments.
- Document correction of problems identified in Surveys.
- Use material with confirmed results as an alternative external quality control.
- Identify potential proficiency testing failures.

Each laboratory receives a Survey Participant Summary, which includes readily available results.

Chemistry, Validated Materials

Validated Material	Validated Material Code	Corresponding Program	Page
General Chemistry and Therapeutic Drugs	CZVM	CZ	54–56
Cerebrospinal Fluid	MVM	M	73
Urine Chemistry—General	UVM	U	68

Coagulation—Limited, Validated Material

Validated Material	Validated Material Code	Corresponding Program	Page
Coagulation—Limited	CGM	CGL	164

Endocrinology, Validated Materials

Validated Material	Validated Material Code	Corresponding Program	Page
Ligand—General	KVM	K	82
Sex Hormones	YVM	Y	83

Toxicology, Validated Material

Validated Material	Validated Material Code	Corresponding Program	Page
Urine Drug Testing, Screening	UDSM	UDS	98

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Transmit your quantitative PT/EQA results directly to the CAP with **direct transmission**. Your laboratory will spend less time manually entering results, which will free up resources for other priorities. Plus, you will reduce clerical errors and streamline your process to be more like patient testing.

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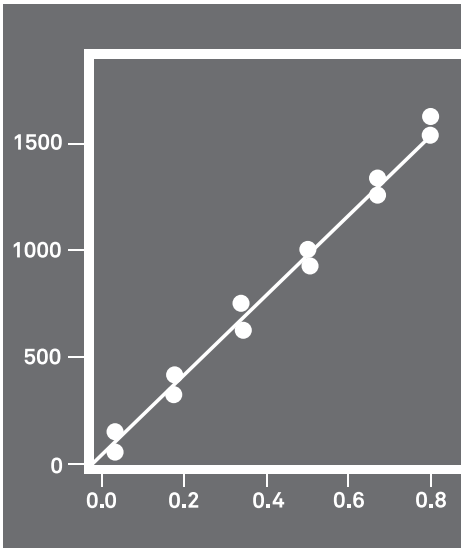
More accurate

Less time
entering results
More time for patient testing

LESS = MORE

11 Instrumentation Verification Tools



Ensure your instruments and methods are performing to their optimal levels.

Verify your analytical measurement range using our newest calibration verification/linearity programs for:

- Thyroid panel (LN50)
- Factor VIII (LN51)
- Hepatitis B viral load (LN52)
- Reticulocyte (LN53)

Instrumentation Verification Tools

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New Programs NEW

Reticulocyte Calibration Verification/Linearity (LN53) 127

Program Changes

Human chorionic gonadotropin (hCG) has been removed from LN5 and LN5S 123

Discontinued Programs

Troponin I Calibration Verification/Linearity (LN25)
Interfering Substance (IFS)

Calibration Verification/Linearity

The CAP CVL Program

The CAP is your trusted calibration verification and linearity (CVL) partner. Our CVL program will help you meet both CLIA regulations and CAP Laboratory Accreditation Program requirements for calibration and analytical measurement range verification under 42 CFR 493.1255(bX3). Don't let instrument problems impact your patient results; use the calibration verification and linearity studies to ensure your instrument and method are performing to their optimal levels.

With your enrollment in the CAP CVL program you'll receive:

- **Testing Kit**
  - Kit Instructions—Contain important information to help you complete testing and accurately report your results
  - Specimens—The majority of CAP CVL programs offer human-based materials to closely mimic your patient results.
- **Customized Report Package**
  - Executive Summary—A quick overview of both your calibration verification and linearity results for all reported analytes
  - Calibration Verification Evaluation
  - Linearity Evaluation
    - Rapid result turnaround is complimentary for most CVL programs. View your expedited linearity evaluations within two business days of submission by logging into e-LAB Solutions Suite.
  - Linearity Troubleshooting Report
  - Participant Summary—A summary of laboratory performance that includes peer group statistics and enhanced diagnostic information for early insight into potential problems
- **Additional Tools**
  - Calibration Verification/Linearity Program User's Guide—Get assistance in interpreting your evaluations and reports as well as helpful troubleshooting information with suggested actions. Also available online by logging into e-LAB Solutions Suite
  - Calibration Verification Troubleshooting Guide—The guide provides suggested actions if you receive a calibration verification result of Different, or if your evaluation result is Verified over a range that does not include all of your reported results.
  - Calibration Verification/Linearity Surveys Investigation Checklist for Problematic Results—Interpretive checklists are included to help with troubleshooting and documentation.

Your Total Calibration Verification/Linearity (CVL) Solution

CVL Program	Page No.	Corresponding Proficiency Testing Program	Page No.
LN2 - Chemistry, Lipid, Enzyme CVL	122	C1, C3/C3X, C4, CZ/CZX/CZ2X	54–56
LN2BV - Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122		
LN3 - Therapeutic Drug Monitoring CVL	123	CZ/CZX/CZ2X/Z	54–56
LN5 - Ligand CVL	123	K/KK	82
LN5S - Ligand CVL – all Siemens ADVIA (Centaur, CP, and XP) and Atellica IM	123		
LN6 - Urine Chemistry CVL	124	U	68
LN7 - Immunology CVL	124	IG/IGX	218
LN8 - Reproductive Endocrinology CVL	125	Y/YY	83
LN9 - Hematology CVL	125	FH series, HE	138
LN11 - Serum Ethanol CVL	125	AL2	102
LN12 - C-reactive Protein CVL	126	CRP	218
LN13, LN13C - Blood Gas/Critical Care CVL	126	AQ, AQH, AQIS	90–91
LN15 - Hemoglobin A1c Accuracy CVL	126	GH2, GH5	61–62
LN16 - Homocysteine CVL	127	HMS	63
LN17 - Whole Blood Glucose CVL	127	N/A	
LN19 - Reticulocyte CVL	127	RT3	143
LN20 - Urine Albumin CVL	128	U	68
LN21 - High-Sensitivity C-reactive Protein CVL	128	HSCRP	63
LN22 - Flow Cytometry CVL	128	FL	226
LN23 - Prostate-Specific Antigen CVL	128	K/KK	82
LN24 - Creatinine Accuracy CVL	129	C1, C3/C3X, C4, CZ/CZX/CZ2X	54–56
LN30 - B-type Natriuretic Peptides CVL	129	BNP5	60
LN31 - Immunosuppressive Drugs CVL	129	CS	58
LN32 - Ammonia CVL	130	C1, C3/C3X, CZ/CZX/CZ2X	54–56
LN33 - Serum Myoglobin CVL	130	CRT, CRTI	60
LN34 - Tumor Markers CVL	130	K, TM/TMX	82, 88
LN35 - Thrombophilia CVL	131	CGS2	166
LN36 - Heparin CVL	131	CGS4	166
LN37 - von Willebrand Factor Antigen CVL	131	CGS3	166
LN38 - CMV Viral Load CVL	131	VLS, VLS2	205
LN39 - HIV Viral Load CVL	131	HIVG, HV2	205
LN40 - Vitamin D CVL	132	VITD	84
LN41 - Procalcitonin CVL	132	PCT	75
LN42 - D-dimer CVL	132	CGL, CGDF	164
LN44 - Fibrinogen CVL	132	CGL	164
LN45 - HCV Viral Load CVL	131	HCV2	205
LN46 - C-peptide/Insulin CVL	133	N/A	
LN47 - High-Sensitivity Troponin T CVL	133	HCRT, HCRTI	60
LN48 - High-Sensitivity Troponin I CVL	133	HCRT, HCRTI	60
LN49 - Cystatin C CVL	133	CYS	73
LN50 - Thyroid Panel CVL	134	C1, C3/C3X, CZ/CZX/CZ2X, K/KK	54–56, 82
LN51 - Factor VIII CVL	131	CGE/CGEX, CGS3, ECF	165–166
LN52 - HBV Viral Load CVL	131	HBVL/HBVL5	205
LN53 - Reticulocyte CVL	127	RT4	143

All CVL programs provide individual evaluation reports by analytes, an executive summary, and graphical plots for linearity and calibration verification.

Chemistry, Lipid, Enzyme
Calibration Verification/Linearity LN2, LN2BV

Analyte	Program Code	LN2 Target Ranges	LN2BV Target Ranges		Units
	LN2, LN2BV	All Instruments	All Beckman (Except AU)	Vitros	
Albumin	▮	1.5–9.0			g/dL
Calcium	▮	4.0–18.0			mg/dL
Chloride	▮	60–180			mmol/L
CO_2	▮	7–42			mmol/L
Creatinine	▮	0.8–34.0			mg/dL
Glucose	▮	20–750			mg/dL
Iron	▮	10–950			µg/dL
Magnesium	▮	0.5–9.0			mg/dL
Osmolality	▮	200–600			mOsm/kg H_2O
Phosphorus	▮	0.5–22.0			mg/dL
Potassium	▮	1.5–13.0			mmol/L
Protein	▮	1.5–12.0			g/dL
Sodium	▮	65–195			mmol/L
Urea nitrogen/Urea	▮	5–170			mg/dL
Uric acid	▮	1–25			mg/dL
Alkaline phosphatase	▮	25–1,800	25–1,000	25–1,100	U/L
ALT (SGPT)	▮	10–900	10–650	30–700	U/L
Amylase	▮	30–1,800	30–900	30–800	U/L
AST (SGOT)	▮	10–900	10–500	10–700	U/L
Creatine kinase	▮	25–2,000	25–1,200	25–700	U/L
CK-2 (MB) mass	▮	1–250	1–450	1–450	ng/mL
Gamma glutamyl transferase	▮	10–1,400	10–700	10–700	U/L
Lactate dehydrogenase	▮	50–1,800	50–700	185–3,000	U/L
Lipase	▮	20–1,200	20–190	150–2,500	U/L
Bilirubin, direct	▮	0.1–10.0			mg/dL
Bilirubin, total	▮	0.2–25.0			mg/dL
Cholesterol	▮	35–625			mg/dL
HDL	▮	7–120			mg/dL
Triglycerides	▮	20–700			mg/dL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information

- Seven 5.0-mL liquid serum specimens for basic chemistry, six 3.0-mL liquid serum specimens for direct and total bilirubin, seven 2.0-mL liquid serum specimens for lipids, and seven 5.0-mL liquid serum specimens for enzymes
- LN2 - Appropriate for most major instruments
- LN2BV - Appropriate for Beckman (except AU) and Vitros instruments only
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Please note that the ranges listed are an estimate of the values recovered. Some instruments may recover lower or higher values than the ranges listed.

Therapeutic Drug Monitoring Calibration Verification/Linearity LN3

Analyte	Program Code	
	LN3	LN3 Target Ranges
Acetaminophen	▮	20–350 µg/mL
Amikacin	▮	2–45 µg/mL
Carbamazepine	▮	2–25 µg/mL
Digoxin	▮	0.5–4.4 ng/mL
Gentamicin	▮	1–11 µg/mL
Lidocaine	▮	1–10 µg/mL
Lithium	▮	0.3–4.0 mmol/L
Phenobarbital	▮	8–80 µg/mL
Phenytoin	▮	5–35 µg/mL
Salicylate	▮	7–90 mg/dL
Theophylline	▮	5–35 µg/mL
Tobramycin	▮	1–10 µg/mL
Valproic acid	▮	15–140 µg/mL
Vancomycin	▮	7–85 µg/mL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information

- Six 4.0-mL liquid serum specimens
- A seventh 4.0-mL liquid serum specimen for acetaminophen, carbamazepine, and vancomycin
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Ligand Calibration Verification/Linearity LN5, LN5S

Analyte	Program Code		
	LN5, LN5S*	LN5 Target Ranges	LN5S Target Ranges
AFP	▮	1.0–900.0 ng/mL	
CEA	▮	0.5–750.0 ng/mL	0.6–90.0 ng/mL
Cortisol	▮	1–65 µg/dL	
Ferritin	▮	2–1,100 ng/mL	
Folate	▮	1.3–20.0 ng/mL	
Vitamin B_{12}	▮	100–2,200 pg/mL	

*The LN5S CVL will allow Siemens ADVIA (Centaur, XP, and CP) and Atellica IM users to report other major instruments for analytes other than CEA, if needed.

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information

- LN5 - Six 4.0-mL liquid serum specimens; appropriate for most major instruments except Siemens ADVIA (Centaur, XP, and CP) and Atellica IM users
- LN5S - Eleven 4.0-mL liquid serum specimens; appropriate for Siemens ADVIA (Centaur, XP, and CP) and Atellica IM users
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Please note that the ranges listed are an estimate of the values recovered. Some instruments may recover lower or higher values than the ranges listed.

Urine Chemistry Calibration Verification/Linearity LN6

Analyte	Program Code	
	LN6	LN6 Target Ranges
Amylase	▮	40–5,400 U/L
Calcium	▮	5–30 mg/dL
Chloride	▮	20–270 mmol/L
Creatinine	▮	20–560 mg/dL
Glucose	▮	25–640 mg/dL
Osmolality	▮	30–1,800 mOsm/kg H_20
Phosphorus	▮	15–225 mg/dL
Potassium	▮	7–260 mmol/L
Protein, total	▮	10–180 mg/dL
Sodium	▮	20–360 mmol/L
Urea nitrogen/Urea	▮	20–2,000 mg/dL
Uric acid	▮	6–200 mg/dL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information

- Twenty 4.0-mL liquid simulated urine specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Immunology Calibration Verification/Linearity LN7

Analyte	Program Code	
	LN7	LN7 Target Ranges
Alpha-1 antitrypsin	▮	35–500 mg/dL
Complement C3	▮	21–420 mg/dL
Complement C4	▮	5–125 mg/dL
IgA	▮	32–650 mg/dL
IgG	▮	160–3,800 mg/dL
IgM	▮	25–550 mg/dL
Transferrin	▮	50–750 mg/dL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information

- Seven 2.0-mL liquid serum specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Please note that the ranges listed are an estimate of the values recovered. Some instruments may recover lower or higher values than the ranges listed.

Reproductive Endocrinology Calibration Verification/Linearity LN8

Analyte	Program Code	
	LN8	LN8 Target Ranges
Estradiol	▮	25–4,500 pg/mL
Follicle-stimulating hormone (FSH)	▮	3–190 mIU/mL
Human chorionic gonadotropin (hCG)	▮	5–8,000 mIU/mL
Luteinizing hormone (LH)	▮	2–190 mIU/mL
Progesterone	▮	1–50 ng/mL
Prolactin	▮	3–315 ng/mL
Testosterone	▮	20–1,500 ng/dL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information

- Seven 4.0-mL liquid serum specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Hematology Calibration Verification/Linearity LN9

Analyte	Program Code	
	LN9	LN9 Target Ranges
Hemoglobin	▮	1.0–22.5 g/dL
Platelet count	▮	10–4,200 x 10^9/L
Red blood cell (RBC) count	▮	0.3–7.5 x 10^{12}/L
White blood cell (WBC) count	▮	0.5–350.0 x 10^9/L

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information

- Twenty 3.0-mL liquid specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Serum Ethanol Calibration Verification/Linearity LN11

Analyte	Program Code	
	LN11	LN11 Target Range
Serum ethanol	▮	15–550 mg/dL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information

- Seven 3.0-mL liquid serum specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Please note that the ranges listed are an estimate of the values recovered. Some instruments may recover lower or higher values than the ranges listed.

C-reactive Protein Calibration Verification/Linearity LN12

Analyte	Program Code	
	LN12	LN12 Target Range
C-reactive protein	▮	7–316 mg/L

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Not appropriate for reporting high-sensitivity C-reactive protein (hsCRP). For reporting hsCRP, use LN21 on page 128.

Program Information

- Seven 1.0-mL liquid serum specimens
- Two shipments per year

Blood Gas/Critical Care Calibration Verification/Linearity LN13, LN13C

Analyte	Program Code		Program Code	
	LN13	LN13 Target Ranges	LN13C	LN13C Target Ranges
pCO_2	▮	12–91 mm Hg	▮	12–91 mm Hg
pH	▮	6.83–7.82	▮	6.83–7.82
pO_2	▮	18–490 mm Hg	▮	18–490 mm Hg
Calcium, ionized			▮	0.15–3.30 mmol/L
Chloride			▮	62–148 mmol/L
Glucose			▮	10–465 mg/dL
Lactate			▮	0.2–18.0 mmol/L
Potassium			▮	0.5–10.7 mmol/L
Sodium			▮	83–172 mmol/L

Program Information

- LN13, LN13C - Ten 2.5-mL ampules of aqueous specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Hemoglobin A1c Accuracy Calibration Verification/Linearity LN15

Analyte	Program Code	
	LN15	LN15 Target Range
Hemoglobin A1c	▮	5%–12%

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

CAP-assigned target values are derived from Hemoglobin A1c measurements assayed by National Glycohemoglobin Standardization Program (NGSP) secondary reference laboratories.

Program Information

- Six 0.8-mL liquid human whole blood specimens
- Two shipments per year

Please note that the ranges listed are an estimate of the values recovered. Some instruments may recover lower or higher values than the ranges listed.

Homocysteine Calibration Verification/Linearity LN16

Analyte	Program Code	
	LN16	LN16 Target Range
Homocysteine	▮	5–65 µmol/L

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information

- Six 1.0-mL liquid serum specimens
- Two shipments per year

Whole Blood Glucose Calibration Verification/Linearity LN17

Analyte	Program Code	
	LN17	LN17 Target Range
Whole blood glucose	▮	50–400 mg/dL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information

- Five 2.0-mL liquid whole blood specimens
- Report up to 10 different ancillary testing sites or instruments.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Reticulocyte Calibration Verification/Linearity LN19, LN53

Instrument/Method	Program Code		
	LN19	LN53 NEW	Target Range
Beckman Coulter Unicel DxH series (except DxH 500)	▮		0.3%–28.0%
Sysmex XE-2100, XE-2100C, XE-2100D, XE-2100DC, XE-2100L, XE-5000, XN-L series, XN-series (includes RL app), XR-series, XT-2000i, XT4000i		▮	0.5%–25.0%

View your expedited linearity evaluations for LN19 within two business days by logging into e-LAB Solutions Suite.

Program Information

- LN19, LN53 - Five 2.5-mL liquid whole blood specimens with pierceable caps
- Two shipments per year

Please note that the ranges listed are an estimate of the values recovered. Some instruments may recover lower or higher values than the ranges listed.

Urine Albumin Calibration Verification/Linearity LN20

Analyte	Program Code	
	LN20	LN20 Target Ranges
Urine albumin	▮	10–350 mg/L
Urine creatinine	▮	20–500 mg/dL
Urine albumin:creatinine ratio	▮	

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

The urine albumin:creatinine ratio results will be evaluated with a calculation verification comparison.

Program Information
- Six 5.0-mL urine specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

High-Sensitivity C-reactive Protein Calibration Verification/Linearity LN21

Analyte	Program Code	
	LN21	LN21 Target Range
High-sensitivity C-reactive protein	▮	0.5–18.0 mg/L

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information
- Six 1.0-mL liquid serum specimens
- For high-sensitivity methods only
- Two shipments per year

Flow Cytometry Calibration Verification/Linearity LN22

Analyte	Program Code	
	LN22	LN22 Target Ranges
CD3+	▮	50%–70% positive
CD3+ T lymphocytes absolute	▮	350–4,000 cells/µL
CD3+/CD4+	▮	1%–40% positive
CD3+/CD4+ T lymphocytes absolute	▮	6–2,000 cells/µL
CD3+/CD8+	▮	25%–40% positive
CD3+/CD8+ T lymphocytes absolute	▮	250–1,600 cells/µL

Program Information
- Seven 1.0-mL liquid whole blood specimens
- Two shipments per year

Prostate-Specific Antigen Calibration Verification/Linearity LN23

Analyte	Program Code	
	LN23	LN23 Target Range
Prostate-specific antigen (PSA)	▮	0.1–90.0 ng/mL

Program Information
- Eight 1.0-mL liquid serum specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Please note that the ranges listed are an estimate of the values recovered. Some instruments may recover lower or higher values than the ranges listed.

Creatinine Accuracy Calibration Verification/Linearity LN24

Analyte/Procedure	Program Code	
	LN24	LN24 Target Range
Creatinine	▮	0.6–4.0 mg/dL
Estimated glomerular filtration rate (eGFR)	▮	

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

eGFR results will be evaluated with a calculation verification comparison.

The CAP and the National Kidney Disease Education Program (NKDEP) have an initiative to harmonize clinically reported creatinine values. This initiative is analogous to what the federal health agencies and the clinical laboratory community did to improve the accuracy of cholesterol and glycohemoglobin testing.

Program Information

- Six 1.0-mL human serum specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

B-type Natriuretic Peptides Calibration Verification/Linearity LN30

Analyte	Program Code	
	LN30	LN30 Target Ranges
B-type natriuretic peptides (BNP)	▮	18–5,000 pg/mL
NT-proBNP	▮	35–25,000 pg/mL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information

- Six 1.0-mL liquid plasma specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Immunosuppressive Drugs Calibration Verification/Linearity LN31

Analyte	Program Code	
	LN31	LN31 Target Ranges
Cyclosporine	▮	60–1,200 ng/mL
Tacrolimus	▮	1.5–30.0 ng/mL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information

- Seven 2.0-mL liquid whole blood hemolysate specimens
- Two shipments per year

Please note that the ranges listed are an estimate of the values recovered. Some instruments may recover lower or higher values than the ranges listed.

Ammonia Calibration Verification/Linearity LN32

Analyte	Program Code	
	LN32	LN32 Target Range
Ammonia	▮	13–900 µmol/L

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information

- Seven 2.0-mL aqueous specimens
- Two shipments per year

Serum Myoglobin Calibration Verification/Linearity LN33

Analyte	Program Code	
	LN33	LN33 Target Range
Myoglobin	▮	25–900 ng/mL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information

- Seven 1.0-mL liquid serum specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Tumor Markers Calibration Verification/Linearity LN34

Analyte	Program Code	
	LN34	LN34 Target Ranges
CA 125	▮	1–1,000 U/mL
CA 15-3	▮	2–190 U/mL
CA 19-9	▮	10–900 U/mL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information

- Seven 3.0-mL liquid serum specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

The CAP is your trusted calibration verification and linearity partner, offering a comprehensive menu of programs for diagnostic confidence.

- **Expedited results**—View your linearity evaluation for most CVL programs within two business days of data submission.
- **Customized report package**—Let our team of biostatisticians perform the statistical analysis of your results so you don't have to.
- **Objective Assessment**—Maximize confidence in instrument calibration by using peer group data for a view beyond your laboratory.

See the Instrumentation Verification Tools section of this catalog to determine programs that best fit your laboratory's CVL needs.

Please note that the ranges listed are an estimate of the values recovered. Some instruments may recover lower or higher values than the ranges listed.

Coagulation Calibration Verification/Linearity LN35, LN36, LN37, LN51

Analyte	Program Code				
	LN35	LN36	LN37	LN51	Target Ranges
Antithrombin activity	▮				10%–130%
Protein C activity	▮				10%–100%
Heparin, low molecular weight		▮			0.1–2.0 U/mL
Heparin, unfractionated		▮			0.1–1.3 U/mL
von Willebrand factor antigen			▮		5%–140%
Factor VIII clot-based				▮	1–200 IU/dL
Factor VIII chromogenic				▮	1–200 IU/dL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

The LN35, LN36, and LN37 CVL programs meet the CAP Accreditation Checklist requirements HEM.37363, 37365, 37373, and 37375.

Program Information

- LN35, LN37, LN51 - Six 1.0-mL frozen plasma specimens per mailing
- LN36 - Twelve 1.0-mL frozen plasma specimens per mailing, which include six for low molecular weight heparin and six for unfractionated heparin
- Two shipments per year; ships on dry ice

Viral Load Calibration Verification/Linearity LN38, LN39, LN45, LN52

Analyte	Program Code				
	LN38	LN39	LN45	LN52	Target Ranges
Cytomegalovirus (CMV) viral load	▮				316.0–8.0M IU/mL
HIV viral load		▮			50.0–5.0M IU/mL
Hepatitis C (HCV) viral load			▮		50.0–280.0M IU/mL
Hepatitis B (HBV) viral load				▮	1.3 log–8.5 log IU/mL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information

- LN38 - Six 1.5-mL liquid plasma specimens
- LN39 - Six 2.5-mL liquid plasma specimens
- LN45 - Seven 2.5-mL frozen DNA specimens
- LN52 - Seven 2.5-mL frozen DNA specimens
- Two shipments per year; LN45 and LN52 ship on dry ice

Please note that the ranges listed are an estimate of the values recovered. Some instruments may recover lower or higher values than the ranges listed.

Vitamin D Calibration Verification/Linearity LN40

Analyte	Program Code	
	LN40	LN40 Target Range
25-OH vitamin D, total	▮	10–135 ng/mL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information
- Six 1.0-mL serum specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Procalcitonin Calibration Verification/Linearity LN41

Analyte	Program Code	
	LN41	LN41 Target Range
Procalcitonin	▮	0.3–175.0 ng/mL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information
- Six 1.0-mL frozen serum specimens
- Two shipments per year; ships on dry ice

D-dimer Calibration Verification/Linearity LN42

Analyte	Program Code	
	LN42	LN42 Target Range
D-dimer	▮	220–5,500 ng/mL FEU

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information
- Six 1.0-mL plasma specimens
- Two shipments per year

Fibrinogen Calibration Verification/Linearity LN44

Analyte	Program Code	
	LN44	LN44 Target Range
Fibrinogen	▮	80–900 mg/dL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information
- Six 1.0-mL frozen plasma specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year; ships on dry ice

Please note that the ranges listed are an estimate of the values recovered. Some instruments may recover lower or higher values than the ranges listed.

C-peptide/Insulin Calibration Verification/Linearity LN46

Analyte	Program Code	
	LN46	LN46 Target Ranges
C-peptide	▮	0.2–35.0 ng/mL
Insulin	▮	0.6–800.0 µIU/mL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information
- Seven 2.0-mL frozen serum specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

High-Sensitivity Troponin T Calibration Verification/Linearity LN47

Analyte	Program Code	
	LN47	LN47 Target Range
High-sensitivity troponin T	▮	10–9,000 ng/L

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information
- Six 2.0-mL serum specimens
- Two shipments per year

High-Sensitivity Troponin I Calibration Verification/Linearity LN48

Analyte	Program Code	
	LN48	LN48 Target Range
High-sensitivity troponin I	▮	10–25,000 ng/L

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information
- Six 2.0-mL serum specimens
- Two shipments per year

Cystatin C Calibration Verification/Linearity LN49

Analyte/Procedure	Program Code	
	LN49	LN49 Target Range
Cystatin C	▮	0.5 - 6.5 mg/L
Estimated glomerular filtration rate (eGFR)	▮	

eGFR results will be evaluated with a calculation verification comparison.

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information
- Six 1.0-mL liquid serum specimens
- Two shipments per year

Please note that the ranges listed are an estimate of the values recovered. Some instruments may recover lower or higher values than the ranges listed.

Thyroid Panel
Calibration Verification/Linearity LN50

Analyte	Program Code	
	LN50	LN50 Target Ranges
Triiodothyronine (T3), free	▮	1.0–18.0 pg/mL
Triiodothyronine (T3), total	▮	0.4–7.0 ng/mL
Thyroxine (T4), free	▮	0.7–7.0 ng/dL
Thyroxine (T4), total	▮	1.0–27.0 µg/dL
Thryoid-stimulating hormone (TSH)	▮	0.1–120.0 µIU/mL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information

- Eighteen 2.0-mL serum specimens
- Two shipments per year

Quality Management in Clinical Laboratories

Quality Management in Clinical Laboratories, Second Edition is a practical "how to" manual written for the laboratory director, supervisor, and practicing pathologist. It covers how to manage quality and patient safety in clinical laboratories, comply with quality and patient safety regulations and accreditation requirements, and develop and administer a quality management plan. The book addresses important standards and areas that have proven to be particularly problematic in the management of clinical laboratories.

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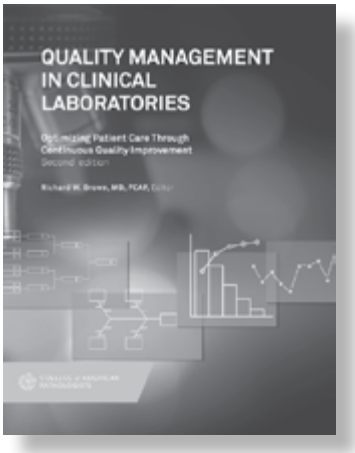

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Instrumentation Quality Management Programs

Instrumentation I

Challenges	Program Code
	I
Gravimetric pipette check	▮
Microtiter plate linearity	▮
Refractometer check	▮
Spectrophotometer (stray light check)	▮
Fluorescent intensity check – fluorescent microscopes	▮
pH meter check	▮

WARNING: The Instrumentation (I) program specimens may contain corrosive or toxic substances, environmental hazards, or irritants.

Program Information

- Designed to assess instruments not routinely challenged during the proficiency testing process
- Includes appropriate materials to assess important functional parameters, including accuracy and linearity
- One shipment per year

Serum Carryover SCO

Analyte	Program Code
	SCO
Creatinine	▮
Human chorionic gonadotropin (hCG)	▮
Lactate dehydrogenase (LD)	▮
Phenytoin	▮

Program Information

- One 10.0-mL liquid serum specimen (low level) and one 5.0-mL liquid serum specimen (high level)
- Designed to screen for instrument sample probe carryover
- One shipment per year

Urine Toxicology Carryover UTCO

Analyte	Program Code
	UTCO
Benzoylecgonine	▮
Delta-9-THC-COOH	▮
Opiates	▮
Amphetamine	▮

Program Information

- Two 40.0-mL urine specimens (low and high levels)
- Designed to screen for instrument sample probe carryover
- One shipment per year

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"As new technologies emerge or regulatory requirements come up, the CAP provides education and resources from experts to understand and implement them. And that brings a practical aspect that's invaluable."

Julie Kingery, MD, FCAP
Vice Chair of Clinical Pathology
University of Florida

12 Hematology and Clinical Microscopy

All Centers for Medicare & Medicaid Services (CMS) regulated analytes are listed in **bold** type.

Hematology and Clinical Microscopy

Hematology 138
Clinical Microscopy 150

Hematology

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Hematology—Basic HE

Analyte/Procedure	Program Code	Challenges per Shipment
	HE	
Hematocrit	▮	5
Hemoglobin	▮	5
MCV, MCH, MCHC	▮	5
MPV	▮	5
Platelet count	▮	5
RDW	▮	5
Red blood cell (RBC) count	▮	5
White blood cell (WBC) count	▮	5

Program Information

- Five 3.0-mL whole blood specimens
- Conventional and International System of Units (SI) reporting offered
- Three shipments per year

CE credit

Hematology Automated Differential Series FH1–FH4, FH9–FH10, FH13, FH16–FH17

Analyte/Procedure	Program Code	Challenges per Shipment
	FH1–FH4, FH9–FH10, FH13, FH16–FH17	
Hematocrit	▮	5
Hemoglobin	▮	5
Immature granulocyte (IG)	▮	5 (FH9 and FH17)
Immature platelet fraction (IPF)/ reticulated platelet (RP)	▮	5 (FH9 only)
Large unstained cell (LUC)	▮	5 (FH4 only)
MCV, MCH, MCHC	▮	5
MPV	▮	5
Nucleated red blood cell count (nRBC)	▮	5 (FH3, FH9, FH13, FH16, and FH17)
Platelet count	▮	5
RDW	▮	5
Red blood cell (RBC) count	▮	5
White blood cell (WBC) count	▮	5
WBC differential	▮	5

For multiple instrument reporting options, see the Quality Cross Check programs, FH3Q, FH9Q, and FH13Q, on page 140.

Program Information

- FH1–4, FH10, FH16–17 - Five 2.5-mL whole blood specimens in vials with pierceable caps
- FH9, FH13 - Five 2.0-mL whole blood specimens in vials with pierceable caps
- For method compatibility, see instrument matrix on page 139.
- Conventional and International System of Units (SI) reporting offered
- Three shipments per year

CE credit

Hematology Automated Differential Series, Instrument Matrix

Instrument	FH and FHQ Series								
	FH1	FH2	FH3/ FH3Q	FH4	FH9/ FH9Q	FH10	FH13/ FH13Q	FH16/ FH3Q	FH17
Abbott Cell-Dyn® 1200, 1400, 1600, 1700, Emerald™	▮								
Horiba ABX 9000+, 9018+, 9020+	▮								
Sysmex K-series, K-1000/KCP-1, KX-21/21N, pocH-100i, XP-series, XQ-320	▮								
CDS/Medonic M-series		▮							
Beckman Coulter® AcT, diff/diff 2™ MD 2/8/10/16, ONYX™, S880, S-plus V, ST, STKR, T-series		▮							
Drew Scientific DC-18, I-1800, DREW3, EXCELL 10/16/18, I-1800		▮							
Horiba ABX Micros		▮							
Mindray BC-2800, 3000/3200 series		▮							
Siemens ADVIA® 360		▮							
Abbott Cell-Dyn 3000, 3500, 3700, 4000, Emerald 22/AL, Ruby™, Sapphire™			▮						
Biosystems HA3/HA5			▮						
Drew Scientific EXCELL 22, 2280			▮						
HumaCount5D			▮						
Nihon Kohden MEK 9100			▮						
Orphee Mythic 18, 22 AL, 22 OT, 60			▮						
Siemens ADVIA 560			▮						
Siemens ADVIA 120, 120 w/SP1, 2120				▮					
Abbott Alinity hq, Sysmex XE-2100, XE-2100C, XE-2100D, XE-2100DC, XE-2100D/L (Blood Center), XE-2100L, XE-5000, XN-series (includes RL App), XN-L series, XR-series, XS-500i, XS-800i, XS-1000i, XS-1000i-AL, XS-1000iC, XT-1800i, XT-2000i, XT-4000i, Zybio EXZ 6000 series					▮				
Beckman Coulter AcT 5diff (AL, CP, OV)						▮			
DIRUI BF series						▮			
Horiba ABX Pentra 60, 80, 120, Pentra DF Nexus						▮			
Beckman Coulter LH 750, LH 755, LH 780, LH 785, UniCel DxH series (except DxH 500 series)							▮		
Beckman Coulter DxH 500 series								▮	
Horiba Yumizen H500/550, H1500/2500								▮	
Mindray BC-700, BC-720, BC-760, BC-780, BC-6000, BC-6000Plus, BC-6100, BC-6100Plus, BC-6200, BC-6200Plus, BC-6600, BC-6600Plus, BC-6700, BC-6800, BC-6800Plus, BC-7500, BC-7500 CRP									▮

Quality Cross Check—Hematology FH3Q, FH9Q, FH13Q

Analyte/Procedure	Program Code			Challenges per Shipment
	FH3Q	FH9Q	FH13Q	
Hematocrit	▮	▮	▮	3
Hemoglobin	▮	▮	▮	3
Immature granulocyte (IG)		▮		3
Immature platelet fraction (IPF)%		▮		3
MCV, MCH, MCHC	▮	▮	▮	3
MPV	▮	▮	▮	3
Nucleated red blood cell (nRBC) count	▮	▮	▮	3
Platelet count	▮	▮	▮	3
RDW	▮	▮	▮	3
Red blood cell (RBC) count	▮	▮	▮	3
White blood cell (WBC) differential	▮	▮	▮	3
WBC count	▮	▮	▮	3

These programs do not meet regulatory requirements for proficiency testing; see the FH Series on page 138. For additional information about the Quality Cross Check program, see page 36.

Program Information

- FH3Q, FH9Q, FH13Q - Three 2.5-mL whole blood specimens in vials with pierceable caps
- Report up to three instruments.
- For method compatibility, see instrument matrix on page 139.
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

12

Hematology and Clinical Microscopy

Blood Cell Identification, Photographs BCP

Procedure	Program Code	Challenges per Shipment
	BCP	
Blood cell identification	▮	5
Educational challenges	▮	5

Program Information

- Ten images, each available as photographs and online images
- Three shipments per year

CE credit

Blood Cell Identification, Virtual BCPV

Procedure	Program Code	Challenges per Shipment
	BCPV	
Blood cell identification	▮	5
Educational challenges	▮	5

Program Information

- Ten online images
- Three shipments per year

CE credit

Assessment of Consistency of Peripheral Blood Morphologic Observations QPC10/QPC25

Introduction

The widespread use of automated white blood cell (WBC) differential counts and computer-generated whole slide imaging has decreased the time that the medical laboratory scientist/technologist staff dedicate to morphological assessment of blood cells. However, these staff must maintain their morphological skills. Laboratories have an annual requirement to do a morphologic comparison of their technical staff's peripheral blood smear results, assess their competency on peripheral blood smears, and provide appropriate education.

Objectives

This study will help assess the effectiveness of educational and practical experience policies and procedures dedicated to the laboratory's efforts in maintaining technologist skills in the performance of accurate WBC differential counts and other peripheral blood smear morphological assessments. The evaluation provided will assist in the construction of individual educational programs for the technical staff and show areas that need focused review and improvement. The study will help management meet applicable CLIA, CAP Laboratory Accreditation Program, and The Joint Commission laboratory requirements for consistency of reporting morphology among staff and personnel competency requirements (testing previously analyzed specimens).*

Data Collection

A series of online, whole slide images of Wright or Wright-Giemsa-stained peripheral blood smears using DigitalScope® technology will be available to each participating institution to assess technologists' performance on WBC differential counts and morphology assessment. Each technologist will receive their own kit. Technologists will provide information about their continuing education and professional background. Information will be collected from each site regarding their institution's minimum continuing education requirements for their technologists in hematology and relevant procedures and policies related to peripheral blood smear assessment.

Performance Indicators

- Individual technologist score based on a standardized competency assessment method to determine a technologist's ability to identify various WBC types, red blood cell morphology, and platelet morphology in normal and abnormal cases
- Overall laboratory score based on the facility's individual technologist performance(s)

Your Reports – What to Expect

- A participant summary explaining the grading criteria for each case and how to read the reports
- An institution report with your facility's score summary with comparison to other institutions and a technologist score summary by case for each participant
- An individual report for each participant listing their responses and score for each case
- A data analysis and critique report with analysis of the institution and participant scores, author commentary about each case, and links to annotated slides

Program Information

To meet your staff comparative morphology and technical competency assessment requirements:

- Result forms for up to 10 technologists (QPC10)
- Result forms for up to 25 technologists (QPC25)
- Multiple orders may be purchased to accommodate the quantity of technologist result forms needed.

Preliminary study reports are provided at institution and technologist levels.

***Participation in this study helps laboratories meet applicable requirements:**

- CLIA personnel requirements (Subpart M, 42 CFR §493.1)
- CAP Laboratory Accreditation Program Checklist statements: HEM.34400, consistency of morphologic observation among personnel performing blood cell microscopy at least annually; GEN.55500, element 5, Competency Assessment of Testing Personnel; GEN.55525, Performance Assessment of Supervisors/Consultants; DRA.11425, functions or responsibilities are properly performed by a qualified individual
- The Joint Commission Standards HR.01.05.03, 01.06.01 (EPs 3, 18,19), HR.01.07.01, PI.03.01.01(EPs 3-5), and LD.04.05.01, 04.05.03 (EPs 1-6) regarding in-service training, continuing education, competency, and evaluation of staff members.

This is a one-time study conducted in the third quarter.

Blood Parasite BP

Procedure	Program Code	Challenges per Shipment
	BP	
Blood parasite identification (thin/thick film sets*)	▮	5

*This program will include corresponding thick films when available.

Program Information

- Five Giemsa-stained blood film sets, photographs, and/or online images
- Percent parasitemia reporting is provided when appropriate for educational purposes.
- A variety of blood parasites, including *Plasmodium, Babesia, Trypanosoma,* and filarial worms
- Three shipments per year

Bone Marrow Cell Differential BMD

Procedure	Program Code	Challenges per Shipment
	BMD	
Bone marrow differential	▮	1
Bone marrow cell identification	▮	5

Additional Information

- Examine an online whole slide image that includes a manual 500-count bone marrow differential and annotated cells for identification.
- Recognize and integrate problem-solving skills through the use of interpretive questions found throughout the discussion.
- Evaluate cell morphology and identify specific cells in bone marrow.
- See system requirements on page 12.

Program Information

- One online bone marrow aspirate whole slide image that includes five annotated cells for identification
- Powered by DigitalScope® technology
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

CE credit

Erythrocyte Sedimentation Rate ESR, ESR1, ESR2, ESR3

Instrument/Method	Program Code				Challenges per Shipment
	ESR	ESR1	ESR2	ESR3	
All methods except the ALCOR, Alifax®, Sedimat 15®, and Sedimat 15 Plus	▮				3
Sedimat 15, Sedimat 15 Plus		▮			3
Alifax			▮		3
Mindray BC 700 series, Mindray BC 6800 Plus, Mindray BC 7600/7800/7900, and Mindray BP 200n series			▮		3
ALCOR iSED®, miniiSED®				▮	3

Program Information

- ESR, ESR1 - Three 6.0-mL whole blood specimens
- ESR2 - Three 3.0-mL latex bead specimens
- ESR3 - Three 3.5-mL whole blood specimens
- Two shipments per year

Fetal Red Cell Detection HBF

Procedure	Program Code	Challenges per Shipment
	HBF	
Kleihauer-Betke and flow cytometry	▮	2
Rosette fetal screen	▮	2
Acid elution whole slide image	▮	1

Program Information

- Two 1.2-mL liquid whole blood specimens
- Not designed for F-cell quantitation
- Two online whole slide images per year with optional grids for cell counting
- Powered by DigitalScope technology
- Two shipments per year

Reticulocyte Series RT, RT2, RT3, RT4

Instrument/Method	Program Code				Challenges per Shipment
	RT	RT2	RT3	RT4	
Abbott Alinity hq, Abbott Cell-Dyn 4000, Sapphire, Siemens ADVIA 120/2120, and all other automated and manual methods	▮				3
Abbott Cell-Dyn 3500, 3700, Ruby		▮			3
Beckman Coulter LH 500, LH 700 series, UniCel DxH series			▮		3
Mindray BC-760 CS, Sysmex XE-2100, XE-2100C, XE-2100D, XE-2100DC, XE-2100L, XE-5000, XN-L series, XN-series (includes RL App), XR-series, XT-2000i, XT-4000i				▮	3
Pierceable caps			▮	▮	3

For specific program testing components, see reticulocyte matrix below.

Program Information

- RT, RT2 - Three 1.0-mL stabilized red blood cell (RBC) specimens
- RT3, RT4 - Three 3.0-mL stabilized RBC specimens
- Two shipments per year

Reticulocyte, Matrix

Program Code	Reticulocyte count, percent	Absolute reticulocyte count	Immature reticulocyte fraction (IRF)	Reticulocyte hemoglobin concentration (CHr)	Reticulocyte hemoglobin (RET-He)
RT/RTQ	▮	▮	▮	▮	
RT2	▮	▮			
RT3/RT3Q	▮	▮	▮		
RT4/RT4Q	▮	▮	▮		▮

Quality Cross Check—Reticulocyte RTQ, RT3Q, RT4Q

Instrument/Method	Program Code			Challenges per Shipment
	RTQ	RT3Q	RT4Q	
Abbott Alinity hq, Abbott Cell-Dyn 4000, Sapphire, Siemens ADVIA 120/2120, and all other automated and manual methods	▮			3
Beckman Coulter, LH 500, LH 700 series, UniCel DxH series		▮		3
Mindray BC 760 CS, Sysmex XE-2100, XE-2100C, XE-2100D, XE-2100DC, XE-2100L, XE-5000, XN-L series, XN-series (includes RL App), XR-series, XT-2000i, XT-4000i			▮	3

These programs do not meet regulatory requirements for proficiency testing; see the RT Series on page 143. For additional information about the Quality Cross Check program, see page 36.

Program Information

- RTQ - Three 1.0-mL stabilized red blood cell (RBC) specimens
- RT3Q, RT4Q - Three 3.0-mL stabilized RBC specimens
- Includes percentage and absolute result reporting
- Report up to three instruments.
- Two shipments per year

Reticulocyte Calibration Verification/Linearity LN19, LN53

Instrument/Method	Program Code		
	LN19	LN53 NEW	Target Range
Beckman Coulter Unicel DxH series (except DxH 500)	▮		0.3%–28.0%
Sysmex XE-2100, XE-2100C, XE-2100D, XE-2100DC, XE-2100L, XE-5000, XN-L series, XN-series (includes RL app), XR-series, XT-2000i, XT4000i		▮	0.5%–25.0%

View your expedited linearity evaluations for LN19 within two business days by logging into e-LAB Solutions Suite.

Program Information

- LN19, LN53 - Five 2.5-mL liquid whole blood specimens with pierceable caps
- Two shipments per year

Hemoglobinopathy HG

Procedure	Program Code	Challenges per Shipment
	HG	
Hemoglobin identification and quantification	▮	4
Educational dry challenges	▮	2
Hemoglobin A2 quantitation	▮	4
Hemoglobin F quantitation	▮	1
Sickling test, qualitative	▮	4

Program Information

- Four 0.5-mL stabilized red blood cell specimens
- Two educational dry challenges (case histories, electrophoresis patterns, and clinical interpretation questions)
- Two shipments per year

Rapid Total White Blood Cell Count RWBC

Procedure	Program Code	Challenges per Shipment
	RWBC	
Rapid total white blood cell (WBC) count	▮	5

Program Information
- Five 2.0-mL whole blood specimens
- For use with the HemoCue WBC instrument
- Three shipments per year

Sickle Cell Screening SCS

Procedure	Program Code	Challenges per Shipment
	SCS	
Sickling test, qualitative	▮	3

Program Information
- Three 1.0-mL whole blood specimens
- Two shipments per year

Transfusion-Related Cell Count TRC

Procedure	Program Code	Challenges per Shipment
	TRC	
Platelet count (platelet-rich plasma)	▮	5
White blood cell (WBC) count	▮	4
Dry challenge	▮	2

WBC counts must be performed using a Nageotte chamber, by fluorescence microscopy, or by flow cytometry.

Program Information
- Five 1.2-mL suspensions of platelet-rich plasma
- Two 1.0-mL vials leukocyte-reduced platelet material
- Two 1.0-mL vials leukocyte-reduced red blood cells
- Three shipments per year

Waived Combination HCC

Analyte	Program Code	Challenges per Shipment
	HCC	
Hemoglobin	▮	2
Whole blood glucose	▮	2

Program Information
- Two 1.5-mL whole blood specimens; two shipments per year
- Conventional and International System of Units (SI) reporting offered
- To identify instrument-specific programs, refer to the whole blood chemistry compatibility matrix on page 65.

Waived Hemoglobin HCC1

Analyte	Program Code	Challenges per Shipment
	HCC1	
Hemoglobin	▮	2

Program Information

- Two 1.0-mL whole blood specimens; two shipments per year
- Conventional and International System of Units (SI) reporting offered
- To identify instrument-specific programs, refer to the whole blood chemistry compatibility matrix on page 65.

Waived Combination HCC2

Analyte	Program Code	Challenges per Shipment
	HCC2	
Hematocrit	▮	2
Hemoglobin	▮	2
Urinalysis/urine human chorionic gonadotropin (hCG)	▮	2
Whole blood glucose	▮	3

Program Information

- Total of four shipments per year
- Hematocrit, hemoglobin, and urinalysis/urine hCG testing - Two 3.0-mL whole blood specimens and two 10.0-mL urine specimens; two shipments per year: A and C
- Whole blood glucose testing - Three 2.0-mL whole blood specimens; two shipments per year: B and D
- Conventional and International System of Units (SI) reporting offered
- To identify instrument-specific programs, refer to the whole blood chemistry compatibility matrix on page 65.

NEW

Waived Hematocrit, Hemoglobin, and Urinalysis/Urine hCG HCC3

Analyte	Program Code	Challenges per Shipment
	HCC3	
Hematocrit	▮	2
Hemoglobin	▮	2
Urinalysis/urine human chorionic gonadotropin (hCG)	▮	2

Program Information

- Two 3.0-mL whole blood specimens; two 10.0-mL urine specimens; two shipments per year
- Conventional and International System of Units (SI) reporting offered

Waived Whole Blood Glucose HCC4

NEW

Analyte	Program Code	Challenges per Shipment
	HCC4	
Whole blood glucose	▮	3

Program Information

- Three 2.0-mL whole blood specimens; two shipments per year
- Conventional and International System of Units (SI) reporting offered
- To identify instrument-specific programs, refer to the whole blood chemistry compatibility matrix on page 65.

Virtual Peripheral Blood Smear VPBS

Procedure	Program Code	Challenges per Shipment
	VPBS	
White blood cell (WBC) differential	▮	3
Platelet estimate	▮	3
Red blood cell (RBC) morphology	▮	3
Blood cell identification	▮	15

To meet CMS and CAP-accredited laboratory regulatory requirements for these analytes, see programs BCP or BCPV on page 140.

Additional Information

- Examine online whole slide images that include a manual 100 WBC differential count and annotated cells for identification.
- Evaluate and identify RBC morphology and identify specific WBCs in peripheral blood.
- Recognize and integrate problem-solving skills through the use of interpretive questions found throughout the discussion.
- See system requirements on page 12.

Program Information

- Three online peripheral blood whole slide images that include 15 annotated cells for identification
- Powered by DigitalScope technology
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

CE credit

Expanded Virtual Peripheral Blood Smear EHE1

Procedure	Program Code	Challenges per Shipment
	EHE1	
White blood cell (WBC) differential	▮	2
Platelet estimate	▮	2
Red blood cell (RBC) morphology	▮	2
Blood cell identification	▮	10

To meet CMS and CAP-accredited laboratory regulatory requirements for these analytes, see programs BCP or BCPV on page 140.

Additional Information

- More challenging and/or complex testing than the Virtual Peripheral Blood Smear (VPBS) program
- Examine online whole slide images that include a manual 100 WBC differential count and annotated cells for identification.
- Comprehensive case studies
- Recognize and integrate problem-solving skills through the use of interpretive questions found throughout the discussion.
- Evaluate and identify RBC morphology and identify specific WBCs in peripheral blood.
- See system requirements on page 12.

Program Information

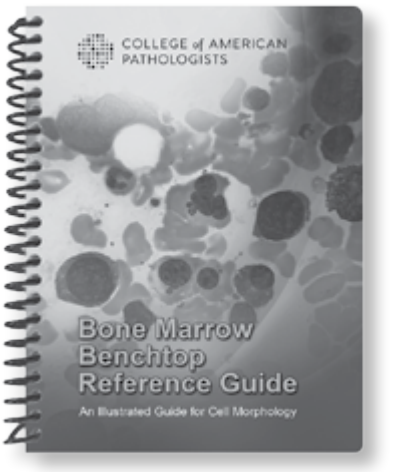
- Two online peripheral blood whole slide images that include 10 annotated cells for identification
- Powered by DigitalScope technology
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

Bone Marrow Benchtop Reference Guide

With more than 60 different identifications and a detailed description for each cell morphology, this illustrated guide is an affordable, convenient way to identify various cell types quickly and confidently. Plus, its rugged construction makes it well-suited for heavy use at the benchtop.

Add it to your order, or view sample pages and purchase online.

- printed books at estore.cap.org
- ebooks at ebooks.cap.org



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Hematopathology Online Education HPATH/HPATH1

Program	Program Code	Challenges per Shipment
	HPATH/HPATH1	
Hematopathology online case review	▮	5

Additional Information

HPATH/HPATH1 prepares pathologists and pathology trainees with an interest in hematopathology to succeed by providing ongoing diagnostic learning and self-assessment.

The program includes 10 challenge cases written by expert hematopathologists per year. For each case, the learner will:

- Review virtual whole slide image(s) in the context of a clinical scenario and relevant laboratory data.
- Select and interpret appropriate ancillary studies (IHC, flow cytometry, FISH, cytogenetics, molecular studies, etc) with real-time feedback.
- Simulate a real-world diagnostic workup to arrive at the appropriate diagnosis.
- Apply knowledge to answer three CME questions.

Cases span the breadth of benign and neoplastic hematopathology. Discussions incorporate current best practices in the workup, diagnosis, and subclassification of hematolymphoid diseases.

Neoplastic entities are discussed in the context of both the International Consensus Classification (ICC) and the fifth edition of the World Health Organization (WHO) classification.

See system requirements on page 12.

Program Information

- HPATH - Five diagnostic challenges per activity (two activities per year), with online whole slide images. Reporting with CME credit is available for one participant.
- HPATH1 - Reporting option with CME credit for each additional participant (within the same institution); must order in conjunction with program HPATH.
- Earn a maximum of 12.5 CME credits (*AMA PRA Category 1 Credits™*) per participant.
- This activity meets the ABPath CC requirements for Improvement in Health and Health Care (IHHC).
- Powered by DigitalScope technology
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

Clinical Microscopy

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

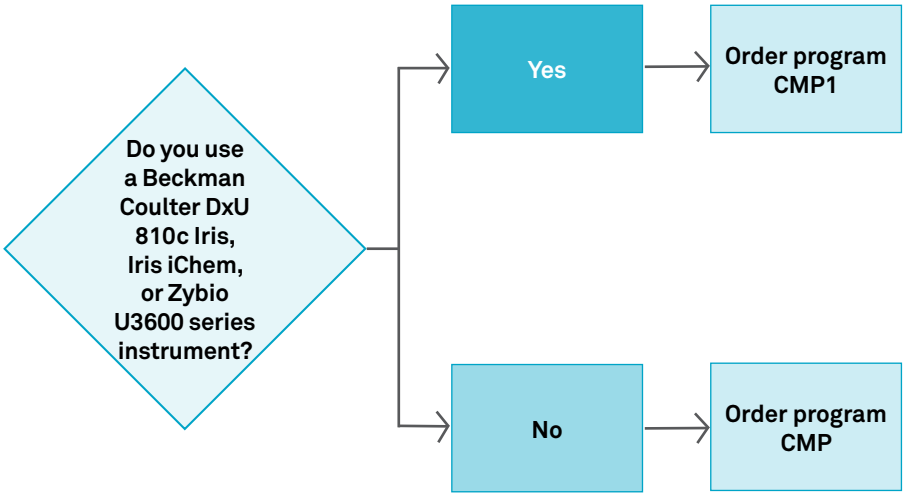
Urinalysis and Clinical Microscopy CMP, CMP1

Analyte/Procedure	Program Code		Challenges per Shipment
	CMP	CMP1	
Bilirubin	▮	▮	3
Blood or hemoglobin	▮	▮	3
Body fluid photographs	▮	▮	3
Glucose	▮	▮	3
Human chorionic gonadotropin (hCG) urine, qualitative	▮	▮	3
Ketones	▮	▮	3
Leukocyte esterase	▮	▮	3
Nitrite	▮	▮	3
Osmolality	▮	▮	3
pH	▮	▮	3
Protein, qualitative	▮	▮	3
Reducing substances	▮	▮	3
Specific gravity	▮	▮	3
Urine sediment photographs	▮	▮	3
Urobilinogen	▮	▮	3

For multiple instrument reporting options, see the Quality Cross Check program, CMQ, on page 151.

Program Information

- CMP - Three 10.0-mL liquid urine specimens; for use with all instruments except Beckman Coulter DxU 810c Iris and Iris iChem; six images, each available as photographs and online images
- CMP1 - Three 10.0-mL liquid urine specimens; for use with Beckman Coulter DxU 810c Iris, Iris iChem, and Zybio U3600 Series instruments only, urinalysis; six images, each available as photographs and online images
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year



Quality Cross Check—Urinalysis CMQ

Analyte	Program Code	Challenges per Shipment
	CMQ	
Bilirubin	▮	3
Blood or hemoglobin	▮	3
Glucose	▮	3
Human chorionic gonadotropin (hCG) urine, qualitative	▮	3
Ketones	▮	3
Leukocyte esterase	▮	3
Nitrite	▮	3
Osmolality	▮	3
pH	▮	3
Protein, qualitative	▮	3
Reducing substances	▮	3
Specific gravity	▮	3
Urobilinogen	▮	3

This program does not meet regulatory requirements for proficiency testing; see programs CMP and CMP1 on page 150. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 10.0-mL liquid urine specimens for use with all instruments
- Report up to three instruments.
- Two shipments per year

Clinical Microscopy Miscellaneous Photopage CMMP

Procedure	Program Code	Challenges per Shipment
	CMMP	
Fern test (vaginal)	▮	1
KOH preparation (skin or vaginal)	▮	1
Nasal smear	▮	1
Pinworm preparation	▮	1
Spermatozoa	▮	1
Stool for leukocytes	▮	1
Urine sediment photographs	▮	3
Vaginal wet preparation photographs (for clue cells, epithelial cells, trichomonas, or yeast)	▮	1

Program Information

- Ten images, each available as photographs and online images
- Two shipments per year

Amniotic Fluid Leakage AFL

Procedure	Program Code	Challenges per Shipment
	AFL	
pH interpretation	▮	3

Program Information
- Three 2.0-mL liquid specimens
- For use with nitrazine paper and the Amniotest™
- Two shipments per year

Automated Body Fluid Series ABF1, ABF2, ABF3

Procedure	Program Code			Challenges per Shipment
	ABF1	ABF2	ABF3	
Red blood cell (RBC) fluid count	▮	▮	▮	2
Total nucleated cell/White blood cell (WBC) fluid count	▮	▮	▮	2

For method compatibility, see automated body fluid instrument matrix below.

Program Information
- ABF1–3 - Two 3.0-mL simulated body fluid specimens
- Two shipments per year

Automated Body Fluid, Instrument Matrix

Instrument	ABF Series		
	ABF1	ABF2	ABF3
Advanced Instruments GloCyte, Siemens ADVIA 120/2120 series	▮		
Beckman Coulter LH 700 series, Mindray BC-760 CS, Unicel DxH series		▮	
Mindray BC series (BC-700/720/760/780/760CS/6000/6200/6800/6800Plus/7600/7800/7900)		▮	
Sysmex XE-2100, XE-2100C, XE-2100D, XE-2100DC, XE-2100L, XE-5000, XN-series, XN-L series, XT-1800i, XT-2000i, XT-4000i		▮	
Beckman Coulter iQ200/DxU Iris series			▮

Virtual Body Fluid VBF

Procedure	Program Code	Challenges per Shipment
	VBF	
Body fluid cell differential	▮	2
Body fluid cell identification	▮	10

Additional Information
- Examine online whole slide images that include a manual differential count and annotated cells for identification.
- Evaluate cell morphology and identify specific cells in a body fluid.
- See system requirements on page 12.

Program Information
- Two online whole slide body fluid images that include 10 annotated cells for identification
- Powered by DigitalScope technology
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

Assessment of Consistency of Body Fluid Morphologic Observations QPB10/QPB25

Introduction

Laboratories receive a variety of body fluids for evaluation that technologists review. Technical staff must maintain their identification skills of these specimens, and laboratories are required to provide education and assess consistency of reporting morphology among staff and competency of body fluid cell identification on an annual basis.

Objectives

This study will assess the effectiveness of educational and practical experience policies and procedures dedicated to the laboratory's efforts in maintaining technologist skills in the performance of accurate body fluid cell counts and identification of other body fluid features. Results of this study will assist individuals, the laboratory director, and the manager with areas to focus on for improvement and education.

The study will help management meet applicable CLIA, CAP Laboratory Accreditation Program, and The Joint Commission laboratory requirements for consistency of reporting morphology among staff and personnel competency requirements (testing previously analyzed specimens).*

Data Collection

Technologists will access a series of online, whole slide images to assess their ability to perform cell differentials on Wright-stained body fluids and to identify miscellaneous cells and inclusions in cytocentrifuged preparations using their own kit and result form. Participants will provide additional information about their competency assessment programs, continuing education, and professional background. Information will be collected from each site regarding their institution's minimum continuing education programs and requirements for their technologists in who review body fluids, and relevant procedures and policies related to body fluid review assessment.

Information will be collected from each site regarding their institution's minimum continuing education requirements for their technologists in hematology and relevant procedures and policies related to body fluid slide review.

Performance Indicators

- Individual technologist score based on a standardized competency assessment method to determine a technologist's ability to identify various white blood cell types, microorganisms, and other cells and inclusions present in normal and abnormal cases
- Overall laboratory score based on the facility's individual technologist performance(s)

Your Reports – What to Expect

- A participant summary explaining the grading criteria for each case and how to read the reports
- An institution report with your facility's score summary with comparison to other institutions and a technologist score summary by case for each participant
- An individual report for each participant listing their responses and score for each case
- A data analysis and critique with analysis of the institution and participant scores, author commentary about each case, and links to annotated slides

Program Information

To meet your technical staff morphology and competency assessment requirements:

- Result forms for up to 10 technologists (QPB10)
- Result forms for up to 25 technologists (QPB25)
- Multiple orders may be purchased to accommodate the quantity of technologist result forms needed.

***Participation in this study helps laboratories meet applicable requirements:**

- CLIA personnel requirements (Subpart M, 42 CFR §493.1)
- CAP Laboratory Accreditation Program Checklist statements: HEM.35566, consistency of morphologic observation among personnel performing body fluid cell differentials at least annually; GEN.55500, Competency Assessment of Testing Personnel (element 5); GEN.55525, Performance Assessment of Supervisors/Consultants; DRA.11425, functions or responsibilities are properly performed by a qualified individual
- The Joint Commission Standards HR.01.05.03, 01.06.01 (EPs 3, 18,19), HR.01.07.01, PI.03.01.01(EPs 3-5), and LD.04.05.01, 04.05.03 (EPs 1-6) regarding in-service training, continuing education, competency, and evaluation of staff members

This is a one-time study conducted in the second quarter.

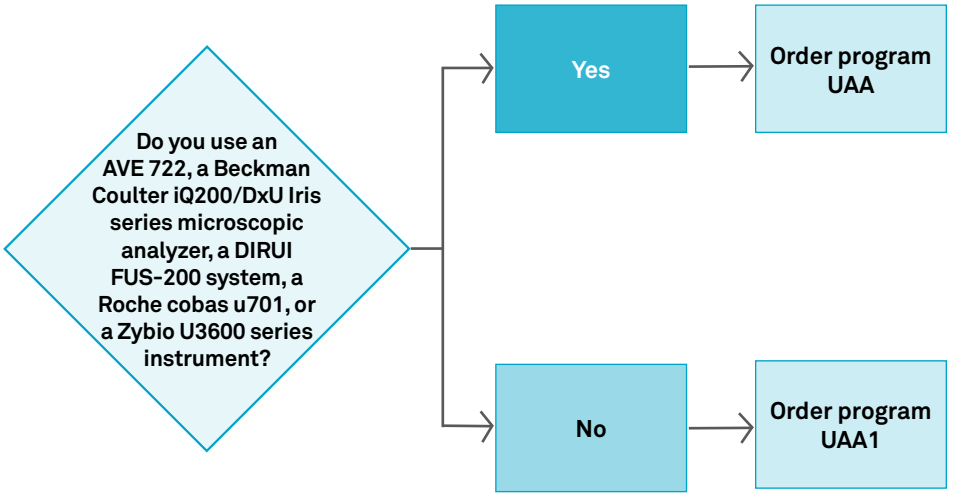
Automated Urine Microscopy UAA, UAA1

Analyte	Program Code		Challenges per Shipment
	UAA	UAA1	
Casts, quantitative/qualitative	▮	▮	2
Crystals, quantitative/qualitative	▮		2
Epithelial cells, quantitative/qualitative		▮	2
Red blood cells (RBCs), quantitative/qualitative	▮	▮	2
White blood cells (WBCs), quantitative/qualitative	▮	▮	2

For method compatibility, see automated urine microscopy instrument matrix below.

Program Information

- UAA - Two 10.0-mL liquid urine specimens for use with AVE 722, Beckman Coulter Iris, DIRUI, Roche, and Zybio instruments
- UAA1 - Two 12.0-mL liquid urine specimens for use with Sysmex instruments
- Two shipments per year



Automated Urine Microscopy, Instrument Matrix

Instrument	UAA, UAA1	
	UAA	UAA1
AVE 722	▮	
Beckman Coulter iQ200/DxU Iris series	▮	
DIRUI FUS-200	▮	
Roche cobas u701	▮	
Zybio U3600 series	▮	
77 Elektronika		▮
ARKRAY Aution Hybrid		▮
Siemens Atellica UAS 800		▮
Sysmex UF 50, 100, 500i, 1000i, 3000/4000/5000, Sysmex UX 2000		▮

Crystals BCR, BFC, URC

Procedure	Program Code			Challenges per Shipment
	BCR	BFC	URC	
Bile crystal identification	▮			2
Body fluid crystal identification		▮		2
Urine crystal identification			▮	2

Program Information
- BCR - Two photographs
- BFC - Two 1.5-mL simulated body fluid specimens (eg, synovial fluid)
- URC - Two 1.5-mL urine specimens
- Two shipments per year

Dipstick Confirmatory DSC

Analyte	Program Code	Challenges per Shipment
	DSC	
Bilirubin	▮	2
Protein	▮	2

Program Information
- Two 12.0-mL liquid urine specimens
- For use with methods to confirm positive bilirubin and protein dipstick results
- Two shipments per year

Fecal Fat FCFS

Analyte	Program Code	Challenges per Shipment
	FCFS	
Fecal fat, qualitative	▮	2

Program Information
- Two 10.0-g simulated fecal fat specimens
- For microscopic detection of neutral fats (triglycerides) and/or split fats (total free fatty acids)
- Two shipments per year

Fetal Hemoglobin APT

Analyte	Program Code	Challenges per Shipment
	APT	
Fetal hemoglobin (gastric fluid or stool)	▮	2

Program Information
- Two 1.2-mL simulated body fluid specimens
- Two shipments per year

Gastric Occult Blood GOCB

Analyte	Program Code	Challenges per Shipment
	GOCB	
Gastric occult blood	▮	3
Gastric pH	▮	3

Program Information
- Three 2.0-mL simulated gastric fluid specimens
- Two shipments per year

Glucose-6-Phosphate Dehydrogenase G6PDS

Analyte	Program Code	Challenges per Shipment
	G6PDS	
G6PD, qualitative and quantitative	▮	2

Program Information
- Two 0.5-mL lyophilized hemolysate specimens
- Two shipments per year

Hemocytometer Fluid Count HFC

Procedure	Program Code	Challenges per Shipment
	HFC	
Cytopreparation differential	▮	3
Red blood cell (RBC) fluid count	▮	3
Total nucleated cell/White blood cell (WBC) fluid count	▮	3

This program has limited stability. Laboratories outside the US or Canada should consider purchase of HFCI, which has longer stability.

Program Information
- Three 1.0-mL simulated body fluid specimens
- Two shipments per year

Hemocytometer Fluid Count, International HFCI

Procedure	Program Code	Challenges per Shipment
	HFCI	
Body fluid differential	▮	2
Red blood cell (RBC) fluid count	▮	3
Total nucleated cell/White blood cell (WBC) fluid count	▮	3

Additional Information
- This program meets the CAP's Laboratory Accreditation Program requirements.
- Examine online whole slide images that include a manual differential count.
- See system requirements on page 12.

Program Information
- Three 2.0-mL simulated body fluid specimens; two online whole slide images for 2- and 5-part differential
- Powered by DigitalScope technology
- Designed for laboratories outside the US or Canada that have experienced significant shipping and receiving issues and need longer program stability
- Two shipments per year

Lamellar Body Count LBC

Procedure	Program Code	Challenges per Shipment
	LBC	
Lamellar body count	▮	3

Program Information
- Three 2.0-mL simulated amniotic fluid specimens
- For use with LBC methods performed on all hematology analyzers
- Two shipments per year

Occult Blood OCB

Analyte	Program Code	Challenges per Shipment
	OCB	
Occult blood	▮	3

For multiple instrument reporting options, see the Quality Cross Check program, OCBQ, below.

Program Information
- Three 2.0-mL simulated fecal specimens
- Two shipments per year

Quality Cross Check—Occult Blood OCBQ

Analyte	Program Code	Challenges per Shipment
	OCBQ	
Occult blood	▮	3

This program does not meet regulatory requirements for proficiency testing; see program OCB, above. For additional information about the Quality Cross Check program, see page 36.

Program Information
- Three 2.0-mL simulated fecal specimens
- Report up to three instruments.
- Two shipments per year

Fetal Membranes/Preterm Labor ROM1

Procedure	Program Code	Challenges per Shipment
	ROM1	
Fetal membranes/preterm labor	▮	3

Program Information
- Three 0.5-mL simulated vaginal specimens for methods such as Actim PROM, AmniSure, Clinical Innovations, and PartoSure
- Two shipments per year

Special Clinical Microscopy SCM1, SCM2

Analyte/Procedure	Program Code		Challenges per Shipment
	SCM1	SCM2	
Urine hemosiderin, Prussian blue	▮		3
Urine eosinophils, Wright stain		▮	3

Program Information
- SCM1, SCM2 - Three images, each available as photographs and online images
- Two shipments per year

Ticks, Mites, and Other Arthropods TMO

Procedure	Program Code	Challenges per Shipment
	TMO	
Tick, mite, and arthropod identification	▮	3

Program Information
- Three images, each available as photographs and online images
- Two shipments per year

CE credit

Urine hCG UHCG

Procedure	Program Code	Challenges per Shipment
	UHCG	
Urine human chorionic gonadotropin (hCG), qualitative	▮	5

Program Information
- Five 1.0-mL urine specimens
- Three shipments per year

Urine Albumin and Creatinine, Semiquant UMC

Analyte/Procedure	Program Code	Challenges per Shipment
	UMC	
Creatinine, semiquantitative	▮	2
Urine albumin (microalbumin): creatinine ratio	▮	2
Urine albumin (microalbumin), semiquantitative/qualitative	▮	2

For quantitative reporting, refer to program U, page 68.

Program Information
- Two 3.0-mL liquid urine specimens
- For use with dipstick and semiquantitative methods only
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

Worm Identification WID

Procedure	Program Code	Challenges per Shipment
	WID	
Worm identification	▮	3

Program Information
- Three images, each available as photographs and online images
- Two shipments per year

13 Reproductive Medicine

Enhance your learning with continuing education (CE) content included with many of our proficiency testing programs.

- For many of our PT/EQA programs, each member of a participating laboratory has complimentary enrollment to online CE activities.
- Advance skills with education activities developed by more than 600 physicians and doctoral scientists with expertise in pathology and laboratory medicine.

Reproductive Medicine

Andrology and Embryology..... 160

Discontinued Programs

Antisperm Antibody IgG (ASA)

Andrology and Embryology

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Semen Analysis SC, SC1, PV, PV1, SM, SV

Procedure	Program Code						Challenges per Shipment
	SC	SC1	PV	PV1	SM	SV	
Sperm count and presence/absence (manual methods)	▮						2
Sperm count (automated methods)		▮					2
Postvasectomy sperm count and presence/absence (manual methods)			▮				2
Postvasectomy sperm count (automated methods)				▮			2
Sperm morphology					▮		2
Sperm viability						▮	2

Program Information

- SC - Two 0.3-mL stabilized sperm specimens
- SC1 - Two 1.0-mL stabilized sperm specimens
- PV - Two 0.3-mL stabilized sperm specimens with counts appropriate for postvasectomy testing
- PV1 - Two 1.0-mL stabilized sperm specimens with counts appropriate for postvasectomy testing
- SM - Two prepared slides for staining
- SV - Two eosin-nigrosin-stained slides
- Two shipments per year

CE credit

Sperm Count, Motility, Morphology, and Viability SMCD, SM1CD, SM2CD

Procedure	Program Code			Challenges per Shipment
	SMCD	SM1CD	SM2CD	
Sperm count	▮			2
Sperm motility/forward progression	▮			2
Sperm classification		▮		10
Sperm morphology		▮		2
Sperm viability			▮	2

Program Information

- SMCD - Online video clips of sperm available for hemocytometer, Makler, and disposable chambers
- SM1CD, SM2CD - Two online challenges that may be viewed as whole slide images powered by DigitalScope® technology
- Two online activites per year; your CAP shipping contact will be notified via email when the activity is available.

CE credit

Embryology EMB

Procedure	Program Code	Challenges per Shipment
	EMB	
Embryo transfer and quality assessment (three- and five-day-old embryos)	▮	4

Program Information

- Two online sets of five video clips
- Two online activites per year; your CAP shipping contact will be notified via email when the activity is available.

CE credit

Sex Hormones Y/YY

Analyte	Program Code	Challenges per Shipment
	Y/YY	
11-deoxycortisol	▮	5
17-hydroxyprogesterone	▮	5
Androstenedione	▮	5
DHEA sulfate	▮	5
Estradiol	▮	5
Estriol, unconjugated (uE3)	▮	5
Follicle-stimulating hormone (FSH)	▮	5
Growth hormone (GH)	▮	5
IGF-1 (somatomedin C)	▮	5
Luteinizing hormone (LH)	▮	5
Progesterone	▮	5
Prolactin	▮	5
Sex hormone-binding globulin (SHBG)	▮	5
Testosterone	▮	5
Testosterone, free (measured)	▮	5

Program Information

- Y - Five 5.0-mL liquid serum specimens in duplicate
- YY - Five 5.0-mL liquid serum specimens in triplicate
- Conventional and International System of Units (SI) reporting offered
- Three shipments per year

CE credit

Antimüllerian Hormone AMH

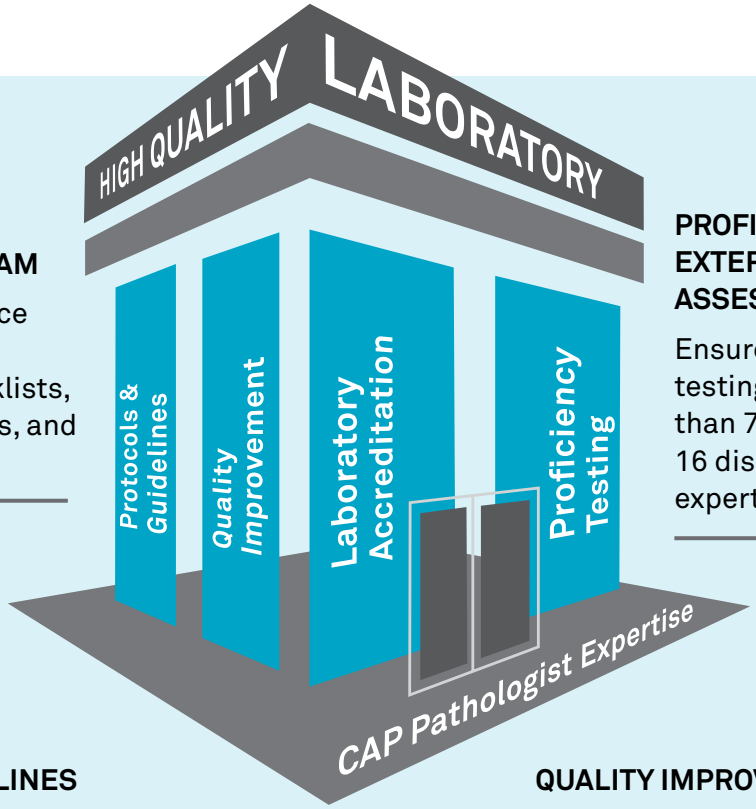
Analyte	Program Code	Challenges per Shipment
	AMH	
Antimüllerian hormone	▮	3

Program Information

- Three 1.0-mL lyophilized serum specimens
- Two shipments per year

Amplifying Quality, Simplifying Compliance, and Elevating Outcomes

Built on a foundation of pathologist expertise, the College of American Pathologists' Laboratory Quality Solutions partners with laboratories worldwide to elevate the quality of laboratory medicine with best-in-class solutions designed to drive operational excellence, achieve diagnostic confidence, and simplify compliance while ensuring the best patient care.



LABORATORY ACCREDITATION PROGRAM

Amplify quality and reduce risk through customized, discipline-specific checklists, collegial peer inspections, and educational resources.

PROFICIENCY TESTING/ EXTERNAL QUALITY ASSESSMENT

Ensure accurate and reliable testing results with more than 700 programs across 16 disciplines developed by expert scientific committees.

PROTOCOLS AND GUIDELINES

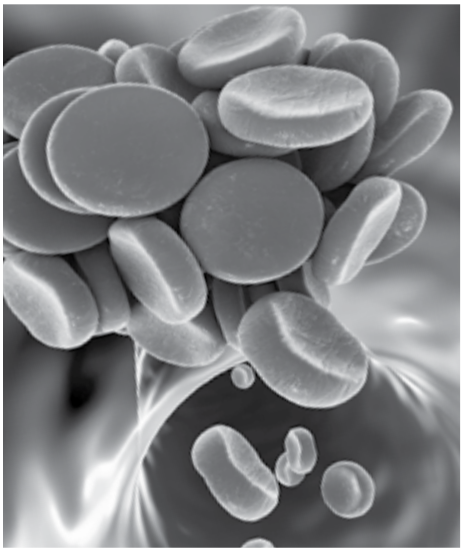
Enhance cancer reporting and clinical decision making, providing more effective testing with consistent, high-quality results and expert interpretations.

QUALITY IMPROVEMENT

Improve processes and strengthen staff expertise while reducing risk and improving patient outcomes.

Learn more about how the CAP can help you achieve your laboratory quality goals.

14 Coagulation



Provide for patient care and safety.

The CAP continues to support laboratory quality initiatives through the development, maintenance, and enhancement of effective PT/EQA programs for coagulation.

All Centers for Medicare & Medicaid Services (CMS) regulated analytes are listed in **bold** type.

Program Changes

Fibrin(ogen) degradation products, serum, has been removed from CGL, CGDF, CGLQ, CGM..... 164, 172

Discontinued Programs

Activated Clotting Time (CT)

Coagulation

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Coagulation—Limited CGB, CGL, CGDF

Analyte/Procedure	Program Code			Challenges per Shipment
	CGB	CGL	CGDF	
Activated partial thromboplastin time	▮	▮		5
Fibrinogen		▮		5
International normalized ratio (INR)*	▮	▮		5
Prothrombin time	▮	▮		5
D-dimer		▮	▮	2
Fibrin(ogen) degradation products, plasma		▮	▮	1
Fibrin monomer		▮	▮	2

*Participants reporting INR results will receive a special evaluation to assess the INR calculation.

For multiple instrument reporting options, see the Quality Cross Check program, CGLQ, below.

Program Information

- CGB - Five 1.0-mL lyophilized plasma specimens
- CGL - Seven 1.0-mL lyophilized plasma specimens
- CGDF - Two 1.0-mL lyophilized plasma specimens
- Conventional and International System of Units (SI) reporting offered
- Three shipments per year

CE credit

Quality Cross Check—Coagulation CGLQ

Analyte	Program Code	Challenges per Shipment
	CGLQ	
Activated partial thromboplastin time	▮	3
Fibrinogen	▮	3
Prothrombin time	▮	3
D-dimer	▮	2
Fibrin(ogen) degradation products, plasma	▮	1

This program does not meet regulatory requirements for proficiency testing; see program CGL, above. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 1.0-mL lyophilized plasma specimens in triplicate and two 1.0-mL lyophilized plasma specimens
- Report up to three instruments.
- Two shipments per year

Coagulation—Extended CGE/CGEX

Analyte	Program Code	Challenges per Shipment
	CGE/CGEX	
See analyte listing below	▮	2

Program Information

- CGE - Two 1.0-mL lyophilized plasma specimens (three vials each)
- CGEX - Two 1.0-mL lyophilized plasma specimens (five vials each)
- Two shipments per year

Coagulation Analyte Listing (Quantitative Results)

50:50 mixing study, PT and aPTT
Activated partial thromboplastin time
Activated protein C resistance
Alpha-2-antiplasmin
Antithrombin activity/antigen
Dilute prothrombin time
Factors II, V, VII, VIII, IX, X, XI, XII, and XIII
Fibrinogen antigen
Heparin-induced thrombocytopenia (HIT)
Plasminogen activator inhibitor
Plasminogen activity/antigen
Prekallikrein
Protein C
Protein S
Prothrombin time
Reptilase time
Thrombin time

Expanded Coagulation Factors ECF

Analyte/Procedure	Program Code	Challenges per Shipment
	ECF	
Factor II	▮	3
Factor V	▮	3
Factor VII	▮	3
Factor VIII clot based	▮	3
Factor VIII chromogenic	▮	3
Factor IX	▮	3
Factor IX chromogenic	▮	3
Factor X clot based	▮	3
Factor X chromogenic	▮	3
Factor XI	▮	3
Factor XII	▮	3
Factor XIII (activity and antigen)	▮	3
Fibrinogen antigen	▮	3
Reptilase time	▮	3
Thrombin time	▮	3

Program Information

- Three 1.0-mL lyophilized plasma specimens (three vials each)
- Two shipments per year

Coagulation Special Testing Series CGS1, CGS2, CGS3, CGS4, CGS5, CGS7

Module/Analyte	Challenges per Shipment					
	Program Code					
	CGS1	CGS2	CGS3	CGS4	CGS5	CGS7
Activated partial thromboplastin time*	2		2	3		
International normalized ratio (INR)*	2			3		
Prothrombin time*	2			3		
Lupus Anticoagulant and Mixing Studies Module						
Dilute prothrombin time	2					
Dilute Russell's viper venom time	2					
Lupus anticoagulant sensitive aPTT (confirmation and screen)	2					
50:50 mixing studies, PT and aPTT	2					
Thrombophilia Module						
Activated protein C resistance		2				
Antithrombin (activity, antigen)		2				
Protein C (activity, antigen)		2				
Protein S (activity, free antigen, total antigen)		2				
von Willebrand Factor Antigen Module						
Factor VIII assay			2			
von Willebrand factor (antigen, activity, multimers)			2			
Factor VIII inhibitor			2			
Heparin Module						
Heparin activities using methodologies including Anti-Xa (unfractionated, low molecular weight, and hybrid curve)				3		
Thrombin time				3		
Heparin-Induced Thrombocytopenia Module						
Appropriate with methods such as Immucor Lifecodes PF4 IgG and Immucor Lifecodes PF4 Enhanced® assays					2	
ADAMTS13 Module						
ADAMTS13 (activity, inhibitor screen, titer, and anti-ADAMTS13 IgG)						3

*Not appropriate for meeting regulatory requirements; see CGL on page 164.

Program Information

- CGS1, CGS2, CGS3 - Two 2.0-mL lyophilized plasma specimens
- CGS4 - Three 1.0-mL lyophilized plasma specimens
- CGS5 - Two 60.0-µL serum specimens
- CGS7 - Three 1.0-mL lyophilized plasma specimens in duplicate
- Two shipments per year

D-dimer Calibration Verification/Linearity LN42

Analyte	Program Code	
	LN42	LN42 Target Range
D-dimer	▮	220–5,500 ng/mL FEU

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information

- Six 1.0-mL plasma specimens
- Two shipments per year

Fibrinogen Calibration Verification/Linearity LN44

Analyte	Program Code	
	LN44	LN44 Target Range
Fibrinogen	▮	80–900 mg/dL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information

- Six 1.0-mL frozen plasma specimens
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year; ships on dry ice

Coagulation Calibration Verification/Linearity LN35, LN36, LN37, LN51

Analyte	Program Code				
	LN35	LN36	LN37	LN51	Target Ranges
Antithrombin activity	▮				10%–130%
Protein C activity	▮				10%–100%
Heparin, low molecular weight		▮			0.1–2.0 U/mL
Heparin, unfractionated		▮			0.1–1.3 U/mL
von Willebrand factor antigen			▮		5%–140%
Factor VIII clot-based				▮	1–200 IU/dL
Factor VIII chromogenic				▮	1–200 IU/dL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

The LN35, LN36, and LN37 CVL programs meet the CAP Accreditation Checklist requirements HEM.37363, 37365, 37373, and 37375.

Program Information

- LN35, LN37, LN51 - Six 1.0-mL frozen plasma specimens per mailing
- LN36 - Twelve 1.0-mL frozen plasma specimens per mailing, which include six for low molecular weight heparin and six for unfractionated heparin
- Two shipments per year; ships on dry ice

Apixaban, Dabigatran, Fondaparinux, Rivaroxaban Anticoagulant Monitoring APXBN, DBGN, FNPX, RVBN

Analyte	Program Code				Challenges per Shipment
	APXBN	DBGN	FNPX	RVBN	
Activated partial thromboplastin time*	▮	▮	▮	▮	3
Prothrombin time*	▮	▮	▮	▮	3
Thrombin time		▮			3
Apixaban	▮				3
Dabigatran		▮			3
Fondaparinux			▮		3
Rivaroxaban				▮	3

*To meet CMS and CAP-accredited laboratory regulatory requirements for these analytes; see CGL on page 164.

Program Information

- APXBN, DBGN, FNPX, RVBN - Three 1.0-mL lyophilized plasma specimens
- Two shipments per year

Activated Clotting Time Series CT1, CT2, CT3, CT5

Instrument/Cartridge	Program Code				Challenges per Shipment
	CT1	CT2	CT3	CT5	
IL GEM Hemochron 100/ACT+			▮		3
IL GEM Hemochron 100/ACT-LR		▮			3
IL Hemochron Signature Elite/ Hemochron Jr./ACT+			▮		3
IL Hemochron Signature Elite/ Hemochron Jr./ACT-LR		▮			3
i-STAT Celite® and Kaolin ACT				▮	3
Medtronic Hemotec ACT/ACTII/ACT Plus® HR-ACT	▮				3
Medtronic Hemotec ACT/ACTII/ACT Plus LR-ACT	▮				3
Medtronic Hemotec ACT/ACTII/ACT Plus R-ACT	▮				3
Medtronic Hepcon HMS Plus	▮				3

For multiple instrument reporting options, see the Quality Cross Check programs, CT1Q, CT2Q, CT3Q, and CT5Q, on page 169.

Program Information

- CT1 - Three 1.7-mL lyophilized whole blood specimens with corresponding diluents
- CT2 - Three 0.5-mL lyophilized whole blood/ diluent ampules
- CT3 - Three 0.5-mL lyophilized whole blood/ diluent ampules
- CT5 - Three 1.7-mL lyophilized whole blood specimens with corresponding diluents
- Two shipments per year

Quality Cross Check—Activated Clotting Time Series CT1Q, CT2Q, CT3Q, CT5Q

Instrument/Cartridge	Program Code				Challenges per Shipment
	CT1Q	CT2Q	CT3Q	CT5Q	
IL GEM Hemochron 100/ACT+			▮		3
IL GEM Hemochron 100/ACT-LR		▮			3
IL Hemochron Signature Elite/ Hemochron Jr./ACT+			▮		3
IL Hemochron Signature Elite/ Hemochron Jr./ACT-LR		▮			3
i-STAT Celite® and Kaolin ACT				▮	3
Medtronic Hemotec ACT/ACTII/ACT Plus® HR-ACT	▮				3
Medtronic Hemotec ACT/ACTII/ACT Plus LR-ACT	▮				3
Medtronic Hemotec ACT/ACTII/ACT Plus R-ACT	▮				3
Medtronic Hepcon HMS Plus	▮				3

These programs do not meet regulatory requirements for proficiency testing; see programs CT1, CT3, and CT5 on page 168. For additional information about the Quality Cross Check program, see page 36.

Program Information

- CT1Q - Three 1.7-mL lyophilized whole blood specimens in triplicate with corresponding diluents
- CT2Q - Three 0.5-mL lyophilized whole blood/ diluent ampules in triplicate
- CT3Q - Three 0.5-mL lyophilized whole blood/ diluent ampules in triplicate
- CT5Q - Three 1.7-mL lyophilized whole blood specimens in triplicate with corresponding diluents
- Report up to three instruments.
- Two shipments per year

Platelet Function PF, PF1

Instrument/Method	Program Code		Challenges per Shipment
	PF	PF1	
Platelet aggregation	▮		2
PFA-100, PFA-200		▮	2
Helena Plateletworks®		▮	2

These programs require the draw of a normal donor sample.

Program Information

- PF, PF1 - Five 3.2% sodium citrate vacuum tubes; two 10.0-mL plastic tubes
- Two shipments per year

Viscoelastic Studies VES

Instrument	Program Code	Challenges per Shipment
	VES	
TEG® 5000, TEG 6s, ROTEM® *delta*	▮	2

Program Information
- Two 1.0-mL lyophilized plasma specimens
- Two shipments per year

Viscoelastic Testing—Whole Blood VES1

Instrument	Program Code	Challenges per Shipment
	VES1	
Hemosonics Quantra®, ROTEM *sigma*, ROTEM *delta*	▮	2

This program requires the draw of a normal donor sample.

Program Information
- Four 3.2% sodium citrate vacuum tubes; two 4.0-mL pierceable cap tubes
- Two shipments per year

Whole Blood Viscoelastic Assays in Clinical Diagnosis

The use of whole blood viscoelastic assays (TEG and ROTEM) to monitor or diagnose patients with various coagulopathies has increased exponentially in recent years. *Whole Blood Viscoelastic Assays in Clinical Diagnosis* offers a practical and comprehensive case-based guide for tracings interpretation to ensure testing quality and patient safety. Pathologists and other laboratory personnel will all benefit from its case use studies for hemostatic disorders, pregnancy, trauma, cardiac surgery, and more.

Topics covered include:
- Overview of hemostasis physiology
- Viscoelastic testing
- Case studies addressing different hemostatic disorders
- Clinical uses of viscoelastic assays

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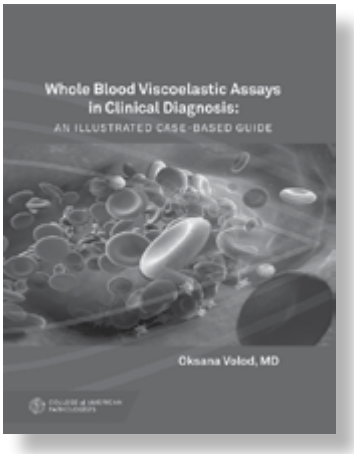

Item number: PUB231
Softcover; 342 pages; 2023

Drug-Specific Platelet Aggregation PIA/PIAX

Procedure	Program Code		Challenges per Shipment
	PIA	PIAX	
Aspirin assay	▮	▮	3
PRU test	▮	▮	3

Program Information

- PIA - Three lyophilized specimens with diluents
- PIAX - All program PIA specimens in duplicate
- For use with the Accumetrics VerifyNow® System
- Kit includes sufficient material to perform one assay; multiple assay reporting requires the purchase of PIAX.
- Two shipments per year

Whole Blood Coagulation WP3, WP4, WP6, WP9, WP10

Analyte	Challenges per Shipment				
	Program Code				
	WP3	WP4	WP6	WP9	WP10*
International normalized ratio (INR)	5	5	5	5	3
Prothrombin time	5	5	5	5	–

*To meet CMS and CAP-accredited laboratory regulatory requirements for these analytes, see CGL on page 164.

For method compatibility, see whole blood coagulation instrument matrix below.

Program Information

- WP3 - Five 1.0-mL lyophilized plasma specimens with corresponding diluents
- WP4, WP6 - Five 0.5-mL unitized lyophilized blood specimens
- WP9 - Five 0.3-mL lyophilized plasma specimens
- Three shipments per year
- WP10 - Three 0.3-mL lyophilized plasma specimens with corresponding diluents; two shipments per year

Whole Blood Coagulation, Instrument Matrix

Instrument	Program Code				
	WP3	WP4	WP6	WP9	WP10
CoaguSense™	▮				
IL GEM Hemochron Jr. Signature/Signature+, Signature Elite and Jr. II – citrated cuvette		▮			
IL GEM Hemochron Jr. Signature/Signature+, Signature Elite and Jr. II – noncitrated cuvette			▮		
i-STAT/i-STAT PTPlus	▮				
Roche CoaguChek XS Plus, XS Pro, and CoaguChek Pro II				▮	
Roche CoaguChek XS System					▮
Siemens Xprecia Stride				▮	

Platelet Mapping PLTM

Procedure	Program Code	Challenges per Shipment
	PLTM	
AA % aggregation/inhibition	▮	2
ADP % aggregation/inhibition	▮	2

This program requires the draw of a normal donor sample.

Program Information

- One 3.2% sodium citrate and two heparin vacuum tubes; two 3.5-mL plastic tubes; one vial of 0.2M $CaCl_2$
- For use with the Haemonetics Platelet Mapping® assay
- Two shipments per year

Improve the reliability of your patient results with CAP Survey Validated Materials

Use the same material that's sent in the Surveys program to:

- Identify and troubleshoot instrument/method problems.
- Correlate results with other laboratories or instruments.
- Document correction of problems identified in Surveys.
- Use material with confirmed results as an alternative external quality control.
- Identify potential proficiency testing failures.

Each laboratory receives a Survey Participant Summary, which includes readily available results.

Coagulation—Limited, Validated Material

Validated Material	Program Code	Corresponding Program	Page
Coagulation	CGM	CGL	164

Program Information

- Seven 1.0-mL lyophilized plasma specimens; three shipments per year

15 Microbiology

Count on the CAP to support your PT/EQA needs in microbiology.

All Centers for Medicare & Medicaid Services (CMS) regulated analytes are listed in **bold** type.

Microbiology

Microbiology 174
Bacteriology 175
Mycobacteriology 191
Mycology 192
Parasitology 195
Virology 198
Multidiscipline Microbiology 207
Infectious Disease Serology 215

New Programs NEW

Shiga Toxin, Extra Volume (STX) 188
H5N1 Influenza A Detection and Subtyping (FLUA) 204
HIV-1/HIV-2 Qualitative Detection and Differentiation, Molecular (HVDD) 204
Dengue Virus Serology (DENS) 216

Program Changes

Shiga Toxin (ST) and Stool Pathogen (SP) mailing frequency has increased to three mailings ... 187, 188

Microbiology

- Participants must report a minimum of five specimens, three times per year, to meet CLIA requirements for each of the subspecialties of microbiology (Bacteriology, Mycobacteriology*, Mycology, Parasitology, and Virology) for regulated testing.
  *Mycobacteriology requires five specimens, two times per year.
- CLIA regulated tests are bolded.
- If any of the tests performed become waived by the FDA mid-year, your laboratory is responsible for maintaining five challenges per test event for the remaining non-waived tests in that subspecialty.

Guide to Molecular Microbiology Testing

Use this flowchart as a guide for ordering the appropriate Molecular Microbiology programs for your laboratory's testing menu. Participants must report five specimens for each mailing to meet CLIA requirements for the subspecialties of microbiology. See the following pages for more detailed information about each program.

Do you perform molecular testing on *Chlamydia* or GC only?

YES

Select from the following:

- **HC6, HC6X, HC7**
  Chlamydia/GC Nucleic Acid Amplification (page 189)

Do you perform nucleic acid amplification other than GC?

YES

Select from the following:

- **ID1, ID1T, ID2, ID5 , IDN, IDO**
  Nucleic Acid Amplification (pages 200, 203–204, 207)
- **D1**
  Group A *Streptococcus* Culture/Molecular (page 177)
- **MRS2M, MRS5M**
  MRSA Screen, Molecular (page 186)
- **BOR**
  Bordetella pertussis/parapertussis (page 183)
- **CDF5**
  C. difficile Detection (page 185)
- **MGEN**
  Mycoplasma genitalium (page 189)
- **TVAG, TVG5**
  Trichomonas vaginalis (page 195)
- **HVDD**
  HIV-1/HIV-2 (page 204)
- **COV2, COVM**
  SARS-CoV-2 (pages 201–202)

Do you perform viral load testing only?

YES

Select from the following:

- **HV2**
  HIV Viral Load (page 205)
- **HCV2, HBVL, HBVL5**
  Hepatitis Viral Load (page 205)
- **VLS, VLS2**
  Viral Load (page 205)

Do you perform molecular multiplexing?

YES

Select from the following:

- **ID3**
  Nucleic Acid Amplification, Respiratory Limited (page 203)
- **IDM5, IDME**
  Meningitis/Encephalitis Panel (page 209)
- **IDPN**
  Infectious Disease Pneumonia Panel (page 211)
- **IDR**
  Infectious Disease Respiratory Panel (page 210)
- **GIP, GIP5, GIPN**
  Gastrointestinal Panel (pages 212–213)
- **BCM**
  Bacterial Blood Culture (page 182)
- **MVP**
  Molecular Vaginal Panel (page 189)
- **STIM**
  Sexually Transmitted Infection Detection (page 190)

Bacteriology

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Guide for Ordering Regulated Bacteriology Programs

Procedure	Program Code					
	D	D2	RMC	D3	MC4	D1
Bacterial identification	▮	▮	▮	▮	▮	▮
Gram stain and morphology	▮	▮	▮	▮		
Antimicrobial susceptibility testing	▮	▮	▮			
Bacterial antigen/toxin detection	▮		▮		▮	

Participants must report five specimens for each mailing to meet CLIA requirements for the subspecialty of bacteriology. See the following pages for more detailed information about each program.

Bacteriology D

Procedure	Program Code	Challenges per Shipment		
	D	A	B	C
Antimicrobial susceptibility testing	▮	2	2	2
Bacterial identification	▮	5	5	5
Gram stain and morphology	▮	1	1	1
***C. difficile* antigen/toxin**	▮	1	1	1
Group A *Streptococcus* antigen	▮		1	1
Spinal fluid antigen panel	▮	1	1	

Program Information

- Five swab specimens with diluents in duplicate for culture
- Culture sources may include wounds, blood, respiratory, urines, stools, and anaerobes on a rotational basis.
- Specimens for bacterial antigen/toxin detection from the following:

  One swab for Group A *Streptococcus*

  One 1.0-mL lyophilized specimen for spinal fluid meningitis testing

  One 0.5-mL lyophilized specimen for *Clostridioides (Clostridium) difficile*, for use with rapid or molecular testing methods
- Three shipments per year

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BIOHAZARD

BIOHAZARD Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Expanded Bacteriology DEX

Procedure	Program Code	Challenges per Shipment
	DEX	
Bacterial identification	▮	2

Additional Information

Expanded Bacteriology (DEX) is an educational opportunity that provides:

- Culture and susceptibility testing challenges for microbiology laboratories that perform complete identification and susceptibility of bacterial isolates including less common or problematic bacteria
- More exposure to emerging bacterial pathogens and novel resistance mechanisms
- Ability to recognize and identify organisms that exhibit multiple drug-resistance patterns
- Recovery and identification of mixed pathogens such as yeast and bacteria (aerobic and anaerobic) in cultures containing multiple organisms

Program Information

- Two swab specimens in duplicate with diluents to perform bacterial identification and susceptibility (when directed)
- Three shipments per year

Microbiology Bench Tools Competency MBT

Procedure	Program Code	Challenges per Shipment
	MBT	
Bacterial identification	▮	6
Antimicrobial susceptibility testing	▮	2

Additional Information

Microbiology Bench Tools Competency (MBT) is a supplemental module for competency assessment and an educational resource for microbiology laboratories. The module:

- Provides organisms that challenge the basic elements of testing at the microbiology bench, including direct observation, monitoring, recording, and reporting of test results
- Can be used for both competency and educational purposes, including teaching and training pathology residents, new employees, and medical and MT/MLT students
- Provides identification and susceptibility results for supervisor use

This is not a proficiency testing program and participants will not return results to the CAP.

Program Information

- Six swab specimens with diluents for bacterial identification and susceptibility
- Culture sources will vary with each shipment.
- Results will be provided with the kit to assess personnel competency.
- Two shipments per year

Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Group A *Streptococcus* Culture/Molecular D1

Procedure	Program Code	Challenges per Shipment
	D1	
Bacterial identification	▮	5
Culture source	Throat	
Microbiologic level	Presence or absence of Group A *Streptococcus* determination	

Program Information

- Five swab specimens with diluents in duplicate
- Throat swabs compatible with molecular- and culture-based methods
- Three shipments per year

GC and Urine Cultures D2, D3

Procedure	Program Code		Challenges per Shipment
	D2	D3	
Antimicrobial susceptibility testing	▮		2
Bacterial identification	▮	▮	5
Gram stain and morphology	▮	▮	1
Culture source	Urine	Cervical	
Microbiologic level	Organisms identified to the extent of your laboratory's protocol	Presence or absence of *Neisseria gonorrhoeae* determination	

Program Information

- D2 - Five loop specimens with diluents in duplicate, with two susceptibility challenges and one Gram stain and morphology challenge
- D3 - Five loop specimens with diluents in duplicate, and one Gram stain and morphology challenge
- Three shipments per year

Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Routine Microbiology Combination RMC

Procedure	Program Code	Challenges per Shipment
	RMC	
Antimicrobial susceptibility testing	▮	2
GC culture	▮	2
Gram stain and morphology	▮	2
Group A *Streptococcus* antigen detection*	▮	1
Throat culture/molecular	▮	3
Urine culture	▮	3

*If your laboratory uses a waived method for Group A *Streptococcus*, these results will not count toward the required five challenges for the subspecialty of bacteriology.

Program Information

- Five loop specimens with diluents in duplicate, three swab specimens with diluents in duplicate, and one swab specimen for bacterial antigen detection
- Urine culture will have two susceptibility challenges.
- Throat swabs compatible with molecular- and culture-based methods
- Three shipments per year

Urine Colony Count MC3, MC4

Procedure	Challenges per Shipment	
	Program Code	
	MC3	MC4
Urine colony count/**urine culture identification**	2	5
Group A *Streptococcus* antigen detection*		3
Throat culture/molecular		3

*If your laboratory uses a waived method for Group A *Streptococcus*, these results will not count toward the required five challenges for the subspecialty of bacteriology.

Program Information

- MC3 - Two urine specimens with diluents
- MC4 - Five urine specimens with diluents, three swab specimens with diluents in duplicate, and three swab specimens for bacterial antigen detection
- Throat swabs compatible with molecular- and culture-based methods
- Three shipments per year

Gram Stain D5

Procedure	Program Code	Challenges per Shipment
	D5	
Gram stain and morphology	▮	5

Program Information

- Five air-dried, methanol-fixed, unstained glass slides
- Three shipments per year

Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Assessment of Consistency of Gram Stain Morphologic Observations QPD10/QPD25

Introduction

Gram stain is a commonly performed bacterial stain in clinical microbiology laboratories. It is often the starting point guiding microbiological workup and initial clinical diagnosis and therapy. It is important for medical laboratory scientist/technologist staff who read Gram stains to provide an accurate interpretation based on reaction type and microscopic morphology, in order to provide presumptive identifications and quantification of bacteria and fungi in clinical specimens.

Objectives

This study will help assess the effectiveness of educational and practical experience policies and procedures dedicated to the laboratory's efforts in maintaining technologist skills in the morphological assessment of Gram stains. Participation in this study will help management assess the technologist's ability to evaluate Gram stains using online, whole slide images. These cases provide a standardized review and evaluation for each technologist. The study will help management meet applicable CLIA, CAP Laboratory Accreditation Program, and The Joint Commission laboratory requirements for morphology consistency of reporting among staff and personnel competency requirements (testing previously analyzed specimens).*

Data Collection

A series of online, whole slide images of Gram-stained smears using DigitalScope technology will be provided to each participating institution to assess technologists' ability to detect various microorganisms. Technologists will provide information about their work experience related to Gram stains, continuing education, and professional background. Information will be collected from each laboratory site about their continuing education requirements in microbiology and relevant laboratory procedures and policies related to Gram stain assessment. Each technologist will receive their own kit and result form.

Performance Indicators

- Individual technologist score for each Gram stain case, and overall based on a standardized competency assessment method
- Overall laboratory score based on the facility's individual technologist performance(s)

Your Reports – What to Expect

- A participant summary explaining the grading criteria for each case and how to read the reports
- An institution report with your facility's score summary with comparison to other institutions and a technologist score summary by case for each participant
- An individual report for each participant listing their responses and score for each case
- A data analysis and critique report with analysis of the institution and participant scores, author commentary about each case, and links to annotated slides

Program Information

To meet your staff comparative morphology and technical competency assessment requirements:

- Result forms for up to 10 technologists (QPD10)
- Result forms for up to 25 technologists (QPD25)
- Multiple orders may be purchased to accommodate the quantity of technologist result forms needed.

Preliminary study reports are provided at institution and technologist levels.

***Participation in this study helps laboratories meet:**

- CLIA personnel requirements (Subpart M, 42 CFR §493.1)
- CAP Laboratory Accreditation Program Microbiology Checklist statements: MIC.11060, Culture Result Reporting, personnel performing Gram stains for this purpose are subject to competency assessment; MIC.11350, Morphologic Observation Evaluation, the laboratory evaluates consistency of morphologic observation among personnel performing microscopic analysis (eg, stains, wet preparations) from direct specimens and cultured organisms at least annually. The laboratory director or designee must determine acceptability criteria for agreement.
- CAP Laboratory Accreditation Program Checklist items: GEN.55500, element 5, Competency Assessment of Testing Personnel; GEN.55525, Performance Assessment of Supervisors/Consultants; DRA.11425, functions or responsibilities are properly performed by a qualified individual.
- The Joint Commission Standards HR.01.05.03, 01.06.01 (EPs 3, 18,19), HR.01.07.01, PI.03.01.01(EPs 3-5), and LD.04.05.01, 04.05.03 (EPs 1-6) regarding in-service training, continuing education, competency, and evaluation of staff members

This is a one-time study conducted in the fourth quarter.

Virtual Gram Stain Competency VGS1, VGS2

Procedure	Program Code		Challenges per Shipment
	VGS1	VGS2	
Virtual gram stain basic	▮		3
Virtual gram stain advanced		▮	3

Additional Information

- Virtual Gram Stain Basic Competency (VGS1) is for general and new laboratory technologists/technicians. Participants will assess the quality of specimens and stains and will report artifacts and detailed gram-positive and gram-negative morphology. Challenges will include specimens such as CSF, body fluids, and positive blood cultures.
- Virtual Gram Stain Advanced Competency (VGS2) is for experienced laboratory technologists/technicians and microbiologists. Participants will receive challenging images of sputum, body fluids, and other specimens to assess the quality, quantity, and typical morphology of both gram-positive and gram-negative organisms appropriate for the site.
- See system requirements on page 12.

Program Information

- VGS1, VGS2 - Three online whole slide images
- Results included in the kit to assess personnel competency
- Powered by DigitalScope® technology
- Two shipments per year

Rapid Group A Strep Antigen Detection D6

Procedure	Program Code	Challenges per Shipment
	D6	
Group A *Streptococcus* antigen detection*	▮	5

*If your laboratory uses a waived method for Group A *Streptococcus*, these results will not count toward the required five challenges for the subspecialty of bacteriology.

Program Information

- Five swab specimens
- Not compatible with molecular- and culture-based methods
- Three shipments per year

CE credit

Rapid Group A Strep Antigen Detection, Waived D9

Procedure	Program Code	Challenges per Shipment
	D9	
Group A *Streptococcus* antigen detection	▮	2

Program Information

- Two swab specimens
- Not compatible with molecular- and culture-based methods
- Two shipments per year

Group B Strep Detection D8

Analyte	Program Code	Challenges per Shipment
	D8	
Group B *Streptococcus*	▮	5

Program Information

- Five swab specimens with diluents
- Program includes A549 cells to meet sample adequacy control requirement.
- Compatible with molecular- and culture-based methods
- Three shipments per year

Bacterial Antigen Detection LBAS, SBAS

Procedure	Program Code		Challenges per Shipment
	LBAS	SBAS	
Legionella pneumophila antigen detection	▮		2
Streptococcus pneumoniae antigen detection		▮	2

Program Information

- LBAS, SBAS - Two 0.5-mL liquid simulated clinical specimens
- Two shipments per year

Blood Culture BCS

Procedure	Program Code	Challenges per Shipment
	BCS	
Blood culture bacterial and fungal detection and identification	▮	2

Program Information

- Two specimens with diluents for inoculation of blood culture bottles
- Two shipments per year

Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Blood Culture, *Staphylococcus aureus* BCS1

Analyte	Program Code	Challenges per Shipment
	BCS1	
Staphylococcus aureus/MRSA	▮	3

Program Information

- Three specimens with diluents for inoculation of blood culture bottles
- Compatible with molecular methods for detection of *S. aureus*/MRSA from positive blood culture bottles
- Two shipments per year

Bacterial Blood Culture, Molecular BCM

Procedure	Program Code	Challenges per Shipment
	BCM	
Blood culture bacterial identification	▮	5

Program Information

- Five 1.0-mL simulated blood culture fluid specimens
- For laboratories using molecular multiplex panels
- Three shipments per year

Additional Information

- This program is for the identification of gram-positive and gram-negative organisms, including common resistance mechanisms isolated from blood culture bottles.
- This program is not for the inoculation of blood culture bottles.

Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Blood Culture Contamination QT2

Despite advances in blood culture practices and technology, false-positive blood culture results due to contaminants continue to be a critical problem. Blood culture contamination rate, the primary indicator of preanalytic performance in microbiology, is associated with increased length of hospital stay, additional expense, and inappropriate antibiotic usage. The results of this study may contribute to report findings to hospital/system antibiotic stewardship programs.

The CAP and other accrediting organizations require you to monitor and evaluate key indicators of quality for improvement opportunities. Use this monitor to help meet CAP Laboratory Accreditation Program Checklist statements MIC.22630 and MIC.22635: "The laboratory must determine and regularly review the number of contaminated cultures. Tracking the contamination rate and providing feedback to units and persons drawing cultures is one method that has been shown to reduce contamination rates." This will also help laboratories meet The Joint Commission Standard QSA 04.07.01 EP 3.

Objective

This study will determine the rate of blood culture contamination using standardized criteria for classifying contaminants.

Data Collection

On a monthly basis, participants will tabulate the total number of blood cultures processed and the total number of contaminated blood cultures. Blood cultures from neonatal patients are tabulated separately. For the purposes of this study, participants will consider a blood culture to be contaminated if they find one or more of the following organisms in only one of a series of blood culture specimens: *Aerococcus* spp., *Bacillus* spp. (excluding *Bacillus anthracis*) and related genera, *Corynebacterium* spp. and related Coryneform genera, *Cutibacterium* spp. or *Propionibacterium* spp., *Micrococcus* spp. and related genera; *Rothia mucilaginosa*, *Coagulase-negative staphylococci*, and *Streptococcus* spp. (viridans group only). Participants have the option to monitor institution-specific subgroups (for example, a specific department or patient population).

Performance Indicators

- Neonatal contamination rate (%)
- Other contamination rate (%)
- Overall contamination rate (%)

Look in e-LAB Solutions Suite for your input forms approximately two weeks before the start of the next quarter.

Bordetella pertussis/parapertussis, Molecular BOR

Analyte	Program Code	Challenges per Shipment
	BOR	
Bordetella pertussis	▮	3
Bordetella parapertussis	▮	3

Program Information

- Three swab specimens
- Designed for molecular techniques
- Two shipments per year

Carbapenemase Detection CRE

Procedure	Program Code	Challenges per Shipment
	CRE	
Resistance mechanism detection	▮	3

Program Information

- Three swab specimens containing live organisms
- Designed for molecular and phenotypic testing methods
- Challenge isolates may include Enterobacterales, *Pseudomonas*, or *Acinetobacter.*
- Two shipments per year

Carbapenem-Resistant Organisms CRO

Analyte	Program Code	Challenges per Shipment
	CRO	
KPC	▮	3
IMP	▮	3
NDM	▮	3
OXA-48	▮	3
VIM	▮	3

Program Information

- Three 130-µL specimens
- Designed for molecular techniques
- Compatible with Cepheid GeneXpert
- Two shipments per year

Campylobacter CAMP

Analyte	Program Code	Challenges per Shipment
	CAMP	
Campylobacter	▮	2

Program Information

- Two swabs with diluents in duplicate
- For use with rapid antigen, culture-based testing, and molecular methods
- Two shipments per year

Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

C. difficile, 2 Challenge CDF2

Analyte	Program Code	Challenges per Shipment
	CDF2	
Clostridioides (Clostridium) difficile antigen/toxin	▮	2

Program Information
- Two 0.5-mL lyophilized specimens, for use with rapid or molecular testing methods
- Two shipments per year

C. difficile, 5 Challenge CDF5

Analyte	Program Code	Challenges per Shipment
	CDF5	
***Clostridioides (Clostridium) difficile* antigen/toxin**	▮	5

Program Information
- Five 0.5-mL lyophilized specimens, for use with rapid or molecular testing methods
- Three shipments per year

C. trachomatis Antigen Detection HC3

Procedure	Program Code	Challenges per Shipment
	HC3	
C. trachomatis antigen detection (EIA)*	▮	5

*HC3 will not meet regulatory requirements.

Program Information
- Five 2.0-mL liquid specimens for *Chlamydia* antigen testing by EIA
- Three shipments per year

Fecal Lactoferrin FLAC

Analyte	Program Code	Challenges per Shipment
	FLAC	
Fecal lactoferrin	▮	3

Program Information
- Three 0.5-mL simulated stool specimens
- For use with rapid methods
- Two shipments per year

Helicobacter pylori Antigen, Stool HPS

Analyte	Program Code	Challenges per Shipment
	HPS	
Helicobacter pylori antigen	▮	2

Program Information
- Two 0.5-mL fecal suspensions
- Two shipments per year

Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Methicillin-Resistant *Staphylococcus aureus* Screen, 2 Challenge MRS

Procedure	Program Code	Challenges per Shipment
	MRS	
MRSA/MSSA detection	▮	2

Program Information
- Two swab specimens with diluents
- For laboratories performing culture-based testing only or using culture and molecular testing
- Two shipments per year

MRSA Screen, Molecular, 2 Challenge MRS2M

Procedure	Program Code	Challenges per Shipment
	MRS2M	
MRSA/MSSA/SA detection	▮	2

Program Information
- Two swab specimens (in duplicate)
- For use with molecular methods that detect *mecA*
- Two shipments per year

Methicillin-Resistant *Staphylococcus aureus* Screen, 5 Challenge MRS5

Procedure	Program Code	Challenges per Shipment
	MRS5	
MRSA/MSSA **detection**	▮	5

Program Information
- Five swab specimens with diluents
- For laboratories performing culture-based testing only or using culture and molecular testing
- Three shipments per year

MRSA Screen, Molecular, 5 Challenge MRS5M

Procedure	Program Code	Challenges per Shipment
	MRS5M	
MRSA/MSSA/SA **detection**	▮	5

Program Information
- Five swab specimens (in duplicate)
- For use with molecular methods that detect *mecA*
- Three shipments per year

Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Laboratory Preparedness Exercise LPX

Analyte	Program Code	Challenges per Shipment
	LPX	
Bacterial identification	▮	3

The Laboratory Preparedness Exercise (LPX) was developed as a collaborative effort between the CAP, the CDC, and the Association of Public Health Laboratories (APHL). Laboratories will be sent live organisms that either exhibit characteristics of bioterrorism agents or demonstrate epidemiologic importance, and will be expected to respond following Laboratory Response Network Sentinel Laboratory Guidelines if a bioterrorism agent is suspected. All agents provided are excluded from the CDC's select agent list. These may include strains of *Bacillus anthracis, Yersinia pestis, Francisella tularensis,* and *Brucella abortus* that have been modified and are safe for testing in a laboratory that contains a certified Class II Biological Safety Cabinet and is capable of handling Category A and B agents.

Program Information

- Three swab specimens with diluents
- Not available to customers outside the US due to US export law restrictions
- Two shipments per year

Rapid Urease RUR

Analyte	Program Code	Challenges per Shipment
	RUR	
Urease	▮	3

Program Information

- Three simulated gastric biopsy specimens
- For use with rapid urease tests.
- Two shipments per year

Stool Pathogen SP, SPN, SP1

Analyte	Program Code			Challenges per Shipment
	SP	SPN	SP1	
Adenovirus 40/41**	▮	▮		2
C. difficile antigen/toxin**	▮	▮		2
Rotavirus**	▮	▮		2
Shiga toxin*	▮			2
Norovirus			▮	1

*Add-on to other Bacteriology subspecialty program(s).
**To meet CMS and CAP-accredited laboratory regulatory requirements for these analytes, see program CDF5 on page 185, program D on page 175, and program GIP5 on page 212.

Program Information

- SP - Two 1.0-mL liquid specimens; for use with rapid or molecular testing methods; not available to customers outside the US due to US export law restrictions
- SPN - Two 1.0-mL liquid specimens; for use with rapid or molecular testing methods; intended for laboratories outside the US
- SP1 - One 1.0-mL liquid specimen compatible with molecular methods only
- SPN and SP1 - Two shipments per year
- SP - Three shipments per year

Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Shiga Toxin ST, STX

Analyte/Procedure	Program Code		Challenges per Shipment
	ST	STX NEW	
Shiga toxin	▮	▮	2

Add-on to other Bacteriology subspecialty program(s). Participation in ST/STX programs only will not meet CMS requirements.

Program Information

- ST - Two 0.5-mL liquid specimens
- STX - Two 1.25-mL liquid specimens (intended for Meridian Curian users and laboratories that require extra volume for shiga toxin testing)
- For use with direct shiga toxin testing only; not compatible with culture methods, cytotoxicity assays, or PCR
- Not available to customers outside the US due to US export law restrictions
- Three shipments per year

Bacterial Vaginosis BV

Procedure	Program Code	Challenges per Shipment
	BV	
Bacterial vaginosis detection	▮	3

Program Information

- Three 1.0-mL liquid specimens
- For Sekisui OSOM® BVBlue users
- Two shipments per year

Vaginitis Screen VS, VS1

Analyte	Program Code		Challenges per Shipment
	VS*	VS1**	
***Candida* sp.**	▮		5
Gardnerella vaginalis	▮		5
Trichomonas vaginalis* **	▮	▮	5

*The biohazard warning applies to program VS.
**Molecular users are encouraged to use *Trichomonas vaginalis*, Molecular (TVAG or TVG5), on page 195.
***_Trichomonas vaginalis_ is only reported to CMS for the VS program.

Program Information

- VS - Five swabs for DNA probe technology; BD Affirm™ VP III probe detection method; three shipments per year

BIOHAZARD

- VS1 - Five swabs for methods such as Sekisui OSOM *Trichomonas* Rapid Test, *Trichomonas vaginalis*; three shipments per year

BIOHAZARD Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Mycoplasma genitalium, Molecular MGEN

Analyte	Program Code	Challenges per Shipment
	MGEN	
Mycoplasma genitalium	▮	3

Program Information

- Three 1.0-mL liquid specimens
- Designed for molecular techniques
- Two shipments per year

Molecular Vaginal Panel MVP

Analyte	Program Code	Challenges per Shipment
	MVP	
***Candida* species group**	▮	5
Candida krusei	▮	5
Candida glabrata	▮	5
Trichomonas vaginalis	▮	5
Bacterial vaginosis	▮	5

Program Information

- Five 1.0-mL liquid simulated vaginal specimens
- Designed for molecular methods such as BD MAX, Hologic, and Cepheid
- Three shipments per year

C. trachomatis and *N. gonorrhoeae* by NAA HC6, HC6X, HC7

Procedure	Program Code		Challenges per Shipment
	HC6*, HC6X*	HC7	
Nucleic acid amplification (NAA)	▮		5
Nucleic acid amplification (NAA/DNA)		▮	5

*The biohazard warning applies to programs HC6 and HC6X.

Program Information

- HC6 - Three swab specimens and two 1.0-mL liquid simulated urine specimens
- HC6X - Three swab specimens and two 1.0-mL liquid simulated urine specimens in duplicate
- Three shipments per year

BIOHAZARD

- HC7 - Five 1.5-mL simulated body fluid specimens; designed for Cepheid users
- Three shipments per year

BIOHAZARD Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Sexually Transmitted Infection Detection, Molecular STIM

Analyte	Program Code	Challenges per Shipment
	STIM	
Chlamydia trachomatis	▮	5
Neisseria gonorrhoeae	▮	5
Mycoplasma genitalium	▮	5
Trichomonas vaginalis	▮	5

Program Information

- Five 2.0-mL simulated urogenital specimens
- Designed for molecular multiplex methods
- Three shipments per year

Vaginitis Screen, Virtual Gram Stain VS2

Procedure	Program Code	Challenges per Shipment
	VS2	
Interpretation of gram-stained vaginal smears	▮	3

See system requirements on page 12.

Program Information

- Three online whole slide images
- Powered by DigitalScope technology
- Two activities per year; your CAP shipping contact will be notified via email when the activity is available.

Vancomycin-Resistant *Enterococcus* VRE

Procedure	Program Code	Challenges per Shipment
	VRE	
Vancomycin-resistant *Enterococcus* (VRE) detection	▮	2

Program Information

- Two swabs with diluents
- For use with molecular methods and culture-based testing
- Two shipments per year

Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Mycobacteriology

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Mycobacteriology E

Procedure	Program Code	Challenges per Shipment
	E	
Acid-fast smear	▮	1
Antimycobacterial susceptibility testing	▮	1 graded, 1 ungraded
Mycobacterial identification*	▮	5

*This procedure requires identification of *Mycobacterium tuberculosis*.

Program Information

- Five simulated clinical isolates with diluents and one specimen for performing an acid-fast bacillus smear
- Identification may be performed by culture or molecular methods.
- Two shipments per year

Mycobacteriology—Limited E1

Procedure	Program Code	Challenges per Shipment
	E1	
Acid-fast smear	▮	5
Mycobacterial culture	▮	5

Program Information

- Five simulated specimens for acid-fast smears and/or for the determination of the presence or absence of acid-fast bacillus by culture
- Two shipments per year

Molecular MTB Detection and Resistance MTR5, MTBR

Procedure	Challenges per Shipment	
	Program Code	
	MTR5	MTBR
Mycobacterium tuberculosis* detection	5	3
Rifampin resistance	5	3

**Mycobacterium tuberculosis* detection is only reported to CMS for the MTR5 program.*

Program Information

- MTR5 - Five 1.25-mL simulated sputum specimens for use with molecular methods
- MTBR - Three 1.25-mL simulated sputum specimens for use with molecular methods
- Not suitable for culture
- Two shipments per year

Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Mycology

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Mycology and Aerobic Actinomycetes F

Procedure	Program Code	Challenges per Shipment
	F	
Antifungal susceptibility testing	▮	1
Cryptococcal antigen detection	▮	1
Mold and yeast identification	▮	5

Program Information

- Five loops for culture with diluents in duplicate and one 1.0-mL simulated cerebrospinal fluid specimen
- Identification of yeasts, molds, and aerobic actinomycetes may be performed by molecular- and culture-based methods.
- Three shipments per year

Yeast F1

Procedure	Program Code	Challenges per Shipment
	F1	
Antifungal susceptibility testing	▮	1
Cryptococcal antigen detection	▮	1
Yeast identification	▮	5

Program Information

- Five loops for culture with diluents in duplicate and one 1.0-mL simulated cerebrospinal fluid specimen
- Identification of yeast may be performed by molecular- and culture-based methods.
- Three shipments per year

Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Candida Culture F3

Procedure	Program Code	Challenges per Shipment
	F3	
Yeast identification	▮	5

Program Information

- Five loops for culture with diluents in duplicate
- For laboratories identifying *Candida* sp. only
- Identification of *Candida* species may be performed by chromogenic agar, culture, molecular, and rapid methods.
- Three shipments per year

Yeast Blood Culture, Molecular YBC

Procedure	Program Code	Challenges per Shipment
	YBC	
Blood culture yeast identification	▮	5

Additional Information

- This program is for identification of fungal organisms such as yeast isolated from blood culture bottles.
- This program is not for the inoculation of blood culture bottles.

Program Information

- Five 1.0-mL simulated blood culture fluid specimens
- For laboratories using molecular multiplex panels
- Three shipments per year

Cryptococcal Antigen Detection CRYP

Procedure	Program Code	Challenges per Shipment
	CRYP	
Cryptococcal antigen	▮	5

Program Information

- Five 1.0-mL simulated cerebrospinal fluids
- Three shipments per year

Galactomannan FGAL

Analyte	Program Code	Challenges per Shipment
	FGAL	
Galactomannan - *Aspergillus*	▮	3

Program Information

- Three liquid specimens
- For use with methods such as Bio-Rad Platelia™
- Two shipments per year

Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Fungal Serology FSER

Procedure	Program Code	Challenges per Shipment
	FSER	
Serological detection of specific fungal antibodies	▮	3

Program Information
- Three serum specimens
- For use with immunodiffusion methods
- Designed for the detection of IgG antibodies to *Aspergillus*, *Blastomyces*, *Coccidioides*, and *Histoplasma*
- Two shipments per year

Fungal Smear FSM

Procedure	Program Code	Challenges per Shipment
	FSM	
KOH preparation/calcofluor white	▮	3

Program Information
- Three unstained slides
- Two shipments per year

India Ink IND

Procedure	Program Code	Challenges per Shipment
	IND	
India ink	▮	2

Program Information
- Two liquid specimens
- Two shipments per year

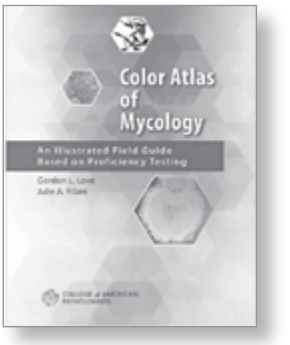
Pneumocystis jirovecii PCP1, PCP2, PCP4

Procedure	Program Code			Challenges per Shipment
	PCP1	PCP2	PCP4	
PCP – Calcofluor white stain	▮			3
PCP – DFA stain		▮		3
PCP – GMS stain			▮	3

Program Information
- PCP1, PCP2, PCP4 - Three images, each available as photographs and online images for *Pneumocystis jirovecii*
- Two shipments per year

Color Atlas of Mycology

Built on more than 15 years of proficiency testing data, this resource assists in the laboratory identification of fungi using the most recent taxonomic classifications. This book merges in vitro mycology (colonies on plated media/LPAB preparations) with in vivo mycology (histology/cytology).



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Parasitology

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Parasitology P, P3, P4, P5

Procedure	Challenges per Shipment			
	Program Code			
	P	P3	P4	P5
Fecal suspension (wet mount)	2	5	2	
Fecal suspension (*Giardia* and *Cryptosporidium* immunoassays and/or modified acid-fast stain)	2	1	1	5
Giemsa-stained blood smear	1			
Preserved slide (for permanent stain)	2		3	

Note: Fecal suspension (wet mount) and Fecal suspension (*Giardia* and *Cyptosporidium* immunoassays) in P3 will not meet CMS requirements.

Additional Information

- The proficiency testing materials used for the Parasitology programs contain formalin as a preservative.
- Number of specimen types are indicated in chart.

Program Information

- P - Five specimens consisting of thin and thick films for blood and tissue parasite identification, preserved slides for permanent stain, 0.75-mL fecal suspensions for direct wet mount examination, photographs, and/or online images; two 0.75-mL fecal suspensions for immunoassay and/or MAF
- P3 - Five 0.75-mL fecal suspensions for direct wet mount examination, photographs, and/or online images; one 0.75-mL fecal suspension for immunoassay and/or MAF
- P4 - Five specimens consisting of 0.75-mL fecal suspensions for direct wet mount examination, preserved slides for permanent stain, photographs, and/or online images; one 0.75-mL fecal suspension for immunoassay and/or MAF
- P5 - Five 0.75-mL fecal suspensions for *Giardia* and *Cryptosporidium* immunoassays and/or modified acid-fast stain
- Three shipments per year

CE credit

Trichomonas vaginalis, Molecular TVAG, TVG5

Analyte	Program Code	
	Challenges per Shipment	
	TVAG	TVG5
Trichomonas vaginalis	3	5

Note: Only analytes in TVG5 will meet CMS requirements for parasite identification.

Program Information

- TVAG - Three 1.5-mL liquid specimens; two shipments per year
- TVG5 - Five 1.5-mL liquid specimens; three shipments per year

Blood Parasite BP

Procedure	Program Code	Challenges per Shipment
	BP	
Blood parasite identification (thin/thick film sets*)	▮	5

*This program will include corresponding thick films when available.

Program Information

- Five Giemsa-stained blood film sets, photographs, and/or online images
- Percent parasitemia reporting is provided when appropriate for educational purposes.
- A variety of blood parasites, including *Plasmodium, Babesia, Trypanosoma,* and filarial worms
- Three shipments per year

Rapid Malaria RMAL, RML5

Analyte	Program Code	
	Challenges per Shipment	
	RMAL	RML5
Rapid malaria detection	3	5
***Plasmodium falciparum* only**	3	5

Note: Only analytes in program RML5 will meet CMS requirements for parasite antigen detection.

Program Information

- RMAL - Three 0.5-mL antigen specimens; two shipments per year
- RML5 - Five 0.5-mL liquid specimens; three shipments per year

Expanded Parasitology PEX

Procedure	Program Code	Challenges per Shipment
	PEX	
Parasite identification	▮	3

This program provides an educational opportunity to challenge laboratory professionals' competency using photo images in the identification of parasites.

Program Information

- Three images, each available as photographs and online images
- Two shipments per year

Ticks, Mites, and Other Arthropods TMO

Procedure	Program Code	Challenges per Shipment
	TMO	
Tick, mite, and arthropod identification	▮	3

Program Information

- Three images, each available as photographs and online images
- Two shipments per year

CE credit

Worm Identification WID

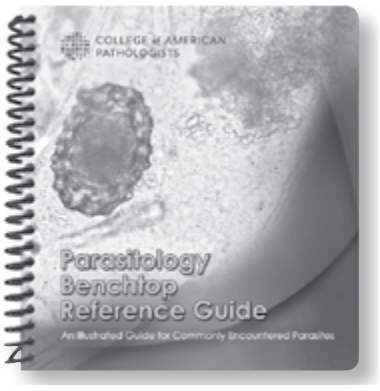
Procedure	Program Code	Challenges per Shipment
	WID	
Worm identification	▮	3

Program Information

- Three images, each available as photographs and online images
- Two shipments per year

Parasitology Benchtop Reference Guide

- More than 70 identifications for parasites commonly encountered in the clinical laboratory
- Five tabbed sections for easy reference
  - Blood Parasites
  - Intestinal Protozoa
  - Intestinal Helminths
  - Miscellaneous Specimens
  - Macroscopic Worms
- A durable and water-resistant format to withstand years of benchtop use—6½" x 7"



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Virology

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Guide for Ordering Regulated Virology Programs

Program Code	Procedure	
	Viral Identification	Viral Antigen Detection
VR1	▮	
VR2		▮
VR4		▮
HC4	▮	
ID3	▮	
ID5	▮	
COVM	▮	
CVAG		▮

Guide to Virology Testing

Use this flowchart as a guide for ordering the appropriate Virology programs for your laboratory's testing menu. For the subspecialty of virology, participants must test five specimens per mailing. If you have any questions, please call the Customer Contact Center at 800-323-4040 or +1-847-832-7000, Option 1.

For Comprehensive Virology Culture Testing	→	Select **VR1** (page 199)
For Virology Antigen Testing by Immunofluorescence	→	Select **VR2** (page 199)
For Viral Serology Testing	→	Select **DENS, VR3, VR3M** (pages 215–216)
For Virology Antigen by EIA or Latex Agglutination	→	Select **VR4, CVAG** (pages 199, 202)
For Herpes Simplex Virus Culture Testing	→	Select **HC4** (page 200)
For Viral Load Testing	→	Select **HV2, HCV2, HBVL, HBVL5, VLS, VLS2** (page 205)
For Nucleic Acid Amplification	→	Select **COV2, COVM, FLUA, HVDD, ID1, ID1T, ID2, ID3, ID5, MPOX, VBDM** (pages 200–204, 206)

Virology Culture VR1

Procedure	Program Code	Challenges per Shipment
	VR1	
Chlamydia trachomatis culture	▮	1
Viral isolation/identification	▮	5

Program Information

- Five 0.5-mL specimens for viral culture and one 0.5-mL specimen for *Chlamydia trachomatis* culture
- Three shipments per year

Virology Antigen Detection (DFA) VR2

Analyte/Procedure	Program Code	Challenges per Shipment		
	VR2	A	B	C
Adenovirus antigen	▮	1	1	
Cytomegalovirus (CMV) antigen	▮	1	1	
Herpes simplex virus (HSV) antigen	▮		1	1
Influenza A antigen	▮	1		1
Influenza B antigen	▮		1	
Parainfluenza antigen	▮	1		1
Respiratory syncytial virus (RSV) antigen	▮	1		1
Varicella-zoster (VZV) antigen	▮		1	1
Educational challenge	▮	1		

Program Information

- Five 5-well slide specimens
- Three shipments per year

Virology Antigen Detection (Non-DFA) VR4

Analyte	Program Code	Challenges per Shipment
	VR4	
Adenovirus (not 40/41) antigen	▮	5
Influenza A antigen	▮	5
Influenza B antigen	▮	5
Respiratory syncytial virus (RSV) antigen	▮	5
Rotavirus antigen	▮	5

Program Information

- Five 1.5-mL specimens
- For use with enzyme immunoassay and/or latex agglutination methods
- Specimens not designed for molecular methods
- Three shipments per year

Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Herpes Simplex Virus HC4

Procedure	Program Code	Challenges per Shipment
	HC4	
Herpes simplex virus (HSV) culture	▮	5

Program Information
- Five 0.5-mL lyophilized specimens
- Three shipments per year

Human Papillomavirus HPV

Analyte	Program Code	Challenges per Shipment
	HPV	
Human papillomavirus (HPV)	▮	2

For laboratories using Digene, SurePath, and/or ThinPrep collection media, see page 313.

Program Information
- Two simulated cervical specimens contained in Digene transport media
- For Digene Hybrid Capture only
- Two shipments per year

Nucleic Acid Amplification, Viruses ID1, ID1T

Analyte	Program Code		Challenges per Shipment
	ID1	ID1T	
Cytomegalovirus (CMV)	▮		1
Enterovirus	▮		1
Epstein-Barr virus (EBV)	▮		1
Herpes simplex virus (HSV)	▮		1
Human herpesvirus 6 (HHV-6)	▮		1
Human herpesvirus 8 (HHV-8)	▮		1
Parvovirus B19	▮		1
Varicella-zoster virus (VZV)	▮		1
BK virus		▮	1
JC virus		▮	1

Program Information
- ID1- Eight 1.0-mL liquid specimens
- ID1T - Two 1.0-mL liquid specimens
- Two shipments per year

Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Mpox Molecular MPOX

Procedure	Program Code	Challenges per Shipment
	MPOX	
Monkeypox virus detection	▮	3

This program is only available to customers within the US.

Program Information

- Three 1.0-mL simulated body fluid specimens that contain whole killed virus
- A549 cells included in each specimen
- For laboratories using molecular tests
- Two shipments per year

SARS-CoV-2 Molecular COV2

Analyte	Program Code	Challenges per Shipment
	COV2	
SARS-CoV-2	▮	3

To meet CMS and CAP-accredited laboratory regulatory requirements for these analytes, see program COVM on page 202. For multiple instrument reporting options, see the Quality Cross Check program, COV2Q, below.

Program Information

- Three 1.5-mL liquid simulated respiratory specimens
- Designed for molecular techniques
- Whole genome with sequence targets across all the assay platforms
- Qualitative reporting options available
- Two shipments per year

Quality Cross Check—SARS-CoV-2 Molecular COV2Q

Analyte	Program Code	Challenges per Shipment
	COV2Q	
SARS-CoV-2	▮	3

This program does not meet regulatory requirements for proficiency testing; see program COV2, above. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 3.2-mL non-infectious liquid specimens that contain the whole SARS-CoV-2 genome
- Designed for molecular techniques
- Report up to three instruments.
- Two shipments per year

SARS-CoV-2 Molecular, 5 Challenge COVM

Analyte	Program Code	Challenges per Shipment
	COVM	
SARS-CoV-2	▮	5

For multiple instrument reporting options, see the Quality Cross Check program, COV2Q, on page 201.

Program Information
- Five 1.5-mL liquid simulated respiratory specimens
- Designed for molecular techniques
- Whole genome with sequence targets across all the assay platforms
- Qualitative reporting options available
- Three shipments per year

SARS-CoV-2 Antigen COVAG

Analyte	Program Code	Challenges per Shipment
	COVAG	
SARS-CoV-2 antigen	▮	3

To meet CMS and CAP-accredited laboratory regulatory requirements for these analytes, see program CVAG below. For multiple instrument reporting options, see the Quality Cross Check program, COVAQ, below.

Program Information
- Three 0.5-mL simulated respiratory specimens
- Designed for antigen test
- Two shipments per year

SARS-CoV-2 Antigen, 5 Challenge CVAG

Analyte	Program Code	Challenges per Shipment
	CVAG	
SARS-CoV-2 antigen	▮	5

For multiple instrument reporting options, see the Quality Cross Check program, COVAQ, below.

Program Information
- Five 0.5-mL simulated respiratory specimens
- Designed for antigen test
- Three shipments per year

Quality Cross Check—SARS-CoV-2 Antigen COVAQ

Analyte	Program Code	Challenges per Shipment
	COVAQ	
SARS-CoV-2 antigen	▮	3

This program does not meet regulatory requirements for proficiency testing; see program COVAG, above. For additional information about the Quality Cross Check program, see page 36.

Program Information
- Three 0.5-mL simulated respiratory specimens in triplicate
- Report up to three instruments.
- Two shipments per year

SARS-CoV-2 Serology COVS

Analyte	Program Code	Challenges per Shipment
	COVS	
SARS-CoV-2 antibody (total, IgG, IgM, and IgA)	▮	3

Program Information

- Three 0.5-mL serum specimens
- Appropriate for assays that detect antibodies to nucleocapsid, spike, combined antigen (nucleocapsid and spike), and the receptor binding domain of the spike protein
- Two shipments per year

Nucleic Acid Amplification, Respiratory ID2

Analyte	Program Code	Challenges per Shipment
	ID2	
Adenovirus	▮	1
Coronavirus/Rhinovirus*	▮	1
Human metapneumovirus (HMPV)	▮	1
Influenza virus*	▮	1
Parainfluenza virus	▮	1
Respiratory syncytial virus (RSV)	▮	1

*Coronavirus/Rhinovirus and Influenza virus will be included in the following shipments:

- Shipment A: Coronavirus and Influenza A (does not include SARS-CoV-2)
- Shipment B: Rhinovirus and Influenza B

For H5N1 Influenza A Detection and Subtyping program, FLUA, see page 204.

Program Information

- Six 1.0-mL liquid specimens
- Two shipments per year

Nucleic Acid Amplification, Respiratory Limited ID3

Analyte	Program Code	Challenges per Shipment
	ID3	
Influenza A virus	▮	5
Influenza B virus	▮	5
Respiratory syncytial virus (RSV)	▮	5
SARS-CoV-2	▮	5

Additional Information

- This program does not contain human genome material or sequences from human RNase P gene.
- For multiple instrument reporting options, see the Quality Cross Check program, ID3Q, on page 204.
- For H5N1 Influenza A Detection and Subtyping program, FLUA, see page 204.

Program Information

- Five 1.0-mL liquid specimens
- Designed for molecular multiplex panel users
- Three shipments per year

Quality Cross Check—Nucleic Acid Amplification, Respiratory Limited ID3Q

Analyte	Program Code	Challenges per Shipment
	ID3Q	
Influenza A virus	▮	3
Influenza B virus	▮	3
Respiratory syncytial virus (RSV)	▮	3
SARS-CoV-2	▮	3

Program Information
- Three 1.0-mL liquid specimens
- Designed for molecular multiplex panel users
- Report up to three instruments.
- Two shipments per year

Additional Information
- This program does not contain human genome material or sequences from human RNase P gene.
- This program does not meet regulatory requirements for proficiency testing; see program ID3, on page 203. For additional information about the Quality Cross Check program, see page 36.

NEW

H5N1 Influenza A Detection and Subtyping FLUA

Analyte/Procedure	Program Code	Challenges per Shipment
	FLUA	
Influenza A detection	▮	2
Influenza A subtyping	▮	2

This program is only available to customers within the US.

Program Information
- Two 1.5-mL liquid specimens
- Includes Avian Influenza A (H5N1) and other seasonal Influenza A strains
- Two shipments per year

HSV, VZV—Molecular ID5

Analyte	Program Code	Challenges per Shipment
	ID5	
Herpes simplex virus (HSV)	▮	5
Varicella-zoster virus (VZV)	▮	5

Program Information
- Five 1.0-mL liquid specimens
- Designed for molecular techniques
- Three shipments per year

NEW

HIV-1/HIV-2 Qualitative Detection and Differentiation, Molecular HVDD

Analyte/Procedure	Program Code	Challenges per Shipment
	HVDD	
HIV-1 RNA virus detection	▮	3
HIV-2 RNA virus detection	▮	3

Program Information
- Three 1.5-mL liquid specimens
- Designed for molecular techniques that detect and differentiate between HIV-1 and HIV-2 virus
- Two shipments per year

HIV Viral Load HV2, HIVG

Procedure	Program Code		Challenges per Shipment
	HV2	HIVG	
HIV-RNA viral load	▮		5
Human immunodeficiency virus (HIV) genotyping*		▮	1

*HIV genotyping is for laboratories reporting reverse transcriptase, protease, and/or integrase mutations.

Program Information

- HV2 - Five 2.5-mL liquid specimens
- HIVG - One 1.0-mL liquid specimen
- Three shipments per year

Hepatitis Viral Load HCV2, HBVL, HBVL5

Procedure	Challenges per Shipment		
	Program Code		
	HCV2	HBVL	HBVL5
HCV genotyping	1		
HCV, qualitative	1		
HCV viral load	5		
HBV viral load		3	5

Program Information

- HCV2 - Five 1.5-mL liquid plasma specimens; three shipments per year
- HBVL - Three 1.5-mL plasma specimens; two shipments per year
- HBVL5 - Five 1.5-mL plasma specimens; three shipments per year

Viral Load VLS, VLS2

Procedure	Program Code		Challenges per Shipment
	VLS	VLS2	
BK viral load	▮	▮	2
Cytomegalovirus (CMV) viral load	▮	▮	2
Epstein-Barr virus (EBV) viral load	▮	▮	2
Adenovirus viral load		▮	2
Human herpesvirus 6 (HHV-6) viral load		▮	2

Program Information

- VLS - Six 1.0-mL liquid specimens; two shipments per year
- VLS2 - Ten 2.0-mL liquid specimens; three shipments per year

Viral Load Calibration Verification/Linearity LN38, LN39, LN45, LN52

Analyte	Program Code				
	LN38	LN39	LN45	LN52	Target Ranges
Cytomegalovirus (CMV) viral load	▮				316.0–8.0M IU/mL
HIV viral load		▮			50.0–5.0M IU/mL
Hepatitis C (HCV) viral load			▮		50.0–280.0M IU/mL
Hepatitis B (HBV) viral load				▮	1.3 log–8.5 log IU/mL

View your expedited linearity evaluations within two business days by logging into e-LAB Solutions Suite.

Program Information

- LN38 - Six 1.5-mL liquid plasma specimens
- LN39 - Six 2.5-mL liquid plasma specimens
- LN45 - Seven 2.5-mL frozen DNA specimens
- LN52 - Seven 2.5-mL frozen DNA specimens
- Two shipments per year; LN45 and LN52 ship on dry ice

Vector-Borne Disease—Molecular VBDM

Analyte	Program Code	Challenges per Shipment
	VBDM	
Zika virus	▮	3

Program Information

- Three 1.5-mL liquid specimens
- Two shipments per year

CE credit

Multidiscipline Microbiology

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Guide for Ordering Regulated Molecular Multidiscipline Programs

Program Code	Procedure			
	Bacterial Identification	Viral Identification	Fungal Identification	Parasite Identification
IDR	▮	▮		
GIP5	▮	▮		▮
IDM5	▮	▮	▮	
IDPN	▮	▮		
MVP			▮	▮
STIM	▮			▮
VS	▮		▮	▮

Nucleic Acid Amplification, Organisms IDO, IDN

Analyte/Procedure	Program Code		Challenges per Shipment
	IDO	IDN	
Bordetella pertussis/parapertussis	▮	▮	1
*Legionella pneumophila/Chlamydia pneumoniae**	▮	▮	1
MRSA	▮	▮	1
Molecular typing (bacterial isolates)	▮	▮	1
Mycobacterium tuberculosis	▮		1
Mycoplasma pneumoniae	▮	▮	1
Vancomycin-resistant *Enterococcus* (VRE)	▮	▮	1

Program Information

- IDO - Seven liquid or swab simulated clinical isolate specimens and two diluents
- IDN - Six liquid or swab simulated clinical isolate specimens and two diluents; designed for international laboratories that cannot receive MTB
- Two shipments per year

BIOHAZARD

**Legionella pneumophila/Chlamydia pneumoniae* will be included in the following shipments:

- Shipment A: *Chlamydia pneumoniae*
- Shipment B: *Legionella pneumophila*

BIOHAZARD Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Joint Infection Panel JIP

Analyte	Program Code	Challenges per Shipment
	JIP	
Anaerococcus prevotii/vaginalis	▮	5
Bacteroides fragilis	▮	5
Candida albicans	▮	5
Citrobacter spp.	▮	5
Cutibacterium avidum/granulosum	▮	5
Enterobacter cloacae complex	▮	5
Enterococcus faecalis	▮	5
Enterococcus faecium	▮	5
Escherichia coli	▮	5
Finegoldia magna	▮	5
Haemophilus influenzae	▮	5
Kingella kingae	▮	5
Klebsiella aerogenes	▮	5
Klebsiella pneumoniae group	▮	5
Morganella morganii	▮	5
Neisseria gonorrhoeae	▮	5
Parvimonas micra	▮	5
Peptoniphilus spp.	▮	5
Peptostreptococcus anaerobius	▮	5
Proteus spp.	▮	5
Pseudomonas aeruginosa	▮	5
Salmonella spp.	▮	5
Serratia marcescens	▮	5
Staphylococcus aureus	▮	5
Staphylococcus lugdunensis	▮	5
Streptococcus agalactiae	▮	5
Streptococcus pneumoniae	▮	5
Streptococcus pyogenes	▮	5

Program Information

- Five 0.5-mL liquid specimens
- Designed for molecular multiplex panel users
- Program challenges may contain the following antimicrobial resistance genes on a rotational basis: CTX-M, IMP, KPC, *mecA/C* and MREJ, NDM, OXA-48-like, *vanA/B*, and VIM.
- Three shipments per year

Meningitis/Encephalitis Panel IDME, IDM5

Analyte	Challenges per Shipment	
	Program Code	
	IDME	IDM5
***Escherichia coli* K1**	3	5
Haemophilus influenzae	3	5
Listeria monocytogenes	3	5
Neisseria meningitidis	3	5
Streptococcus agalactiae	3	5
Streptococcus pneumoniae	3	5
Cytomegalovirus (CMV)	3	5
Enterovirus	3	5
Herpes simplex virus 1 (HSV-1)	3	5
Herpes simplex virus 2 (HSV-2)	3	5
Human herpesvirus 6 (HHV-6)	3	5
Human parechovirus (PeV)	3	5
Varicella-zoster virus (VZV)	3	5
Cryptococcus neoformans/gattii	3	5

Note: IDM5 analytes will meet CMS requirements for bacteriology, fungal, and virology identification. For programs that include more than one subspecialty of microbiology, per CLIA, your laboratory is required to test five specimens, three times a year, for each subspecialty your laboratory performs.

Program Information

- IDME - Three 1.0-mL liquid specimens; two shipments per year
- IDM5 - Five 1.0-mL liquid specimens; three shipments per year
- Designed for molecular multiplex panel users

Infectious Disease, Respiratory Panel IDR

Analyte	Program Code	Challenges per Shipment
	IDR	
Adenovirus	▮	5
Bocavirus	▮	5
Bordetella (pertussis, parapertussis, bronchiseptica, holmesii)	▮	5
Chlamydia pneumoniae	▮	5
Coronavirus	▮	5
Human metapneumovirus (HMPV)	▮	5
Influenza A	▮	5
Influenza B	▮	5
Legionella pneumophila	▮	5
Mycoplasma pneumoniae	▮	5
Parainfluenza	▮	5
Respiratory syncytial virus (RSV)	▮	5
Rhinovirus/Enterovirus	▮	5
SARS-CoV-2*	▮	5

*SARS-CoV-2 specimens do not contain human genome material or sequences from the human RNase P gene.

Additional Information

- For programs that include more than one subspecialty of microbiology, per CLIA, your laboratory is required to test five specimens, three times a year, for each subspecialty your laboratory performs.
- For H5N1 Influenza A Detection and Subtyping program, FLUA, see page 204.

Program Information

- Five 1.0-mL liquid specimens
- Designed for molecular multiplex panel users
- Three shipments per year

CE credit

Infectious Disease, Pneumonia Panel IDPN

Analyte	Program Code	Challenges per Shipment
	IDPN	
***Acinetobacter calcoaceticus-baumannii* complex**	▮	5
Adenovirus	▮	5
Coronavirus*	▮	5
Chlamydia pneumoniae	▮	5
***Enterobacter cloacae* complex**	▮	5
Escherichia coli	▮	5
Haemophilus influenzae	▮	5
Human metapneumovirus (HMPV)	▮	5
Rhinovirus/Enterovirus	▮	5
Influenza A	▮	5
Influenza B	▮	5
Klebsiella aerogenes	▮	5
Klebsiella oxytoca	▮	5
***Klebsiella pneumoniae* group**	▮	5
Legionella pneumophila	▮	5
Moraxella catarrhalis	▮	5
Mycoplasma pneumoniae	▮	5
Parainfluenza virus	▮	5
***Proteus* spp.**	▮	5
Pseudomonas aeruginosa	▮	5
Respiratory syncytial virus (RSV)	▮	5
Serratia marcescens	▮	5
Staphylococcus aureus	▮	5
Streptococcus agalactiae	▮	5
Streptococcus pneumoniae	▮	5
Streptococcus pyogenes	▮	5

*Laboratories performing SARS-CoV-2 testing, see the COVM/COV2 program on pages 201–202.

Includes antimicrobial resistance genes, as appropriate. For programs that include more than one subspecialty of microbiology, per CLIA, your laboratory is required to test five specimens, three times a year, for each subspecialty your laboratory performs.

Program Information

- Five 1.0-mL liquid specimens
- Designed for molecular multiplex panel users
- Three shipments per year

Gastrointestinal Panel GIP, GIP5

Analyte	Challenges per Shipment	
	Program Code	
	GIP	GIP5
Adenovirus	3	5
Astrovirus	3	5
Campylobacter	3	5
Clostridioides (Clostridium) difficile, toxin A/B	3	5
Cryptosporidium	3	5
Cyclospora cayetanensis	3	5
Entamoeba histolytica	3	5
Enteroaggregative *E. coli* (EAEC)	3	5
Enteropathogenic *E. coli* (EPEC)	3	5
Enterotoxigenic *E. coli* (ETEC) LT/ST	3	5
Escherichia coli O157	3	5
Giardia duodenalis (lamblia)	3	5
Norovirus GI/GII	3	5
Plesiomonas shigelloides	3	5
Rotavirus A	3	5
Salmonella	3	5
Sapovirus	3	5
Shiga-like toxin producing *E. coli* (STEC) *stx1/stx2*	3	5
Shigella/Enteroinvasive *E. coli* (EIEC)	3	5
Shigella	3	5
Vibrio cholerae/Vibrio group	3	5
Yersinia enterocolitica	3	5

Note: GIP5 analytes will meet CMS requirements for bacteriology, parasitology, and virology identification. For programs that include more than one subspecialty of microbiology, per CLIA, your laboratory is required to test five specimens, three times a year, for each subspecialty your laboratory performs.

Program Information

- GIP - Three 1.0-mL simulated stool specimens; two shipments per year
- GIP5 - Five 1.0-mL simulated stool specimens; three shipments per year
- Designed for molecular multiplex panel users
- Not available to customers outside the US due to US export law restrictions

Gastrointestinal Panel, Global GIPN

Analyte	Program Code	Challenges per Shipment
	GIPN	
Adenovirus	▮	5
Astrovirus	▮	5
Campylobacter	▮	5
Clostridiodes (Clostridium) difficile toxin A/B	▮	5
Cryptosporidium	▮	5
Cyclospora cayetanensis	▮	5
Entamoeba histolytica	▮	5
Enteroaggregative E. coli (EAEC)	▮	5
Enteropathogenic E. coli (EPEC)	▮	5
Enterotoxigenic E. coli (ETEC) LT/ST	▮	5
Giardia duodenalis (lamblia)	▮	5
Norovirus GI/GII	▮	5
Plesiomonas shigelloides	▮	5
Rotavirus A	▮	5
Salmonella	▮	5
Sapovirus	▮	5
Shigella/Enteroinvasive E. coli (EIEC)	▮	5
Shigella	▮	5
Yersinia enterocolitica	▮	5

To meet CMS and CAP-accredited laboratory regulatory requirements for these analytes, see program GIP5 on page 212.

Program Information

- Five 1.0-mL simulated stool specimens
- Three shipments per year
- Intended for laboratories outside the US

Vaginitis Screen VS, VS1

Analyte	Program Code		Challenges per Shipment
	VS*	VS1**	
***Candida* sp.**	▮		5
Gardnerella vaginalis	▮		5
Trichomonas vaginalis* **	▮	▮	5

*The biohazard warning applies to program VS.
**Molecular users are encouraged to use *Trichomonas vaginalis*, Molecular (TVAG or TVG5), on page 195.
***_Trichomonas vaginalis_ is only reported to CMS for the VS program.

Program Information

- VS - Five swabs for DNA probe technology; BD Affirm™ VP III probe detection method; three shipments per year

- VS1 - Five swabs for methods such as Sekisui OSOM *Trichomonas* Rapid Test, *Trichomonas vaginalis*; three shipments per year

Molecular Vaginal Panel MVP

Analyte	Program Code	Challenges per Shipment
	MVP	
***Candida* species group**	▮	5
Candida krusei	▮	5
Candida glabrata	▮	5
Trichomonas vaginalis	▮	5
Bacterial vaginosis	▮	5

Program Information

- Five 1.0-mL liquid simulated vaginal specimens
- Designed for molecular methods such as BD MAX, Hologic, and Cepheid
- Three shipments per year

Sexually Transmitted Infection Detection, Molecular STIM

Analyte	Program Code	Challenges per Shipment
	STIM	
Chlamydia trachomatis	▮	5
Neisseria gonorrhoeae	▮	5
Mycoplasma genitalium	▮	5
Trichomonas vaginalis	▮	5

Program Information

- Five 2.0-mL simulated urogenital specimens
- Designed for molecular multiplex methods
- Three shipments per year

Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Infectious Disease Serology

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Infectious Disease Serology VR3, VR3M

Analyte	Program Code		Challenges per Shipment
	VR3	VR3M	
Cytomegalovirus (CMV) – IgG, IgM, and total antibodies	▮		1
Epstein-Barr virus (EBV) – VCA – IgG, IgM EBNA – IgG, IgM, and total antibodies EA – IgG	▮		1
Helicobacter pylori – IgG, IgA, and total antibodies	▮		1
Herpes simplex virus (HSV) – IgG antibody	▮		1
Mycoplasma pneumoniae – IgG, IgM, and total antibodies	▮		1
Mumps – IgG		▮	1
Rubeola virus (English measles) – IgG antibody	▮		1
Toxoplasma gondii – IgG, IgM, and total antibodies	▮		1
Varicella-zoster virus (VZV) – IgG and total antibodies	▮		1

Program Information

- VR3 - Eight 0.5-mL lyophilized defibrinated plasma specimens
- VR3M - One 0.5-mL lyophilized defibrinated plasma specimen
- Two shipments per year

Tick-Transmitted Diseases TTD

Analyte	Program Code	Challenges per Shipment
	TTD	
Antibodies to tick-transmitted disease organisms	▮	3

Program Information

- Three 0.4-mL liquid specimens
- Designed for the detection of antibodies to *Borrelia burgdorferi, Babesia microti,* and *Anaplasma phagocytophilum*
- Two shipments per year

CE credit

Dengue Virus Serology DENS

NEW

Analyte	Program Code	Challenges per Shipment
	DENS	
Dengue IgG	▮	3
Dengue IgM	▮	3

Program Information

- Three 0.75-mL liquid specimens
- Designed for the detection of antibodies to Dengue virus
- Two shipments per year

Professionalism in Pathology and Laboratory Medicine

This important resource provides a basic understanding of how ethics and professionalism impact pathology and laboratory medicine. Approaches and guidance to educational and assessment tools, including more than 100 case vignettes to guide discussion, are included. The book also discusses professionalism in the context of research, pathologist well-being and burnout, legal aspects, diversity, organizational leadership, and patient safety and quality of care. Also addressed are lapses in ethical and professional behavior as well as recommendations on future directions for research and education in professionalism.

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16 Immunology and Flow Cytometry

Use the CAP's participant summaries to take your laboratory to the next level.

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All Centers for Medicare & Medicaid Services (CMS) regulated analytes are listed in **bold** type.

Immunology and Flow Cytometry

Immunology 218
Flow Cytometry 226

New Programs NEW

Thyroid Stimulating Hormone (TSH) Receptor Binding Antibody (TSHR) 224

Immunology

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Immunology
ANA, ASO, CRP, HCG, IM, RF/RFX, RUB/RUBX, IL

Analyte	Program Code								Challenges per Shipment
	ANA	ASO	CRP	HCG	IM	RF/ RFX	RUB/ RUBX	IL	
Antinuclear antibody (ANA)*	▮							▮	5
Antistreptolysin O (ASO)*		▮						▮	5
C-reactive protein, qualitative/quantitative			▮					▮	2
Human chorionic gonadotropin (hCG), serum, qualitative/quantitative				▮				▮	5
Infectious mononucleosis					▮			▮	5
Rheumatoid factor*						▮		▮	5
Rubella (IgG)*							▮	▮	5

*These CLIA-required analytes may be reported as qualitative, titer, or quantitative. The quantitative results are not reported to CMS.

Program Information

- ANA, RUB - Five 0.5-mL serum specimens
- ANA - Three online educational pattern interpretation challenges per year
- ASO, HCG, RF - Five 1.0-mL serum specimens
- CRP - Two 0.5-mL serum specimens; not appropriate for high-sensitivity CRP (hsCRP) methods
- IM - Five 0.6-mL serum specimens
- RFX - All program RF specimens in duplicate
- RUBX - All program RUB specimens in duplicate
- IL - All immunology specimens except RFX and RUBX
- Conventional and International System of Units (SI) reporting offered
- Three shipments per year

Immunology, General IG/IGX

Analyte	Program Code	Challenges per Shipment
	IG/IGX	
Alpha-1 antitrypsin	▮	5
Complement C3	▮	5
Complement C4	▮	5
Haptoglobin	▮	5
IgA	▮	5
IgE	▮	5
IgG	▮	5
IgM	▮	5
Total kappa/lambda ratio	▮	5

Program Information

- IG - Ten 1.0-mL serum specimens
- IGX - All program IG specimens in duplicate
- Conventional and International System of Units (SI) reporting offered
- Three shipments per year

Immunology, Special and *H. pylori* IgG Antibody S2, S4, S5

Analyte	Program Code			Challenges per Shipment
	S2 Special	S4 Special, Limited	S5 *H. pylori* IgG Antibody	
Anticentromere antibody	▮			2
Anti-DNA antibody double-stranded	▮	▮		2
Antiglomerular basement membrane (GBM), IgG antibody	▮			2
Antimitochondrial antibody	▮			2
Antineutrophil cytoplasmic antibody (ANCA, anti-MPO, anti-PR3)	▮			2
Anti-RNP antibody	▮			2
Anti-Ro52 antibody	▮			2
Anti-Ro60 antibody	▮			2
Anti-Sm antibody	▮			2
Anti-Sm/RNP antibody	▮			2
Antismooth muscle antibody	▮			2
Anti-SSA antibody	▮			2
Anti-SSB antibody	▮			2
Anti-SSA/SSB antibody	▮			2
Antithyroglobulin antibody	▮	▮		2
Antithyroid peroxidase antibody/ Antithyroid microsomal antibody	▮	▮		2
Ceruloplasmin	▮	▮		2
Haptoglobin	▮	▮		2
Helicobacter pylori, IgG antibody	▮	▮	▮	2
IgD	▮	▮		2
IgG	▮	▮		2
IgG subclass proteins	▮	▮		2
Prealbumin (transthyretin)	▮	▮		2
Total kappa/lambda ratio	▮	▮		2
Transferrin	▮	▮		2

Program S2 is not appropriate for antimitochondrial antibody assays that are specific for the M2 antibody. Refer to program H on page 220.

Program Information

- S2 - Twenty-two (0.5- to 1.0-mL) serum specimens
- S4 - Eight (0.5- to 1.0-mL) serum specimens
- S5 - Two 1.0-mL serum specimens
- Two shipments per year

Infectious Mononucleosis, Waived IMW

Analyte	Program Code	Challenges per Shipment
	IMW	
Infectious mononucleosis, waived	▮	3

Program Information

- Three 0.6-mL serum specimens
- Two shipments per year

Alpha-2-Macroglobulin A2MG

Analyte	Program Code	Challenges per Shipment
	A2MG	
Alpha-2-macroglobulin	▮	3

Program Information
- Three 0.5-mL serum specimens
- Two shipments per year

Antichromatin Antibody ACA

Analyte	Program Code	Challenges per Shipment
	ACA	
Antichromatin antibody	▮	3

Program Information
- Three 0.5-mL serum specimens
- Two shipments per year

Antifilamentous Actin IgG Antibody FCN

Analyte	Program Code	Challenges per Shipment
	FCN	
Antifilamentous actin (f-actin) IgG antibody	▮	3

Program Information
- Three 0.5-mL serum specimens
- Two shipments per year

Antihistone Antibody AHT

Analyte	Program Code	Challenges per Shipment
	AHT	
Antihistone antibody	▮	3

Program Information
- Three 0.5-mL serum specimens
- Two shipments per year

Antimitochondrial M2 Antibody H

Analyte	Program Code	Challenges per Shipment
	H	
Antimitochondrial M2 antibody (AMA-M2)	▮	2

Program Information
- Two 1.0-mL serum specimens
- Two shipments per year

Autoimmune Gastritis Markers APC

Analyte	Program Code	Challenges per Shipment
	APC	
Antiparietal cell antibody	▮	2
Anti-intrinsic factor antibody	▮	2

Program Information
- Two 1.0-mL serum specimens
- Two shipments per year

Antiphospholipid Antibody ACL

Analyte	Program Code	Challenges per Shipment
	ACL	
Anticardiolipin antibody (polyclonal, IgG, IgM, and IgA)	▮	3
Beta-2-glycoprotein I (polyclonal, IgG, IgM, and IgA)	▮	3

Program Information
- Three 0.5-mL lyophilized serum specimens
- Two shipments per year

Antiphosphatidylserine Antibody APS

Analyte	Program Code	Challenges per Shipment
	APS	
Anticardiolipin antibody (polyclonal, IgG, IgM, and IgA)	▮	3
Antiphosphatidylserine antibody (IgG, IgM, and IgA)	▮	3
Beta-2-glycoprotein I (polyclonal, IgG, IgM, and IgA)	▮	3
Antiphosphatidylserine/prothrombin antibody (aPS/PT)	▮	3

Program Information
- Three 0.5-mL lyophilized serum specimens
- Two shipments per year

Antiribosomal P Antibody ARP

Analyte	Program Code	Challenges per Shipment
	ARP	
Antiribosomal P antibody	▮	3

Program Information
- Three 0.5-mL serum specimens
- Two shipments per year

Anti-*Saccharomyces cerevisiae* Antibody ASC

Analyte	Program Code	Challenges per Shipment
	ASC	
Anti-*Saccharomyces cerevisiae* antibody (IgG and IgA)	▮	2

Program Information
- Two 1.0-mL serum specimens
- Two shipments per year

Celiac Serology CES/CESX

Analyte	Program Code		Challenges per Shipment
	CES	CESX	
Antiendomysial antibody (IgA and IgG)	▮	▮	3
Antiendomysial antibody screen (IgA and IgG)	▮	▮	3
Antigliadin antibody (IgA and IgG)	▮	▮	3
Antideamidated gliadin peptide (DGP) antibody (IgA and IgG)	▮	▮	3
Anti-DGP antibody screen (IgA and IgG)	▮	▮	3
Antitissue transglutaminase (tTG) antibody (IgA and IgG)	▮	▮	3
Anti-DGP and anti-tTG antibody screen (IgA and IgG)	▮	▮	3

Program Information

- CES - Three 0.3-mL serum specimens
- CESX - All program CES specimens in triplicate
- Two shipments per year

Cyclic Citrullinated Peptide Antibody (Anti-CCP) CCP

Analyte	Program Code	Challenges per Shipment
	CCP	
Anti-CCP	▮	2
Rheumatoid factor isotypes (IgA, IgM, and IgG)	▮	2

Program Information

- Two 1.0-mL serum specimens
- Two shipments per year

Cytokines CTKN

Analyte	Program Code	Challenges per Shipment
	CTKN	
Interleukin (IL)-1 beta	▮	3
IL-2	▮	3
IL-6	▮	3
IL-8	▮	3
IL-10	▮	3
Tumor necrosis factor (TNF)-alpha	▮	3
Vascular endothelial growth factor (VEGF)	▮	3

Program Information

- Fifteen 2.0-mL lyophilized serum specimens
- Two shipments per year

Diagnostic Allergy SE

Analyte/Procedure	Program Code	Challenges per Shipment
	SE	
IgE, multiallergen screen, qualitative	▮	5
IgE, total	▮	5
Specific allergens	▮	25

Program Information
- Five 2.0-mL serum specimens
- Includes common allergens from North America as well as less-frequently tested allergens
- Three shipments per year

High-Sensitivity C-reactive Protein HSCRP

Analyte	Program Code	Challenges per Shipment
	HSCRP	
High-sensitivity C-reactive protein	▮	5

Program Information
- Five 0.5-mL liquid serum specimens
- Three shipments per year

Liver-Kidney Microsomal Antibody (Anti-LKM) LKM

Analyte	Program Code	Challenges per Shipment
	LKM	
Anti-LKM	▮	2

Program Information
- Two 0.3-mL serum specimens
- Two shipments per year

M. tuberculosis-Stimulated Infection Detection QF

Analyte	Program Code	Challenges per Shipment
	QF	
M. tuberculosis	▮	2

This program is appropriate for the Autobio AutoLumo series, BioMerieux Vidas TB IGRA, QIAGEN QuantiFERON®-TB Gold and Gold Plus, DiaSorin Liaison QuantiFERON-TB Gold Plus, and SD Biosensor Standard methods.

Program Information
- Two 1.0-mL lyophilized serum specimens and one lyophilized mitogen control
- Two shipments per year

Rheumatic Disease Special Serologies RDS

Analyte	Program Code	Challenges per Shipment
	RDS	
Anti-Jo-1 (antihistidyl t-RNA synthetase)	▮	1
Anti-Scl-70 (anti-DNA topoisomerase)	▮	1

Program Information
- Two 1.0-mL serum specimens
- Two shipments per year

SARS-CoV-2 Serology COVS

Analyte	Program Code	Challenges per Shipment
	COVS	
SARS-CoV-2 antibody (total, IgG, IgM, and IgA)	▮	3

Program Information
- Three 0.5-mL serum specimens
- Appropriate for assays that detect antibodies to nucleocapsid, spike, combined antigen (nucleocapsid and spike), and the receptor binding domain of the spike protein
- Two shipments per year

Dengue Virus Serology DENS

NEW

Analyte	Program Code	Challenges per Shipment
	DENS	
Dengue IgG	▮	3
Dengue IgM	▮	3

Program Information
- Three 0.75-mL liquid specimens
- Designed for the detection of antibodies to Dengue virus
- Two shipments per year

Syphilis Serology G

Analyte	Program Code	Challenges per Shipment
	G	
Syphilis	▮	5

Use with VDRL, RPR, MHA-TP/TP-PA/PK-TP/TPHA, EIA, CMIA, multiplex flow immunoassay, TP-LIA IgG, FTA-ABS, and USR methods. Laboratories performing syphilis serology on CSF specimens may also use this program.

Program Information
- Five 1.5-mL serum specimens
- Three shipments per year

Thyroid Stimulating Hormone (TSH) Receptor Binding Antibody TSHR

NEW

Analyte	Program Code	Challenges per Shipment
	TSHR	
TSH receptor binding antibody	▮	3

This program is not appropriate for use with TSI assays, which specifically detect thyroid stimulating antibodies.

Program Information
- Three 0.5-mL serum specimens
- Two shipments per year

Total Hemolytic Complement CH50

Analyte	Program Code	Challenges per Shipment
	CH50	
Total hemolytic complement, 50% lysis	▮	2

Program Information
- Two 0.5-mL lyophilized serum specimens
- Two shipments per year

Viscosity V

Analyte	Program Code	Challenges per Shipment
	V	
Viscosity	▮	2

Program Information
- Two 10.0-mL serum specimens
- Two shipments per year

Serum Free Light Chains SFLC

Analyte	Program Code	Challenges per Shipment
	SFLC	
Kappa serum free light chain	▮	3
Lambda serum free light chain	▮	3
Kappa/lambda serum free light chain ratio and ratio interpretation	▮	3

Program Information
- Three 1.0-mL serum specimens
- Two shipments per year

Rely on this reference for a rapidly growing field.

Flow Cytometry in Evaluation of Hematopoietic Neoplasms: A Case-Based Approach is a practical guide to flow cytometric analysis in the workup of hematopoietic neoplasms presenting in the peripheral blood, marrow, lymphoid tissue, and extranodal sites. This text provides pathologists, residents, laboratory technologists, and hematologists with both a study guide and an atlas for regular consultation in the clinical flow cytometry laboratory.

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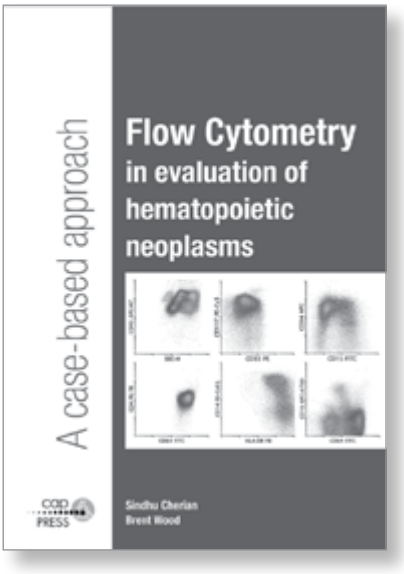

Item number: PUB221
Hardcover; 90+ figures comprising hundreds of dot plots; 176 pages; 2012

Flow Cytometry

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Flow Cytometry FL, FL1, FL2

Procedure	Program Code			Challenges per Shipment
	FL	FL1	FL2	
DNA content and cell cycle analysis	▮		▮	3
Lymphocyte immunophenotyping	▮	▮		3

These programs are not appropriate for hematology analyzers with monoclonal antibody analysis.

Program Information

- FL1 - Three 1.5-mL whole blood specimens
- FL2 - Three 1.1-mL specimens; two fixed cell line specimens and one calibrator for DNA content and cell cycle analysis
- FL - All program FL1 and FL2 specimens
- Three shipments per year

Flow Cytometry—Immunophenotypic Characterization of Leukemia/Lymphoma FL3

Procedure	Program Code	Challenges per Shipment
	FL3	
Leukemia/lymphoma	▮	2

Additional Information

- Program FL3 is suitable for laboratories that perform technical and interpretive components of leukemia/lymphoma specimens or laboratories that perform the technical component only. This program satisfies proficiency testing requirements for laboratories performing general analysis of leukemia/lymphoma specimens.
- Laboratories that provide only interpretation (without technical component) should order program FL5 (see page 227).
- This program has stability of two days or less. The CAP cannot guarantee performance or offer credits for orders placed for shipment outside of the US and Canada.

Program Information

- Two 1.1-mL specimens containing a cell line/whole blood mixture simulating leukemia/lymphoma with clinical histories and pertinent laboratory data
- Two shipments per year

Flow Cytometry, CD34+ FL4

Analyte	Program Code	Challenges per Shipment
	FL4	
CD34+	▮	2

Program Information

- Two 1.5-mL stabilized human CD34+ specimens
- Two shipments per year

Flow Cytometry, Interpretation Only FL5

Procedure	Program Code	Challenges per Shipment
	FL5	
Flow cytometry, interpretation only of leukemia/lymphoma	▮	3

Additional Information

- Program FL5 is suitable for laboratories that provide only interpretation of flow data with technical component performed at an outside laboratory.
- This program may be ordered by laboratories that perform both technical and interpretation components and are interested in obtaining additional interpretive material.

Program Information

- Three online cases consisting of gated dot plots, clinical histories, and pertinent laboratory data; online images of tissue sections, bone marrow, and/or peripheral blood smears as clinically relevant and/or available
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

CE credit

Flow Cytometry—Post-immunotherapy Analysis FL6

Procedure	Program Code	Challenges per Shipment
	FL6	
Post-immunotherapy flow cytometry analysis	▮	3

Additional Information

- Program FL6 is appropriate for laboratories that perform flow cytometry analysis on specimens from patients treated with immunotherapy regimens that cause immunophenotypic changes to normal and/or neoplastic cells. These include anti-CD20 (rituximab), anti-CD19 (CAR T19), and anti-CD38 therapies (daratumumab), among others.
- Participation in this program alone does not satisfy proficiency testing requirements for laboratories performing more general analysis of leukemia/lymphoma specimens.

Program Information

- Three online cases consisting of gated dot plots, clinical histories, and pertinent laboratory data
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

Hematopathology Online Education HPATH/HPATH1

Program	Program Code	Challenges per Shipment
	HPATH/HPATH1	
Hematopathology online case review	▮	5

Additional Information

HPATH/HPATH1 prepares pathologists and pathology trainees with an interest in hematopathology to succeed by providing ongoing diagnostic learning and self-assessment.

The program includes 10 challenge cases written by expert hematopathologists per year. For each case, the learner will:

- Review virtual whole slide image(s) in the context of a clinical scenario and relevant laboratory data.
- Select and interpret appropriate ancillary studies (IHC, flow cytometry, FISH, cytogenetics, molecular studies, etc) with real-time feedback.
- Simulate a real-world diagnostic workup to arrive at the appropriate diagnosis.
- Apply knowledge to answer three CME questions.

Cases span the breadth of benign and neoplastic hematopathology. Discussions incorporate current best practices in the workup, diagnosis, and subclassification of hematolymphoid diseases.

Neoplastic entities are discussed in the context of both the International Consensus Classification (ICC) and the fifth edition of the World Health Organization (WHO) classification.

See system requirements on page 12.

Program Information

- HPATH - Five diagnostic challenges per activity (two activities per year), with online whole slide images. Reporting with CME credit is available for one participant.
- HPATH1 - Reporting option with CME credit for each additional participant (within the same institution); must order in conjunction with program HPATH.
- Earn a maximum of 12.5 CME credits (*AMA PRA Category 1 Credits™*) per participant.
- This activity meets the ABPath CC requirements for Improvement in Health and Health Care (IHHC).
- Powered by DigitalScope® technology
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

Flow Cytometry—B-ALL Measurable Residual Disease BALL

Analyte	Program Code	Challenges per Shipment
	BALL	
B-ALL measurable residual disease	▮	3

Additional Information

- Program BALL is intended for laboratories that perform measurable residual disease (MRD) testing (rare event analysis) for B lymphoblastic leukemia/lymphoma. The cases presented will be a mixture of Children's Oncology Group (COG) approved B-ALL MRD method and laboratory-developed assays.
- Participation in this program alone does not satisfy PT requirements for laboratories performing more general analysis of leukemia/lymphoma specimens.
- This program has stability of two days or less. The CAP cannot guarantee performance or offer credits for orders placed for shipment outside of the US and Canada.

Program Information

- Two 1.1-mL specimens containing a cell line/whole blood mixture simulating B lymphoblastic leukemia/lymphoma measurable residual disease
- One online case consisting of gated dot plots
- Two shipments per year

Flow Cytometry—Mature B-cell Leukemia/Lymphoma Measurable Residual Disease FL8

Procedure	Program Code	Challenges per Shipment
	FL8	
Mature B-cell leukemia/lymphoma measurable residual disease	▮	3

Additional Information

- Program FL8 is intended for laboratories that perform measurable residual disease (MRD) testing (rare event analysis) for mature B-cell leukemia/lymphoma.
- Participation in this program alone does not satisfy PT requirements for laboratories performing more general analysis of leukemia/lymphoma specimens.
- This program has stability of two days or less. The CAP cannot guarantee performance or offer credits for orders placed for shipment outside of the US and Canada.

Program Information

- Two 1.1-mL specimens containing a cell line/whole blood mixture simulating mature B-cell leukemia/lymphoma measurable residual disease
- One online case consisting of gated dot plots
- Two shipments per year

Flow Cytometry—Plasma Cell Myeloma Measurable Residual Disease FL9

Procedure	Program Code	Challenges per Shipment
	FL9	
Plasma cell myeloma measurable residual disease	▮	3

Additional Information

- Program FL9 is intended for laboratories that perform measurable residual disease (MRD) testing (rare event analysis) for plasma cell myeloma.
- Participation in this program alone does not satisfy PT requirements for laboratories performing more general analysis of leukemia/lymphoma specimens.
- This program has stability of two days or less. The CAP cannot guarantee performance or offer credits for orders placed for shipment outside of the US and Canada.

Program Information

- Two 4.5-mL specimens containing a cell line/whole blood mixture simulating plasma cell myeloma measurable residual disease
- One online case consisting of gated dot plots
- Two shipments per year

Flow Cytometry—Plasma Cell Neoplasms PCNEO

Analyte	Program Code	Challenges per Shipment
	PCNEO	
Plasma cell neoplasms	▮	3

Additional Information

- Program PCNEO is intended to supplement the FL3 program for laboratories performing both technical and interpretive components of leukemia/lymphoma analysis with specialized testing for plasma cells, including intracellular light chain (kappa/lambda) testing.
- Participation in this program alone does not satisfy PT requirements for laboratories performing more general analysis of leukemia/lymphoma specimens.
- This program has stability of two days or less. The CAP cannot guarantee performance or offer credits for orders placed for shipment outside of the US and Canada.

Program Information

- One 1.1-mL specimen containing a cell line/whole blood mixture, simulating a plasma cell neoplasm with clinical history and pertinent laboratory data
- Two online cases consisting of gated dot plots, clinical histories, and pertinent laboratory data
- Two shipments per year

CE credit

Flow Cytometry—Immunophenotypic Characterization of Paroxysmal Nocturnal Hemoglobinuria PNH

Analyte	Program Code	Challenges per Shipment
	PNH	
PNH red blood cell (RBC) analysis	▮	2
PNH white blood cell (WBC) analysis	▮	2

Program Information

- Two 0.5-mL whole blood specimens for RBC and WBC analysis
- Two shipments per year

Additional Information

- The PNH program complies with the recommendations from the *Guidelines for the Diagnosis and Monitoring of Paroxysmal Nocturnal Hemoglobinuria and Related Disorders by Flow Cytometry* for RBC and WBC analysis. Due to the unique nature of these human donor-based materials, the shipping dates are subject to change. If this should occur, the CAP will provide notification prior to the originally scheduled shipping date.
- This program is appropriate for high-sensitivity testing (≤ 0.01% PNH type clone in red cells and/or granulocytes).

Fetal Red Cell Detection HBF

Procedure	Program Code	Challenges per Shipment
	HBF	
Kleihauer-Betke and flow cytometry	▮	2
Rosette fetal screen	▮	2
Acid elution whole slide image	▮	1

Program Information

- Two 1.2-mL liquid whole blood specimens
- Not designed for F-cell quantitation
- Two online whole slide images per year with optional grids for cell counting
- Powered by DigitalScope technology
- Two shipments per year

Rare Flow Antigen Validation RFAV1, RFAV3

Analyte	Program Code		Challenges per Shipment
	RFAV1	RFAV3	
CD1a	▮		1
CD30		▮	1

Program Information

- RFAV1 - One 1.1-mL cell line specimen
- RFAV3 - One 1.1-mL cell line specimen
- Two shipments per year

Additional Information

- Programs RFAV1 and RFAV3 do not meet the regulatory requirements for proficiency testing.
- These programs meet CAP Accreditation Checklist item FLO.23737, which requires semiannual testing of rare flow antigens.
- These programs have stability of two days or less. The CAP cannot guarantee performance or offer credits for orders placed for shipment outside of the US and Canada.

ZAP-70/CD49d Analysis by Flow Cytometry ZAP70

Analyte	Program Code	Challenges per Shipment
	ZAP70	
Zeta-chain-associated protein kinase 70	▮	3
CD49d	▮	3

Additional Information

- This program tests for intracellular ZAP-70 staining of a cell line. It allows for assessment of the laboratory's staining techniques and the antibody clone used for ZAP-70 detection.
- CD49d is an important prognostic marker for CLL by flow cytometry. This program allows assessment of the laboratory's ability to detect CD49d.
- Laboratories may perform testing on ZAP-70, CD49d, or both.
- This program has stability of two days or less. The CAP cannot guarantee performance or offer credits for orders placed for shipment outside of the US and Canada.

Program Information

- Three 1.1-mL cell line specimens
- Two shipments per year

Color Atlas of Flow Cytometry

The *Color Atlas of Flow Cytometry* presents more than 70 cases from the CAP flow cytometry proficiency testing program, complete with over 270 images, photomicrographs, dot plots, survey data, and thorough discussions. Overviews of the hematopoietic disorders are also included with each section. Through peer-reviewed cases, practicing pathologists, medical technologists, residents, and students have an opportunity to identify and appreciate disease categories and specific disease entities that are particularly difficult to diagnose correctly in clinical practice.

Topics include:

- B lymphoblastic leukemia and immature B cells
- T lymphoblastic leukemia and immature T cells
- Myeloid neoplasms
- Mature B-cell neoplasms

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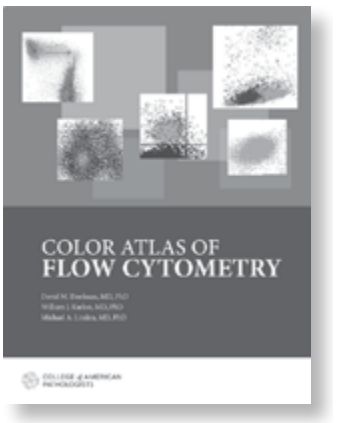

Item number: PUB230
Hardcover; 342 pages; 2023

17 Transfusion Medicine, Viral Markers, and Parentage Testing

All Centers for Medicare & Medicaid Services (CMS) regulated analytes are listed in **bold** type.

Transfusion Medicine, Viral Markers, and Parentage Testing

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New Programs NEW

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Red Blood Cell Antigen Typing—Automated (ARCT) 237
Nucleic Acid Testing, *Babesia* (NAT1) 247

Transfusion Medicine

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Transfusion Medicine J, JXM, J1, JE1

Procedure	Program Code				Challenges per Shipment
	J	JXM	J1	JE1	
ABO group	▮	▮	▮		5
ABO subgroup	▮	▮	▮		5
Rh typing	▮	▮	▮		5
Antibody detection	▮	▮			5
Antibody identification	▮	▮			5
Compatibility testing	▮	▮			5
Red blood cell (RBC) antigen typing	▮	▮			1
Electronic crossmatch		▮			3
Educational challenge				▮	1

Program JXM assists laboratories in monitoring the performance of their electronic crossmatching systems.

Program Information

- J - Five 3.0-mL 3% red blood cell (RBC) suspensions; five 3.0-mL corresponding serum specimens; one 3.0-mL donor RBC suspension
- JXM - Five 3.0-mL 3% RBC suspensions; five 3.0-mL corresponding serum specimens; one 3.0-mL donor RBC suspension; three simulated, ISBT 128 labeled donor unit challenges and three corresponding RBC suspensions
- J1 - Five 3.0-mL 3% RBC suspensions; five 3.0-mL corresponding serum specimens
- JE1 - One educational challenge, which may consist of a dry challenge and/or wet specimen for ABO grouping, ABO subgrouping, Rh typing, antibody detection, antibody identification, compatibility testing, and/or antigen typing
- Must order JE1 in conjunction with J or JXM programs.
- Three shipments per year

CE credit

Transfusion Medicine—Automated JAT, JATXM, JATE1

Procedure	Program Code			Challenges per Shipment
	JAT	JATXM	JATE1	
ABO group	▮	▮		5
ABO subgroup	▮	▮		5
Rh typing	▮	▮		5
Antibody detection	▮	▮		5
Antibody identification	▮	▮		5
Compatibility testing	▮	▮		5
Electronic crossmatch		▮		3
Educational challenge			▮	1

Program JATXM assists laboratories in monitoring the performance of their electronic crossmatching systems.

Program Information

- JAT - Five bar-coded 4.0-mL 13%–17% whole blood specimens and one 2.0-mL 23%–27% red blood cell (RBC) suspension for compatibility testing
- JATXM - Five bar-coded 4.0-mL 13%–17% whole blood specimens and one 2.0-mL 23%–27% RBC suspension for compatibility testing; three simulated, ISBT 128 labeled donor unit challenges and three corresponding RBC suspensions
- JATE1 - One educational challenge, which may consist of a dry challenge and/or wet specimen for ABO grouping, ABO subgrouping, Rh typing, antibody detection, antibody identification, and/or compatibility testing
- Must order JATE1 in conjunction with JAT or JATXM programs.
- Three shipments per year

CE credit

Quality Cross Check—Transfusion Medicine JATQ

Procedure	Program Code	Challenges per Shipment
	JATQ	
ABO grouping	▮	3
Antibody detection	▮	3
Rh typing	▮	3

This program does not meet regulatory requirements for proficiency testing; see program JAT above. For additional information about the Quality Cross Check program, see page 36.

Program Information

- Three 6.0-mL 13%–17% whole blood specimens
- May be used with automated and manual procedures
- Two shipments per year

In-Date Blood Product Wastage QT4

Blood for transfusion is a precious resource. At a minimum, wastage of blood that is not out-of-date represents a financial loss to the health care system. More ominously, systemic wastage of blood may reflect an environment of care that is out of control and may pose risks to patient safety.

Enrollment in this program assists laboratories in meeting regulatory requirements as follows:

- CAP Laboratory Accreditation Program Checklist statements TRM.40875, which requires the transfusion service medical director to monitor and audit transfusion practices to ensure the appropriate use of blood; TRM.30800, Disposition Records; and TRM.32275, Component Records, regarding recording the use of each blood or component product from receipt to final disposition.
- The Joint Commission Standards QSA.05.02.01, adequate blood and blood components; QSA.05.03.03, requirements for policies and procedures for returning unused blood products to blood transfusion services; and QSA.05.22.01, records of blood product disposition.
- AABB Standards for Blood Banks and Transfusion Services assessment 8.2, which requires transfusing facilities to have a peer-review program that monitors transfusion practices for blood components.

Objective

This study will compare the rates of blood product wastage (ie, units discarded in-date) in participating hospitals and track rates of improvement over time.

Data Collection

On a monthly basis, participants will use blood bank records to obtain information on the total number of units transfused for each type of blood component. Participants will track the number and type of blood units that are wasted in-date and the circumstances of wastage. This monitor includes the following types of blood components: whole blood (allogeneic), red blood cells (allogeneic), frozen plasma, platelet concentrates, single donor platelets, and cryoprecipitate.

Performance Indicators

- Overall blood wastage rate (%)
- Wastage rates by blood component type (%)

Performance Breakdown

- Breakdown of circumstances of wastage (%)

Look in e-LAB Solutions Suite for your input forms approximately two weeks before the start of the next quarter.

ABO Subgroup Typing ABOSG

Procedure	Program Code	Challenges per Shipment
	ABOSG	
ABO subgroup typing	▮	3
Rh typing	▮	3

Program Information
- Three 2.0-mL 3% red blood cell suspensions; three 2.0-mL corresponding serum specimens
- Two shipments per year

Red Blood Cell Antigen Genotyping RAG

Procedure	Program Code	Challenges per Shipment
	RAG	
Red blood cell (RBC) blood group genotyping for phenotype prediction	▮	3

Program Information
- Three 2.0-mL whole blood specimens
- Two shipments per year

NEW

Weak RHD Genotyping WRHG

Procedure	Program Code	Challenges per Shipment
	WRHG	
RHD genotyping	▮	3

Due to the use of donor-based materials, enrollment in this program may be limited.

Program Information
- Three 2.0-mL whole blood specimens
- Two shipments per year

Red Blood Cell Antigen Typing RBCAT

Procedure	Program Code	Challenges per Shipment
	RBCAT	
Red blood cell (RBC) antigen typing	▮	2

Program RBCAT is for donor centers and transfusion laboratories performing non-automated/manual RBC phenotyping for the management of patients with complex serology (ie, alloimmunization, sickle cell disease, warm autoimmune hemolytic anemia). Challenges will include antigens such as Rh, Kell, Duffy, and Kidd blood group system.

Program Information
- Two 2.0-mL 2%–4% RBC suspensions
- Two shipments per year

NEW

Red Blood Cell Antigen Typing—Automated ARCT

Procedure	Program Code	Challenges per Shipment
	ARCT	
Red blood cell (RBC) antigen typing	▮	2

Program ARCT is for donor centers and transfusion laboratories performing automated red cell phenotyping for the management of patients with complex serology (ie, alloimmunization, sickle cell disease, warm autoimmune hemolytic anemia). Challenges will include antigens such as Rh, Kell, Duffy, and Kidd blood group system. Due to the use of donor-based materials, enrollment in this program may be limited.

Program Information
- Two 2.0-mL red blood cell suspensions
- Two shipments per year

Antibody Titer ABT, ABT1, ABT2, ABT3

Procedure	Program Code				Challenges per Shipment
	ABT	ABT1	ABT2	ABT3	
Anti-A titer	▮	▮			1
Anti-B titer				▮	1
Anti-D titer	▮		▮		1

Program Information

- ABT - One 2.0-mL specimen for anti-A titer with one corresponding titer cell (3%–4% red blood cell [RBC] suspension); one 2.0-mL specimen for anti-D titer with one corresponding titer cell (3%–4% RBC suspension)
- ABT1 - One 2.0-mL specimen for anti-A titer with one corresponding titer cell (3%–4% RBC suspension)
- ABT2 - One 2.0-mL specimen for anti-D titer with one corresponding titer cell (3%–4% RBC suspension)
- ABT3 - One 2.0-mL specimen for anti-B titer with one corresponding titer cell (3%–4% RBC suspension)
- Two shipments per year

Antibody Titer—Automated AABT, AABT1, AABT2, AABT3

Procedure	Program Code				Challenges per Shipment
	AABT	AABT1	AABT2	AABT3	
Anti-A titer	▮	▮			1
Anti-B titer				▮	1
Anti-D titer	▮		▮		1

Program Information

- AABT - One 2.0-mL specimen for anti-A titer; one 2.0-mL specimen for anti-D titer
- AABT1 - One 2.0-mL specimen for anti-A titer
- AABT2 - One 2.0-mL specimen for anti-D titer
- AABT3 - One 2.0-mL specimen for anti-B titer
- Two shipments per year

Transfusion-Related Cell Count TRC

Procedure	Program Code	Challenges per Shipment
	TRC	
Platelet count (platelet-rich plasma)	▮	5
White blood cell (WBC) count	▮	4
Dry challenge	▮	2

WBC counts must be performed using a Nageotte chamber, by fluorescence microscopy, or by flow cytometry.

Program Information

- Five 1.2-mL suspensions of platelet-rich plasma
- Two 1.0-mL vials leukocyte-reduced platelet material
- Two 1.0-mL vials leukocyte-reduced red blood cells
- Three shipments per year

Direct Antiglobulin Testing DAT

Procedure	Program Code	Challenges per Shipment
	DAT	
Direct antiglobulin testing	▮	3

Program Information

- Three 2.0-mL 3% red blood cell suspensions
- For use with manual method
- Two shipments per year

Direct Antiglobulin Testing—Automated ADAT

Procedure	Program Code	Challenges per Shipment
	ADAT	
Direct antiglobulin testing	▮	3

Program Information

- Three 4.0-mL 15% red blood cell suspensions
- For use with automated method
- Two shipments per year

Eluate Survey ELU

Procedure	Program Code	Challenges per Shipment
	ELU	
Antibody elution	▮	2

Program Information
- Two 2.0-mL 50% red blood cell suspensions
- Two shipments per year

Fetal Red Cell Detection HBF

Procedure	Program Code	Challenges per Shipment
	HBF	
Kleihauer-Betke and flow cytometry	▮	2
Rosette fetal screen	▮	2
Acid elution whole slide image	▮	1

Program Information
- Two 1.2-mL liquid whole blood specimens
- Not designed for F-cell quantitation
- Two online whole slide images per year with optional grids for cell counting
- Powered by DigitalScope® technology
- Two shipments per year

Platelet Serology PS

Procedure	Program Code	Challenges per Shipment
	PS	
Antibody detection	▮	3
Platelet crossmatch	▮	3
Platelet antibody identification	▮	3

A low concentration of sodium azide may be present in the specimens and may affect lymphocytotoxicity methods.

Program Information
- Three 3.0-mL serum specimens
- For use with solid-phase red cell adherence, flow cytometry, and EIA/ELISA methods
- Two shipments per year

Transfusion Medicine Comprehensive—Competency Assessment TMCA

Procedure	Program Code	Challenges per Shipment
	TMCA	
ABO grouping	▮	2
Antibody detection	▮	2
Antibody identification	▮	2
Compatibility testing	▮	2
Rh typing	▮	2

To meet CMS and CAP-accredited laboratory regulatory requirements for these analytes, see program J on page 234.

Program Information

- Two 3.0-mL 3% red blood cell (RBC) suspensions
- Two 3.0-mL corresponding serum specimens
- One 3.0-mL donor 3% RBC suspension
- Three shipments per year; order shipments individually or for an entire year.

Direct Antiglobulin Test—Competency Assessment TMCAD

Procedure	Program Code	Challenges per Shipment
	TMCAD	
Direct antiglobulin testing	▮	2

Program Information

- Two 2.0-mL 3% red blood cell suspensions
- Two shipments per year; order shipments individually or for an entire year.

Eluate Competency Assessment TMCAE

Procedure	Program Code	Challenges per Shipment
	TMCAE	
Antibody elution	▮	2

Program Information

- Two 2.0-mL 50% red blood cell suspensions
- Two shipments per year; order shipments individually or for an entire year.

Fetal Red Cell Quantitation—Competency Assessment TMCAF

Procedure	Program Code	Challenges per Shipment
	TMCAF	
Kleihauer-Betke, flow cytometry	▮	2
Rosette fetal screen	▮	2
Acid elution whole slide image	▮	1

Program Information

- Two 1.2-mL whole blood specimens
- Two online whole slide images per year with optional grids for cell counting
- Powered by DigitalScope technology
- Two shipments per year; order shipments individually or for an entire year.

Cord Blood and Stem Cell Processing CBT, SCP

Analyte	Program Code		Challenges per Shipment
	CBT	SCP	
Absolute CD3		▮	2
Absolute CD34	▮	▮	2
Bacterial culture	▮	▮	2
%CD3+		▮	2
%CD34+	▮	▮	2
%CD45+		▮	2
CFU-GM	▮	▮	2
Total CFC	▮	▮	2
Fungal culture	▮	▮	2
Hematocrit		▮	2
Hemoglobin		▮	2
Mononuclear cell count	▮	▮	2
Nucleated red cells	▮		2
Number of CD34 positive events	▮	▮	2
Number of CD45 positive events		▮	2
Total nucleated cells	▮	▮	2
Viability	▮	▮	2
White blood cell (WBC) count	▮	▮	2

Additional Information

- Because these materials are human donor-based, the ship date is subject to change. If this should occur, notification will be provided prior to the scheduled date. In some instances, the program may ship in two installments.
- Due to material stability, no replacements will be available.
- These programs have stability of two days or less. The CAP cannot guarantee performance or offer credits for orders placed for shipment outside of the US and Canada.
- See International Shipping information section in the Ordering Information Supplement regarding additional dangerous goods shipping fees.

Program Information

- CBT - Two 2.5-mL cord blood specimens; designed for assays required for the production of umbilical cord blood stem cell programs
- SCP - Two 3.0-mL peripheral blood specimens; designed for laboratories that process and assess the suitability of stem cells
- Two shipments per year

Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Bacterial Detection in Platelets BDP, BDP5

Procedure	Program Code		Challenges per Shipment
	BDP	BDP5	
Bacterial culture and detection systems	▮		2
Bacterial culture and detection systems		▮	5

Program Information

- BDP - Two lyophilized pellet specimens with diluents; two shipments per year
- BDP5 - Five lyophilized pellet specimens with diluents; three shipments per year

Additional Information

- The Centers for Medicare & Medicaid Services (CMS) requires proficiency testing for bacterial detection/identification. Please select the appropriate program for your laboratory based on the information below.
- Program BDP is designed for donor centers/laboratories that are associated with a CMS-certified microbiology laboratory with the same CLIA number, and which are participating in an approved proficiency testing program for bacterial detection.
- Program BDP5 is designed for donor centers/laboratories that are performing bacterial detection for the purposes of platelet unit screening and which are not associated with a CMS-certified microbiology laboratory with the same CLIA number.
- See International Shipping information section in the Ordering Information Supplement regarding additional dangerous goods shipping fees.

Bacterial Detection in Platelets, Rapid BDPV5

Procedure	Program Code	Challenges per Shipment
CMS certified rapid immunoassay	**BDPV5**	5

Program Information

- Five frozen specimens; three shipments per year
- For use with methods such as Verax Biomedical

Additional Information

- The Centers for Medicare & Medicaid Services (CMS) requires proficiency testing for bacterial detection in platelets.
- Program BDPV5 is designed for donor centers/laboratories that are performing bacterial detection for the purposes of platelet unit screening, and which are not associated with a CMS-certified microbiology laboratory with the same CLIA number.
- See International Shipping information section in the Ordering Information Supplement regarding additional dangerous goods shipping fees.

Refer to the Ordering Information provided for information regarding additional dangerous goods and related fees.

Expanded Transfusion Medicine Exercises ETME1

Procedure	Program Code	Challenges per Shipment
	ETME1	
Expanded challenges	▮	2

Additional Information

Program ETME1 is an educational opportunity that offers:

- More challenging and/or complex antibody identification
- Comprehensive case studies in transfusion medicine
- Simulated collaboration with other professionals, both those within and outside your institution
- A method for determining your laboratory's ability to recognize and integrate problem solving skills in transfusion medicine

The wet challenge may consist of specimens for ABO grouping, Rh typing, antibody detection, antibody identification, antigen typing, direct antiglobulin testing, and/or antibody elution.

Program Information

- One dry challenge and one wet challenge consisting of a serum specimen(s) and/or red blood cell suspensions
- Two shipments per year

Transfusion Medicine: A Compendium of Educational Cases

Based on more than 10 years of educational material used in proficiency testing from the CAP Transfusion, Apheresis, and Cellular Therapy Committee, this newest book on transfusion medicine covers 20 cases with multiple-choice questions and answers. The topics included reflect clinical cases as well as hot topics in transfusion medicine, and leverage the clinical experience of 19 highly regarded transfusion medicine experts, all leaders in the field.

Contents include:

- Blood components including plasma, platelets, and red blood cells
- Neonatal/peripartum transfusion medicine
- Special situations such as hemolysis and transplantation
- Regulatory issues

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Item number: PUB228
Softcover; 90 pages; 2020

Viral Markers

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Viral Markers—Series 1 VM1

Analyte	Program Code	Challenges per Shipment
	VM1	
Anti-HAV (total: IgM and IgG)	▮	5
Anti-HAV (IgG)	▮	5
Anti-HBc (total: IgM and IgG)	▮	5
Anti-HBs	▮	5
Anti-HBs, quantitative	▮	5
Anti-HCV	▮	5
Anti-HIV-1	▮	5
Anti-HIV-1/2	▮	5
Anti-HIV-2	▮	5
HBsAg	▮	5

Program Information

- Five 3.5-mL plasma specimens
- Three shipments per year

Additional Information

- Do not use program VM1 with rapid anti-HCV, anti-HIV-1, or anti-HIV-1/2 kits. See page 246 for programs appropriate for rapid methods.
- Anti-HIV-1/2, HIV-1 p24 antigen combination assay users should enroll in the VM6 program. Program VM1 is not appropriate for this assay.

Viral Markers—Series 2 VM2

Analyte	Program Code	Challenges per Shipment
	VM2	
Anti-HBe	▮	5
HBeAg	▮	5

Program Information

- Five 3.5-mL plasma specimens
- Three shipments per year

Viral Markers—Series 3 VM3

Analyte	Program Code	Challenges per Shipment
	VM3	
Anti-CMV	▮	3
Anti-HTLV-I/II	▮	3
HIV-1 p24 antigen	▮	3

Program Information

- Three 3.5-mL plasma specimens
- Two shipments per year

Viral Markers—Series 4 VM4

Analyte	Program Code	Challenges per Shipment
	VM4	
Anti-*Trypanosoma cruzi* (Chagas disease)	▮	2

Program Information
- Two 1.0-mL plasma specimens
- Two shipments per year

Viral Markers—Series 5 VM5

Analyte	Program Code	Challenges per Shipment
	VM5	
Anti-HAV (IgM)	▮	5
Anti-HBc (IgM)	▮	5

Program Information
- Five 1.5-mL plasma specimens
- Three shipments per year

Viral Markers—Series 6 VM6/VM6X

Analyte	Program Code		Challenges per Shipment
	VM6	VM6X	
Anti-HIV-1/2	▮	▮	5
HIV-1 p24 antigen	▮	▮	5

Program Information
- VM6 - Five 0.5-mL plasma specimens
- VM6X - All program VM6 specimens in duplicate
- Three shipments per year

Anti-HIV 1/2 AHIV, AHIVW

Analyte/Procedure	Program Code		Challenges per Shipment
	AHIV	AHIVW	
Anti-HIV-1, Anti-HIV-2, Anti-HIV-1/2	▮		5
Anti-HIV-1, Anti-HIV-1/2, waived methods only		▮	2

Program Information
- AHIV - Five 0.5-mL plasma specimens; three shipments per year
- AHIVW - Two 0.5-mL plasma specimens; two shipments per year

NEW

HIV-1/HIV-2 Qualitative Detection and Differentiation, Molecular HVDD

Analyte/Procedure	Program Code	Challenges per Shipment
	HVDD	
HIV-1 RNA virus detection	▮	3
HIV-2 RNA virus detection	▮	3

Program Information
- Three 1.5-mL liquid specimens
- Designed for molecular techniques that detect and differentiate between HIV-1 and HIV-2 virus
- Two shipments per year

Anti-HCV, Rapid Methods, Waived RHCVW

Analyte/Procedure	Program Code	Challenges per Shipment
	RHCVW	
Anti-HCV, waived methods only	▮	3

Program Information
- Three 0.5-mL plasma specimens
- Two shipments per year

Nucleic Acid Testing NAT

Analyte	Program Code	Challenges per Shipment
	NAT	
Hepatitis B (HBV)	▮	5
Hepatitis C (HCV)	▮	5
HIV	▮	5
West Nile virus	▮	5

Program Information
- Five 6.0-mL plasma specimens
- Designed for blood donor centers performing nucleic acid testing on donor units
- Compatible with HIV, HCV, and HBV multiplex assays
- Three shipments per year

NEW

Nucleic Acid Testing, *Babesia* NAT1

Analyte	Program Code	Challenges per Shipment
	NAT1	
Babesia	▮	2

Program Information
- Two 3.0-mL whole blood specimens
- Two shipments per year

Vector-Borne Disease—Molecular VBDM

Analyte	Program Code	Challenges per Shipment
	VBDM	
Zika virus	▮	3

Program Information
- Three 1.5-mL liquid specimens
- Two shipments per year

CE credit

Parentage Testing

Parentage/Relationship Test—Filter Paper PARF

Analyte/Procedure	Program Code	Challenges per Shipment
	PARF	
DNA testing (PCR)	▮	4
Calculation challenge (dry challenge)	▮	1

Program Information

- DNA testing (PCR) - Four samples per mailing: two shipments of mother and child specimens on blood-stained filter paper with buccal swabs for two potential fathers; one shipment with all four specimens on blood-stained filter paper
- Reporting for short tandem repeats (STRs), X-STRs, Y-STRs, as well as the conclusions provided
- Three shipments per year

18 Histocompatibility

Keep your laboratory current with insights from a panel of experts who monitor the latest trends in histocompatibility testing.

- Benefit from the CAP's culture of continuous improvement, which provides direction for updating our proficiency testing programs.
- Ensure your regulatory requirements are covered by continuing to participate in our programs.

Program Changes

Analyte (ABO) added to Class I & II HLA Molecular Typing (DML)..... 251
Analyte (HLA-A*02:01) added to HLA Disease Association—Drug Risk (DADR1)..... 253

Histocompatibility

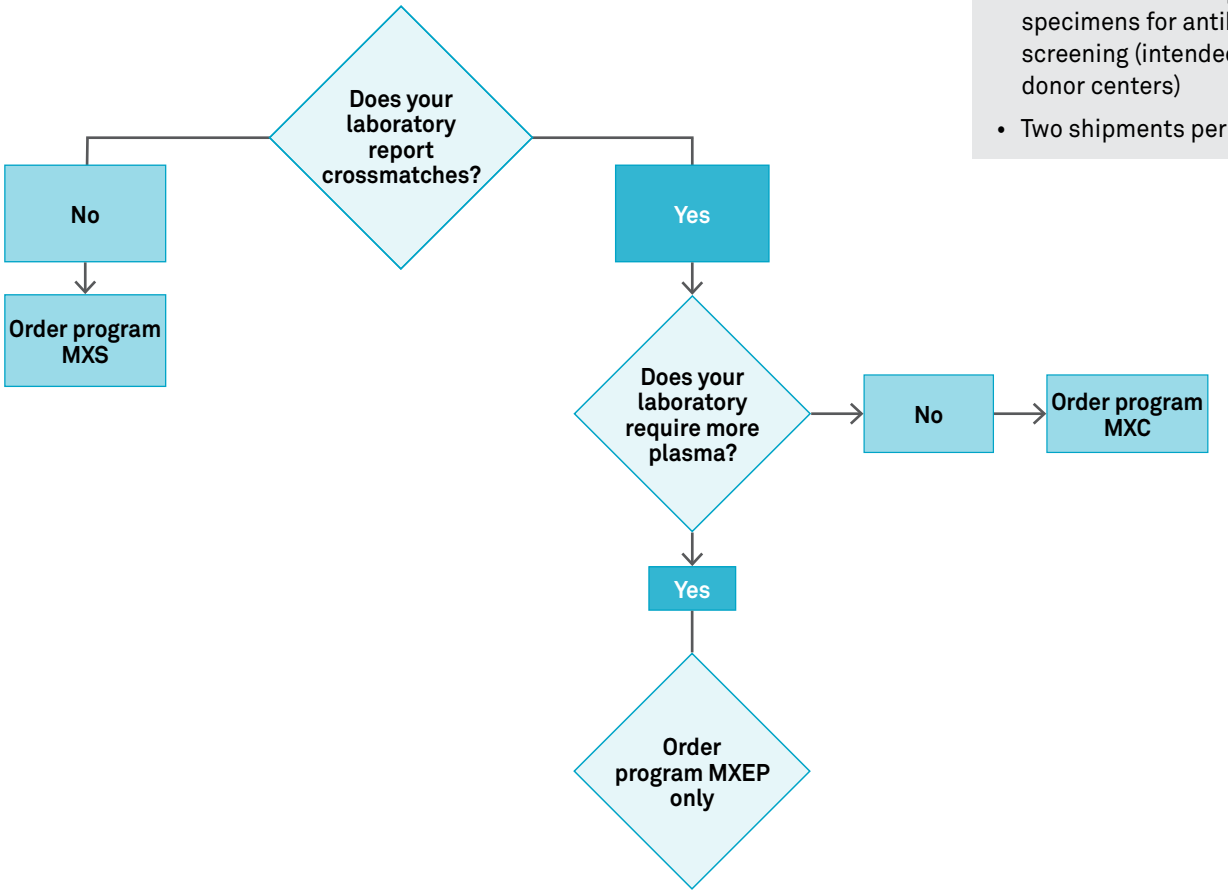
Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

HLA Crossmatching, Antibody Screen, and Antibody Identification (Class I/Class II) MXC, MXEP, MXS

Procedure	Program Code			Challenges per Shipment
	MXC	MXEP	MXS	
Antibody screen (Class I/Class II)	▮	▮	▮	5
Antibody identification (Class I/Class II)	▮	▮		5
Crossmatching (T-cell/B-cell)	▮	▮		10

Program Information

- MXC - Five 0.4-mL plasma specimens; two (approximately 7–8 x 10^6 cells) purified blood lymphocyte specimens
- MXEP - Five 0.4-mL plasma specimens in duplicate (0.8-mL total plasma); two (approximately 7–8 x 10^6 cells) purified blood lymphocyte specimens (intended for laboratories that require extra plasma volume for antibody identification)
- MXS - Five 0.4-mL plasma specimens for antibody screening (intended for blood donor centers)
- Two shipments per year



Class I & II HLA Molecular Typing DML

Procedure	Program Code	Challenges per Shipment
	DML	
Molecular HLA-A, -B, and -C typing (Class I)	▮	5
Molecular HLA-DR, -DQ, and -DP typing (Class II)	▮	5
Molecular typing for ABO NEW	▮	5

Program Information

- Five 2.0-mL whole blood specimens in CPD or CPD-A
- Serologic equivalents reporting available
- Two shipments per year

HLA-B27 Typing B27

Procedure	Program Code	Challenges per Shipment
	B27	
HLA-B27 typing	▮	5

Program Information

- Five 2.0-mL whole blood specimens in CPD or CPD-A
- Two shipments per year

Monitoring Engraftment ME

Procedure	Program Code	Challenges per Shipment
	ME	
Stem cell monitoring engraftment	▮	5

Program Information

- Seven 0.5-mL whole blood specimens
- Designed for laboratories supporting stem cell transplant and laboratories monitoring chimerism after organ transplantation
- Two shipments per year

Antibody Titer ABT, ABT1, ABT2, ABT3

Procedure	Program Code				Challenges per Shipment
	ABT	ABT1	ABT2	ABT3	
Anti-A titer	▮	▮			1
Anti-B titer				▮	1
Anti-D titer	▮		▮		1

Program Information

- ABT - One 2.0-mL specimen for anti-A titer with one corresponding titer cell (3%–4% red blood cell [RBC] suspension); one 2.0-mL specimen for anti-D titer with one corresponding titer cell (3%–4% RBC suspension)
- ABT1 - One 2.0-mL specimen for anti-A titer with one corresponding titer cell (3%–4% RBC suspension)
- ABT2 - One 2.0-mL specimen for anti-D titer with one corresponding titer cell (3%–4% RBC suspension)
- ABT3 - One 2.0-mL specimen for anti-B titer with one corresponding titer cell (3%–4% RBC suspension)
- Two shipments per year

Antibody Titer—Automated AABT, AABT1, AABT2, AABT3

Procedure	Program Code				Challenges per Shipment
	AABT	AABT1	AABT2	AABT3	
Anti-A titer	▮	▮			1
Anti-B titer				▮	1
Anti-D titer	▮		▮		1

Program Information

- AABT - One 2.0-mL specimen for anti-A titer; one 2.0-mL specimen for anti-D titer
- AABT1 - One 2.0-mL specimen for anti-A titer
- AABT2 - One 2.0-mL specimen for anti-D titer
- AABT3 - One 2.0-mL specimen for anti-B titer
- Two shipments per year

HLA Disease Association—Drug Risk DADR1, DADR2

Analyte	Program Code		Challenges per Shipment
	DADR1	DADR2	
HLA-A*02:01 NEW	▮		3
HLA-A*31:01	▮		3
HLA-B*13:01	▮		3
HLA-B*15:02	▮		3
HLA-B*57:01	▮		3
HLA-B*58:01	▮		3
HLA-A*29:01		▮	3
HLA-A*29:02		▮	3
HLA-DQA1*04:01		▮	3
HLA-DQA1*05:01		▮	3
HLA-DQB1*03:02		▮	3
HLA-DQB1*06:02		▮	3
HLA-DRB1*03:01		▮	3
HLA-DRB1*03:02		▮	3
HLA-DRB1*04:02		▮	3
HLA-DRB1*04:03		▮	3
HLA-DRB1*04:06		▮	3
HLA-DRB1*08:02		▮	3
HLA-DRB1*08:04		▮	3
HLA-DRB1*14:04		▮	3
HLA-DRB1*14:05		▮	3
HLA-DRB1*14:08		▮	3
HLA-DRB1*15:01		▮	3
HLA-DRB1*15:02		▮	3
HLA-DQA1*02		▮	3
HLA-DQA1*03		▮	3
HLA-DQA1*05		▮	3
HLA-DQB1*02:01		▮	3
HLA-DQB1*02:02		▮	3

Program Information

- DADR1, DADR2 - Three 0.1-mL specimens, each containing 200 µg/mL of human DNA in media
- Two shipments per year

Additional Information

These programs will challenge the laboratory to accurately identify the presence or absence of alleles associated with a variety of disease states (listed below) and/or the adverse reactions to specific drugs.

DADR1

- Carbamazepine-induced Stevens-Johnson syndrome
- Allopurinol Stevens-Johnson syndrome
- Hypersensitivity to abacavir
- Dapsone hypersensitivity

DADR2

- Celiac disease
- Narcolepsy
- Pemphigus vulgaris
- Psoriasis
- Antiglomerular basement membrane disease
- Birdshot retinochoroidopathy
- Idiopathic myopathy

Enhance Lab Accuracy With Our PT/EQA Resources

Discover a wide range of online tools and support materials tailored to help laboratories succeed in proficiency testing/external quality assessment (PT/EQA). Find everything you need in one convenient location at cap.org.

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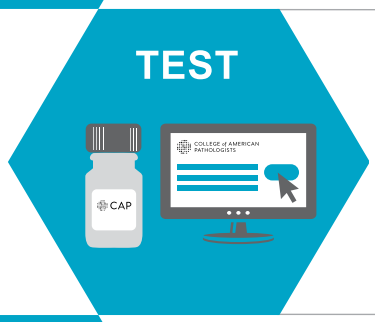
- PT/EQA Manual
- Current Shipping Calendar
- CMS Analyte Reporting Selections

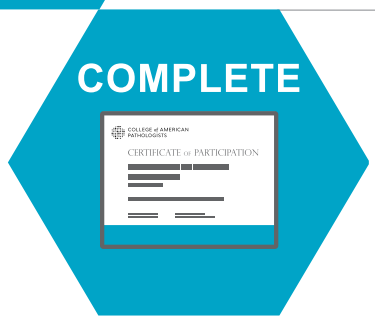


Master the essentials of running PT/EQA

- Kit Instructions and Result Form Resource
- Frequently Asked Questions
- Direct Transmission of PT Results

Harness the potential of your PT/EQA data

- Troubleshooting Guide for PT/EQA Data
- PT/EQA Exception Investigation Worksheet
- Performing a Self-Evaluation When PT Is Not Graded
- Proficiency Testing Participant Summary and Evaluation Resource



Claim CME/CE and proof of participation

- How to Claim CME/CE Credit for Faxed AP Results
- Certificate of Participation
- Performance Analytics Dashboard

Learn More

Discover the CAP's online PT/EQA resources now and unlock a wealth of valuable tools and insights!

19 Genetics and Molecular Pathology

The CAP broadens its network of laboratory experts through its collaborations.

Among the organizations with which we partner:

- Association for Diagnostics & Laboratory Medicine (ADLM)
- American College of Medical Genetics and Genomics (ACMG)
- Association for Molecular Pathology (AMP)
- National Society for Histotechnology (NSH)

Genetics and Molecular Pathology

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Optical Genome Mapping (OGM) 258

Program Changes

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Primers removed from Sanger Sequencing Program (SEC1) 266
Fusion RNA Sequencing (RNA) is now called RNA Fusions, Solid Tumor (RNA) 278
Multigene Tumor Panel (MTP) is now called Multigene Tumor Panel, Genomic DNA (MTP) 279

Cytogenetics

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

CAP/ACMG Cytogenetics CY, CYBK

Analyte/Procedure	Program Code		Challenges per Shipment
	CY	CYBK	
Karyotype abnormality	▮	▮	6
Karyotype nomenclature	▮	▮	6

Each challenge includes a case history and images of metaphase cells that are representative of each case. Each mailing will include three constitutional and three neoplastic challenges.

Program Information

- CY - Online images of metaphase cells delivered two times a year; your CAP shipping contact will be notified via email when the activity is available.
- CYBK - Prints of metaphase cells; two shipments per year

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CAP/ACMG Fluorescence In Situ Hybridization CYF, CYI

Disease/Procedure	Program Code		Challenges per Shipment
	CYF	CYI	
Constitutional and Hematologic Disorders			
FISH for constitutional disorder - slides	▮		1
FISH for constitutional disorder - dry challenge	▮		2
FISH for hematologic disorder - slides	▮		1
FISH for hematologic disorder - dry challenge	▮		2
Urothelial Carcinoma			
FISH for urothelial carcinoma		▮	2

Program Information

- CYF - Four slides and four dry challenges
- CYI - Two 250-µL cell samples suspended in ethanol from two different specimens; participants use FISH to detect chromosome abnormalities.
- Two shipments per year

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Additional Information

- CYF 2026-A:
  Constitutional disorder (two slides): *CEP X*
  Hematologic disorder (two slides): *CCND1*
- CYF 2026-B:
  Constitutional disorder (two slides): 15q11.2 (Prader-Willi/Angelman syndrome critical region)
  Hematologic disorder (two slides): CEP 7/7q
- CYF is prepared from cell suspension samples. For FISH in paraffin-embedded tissues, see page 257.
- These programs are only for laboratories that perform both hybridization and interpretation under the same CLIA number.

CAP/ACMG Fluorescence In Situ Hybridization for Paraffin-Embedded Tissue CYH, CYJ, CYK, CYL, CYALK

Analyte/Procedure	Program Code					Challenges per Shipment	
	CYH	CYJ	CYK	CYL	CYALK	A	B
Breast Cancer							
ERBB2 (HER2) amplification	▮					10	10
Interpretive challenges for *ERBB2 (HER2)* amplification	▮					3	3
Brain/Glioma Tissue							
1p/19q		▮				1	1
Solid Tumor							
MDM2 rearrangement			▮			1	
SS18 (SYT) rearrangement			▮				1
Lymphoma Tissue							
BCL2 rearrangement				▮		1	
MYC rearrangement				▮			1
Lung Cancer							
ALK rearrangement					▮	1	
ALK rearrangement dry challenge					▮		1

Additional Information

- All CYJ, CYK, and CYL specimens will be 4.0-micron tissue sections mounted on positively charged glass slides.
- These programs are for laboratories that perform both hybridization and interpretation under the same CLIA number. For interpretation only *ERBB2 (HER2)* amplification by FISH for breast cancer, see program CYHI, below.

Program Information

- CYH - Two unstained, five-core tissue microarray slides equivalent to 10 paraffin-embedded breast tissue specimens; two H&E stained tissue microarray slides are also provided.
- CYJ - Four unstained slides and one H&E stained slide
- CYK - Two unstained slides and one H&E stained slide
- CYL - Two unstained slides and one H&E stained slide
- CYALK - Two unstained slides and one H&E stained slide are provided for the A mailing; the B mailing will include an *ALK* dry challenge.
- Two shipments per year

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CAP/ACMG *ERBB2 (HER2)* Amplification by FISH, Interpretation Only CYHI

Analyte/Procedure	Program Code	Challenges per Shipment
	CYHI	
ERBB2 (HER2) amplification in breast cancer, interpretation only	▮	3

Additional Information

- *ERBB2 (HER2)* Amplification by FISH, Interpretation Only is not considered proficiency testing. This exercise may be used to meet the requirements for alternative assessment.
- This program is for laboratories that perform interpretation only for *ERBB2 (HER2)* FISH for breast cancer.
- For laboratories that perform both hybridization and interpretation for *ERBB2 (HER2)* FISH for breast cancer under the same CLIA number, see program CYH, above.

Program Information

- Three online interpretation challenges; your CAP shipping contact will be notified via email when the activity is available.
- Two shipments per year

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CAP/ACMG Constitutional Microarray CYCGH

Procedure	Program Code	Challenges per Shipment
	CYCGH	
Cytogenomic microarray analysis for constitutional abnormalities	▮	2

Additional Information

- Participants will identify and characterize gains or losses and the cytogenetic location of abnormalities detected.
- This program is not appropriate for low-resolution arrays that are designed to detect only aneuploidy.

Program Information

- Two 2.0-µg DNA specimens
- Two shipments per year

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CAP/ACMG Oncology Microarray CYCMA

Procedure	Program Code	Challenges per Shipment
	CYCMA	
Cytogenomic microarray analysis for oncologic abnormalities	▮	1

Participants will identify and characterize gains or losses and the cytogenetic location of abnormalities detected.

Program Information

- One 2.0-µg DNA specimen
- Two shipments per year

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Optical Genome Mapping OGM

NEW

Analyte/Procedure	Program Code	Challenges per Shipment
	OGM	
Optical genome mapping*	▮	2

*All challenges are hematologic. Each will include a case history and may be accompanied by an image(s).

Program Information

- Four dry challenges
- Two shipments per year; your CAP shipping contact will be notified via email when the activity is available.

Biochemical and Molecular Genetics

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

CAP/ACMG Biochemical Genetics BGL, BGL1

Analyte/Procedure	Program Code		Challenges per Shipment
	BGL	BGL1	
Acylcarnitines, qualitative and quantitative	▮		1
Amino acids, qualitative and quantitative	▮		1
Carnitine, qualitative and quantitative		▮	3
Glycosaminoglycans (mucopolysaccharides), qualitative and quantitative	▮		1
Organic acids, qualitative and quantitative	▮		1
Educational challenge	▮		1

Program Information

- BGL -
  - Acylcarnitines: One 0.1-mL plasma specimen
  - Amino acids: One 1.0-mL plasma or 2.0-mL urine specimen
  - Glycosaminoglycans (mucopolysaccharides): One 2.0-mL urine specimen
  - Organic acids: One 7.5-mL urine specimen
  - Educational challenge: Will consist of any one of the BGL analytes
- BGL1 - Three 0.3-mL serum specimens
- Two shipments per year

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Sample Exchange Registry for Alternative Assessment

When no formal proficiency testing is yet available, join the CAP's Sample Exchange Registry. After at least three laboratories are identified as testing for the same rare analyte, the CAP can anonymously deliver a sample from each laboratory to another participating facility, all of whom then report their results to us. We send each participant a custom result report, including an anonymous participant summary covering all the laboratories that took part.

Learn more at cap.org

CAP/ACMG Amino Acid Quantitation for Inherited Metabolic Disorders BGL2

Analyte/Procedure	Program Code	Challenges per Shipment
	BGL2	
Alanine	▮	3
Alloisoleucine	▮	3
Arginine	▮	3
Aspartic acid	▮	3
Citrulline	▮	3
Cystine	▮	3
Glutamic acid	▮	3
Glutamine	▮	3
Glycine	▮	3
Histidine	▮	3
Homocystine	▮	3
Hydroxyproline	▮	3
Isoleucine	▮	3
Leucine	▮	3
Lysine	▮	3
Methionine	▮	3
Ornithine	▮	3
Phenylalanine	▮	3
Proline	▮	3
Serine	▮	3
Taurine	▮	3
Threonine	▮	3
Tryptophan	▮	3
Tyrosine	▮	3
Valine	▮	3

Program Information

- Three 1.0-mL liquid specimens
- Two shipments per year

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CAP/ACMG Acylcarnitine Quantitation for Inherited Metabolic Disorders BGL4

Analyte/Procedure	Program Code	Challenges per Shipment
	BGL4	
Acetylcarnitine	▮	3
Propionylcarnitine	▮	3
Butyrylcarnitine	▮	3
Isovalerylcarnitine	▮	3
Glutarylcarnitine	▮	3
Hexanoylcarnitine	▮	3
Octanoylcarnitine	▮	3
Dodecanoylcarnitine	▮	3
Hexadecanoylcarnitine	▮	3
3-OH-hexadecanoylcarnitine	▮	3
Octadecanoylcarnitine	▮	3

Program Information

- Three 1.0-mL liquid specimens
- Two shipments per year

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CAP/ACMG Alpha-1 Antitrypsin Genotyping AAT

Analyte/Procedure	Program Code	Challenges per Shipment
	AAT	
Alpha-1 antitrypsin (*SERPINA1*) genotyping	▮	3

This program will test for the M, S, and Z alleles.

Program Information

- Three 10.0-µg extracted DNA specimens
- Two shipments per year

ACMG American College of Medical Genetics and Genomics Translating Genes Into Health®

CAP/ACMG Apolipoprotein E Genotyping APOE

Analyte/Procedure	Program Code	Challenges per Shipment
	APOE	
Apolipoprotein E (*APOE*) genotyping	▮	3

This program is designed for laboratories utilizing *APOE* testing for hyperlipoproteinemia type III and Alzheimer diseases and will test for *APOE* e2, *APOE* e3, and *APOE* e4.

Program Information

- Three 10.0-µg extracted DNA specimens
- Two shipments per year

ACMG American College of Medical Genetics and Genomics Translating Genes Into Health®

CAP/ACMG *BRCA1/2* Sequencing BRCA

Analyte/Procedure	Program Code	Challenges per Shipment
	BRCA	
BRCA1/2 DNA sequencing and variant interpretation	▮	3
BRCA1/2 duplication/deletion analysis	▮	3

Program Information

- Three 10.0-µg extracted DNA specimens
- Two shipments per year

ACMG American College of Medical Genetics and Genomics Translating Genes Into Health®

Additional Information

- Test your skill at reporting and interpreting DNA sequence variants for *BRCA1/2* using standard nomenclature.
- Receive a summary and discussion of responses, including comments on the variant nomenclature and known or expected outcomes from identified variants.
- Primers are not included; laboratories are expected to use the primers used in routine clinical testing.

CAP/ACMG Cardiomyopathy Sequencing Panel CMSP

Analyte/Procedure	Program Code	Challenges per Shipment
	CMSP	
Cardiomyopathy sequencing panel	▮	3

Program Information

- Three 80.0-µL purified extracted DNA specimens (50 ng/µL)
- Two shipments per year

ACMG American College of Medical Genetics and Genomics Translating Genes Into Health®

Additional Information

- This proficiency challenge is for laboratories performing gene panels, exome sequencing, and whole genome sequencing to detect germline variants associated with inherited forms of cardiomyopathy.
- Participants will be asked to identify variants in the following genes: *ACTC1, MYBPC3, MYH7, MYL2, MYL3, TNNI3, TNNT2,* and *TPM1.*

CAP/ACMG Hemoglobinopathies Genotyping HGM

Analyte/Procedure	Program Code	Challenges per Shipment
	HGM	
Alpha-thalassemia	▮	3
Beta-thalassemia	▮	3
Hemoglobin S/C	▮	3

Program Information

- Three 50.0-µg extracted DNA specimens
- Two shipments per year

ACMG American College of Medical Genetics and Genomics Translating Genes Into Health®

CAP/ACMG Inherited Cancer Sequencing Panel ICSP

Analyte/Procedure	Program Code	Challenges per Shipment
	ICSP	
Inherited cancer sequencing panel	▮	3

Additional Information

- This proficiency challenge is for laboratories performing gene panels, exome sequencing, and whole genome sequencing to detect germline variants associated with inherited forms of cancer.
- Participants will be asked to identify variants in the following genes: *APC, ATM, BRCA1, BRCA2, CDKN2A, CHEK2, MLH1, MSH2, MSH6, PALB2, PMS2, PTEN,* and *TP53*.

Program Information

- Three 80.0-µL purified extracted DNA specimens (50 ng/µL)
- Two shipments per year

ACMG American College of Medical Genetics and Genomics Translating Genes Into Health®

CAP/ACMG Molecular Genetics Series MGL1, MGL2, MGL3, MGL4, MGL5

Disease/Gene	Program Code					Challenges per Shipment
	MGL1	MGL2	MGL3	MGL4	MGL5	
Bloom syndrome (*BLM* gene)				▮		3
BRCA1/2			▮			3
Canavan (*ASPA* gene)				▮		3
Connexin 26 (*GJB2* gene)			▮			3
Cystic fibrosis (*CFTR* gene)		▮			▮	3/2(MGL5)
DMD/Becker (*DMD* gene)		▮				3
Factor V Leiden (*F5* gene)	▮					3
Familial dysautonomia (*ELP1* gene)				▮		3
Fanconi anemia complementation group C (*FANCC* gene)				▮		3
Fragile X (*FMR1* gene)	▮					3
Friedreich ataxia (*FXN* gene)		▮				3
Gaucher (*GBA* gene)				▮		3
Glycogen storage disease type Ia (*G6PC* gene)				▮		3
Hemochromatosis (*HFE* gene)	▮					3
Hemoglobin S/C		▮				3
Huntington (*HTT* gene)		▮				3
Methylenetetrahydrofolate reductase (*MTHFR* gene) c.665C>T (677C>T) and c.1286A>C (1298A>C)	▮					3
Mucolipidosis IV (*MCOLN1* gene)				▮		3
Multiple endocrine neoplasia type 2 (*RET* gene)			▮			3
Myotonic dystrophy (*DMPK* gene)		▮				3
Niemann-Pick type A/B (*SMPD1* gene)				▮		3
Plasminogen activator inhibitor (PAI)-1 (*SERPINE1* gene)	▮					3

Continued on the next page

Program Information

- MGL1, MGL2, MGL3, MGL4 - Three 50.0-µg extracted DNA specimens per disease/gene
- MGL5 - Two 50.0-µg extracted DNA specimens
- Two shipments per year

ACMG American College of Medical Genetics and Genomics

Additional Information

- The *BRCA1/2* program (module MGL3) is designed for laboratories testing for the three Ashkenazi Jewish founder mutations.
- The cystic fibrosis programs (modules MGL2 and MGL5) are designed for laboratories testing for the minimum mutation panel for population-based carrier screening from the ACMG Technical Standards and Guidelines for *CFTR* Mutation Testing, expanded panels, PolyT variant analysis, and/or full gene sequencing.
- Module MGL4 is designed for laboratories testing for diseases/disorders related to Ashkenazi Jewish ancestry.
- The Prader-Willi/Angelman syndrome program is designed for laboratories using methylation techniques for analysis.

CAP/ACMG Molecular Genetics Series MGL1, MGL2, MGL3, MGL4, MGL5 continued

Disease/Gene	Program Code					Challenges per Shipment
	MGL1	MGL2	MGL3	MGL4	MGL5	
Prader-Willi/Angelman syndrome	▮					3
Prothrombin (*F2* gene)	▮					3
RhD		▮				3
Spinal muscular atrophy (*SMN1* and *SMN2* genes)		▮				3
Spinocerebellar ataxia (*ATXN1*, *ATXN2*, *ATXN3*, *CACNA1A*, and *ATXN7* genes)		▮				3
Tay-Sachs (*HEXA* gene)				▮		3

Program Information

- MGL1, MGL2, MGL3, MGL4 - Three 50.0-µg extracted DNA specimens per disease/gene
- MGL5 - Two 50.0-µg extracted DNA specimens
- Two shipments per year

ACMG American College of Medical Genetics and Genomics

Additional Information

- The *BRCA1/2* program (module MGL3) is designed for laboratories testing for the three Ashkenazi Jewish founder mutations.
- The cystic fibrosis programs (modules MGL2 and MGL5) are designed for laboratories testing for the minimum mutation panel for population-based carrier screening from the ACMG Technical Standards and Guidelines for *CFTR* Mutation Testing, expanded panels, PolyT variant analysis, and/or full gene sequencing.
- Module MGL4 is designed for laboratories testing for diseases/disorders related to Ashkenazi Jewish ancestry.
- The Prader-Willi/Angelman syndrome program is designed for laboratories using methylation techniques for analysis.
- The Spinal Muscular Atrophy program includes *SMN1* and *SMN2* gene analysis and copy number analysis.

NEW

Weak RHD Genotyping WRHG

Procedure	Program Code	Challenges per Shipment
	WRHG	
RHD genotyping	▮	3

Due to the use of donor-based materials, enrollment in this program may be limited.

Program Information

- Three 2.0-mL whole blood specimens
- Two shipments per year

CAP/ACMG Inherited Metabolic Diseases IMD1, IMD2, IMD3

Analyte/Procedure	Program Code			Challenges per Shipment
	IMD1	IMD2	IMD3	
Mitochondrial DNA deletion syndromes	▮			3
MCAD		▮		3
Mitochondrial cytopathies*			▮	3

*Includes disorders/diseases such as Leber hereditary optic neuropathy and myoclonus epilepsy with ragged red fibers (MERRF).

Program Information

- IMD1, IMD2, IMD3 - Three 50.0-µg extracted DNA specimens
- Two shipments per year

ACMG American College of Medical Genetics and Genomics

CAP/ACMG Molecular Genetics Sequencing SEC, SEC1

Procedure	Program Code		Challenges per Shipment
	SEC	SEC1	
DNA sequencing interpretation challenge	▮		3
DNA sequencing		▮	3

Additional Information

- Test your skill at interpreting and reporting DNA sequence variants for inherited diseases using standard nomenclature.
- Receive a summary and discussion of responses, including comments on nomenclature, known or expected outcomes from identified variants, and teaching points about genes/disorders represented.
- Primers are not included; laboratories are expected to use the primers used in routine clinical testing.

Program Information

- SEC - DNA sequence electropherogram files with a range of variants, suitable for base-calling and analysis using a range of commercial or public domain software programs; also includes nomenclature/variant references. Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.
- SEC1 - Three 30.0-µg extracted DNA specimens; two shipments per year

ACMG American College of Medical Genetics and Genomics

Pharmacogenetics PGX, PGX1, PGX3

Analyte/Procedure	Program Code			Challenges per Shipment
	PGX	PGX1	PGX3	
CYP2C19	▮			3
CYP2C9	▮			3
CYP2B6	▮			3
CYP2D6	▮			3
CYP3A4	▮			3
CYP3A5	▮			3
CYP4F2	▮			3
SLCO1B1 (rs4149056)	▮			3
VKORC1	▮			3
IL28B (rs12979860)		▮		3
COMT (rs4680)		▮		3
G6PD		▮		3
OPRM1 (rs1799971, c.118A>G)		▮		3
DPYD			▮	3
NUDT15			▮	3
TPMT			▮	3
UGT1A1			▮	3

UGT1A1 (PGX3 program) tests the laboratory's ability to detect variants in the TATA repeat sequence in the *UGT1A1* promotor (eg, *UGT1A1*28* with seven TA repeats). The ability to detect variants in other regions of the *UGT1A1* gene is not part of this program.

Program Information

- PGX, PGX1, PGX3 - Three 25.0-µg extracted DNA specimens
- Includes allele detection (genotyping) and/or interpretive challenges
- Two shipments per year

CAP/ACMG Rett Syndrome *(MECP2)* RETT

Analyte/Procedure	Program Code	Challenges per Shipment
	RETT	
Rett (*MECP2*) genotyping	▮	3
Rett (*MECP2*) duplication/deletion analysis	▮	3

Program Information
- Three 10.0-µg extracted DNA specimens
- Two shipments per year

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CAP/ACMG Thrombophilia Mutations TPM

Analyte/Procedure	Program Code	Challenges per Shipment
	TPM	
Factor II (*F2* gene, Prothrombin)	▮	3
Factor V Leiden (*F5* gene)	▮	3

This program is designed for the Cepheid GeneXpert factor II and factor V assays. DNA extraction for other assays/methods is NOT recommended.

Program Information
- Three 250.0-µL synthetic whole blood specimens
- Two shipments per year

ACMG American College of Medical Genetics and Genomics Translating Genes Into Health®

Red Blood Cell Antigen Genotyping RAG

Procedure	Program Code	Challenges per Shipment
	RAG	
Red blood cell (RBC) blood group genotyping for phenotype prediction	▮	3

Program Information
- Three 2.0-mL whole blood specimens
- Two shipments per year

Noninvasive Prenatal Testing NIPT

Analyte	Program Code	Challenges per Shipment
	NIPT	
Cell-free DNA screening for fetal aneuploidy	▮	3

Noninvasive prenatal testing is an exercise and is not considered proficiency testing. This exercise may be used to meet the requirements for alternative assessment.

Program Information
- Three liquid specimens
- Two shipments per year

Next-Generation Sequencing

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

All laboratories subject to US CLIA Regulations: Proficiency testing (PT) challenges must NOT be referred to another laboratory for any portion of NGS testing, even if this is how patient testing is routinely performed. For PT challenges, any referral is strictly prohibited by CMS.

Next-Generation Sequencing—Germline NGS

Procedure	Program Code	Challenges per Shipment
	NGS	
Next-generation sequencing	▮	2

Laboratories will have the ability to analyze more than 100 preselected chromosomal intervals in hg19 (GRCh37) and hg38 (GRCh38) coordinates within various genes; for a full list of genes in this program, please go to cap.org. Under the Laboratory Improvement tab, click on Catalog and Ordering Information. The list is located under the PT Order Supplements header.

Program Information

- One 10.0-µg extracted gDNA specimen; one educational variant interpretation image/dry challenge
- Methods-based challenge for germline variants for laboratories using gene panels, exome, and genome sequencing
- Two shipments per year

Next-Generation Sequencing—Solid Tumor NGSST

Procedure	Program Code	Challenges per Shipment
	NGSST	
Next-generation sequencing	▮	3

Additional Information

- This is a methods-based proficiency challenge for laboratories performing targeted next-generation sequencing of cancer genes or mutation hotspots in solid tumors.
- This program includes variants present with a variant allele fraction (VAF) potentially as low as 5%.
- Paired normal specimen provided

Program Information

- Three 1.0-µg gDNA (50 ng/µL) specimens
- One 3.0-µg gDNA (50 ng/µl) paired normal specimen
- Two shipments per year

Next-Generation Sequencing—Hematologic Malignancies NGSHM

Procedure	Program Code	Challenges per Shipment
	NGSHM	
Next-generation sequencing	▮	3

Additional Information

- This is a methods-based proficiency challenge for laboratories performing targeted next-generation sequencing of genes or mutation hotspots in hematologic malignancies.
- This program includes variants present with a variant allele fraction (VAF) potentially as low as 5%.

Program Information

- Three 1.0-µg gDNA (50 ng/µL) specimens
- Two shipments per year

Next-Generation Sequencing
Solid Tumor Bioinformatics NGSB1

Procedure	Program Code	Challenges per Shipment
	NGSB1	
Illumina TruSight Tumor 15 Panel	▮	1
Illumina TruSight Tumor 170 Panel	▮	1
Illumina TruSight Oncology 500 Panel	▮	1
Thermo Fisher Ion AmpliSeq Cancer Hotspot Panel v2	▮	1
Thermo Fisher Oncomine Comprehensive Assay v3	▮	1
Thermo Fisher Oncomine Focus Cancer Panel	▮	1

Program Information

- Sequencing files containing somatic variants to be downloaded and incorporated into your laboratory bioinformatics pipeline for analysis and reporting; file sizes range from 100MB to 1GB.
- BAM and FASTQ file formats
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

Additional Information

- This in silico bioinformatics program is designed to complement and augment somatic variant wet bench NGS proficiency testing programs by testing a greater diversity of variants at a greater range of variant allele fractions (VAF).
- The BAM and/or FASTQ files are platform-specific and may not be compatible with other instruments/software.
- This program includes variants present with a VAF potentially as low as 5%.
- For platform-agnostic solid tumor bioinformatic proficiency testing challenges, refer to the NGSB4 program, page 270.

Next-Generation Sequencing Solid Tumor Bioinformatics Hybrid NGSB4

Analyte/Procedure	Program Code	Challenges per Shipment
	NGSB4	
In silico mutagenized sequencing file(s) containing somatic variants of relevance in solid tumors - platform-agnostic	▮	1

This is a platform-agnostic hybrid in silico proficiency testing and validated materials program for laboratories performing targeted NGS of cancer genes or mutational hotspots in solid tumors.

For panel-specific solid tumor bioinformatic proficiency testing challenges, refer to the NGSB1 program, page 269.

Minimum Requirements:

- Laboratories must provide a gene panel sequencing data file (FASTQ or **unaligned** BAM) that has been generated using their current clinical sequencing protocols from one of the following sources: A specimen from the NGS—Germline program (see page 268) or from one of the following NIST Reference Material cell lines: RM 8398 (NA12878), RM 8391, RM 8392, or RM 8393. FASTQs or **unaligned** BAMs must be submitted along with a BED file describing the regions targeted and interrogated by your laboratory. Specimens from the NGSST and NGSHM programs or additional Coriell/NIST Reference Material cell lines cannot be used for this program.
- Laboratories can transfer files from most modern browsers/operating systems. Due to the extremely large file sizes, 40 Mbps transfer speed or higher is needed to ensure successful transfer of your laboratory's sequencing files to the CAP. For the most up-to-date information on system requirements, click **Browser and Operating System Requirements** located at the bottom of the cap.org homepage.

Additional Information, Proficiency Testing Program:

- Laboratories will be asked to identify somatic single nucleotide variants and small (1–15bp) insertions, deletions, duplications, and deletions-insertions (delins) in a subset of solid tumor mutational hotspots/genes with VAF potentially as low as 5%. Laboratories will be required to submit results of the variants identified.

Additional Information, Validated Materials:

- The sequencing file will contain up to 75 custom somatic variants that are tailored to the specific assay submitted (depending on the size of the panel provided) at VAF from 3% to 99% (higher allele fractions to mimic loss of heterozygosity or homozygosity) and will include:
  - o Single nucleotide variants
  - o Insertions, deletions, delins, and/or duplications ranging from 1–100bp (1–15bp, 16–50bp, 51–100bp)
  - o For laboratories doing microsatellite instability, microsatellite instability at mono nucleotide tracts in the submitted capture design will be included.

  All variants will be modeled based on actual somatic mutations from the COSMIC database. This portion of the program is not traditional proficiency testing and no results will be returned to the CAP; information regarding the variants introduced will be sent along with the mutagenized file.

Program Information

- The proficiency testing portion of this program is designed to complement and augment NGS somatic variant wet bench proficiency testing programs by testing for a greater diversity of variants with a wide range of variant allele fractions (VAF), while the validated materials portion is designed to optimize bioinformatics pipelines, augment validations, and assist with pipeline verification after changes to NGS/bioinformatics processes.
- One panel sequencing data file (FASTQ or **unaligned** BAM), originating from your laboratory and provided to the CAP, for in silico mutagenesis
- Sequencing files containing somatic variants to be downloaded and analyzed by your laboratory bioinformatics pipeline
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

Next-Generation Sequencing
Hematologic Malignancies Bioinformatics NGSB3

Procedure	Program Code	Challenges per Shipment
	NGSB3	
Illumina TruSight Myeloid Sequencing Panel	▮	1
Thermo Fisher Oncomine Myeloid Assay	▮	1

Additional Information

- This in silico bioinformatics program is designed to complement and augment somatic variant wet bench NGS proficiency testing programs by testing a greater diversity of variants at a greater range of variant allele fractions (VAF).
- The BAM and/or FASTQ files are platform-specific and may not be compatible with other instruments/software.
- This program includes variants present with a VAF potentially as low as 5%.
- For platform-agnostic hematologic malignancies bioinformatic proficiency testing challenges, refer to the NGSB5 program, page 272.

Program Information

- Sequencing files containing somatic variants to be downloaded and incorporated into your laboratory bioinformatics pipeline for analysis and reporting; file sizes range from 100MB to 1GB.
- BAM and FASTQ file formats
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

Next-Generation Sequencing Hematologic Malignancies Bioinformatics Hybrid NGSB5

Analyte/Procedure	Program Code	Challenges per Shipment
	NGSB5	
In silico mutagenized sequencing file(s) containing somatic variants of relevance in hematologic malignancies - platform-agnostic	▮	1

This is a platform-agnostic hybrid in silico proficiency testing and validated materials program for laboratories performing targeted NGS of cancer genes or mutational hotspots in hematologic malignancies.

For panel-specific hematologic malignancies bioinformatic proficiency testing challenges, refer to the NGSB3 program, page 271.

Minimum Requirements:

- Laboratories must provide a gene panel sequencing data file (FASTQ or **unaligned** BAM) that has been generated using their current clinical sequencing protocols from one of the following sources: a specimen from the NGS—Germline program (see page 268) or from one of the following NIST Reference Material cell lines: RM 8398 (NA12878), RM 8391, RM 8392, or RM 8393. FASTQs or **unaligned** BAMs must be submitted along with a BED file describing the regions targeted and interrogated by your laboratory. Specimens from the NGSST and NGSHM programs or additional Coriell/NIST Reference Material cell lines cannot be used for this program.
- Laboratories can transfer files from most modern browsers/operating systems. Due to the extremely large file sizes, 40 Mbps transfer speed or higher is needed to ensure successful transfer of your laboratory's sequencing files to the CAP. For the most up-to-date information on system requirements, click **Browser and Operating System Requirements** located at the bottom of the cap.org homepage.

Additional Information, Proficiency Testing Program:

- Laboratories will be asked to identify somatic single nucleotide variants and small (1–15bp) insertions, deletions, duplications, and deletions-insertions (delins) in a subset of hematologic malignancies mutational hotspots/genes with VAF potentially as low as 5%. Laboratories will be required to submit results of the variants identified.

Additional Information, Validated Materials:

- The sequencing file will contain up to 75 custom somatic variants that are tailored to the specific assay submitted (depending on the size of the panel provided) at VAF from 3% to 99% (higher allele fractions to mimic loss of heterozygosity or homozygosity) and will include:
  - o Single nucleotide variants
  - o Insertions, deletions, delins, and/or duplications ranging from 1–100bp (1–15bp, 16–50bp, 51–100bp)

  All variants will be modeled based on actual somatic mutations from the COSMIC database. This portion of the program is not traditional proficiency testing and no results will be returned to the CAP; information regarding the variants introduced will be sent along with the mutagenized file.

Program Information

- The proficiency testing portion of this program is designed to complement and augment NGS somatic variant wet bench proficiency testing programs by testing for a greater diversity of variants with a wide range of variant allele fractions (VAF) while the validated materials portion is designed to optimize bioinformatics pipelines, augment validations, and assist with pipeline verification after changes to NGS/bioinformatics processes.
- One panel sequencing data file (FASTQ or **unaligned** BAM), originating from your laboratory and provided to the CAP, for in silico mutagenesis
- Sequencing files containing somatic variants to be downloaded and analyzed by your laboratory bioinformatics pipeline
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

Next-Generation Sequencing Undiagnosed Disorders—Exome NGSE

Analyte/Procedure	Program Code	Challenges per Shipment
	NGSE	
Exome analysis for germline undiagnosed disorders	▮	1

Additional Information/Minimum Requirements

- This in silico based program will assess the ability of the laboratory to identify germline variants responsible for a provided clinic phenotype as is encountered in an undiagnosed disease scenario. In addition to analyzing the in silico mutagenized file to identify a genetic diagnosis for the provided clinical scenario, pathogenic or likely pathogenic ACMG secondary findings may also be reported.
- Laboratories must provide an exome sequencing data file (FASTQ or **unaligned** BAM) that has been generated using their current clinical sequencing protocols from one of the following sources: A specimen from the NGS—Germline program (see page 268) or from one of the NIST Reference Material cell lines: RM 8398 (NA12878), RM 8391, RM 8392, or RM 8393. Specimens from the NGSST and NGSHM programs or additional Coriell/NIST Reference Material cell lines cannot be used for this program.
- FASTQs or **unaligned** BAMs must be submitted along with a BED file describing the regions targeted and interrogated by your laboratory. Additionally, more than 90% of exons targeted and interrogated by your laboratory must have a minimum read coverage of 10X.
- Laboratories can transfer files from most modern browsers/operating systems. Due to the extremely large file sizes, 40 Mbps transfer speed or higher is needed to ensure successful transfer of your laboratory's sequencing files to the CAP. For the most up-to-date information on system requirements, click **Browser and Operating System Requirements** located at the bottom of the cap.org homepage.

Program Information

- One exome sequencing data file, originating from your laboratory and provided to the CAP, for in silico mutagenesis; the mutagenized exome sequencing data file is to be downloaded and analyzed by your bioinformatics pipeline.
- The mutagenized exome sequencing file will be accompanied by a clinical history, relevant laboratory data, and results of ancillary studies, where appropriate.
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

Next-Generation Sequencing
Undiagnosed Disorders—Trio Analysis NGSET

Analyte/Procedure	Program Code	Challenges per Shipment
	NGSET	
Trio (parents and proband) exome analysis for germline undiagnosed disorders	▮	3

Additional Information/Minimum Requirements

- This in silico based program will assess the ability of the laboratory to identify germline variants responsible for a provided clinic phenotype in a proband as is encountered in an undiagnosed disease scenario using a trio approach (ie, laboratories will analyze the proband and parents in an effort to determine the diagnosis in the proband). In addition to analyzing the in silico mutagenized files to identify a genetic diagnosis for the provided clinical scenario, inheritance patterns as well as pathogenic or likely pathogenic ACMG secondary findings may also be reported.
- Laboratories must provide exome sequencing data files (FASTQs or **unaligned** BAMs) that have been generated using their current clinical sequencing protocols from one of the following Genome in a Bottle Consortium trio sources: the Ashkenazi Jewish trio (Coriell IDs GM24385, GM24149, and GM24143 or NIST RM8392) or the Han Chinese trio (Coriell IDs GM24631, GM24694, and GM24695). All exome files must be from the same trio (Ashkenazi Jewish or Han Chinese). Specimens from the NGS, NGSST, and NGSHM programs or additional Coriell/ Genome in a Bottle Consortium sources cannot be used for this program.
- FASTQs or **unaligned** BAMs must be submitted along with a BED file describing the regions targeted and interrogated by your laboratory. Additionally, more than 90% of exons targeted and interrogated by your laboratory must have a minimum read coverage of 10X.
- Laboratories can transfer files from most modern browsers/operating systems. Due to the extremely large file sizes, 40 Mbps transfer speed or higher is needed to ensure successful transfer of your laboratory's sequencing files to the CAP. For the most up-to-date information on system requirements, click **Browser and Operating System Requirements** located at the bottom of the cap.org homepage.

Program Information

- Three exome sequencing data files (one from each parent plus the proband), originating from your laboratory and provided to the CAP, for in silico mutagenesis; the mutagenized exome sequencing data files are to be downloaded and analyzed by your bioinformatics pipeline.
- The mutagenized exome sequencing files will be accompanied by a clinical history, relevant laboratory data, and results of ancillary studies, where appropriate.
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

Copy Number Variant—Solid Tumor CNVST

Procedure	Program Code	Challenges per Shipment
	CNVST	
Copy number variant—solid tumor	▮	3

Additional Information

- This program is designed for laboratories using next-generation sequencing for copy number analysis.
- Laboratories will be asked to identify copy number alterations in some of these genes: *CDKN2A, CDKN2B, EGFR, ERBB2, FGFR3, MET, MYC, MYCN,* or *TP53*.
- Copy number alterations tested will include amplification, gain, copy neutral loss of heterozygosity, and deletion.

Program Information

- One 20-µL gDNA (10ng/µL) specimen
- Two snap-frozen cell pellets
- Two shipments per year

Tumor Mutational Burden TMB

Procedure	Program Code	Challenges per Shipment
	TMB	
Tumor mutational burden	▮	3

Additional Information

- This program is intended for laboratories using next-generation sequencing to determine tumor mutational burden.
- This program is appropriate for laboratories using targeted panels and whole exome sequencing.
- Paired normal tissue is included.
- Specimens are 50% tumor.

Program Information

- Three 10-µL gDNA (50ng/µL) specimens
- Three 10-µL gDNA (50ng/µL) paired normal tissues
- Two shipments per year

Molecular Oncology—Solid Tumors

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Microsatellite Instability MSI

Procedure	Program Code	Challenges per Shipment
	MSI	
Microsatellite instability testing (DNA amplification)	▮	3
MLH1 promoter methylation analysis	▮	3

Laboratories performing DNA mismatch repair assessment by immunohistochemistry methods should see program MMR on page 302.

Program Information

- Three specimens each containing two 10.0-micron unstained paraffin section slides and one H&E slide
- For laboratories performing molecular testing using PCR and NGS
- Two shipments per year

In Situ Hybridization ISH, ISH2

Analyte/Procedure	Program Code		Challenges per Shipment
	ISH	ISH2	
Epstein-Barr virus (EBV)	▮		4
Human papillomavirus (HPV)	▮		4
Kappa/Lambda (IGK/IGL)	▮		4
ERBB2 (HER2) gene amplification (brightfield)		▮	10

Laboratories performing FISH for interphase chromosomal targets in paraffin sections refer to the Cytogenetics programs, page 257.

These programs are only for laboratories that perform both hybridization and interpretation under the same CLIA number.

Program Information

- ISH -

  EBV, HPV: Three 4-core tissue microarray slides and one H&E slide (each)

  Kappa/Lambda: Four 4-core tissue microarray slides and one H&E slide
- ISH2 - Two 5-core tissue microarray slides in duplicate
- Two shipments per year

DNA Extraction & Amplification FFPE MHO5

Procedure	Program Code	Challenges per Shipment
	MHO5	
DNA purification	▮	1

This is a methods-based proficiency challenge to examine DNA purification from formalin-fixed, paraffin-embedded (FFPE) tissues. Laboratories will be able to purify DNA from FFPE sections and amplify control targets using laboratory-provided reagents.

Program Information

- Three 10.0-micron paraffin sections
- Two shipments per year

Neoplastic Cellularity NEO

Procedure	Program Code	Challenges per Shipment
	NEO	
Online assessment of percent neoplastic cellularity	▮	10

Program Information

- Ten regions of interest (ROIs) using online whole slide images
- A method-based preanalytic program to assess competency for determining percent neoplastic cellularity
- Powered by DigitalScope® technology
- Individual reporting fields for up to five pathologists are available.
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

Sarcoma Fusion Gene SARC

Gene	Program Code	Challenges per Shipment
	SARC	
Sarcoma fusion gene*	▮	3

*See fusion gene listing below.

Laboratories performing FISH for sarcoma translocation refer to the Cytogenetics programs, page 257.

Program Information

- Three snap-frozen cell pellets from which approximately 5.0-µg of RNA can be extracted
- For laboratories performing molecular testing using RT-PCR and NanoString
- Two shipments per year

Sarcoma Fusion Gene Listing

COL1A1::PDGFB, t(17;22)
ETV6::NTRK3, t(12;15)
EWSR1::ATF1, t(12;22)
EWSR1::ERG, t(21;22)
EWSR1::FLI1, t(11;22)
EWSR1::FLI1 or *EWSR1::ERG*
EWSR1::WT1, t(11;22)
FUS::DDIT3, t(12;16)
PAX3::FOXO1, t(2;13)
PAX7::FOXO1, t(1;13)
PAX3::FOXO1 or *PAX7::FOXO1*
SS18::SSX1, t(X;18)
SS18::SSX2, t(X;18)
SS18::SSX1 or *SS18::SSX2*

Cell-Free Tumor DNA CFDNA

Analyte/Procedure	Program Code	Challenges per Shipment
	CFDNA	
cfDNA	▮	3

Additional Information

- DNA fragments stabilized in simulated plasma
- This is not intended for laboratories that perform circulating tumor cell (CTC) analysis.
- Genes in this program include *ALK* , *BRAF, BRCA1, EGFR, ERBB2, ESR1, IDH1, KRAS, MET, NRAS,* and *PIK3CA.*
- This program includes variants present with a variant allele frequency (VAF) range of 0.1%–3.0%.

Program Information

- Three 125-ng DNA (25 ng/mL) specimens
- Two shipments per year

RNA Fusions, Solid Tumor RNA

Analyte/Procedure	Program Code	Challenges per Shipment
	RNA	
RNA	▮	3

Additional Information

- Total RNA from a cell line engineered to contain desired fusion RNA
- This is for laboratories using RNAseq to detect gene fusion transcripts.
- This is not intended to replace the current program (SARC) for reverse transcription (RT)-PCR based detection (see page 277).
- Potential fusion variants include *CD74::ROS1, EML4::ALK, ETV6::NTRK3, FGFR3::TACC3, PAX8::PPARG,* and *SLC45A3::BRAF*.
- Specific intragenic fusion/exon skipping variants may also be included, specifically *EGFRvIII* and *MET* exon 14 skipping.

Program Information

- Three 500-ng RNA (20 ng/µL) specimens
- Two shipments per year

Solid Tumor—Other BRAF, EGFR, KRAS, KIT

Analyte	Program Code				Challenges per Shipment
	BRAF	EGFR	KRAS	KIT	
BRAF	▮				3
EGFR		▮			3
KRAS			▮		3
KIT				▮	3
PDGFRA				▮	3

Program Information

- BRAF, EGFR, KRAS - Paraffin-embedded sections or shavings
- KIT -

  One specimen containing four 10.0-micron unstained paraffin section slides and one H&E slide

  Two 1.0-µg gDNA (50 ng/µL) specimens
- For laboratories performing molecular testing using PCR
- Two shipments per year

Multigene Tumor Panel, Genomic DNA MTP

Analyte	Program Code	Challenges per Shipment
	MTP	
BRAF	▮	3
EGFR	▮	3
ERBB2 (HER2)	▮	3
KIT	▮	3
KRAS	▮	3
NRAS	▮	3
PDGFRA	▮	3
PIK3CA	▮	3

CAP-accredited laboratories that perform testing for the detection of somatic single nucleotide variants, insertions, and deletions in *BRAF*, *EGFR*, and *KRAS* by non-NGS methods are required to enroll in either MTP or the respective single gene programs. This includes laboratories that perform non-NGS-based multiplexed assays and nonmultiplexed assays (eg, Sanger sequencing). Laboratories that perform NGS-based testing of somatic single nucleotide variants, insertions, and deletions in *BRAF*, *KRAS*, *EGFR*, and/or other genes are required to enroll in NGSST (on page 268) as this proficiency testing program provides challenges with lower VAF as well as challenges in other genes commonly included in NGS-based panels for the identification of somatic variants in solid tumors.

Program Information

- Three 2.0-µg gDNA (50 ng/µL) specimens for laboratories performing molecular testing on multiple targets
- Two shipments per year

Glioma GLI

Analyte	Program Code	Challenges per Shipment
	GLI	
MGMT	▮	3
IDH1, IDH2	▮	3

Program Information

- Four 2.0-µg gDNA (50 ng/µL) specimens
- One specimen containing four 10.0-micron unstained paraffin section slides and one H&E slide
- For laboratories performing molecular testing using PCR
- Two shipments per year

Molecular Oncology—Hematologic

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Molecular Hematologic Oncology MHO/MHO1, MHO2/MHO3, MHO5

Procedure/Gene	Program Code			Challenges per Shipment
	MHO/MHO1	MHO2/MHO3	MHO5	
Lymphoid Malignancy Genotyping				
IGH	▮			3
IGH::BCL2 major	▮			3
IGH::BCL2 minor	▮			3
IGH::CCND1	▮			3
IGK	▮			3
TRB	▮			3
TRG	▮			3
Myeloid Malignancy Genotyping				
BCR::ABL1 p190		▮		3
BCR::ABL1 p210		▮		3
CALR		▮		3
CBFB::MYH11		▮		3
FLT3 ITD		▮		3
FLT3 TKD		▮		3
JAK2 c.1849G>T p.V617F		▮		3
KMT2A-PTD (*MLL*-PTD)		▮		3
MPL		▮		3
NPM1		▮		3
PML::RARA		▮		3
RUNX1::RUNX1T1		▮		3
DNA extraction and amplification from formalin-fixed, paraffin-embedded (FFPE) tissue			▮	1

Program Information

- MHO - One sample vial containing purified DNA (200 µg/mL per vial) for each specimen
- MHO1 - MHO specimens in duplicate for additional DNA testing
- MHO2 - Two sample vials; one with purified DNA containing 200 µg/mL and one with purified RNA containing 400 µg/mL
- MHO3 - MHO2 specimen in duplicate for additional DNA and RNA testing
- MHO5 - Three 10.0-micron paraffin sections; extraction and amplification from FFPE tissue will be assessed by a method-based challenge.
- Two shipments per year; ships on dry ice (dry ice does not apply to MHO5).

IGHV Mutation Analysis IGHV

Analyte/Procedure	Program Code	Challenges per Shipment
	IGHV	
IGHV	▮	3

Additional Information

- Sequence analysis of the clonal immunoglobulin heavy chain V gene (*IGHV*) to determine somatic hypermutation (SHM) status
- Any sequencing method may be used.
- Report productive/unproductive rearrangement, SHM status, percent similarity, and V-gene utilization.

Program Information

- Three 20-µg DNA specimens (200 ng/µL)
- Two shipments per year

Measurable Residual Disease MRD, MRD1, MRD2

Analyte	Program Code			Challenges per Shipment
	MRD	MRD1	MRD2	
BCR::ABL1 p190		▮		3
BCR::ABL1 p210	▮			3
PML::RARA			▮	3

Program Information

- MRD, MRD1, MRD2 - Three RNA specimens in sterile water
- For laboratories diagnosing and monitoring leukemia tumor burden by measuring the quantity of *BCR::ABL1* or *PML::RARA* fusion transcripts
- Two shipments per year; ships on dry ice.

Navigating Multimodality Biomarker Assessment NMBA/NMB1

Program Name	Program Code	Cases per Mailing
	NMBA/NMB1	
Multimodality biomarker assessment case analysis	▮	2

Biomarkers can be tested through a variety of methodologies (eg, flow cytometry, immunohistochemistry, next-generation sequencing, PCR-based testing, karyotype, FISH, clinical chemistry). Each modality has different technical strengths and weaknesses, along with varied analytical and clinical specifications such as sensitivity and specificity. Results may not be clearly concordant across the modalities. This program will challenge pathologists to resolve discrepancies between different methods or "multimodality" biomarker testing.

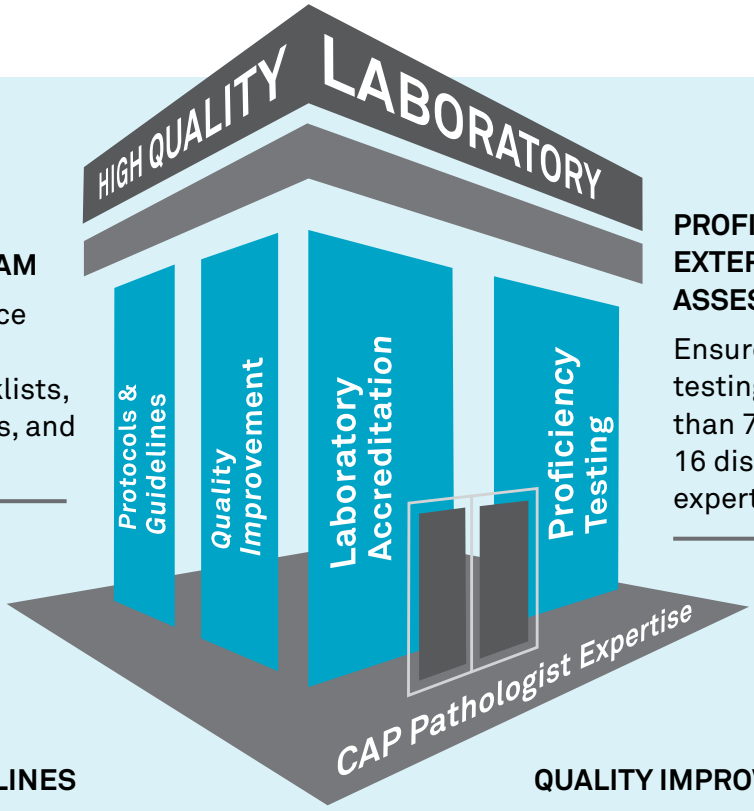
Program Information

- NMBA - Online program, whole slide images powered by DigitalScope technology (if available); NMBA provides CME or CE credit for one pathologist or laboratory professional.
- NMB1 - Reporting option with CME or CE credit for each additional pathologist or laboratory professional (within the same institution); must order in conjunction with program NMBA.
- Two mailings per year with two cases each mailing
- Earn a maximum of five CME credits (*AMA PRA Category 1 Credits™*) per pathologist and a maximum of five CE credits per laboratory professional per year.
- This activity meets the ABPath CC requirements for Improvement in Health and Health Care (IHHC).
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

CME CE credit

Amplifying Quality, Simplifying Compliance, and Elevating Outcomes

Built on a foundation of pathologist expertise, the College of American Pathologists' Laboratory Quality Solutions partners with laboratories worldwide to elevate the quality of laboratory medicine with best-in-class solutions designed to drive operational excellence, achieve diagnostic confidence, and simplify compliance while ensuring the best patient care.



LABORATORY ACCREDITATION PROGRAM

Amplify quality and reduce risk through customized, discipline-specific checklists, collegial peer inspections, and educational resources.

PROFICIENCY TESTING/ EXTERNAL QUALITY ASSESSMENT

Ensure accurate and reliable testing results with more than 700 programs across 16 disciplines developed by expert scientific committees.

PROTOCOLS AND GUIDELINES

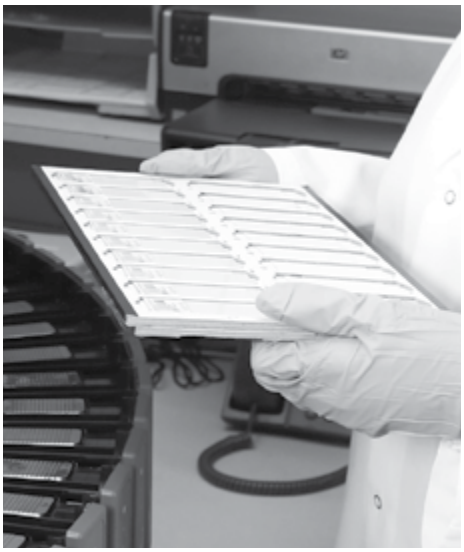
Enhance cancer reporting and clinical decision making, providing more effective testing with consistent, high-quality results and expert interpretations.

QUALITY IMPROVEMENT

Improve processes and strengthen staff expertise while reducing risk and improving patient outcomes.

Learn more about how the CAP can help you achieve your laboratory quality goals.

20 Anatomic Pathology



Prepare for success with our PAP PT and PAP Education programs.

- Every slide is reviewed and approved by pathologists and cytotechnologists before it is put in circulation.
- All slide sets are reviewed every six months by a staff cytotechnologist.
- Slides that do not maintain consensus grading are removed from the program and reviewed by a committee of pathologist experts.

All Centers for Medicare & Medicaid Services (CMS) regulated analytes are listed in **bold** type.

Anatomic Pathology

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Human Papillomavirus (High Risk) for Cytopathology (CHPVD, CHPVJ, CPHVK, CHPVM)
See program CHPV

Surgical Pathology

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Online Performance Improvement Program in Surgical Pathology PIPW/PIPW1

Program	Program Code	Challenges per Shipment
	PIPW/PIPW1	
Surgical pathology case review	▮	10

Additional Information

- Program PIPW prepares pathologists to succeed by providing ongoing diagnostic learning in general surgical pathology.
- Pathologists can assess their diagnostic skills and compare their performance with that of their peers.
- Included PIPW case selections feature:
  - A variety of neoplastic and nonneoplastic lesions
  - Inflammatory and infectious diseases
  - Various sites, encompassing a variety of organ systems
  - Two PIPW cases per release are from smaller tumors and do not duplicate PIP (glass).
- See system requirements on page 12.

Program Information

- PIPW - Ten diagnostic challenges/whole slide H&E images with clinical history; CME credit is available for one pathologist; for each additional pathologist, order PIPW1.
- PIPW1 - Reporting option with CME credit for each additional pathologist (within the same institution); must order in conjunction with program PIPW.
- Earn a maximum of 40 CME credits *(AMA PRA Category 1 Credits™)* per pathologist for completion of an entire year.
- This activity meets the ABPath CC requirements for Improvement in Health and Health Care (IHHC).
- Powered by DigitalScope® technology
- Four online activities per year; your CAP shipping contact will be notified via email when the activity is available.

Performance Improvement Program in Surgical Pathology PIP/PIP1

Program	Program Code	Challenges per Shipment
	PIP/PIP1	
Surgical pathology case review	▮	10

Additional Information

- PIP prepares pathologists to succeed by providing ongoing diagnostic learning in general surgical pathology.
- This program:
  - Provides a practical approach to continuing education
  - Gives pathologists a method to assess their diagnostic skills and compare their performance with that of their peers
  - Allows staff to experience smaller tumors and more interesting cases by providing three online cases per release
  - Features PIP case selections that include:
    - A variety of neoplastic and nonneoplastic lesions
    - Inflammatory and infectious diseases
    - Various sites, encompassing a variety of organ systems

Program Information

- PIP - Ten diagnostic challenges with clinical history: seven H&E stained glass slides and three online only cases; CME credit is available for one pathologist; for each additional pathologist, order PIP1.
- PIP1 - Reporting option with CME credit for each additional pathologist (within the same institution); must order in conjunction with program PIP.
- Powered by DigitalScope technology
- Earn a maximum of 40 CME credits *(AMA PRA Category 1 Credits)* per pathologist for completion of an entire year.
- This activity meets the ABPath CC requirements for Improvement in Health and Health Care (IHHC).
- Four shipments per year

CME credit

Virtual Biopsy Program VBP/VBP1

Program	Program Code	Challenges per Shipment
	VBP/VBP1	
Online biopsy case review	▮	5

Additional Information

- VBP prepares pathologists to succeed by providing ongoing diagnostic learning in surgical pathology.
- This program is applicable to all pathologists, including general pathologists, and focuses on biopsy material. Cases may include gross, radiographic, or endoscopic images.
- There are four topical releases per year that focus on benign and malignant pathology. Cases are from selected organ systems and may include a variety of specimen types (eg, core biopsies, endoscopic biopsies, curettings, aspirate smears).
- See system requirements on page 12.

Program Information

- VBP - Five diagnostic challenges/whole slide images with clinical history; reporting with CME credit is available for one pathologist; for each additional pathologist, order VBP1.
- VBP1 - Reporting option with CME credit for each additional pathologist (within the same institution); must order in conjunction with program VBP.
- Earn a maximum of 25 CME credits *(AMA PRA Category 1 Credits)* per pathologist for completion of an entire year.
- This activity meets the ABPath CC requirements for Improvement in Health and Health Care (IHHC).
- Powered by DigitalScope technology
- Four online activities per year; your CAP shipping contact will be notified via email when the activity is available.

Access CPIP cases when and where it's convenient using a PC or mobile device.

Pathologists can keep abreast of current scientific knowledge with interactive, case-based learning addressing common issues faced in the laboratory.

CPIP supports clinical pathologists as well as anatomic pathologists who cover clinical pathology. A diverse portfolio of real-life case scenarios, including images and clinical background, helps pathologists to stay current on issues and advances in the laboratory.

CPIP is designed for pathologists, by pathologists. Each case is developed and peer-reviewed, ensuring learning is practical and easily applied to work. Thought-provoking questions with feedback and multiple-choice knowledge checks assess and confirm diagnostic skills. Participants may apply 1.25 CME credits for each CPIP toward the ABPath's Continuing Certification (CC) requirements.

Clinical Pathology Improvement Program CPIP/CPIP1

Program Name	Program Code	Cases per Year
	CPIP/CPIP1	
Online cases in clinical pathology	∎	12

Consider CPIP for:

- Medical directors seeking to continuously improve the collective skills and clinical pathology knowledge of their team
- Pathologists with clinical and/or laboratory management responsibilities
- Pathologists seeking CME CC credits in clinical pathology
- Subspecialty clinical pathologists who need to keep current

Program Information

- CPIP - One online clinical laboratory case per month
- CPIP1 - Additional pathologist (within the same institution) reporting option with CME credit; must order in conjunction with CPIP.
- Earn a maximum of 15 CME credits *(AMA PRA Category 1 Credits™)* per year.
- Twelve cases per year; your CAP shipping contact will be notified via email when the activity is available.

Discipline	Case Schedule (subject to change)	Month 2026
Cytogenetics	Update and Testing Algorithms for Plasma Cell Disorders	January
Microbiology	HIV Testing	February
Hematology	Reactive Lymphocytoses	March
Transfusion	Indeterminate RhD Typing	April
Hematology	Red Cell Membrane and Enzymatic Defects	May
Molecular	Next Generation Sequencing & Molecular Basics	June
Chemistry	Westgard Rules Application in Quality Control	July
Transfusion	Patient Blood Management	August
Immunology	Syphilis Serology	September
Laboratory Management	Root Cause Analysis	October
Microbiology	Appropriate Microbiology Sample Collection	November
Hematology	Evaluation for Leukopenia	December

To learn more, visit cap.org and search for CPIP.

Histotechnology Quality Improvement Programs (HistoQIP)

HistoQIP programs that include IHC stains assess preanalytic steps. For immunohistochemistry programs that focus on instrument analytic and pathologist readout steps, see the immunohistochemistry programs on pages 298–303.

CAP/NSH Histotechnology Quality Improvement Program HQIP

Stain/Tissue	Program Code	Challenges per Shipment	
	HQIP	A	B
H&E - Fallopian tube resection	▮	1	
H&E - Small intestine resection	▮	1	
IHC - Desmin, uterus resection	▮	1	
IHC - SOX10, skin resection	▮	1	
Special Stain - PAS, kidney biopsy	▮	1	
H&E - Appendix resection	▮		1
H&E - Ovary resection	▮		1
IHC - CD8, tonsil	▮		1
IHC - PAX8, kidney resection	▮		1
Special Stain - Iron, liver wedge or biopsy with abundantly positive iron	▮		1

HistoQIP improves histologic slide preparation in anatomic pathology laboratories. In this educational program, an expert panel of pathologists, histotechnologists, and histotechnicians evaluates submitted slides for histologic technique using uniform grading criteria. Participants receive laboratory-specific evaluations and participant summaries with peer comparison data and detailed discussions. For biopsy or immunohistochemistry specific programs, see individual program listings.

Program Information

- Participant laboratories may submit up to five stained coverslipped glass slides from the list of challenges per mailing.
- Two shipments per year

CAP/NSH HistoQIP Biopsy Program HQIPBX

Stain/Tissue	Program Code	Challenges per Shipment	
	HQIPBX	A	B
H&E - Bladder biopsy	▮	1	
H&E - Cervical biopsy	▮	1	
H&E - Skin punch biopsy	▮	1	
H&E - Stomach biopsy	▮	1	
H&E - Colon biopsy	▮		1
H&E - Endometrial biopsy	▮		1
H&E - Prostate needle biopsy	▮		1
H&E - Breast core biopsy	▮		1

The HistoQIP Biopsy program is an additional program to improve the preparation of histologic slides in anatomic pathology laboratories. In this educational program, an expert panel of pathologists, histotechnologists, and histotechnicians evaluates submitted slides for histologic technique using uniform grading criteria. Participants receive laboratory-specific evaluations and participant summaries with peer comparison data.

Program Information

- Participant laboratories may submit up to four stained coverslipped glass slides from the list of challenges per mailing.
- Two shipments per year

CAP/NSH HistoQIP Biopsy Specialty Programs HQBX1, HQBX2, HQBX3, HQBX4

Stain/Tissue	Program Code				Challenges per Shipment	
	HQBX1	HQBX2	HQBX3	HQBX4	A	B
Gastrointestinal Biopsy Module						
H&E - Colon biopsy	▮				1	1
H&E - Esophagus biopsy	▮				1	1
H&E - Small intestine biopsy	▮				1	1
H&E - Stomach biopsy	▮				1	1
Dermatopathology Biopsy Module						
H&E - Alopecia biopsy		▮			1	1
H&E - Skin excisional biopsy, large excision		▮			1	1
H&E - Skin punch biopsy		▮			1	1
H&E - Skin shave biopsy		▮			1	1
Urogenital Tract Biopsy Module						
H&E - Bladder biopsy, nonneoplastic			▮		1	1
H&E - Bladder biopsy, urothelial carcinoma			▮		1	1
H&E - Prostate needle biopsy, nonneoplastic			▮		1	1
H&E - Prostate needle biopsy, prostatic carcinoma			▮		1	1
Gynecological Biopsy Module						
H&E - Cervical biopsy				▮	1	1
H&E - Endometrial biopsy				▮	1	1
H&E - Cervical cone/LEEP				▮	1	1
H&E - Vulvar biopsy				▮	1	1

The HistoQIP Biopsy Specialty Programs include modules to improve the preparation of histologic slides in anatomic pathology laboratories that handle gastrointestinal, dermatopathology, urogenital tract, and gynecologic biopsies. In this educational program, an expert panel of pathologists, histotechnologists, and histotechnicians evaluates submitted slides for histologic technique using uniform grading criteria. Participants receive laboratory-specific evaluations and participant summaries with peer comparison data.

Program Information

- Participant laboratories may submit up to four stained coverslipped glass slides from the list of challenges per mailing.
- Two shipments per year

CAP/NSH HistoQIP Immunohistochemistry Program HQIHC

Stain/Tissue	Program Code	Challenges per Shipment	
	HQIHC	A	B
IHC - BAP1, melanoma	▮	1	
IHC - MDM2, liposarcoma	▮	1	
IHC - Synaptophysin, pancreas	▮	1	
IHC - p63, bladder biopsy	▮	1	
IHC - CD20, lymph node excision	▮	1	
IHC - GATA3, breast	▮		1
IHC - CD30, Hodgkin lymphoma	▮		1
IHC - NKX3.1, prostatic adenocarcinoma	▮		1
IHC - Thyroglobulin, thyroid	▮		1
IHC - CK7, lung biopsy or wedge	▮		1

The HistoQIP Immunohistochemistry Program improves the preparation of immunohistochemistry slides in anatomic pathology laboratories that handle a broad range of surgical specimens. In this educational program, an expert panel of pathologists, histotechnologists, and histotechnicians evaluates submitted slides for histologic technique using uniform grading criteria. Participants receive laboratory-specific evaluations and participant summaries with peer comparison data.

Program Information

- Participant laboratories may submit up to five stained coverslipped glass slides per mailing from the list of challenges.
- Two shipments per year

CAP/NSH HistoQIP In Situ Hybridization Program HQISH

Stain/Tissue	Program Code	Challenges per Shipment	
	HQISH	A	B
H&E - Oropharyngeal squamous cell carcinoma, HPV high risk positive	▮	1	
ISH - DNA/RNA negative control probe ISH	▮	1	
ISH - DNA/RNA positive control probe ISH	▮	1	
ISH - HPV high risk (HPV probe, ISH), oropharyngeal squamous cell carcinoma	▮	1	
H&E - Breast carcinoma biopsy, HER2 amplified	▮		1
ISH - DNA/RNA negative control probe ISH	▮		1
ISH - DNA/RNA positive control probe ISH	▮		1
ISH - HER2 (HER2 dual probe, ISH), breast carcinoma biopsy	▮		1

This program augments efforts to improve the preparation of ISH slides in anatomic pathology laboratories that handle specimens undergoing analysis for detection by chromogenic in situ hybridization. Participants receive laboratory-specific evaluations and participant summaries with peer comparison data.

Program Information

- Participant laboratories submit four stained coverslipped glass slides from the list of challenges per mailing.
- Two shipments per year

CAP/NSH HistoQIP Cell Block Preparations Program HQCLB

Stain/Tissue	Program Code	Challenges per Shipment	
	HQCLB	A	B
H&E - Pleural fluid	▮	1	
IHC - TTF-1, pleural fluid	▮	1	
H&E - Metastatic carcinoma lymph node FNA	▮	1	
IHC - P63 or P40, metastatic carcinoma lymph node FNA	▮	1	
H&E - Lung mass adenocarcinoma FNA	▮		1
IHC - Napsin A, lung mass adenocarcinoma FNA	▮		1
H&E - Metastatic carcinoma peritoneal fluid	▮		1
IHC - PAX8, metastatic carcinoma peritoneal fluid	▮		1

This program augments efforts to improve the preparation of H&E and immunohistochemical slides in anatomic pathology and cytopathology laboratories that handle cell block preparations. Participants receive laboratory-specific evaluations and participant summaries with peer comparison data and detailed discussions.

Program Information

- Participant laboratories may submit up to four stained coverslipped glass slides from the list of challenges per mailing.
- Two shipments per year

CAP/NSH HistoQIP Dermatopathology Program HQMEL

Stain/Tissue	Program Code	Challenges per Shipment	
	HQMEL	A	B
H&E - Melanoma skin resection	▮	1	
IHC - S100, melanoma skin resection	▮	1	
IHC - HMB-45, melanoma skin resection	▮	1	
H&E - Melanoma skin biopsy	▮	1	
IHC - MITF, melanoma skin biopsy	▮	1	
H&E - Melanoma skin biopsy	▮		1
IHC - melan A/MART-1, melanoma skin biopsy	▮		1
IHC - SOX10, melanoma skin biopsy	▮		1
H&E - Melanoma skin resection	▮		1
IHC - PRAME, melanoma skin resection	▮		1

This program augments efforts to improve the preparation of H&E and immunohistochemical slides in anatomic pathology laboratories that handle dermatopathology specimens. Participants receive laboratory-specific evaluations and participant summaries with peer comparison data.

Program Information

- Participant laboratories may submit up to five stained coverslipped glass slides from the list of challenges per mailing.
- Two shipments per year

CAP/NSH HistoQIP Mismatch Repair IHC Program HQMMR

Stain/Tissue	Program Code	Challenges per Shipment	
	HQMMR	A	B
H&E - Colonic adenocarcinoma	▮	1	
IHC - MLH1, colonic adenocarcinoma	▮	1	
IHC - MSH2, colonic adenocarcinoma	▮	1	
IHC - MSH6, colonic adenocarcinoma	▮	1	
IHC - PMS2, colonic adenocarcinoma	▮	1	
H&E - Endometrial adenocarcinoma	▮		1
IHC - MLH1, endometrial adenocarcinoma	▮		1
IHC - MSH2, endometrial adenocarcinoma	▮		1
IHC - MSH6, endometrial adenocarcinoma	▮		1
IHC - PMS2, endometrial adenocarcinoma	▮		1

This program augments efforts to improve the preparation of H&E and immunohistochemical slides in anatomic pathology laboratories that handle colonic and endometrial tumors performing mismatch repair IHC. Participants receive laboratory-specific evaluations and participant summaries with peer comparison data.

Program Information

- Participant laboratories submit five stained coverslipped glass slides per mailing from the list of challenges.
- Two shipments per year

CAP/NSH HistoQIP Central Nervous System Program HQNEU

Stain/Tissue	Program Code	Challenges per Shipment	
	HQNEU	A	B
H&E - Glioblastoma	▮	1	
IHC - GFAP, glioblastoma	▮	1	
IHC - p53, glioblastoma	▮	1	
H&E - IDH1 mutant glioma	▮	1	
IHC - IDH1 (R132H), IDH1 mutant glioma	▮	1	
H&E - Low grade astrocytoma	▮		1
IHC - S100, low grade astrocytoma	▮		1
IHC - Ki-67, low grade astrocytoma	▮		1
H&E - ATRX wildtype glioma	▮		1
IHC - ATRX, ATRX wildtype glioma	▮		1

This program augments efforts to improve the preparation of H&E and immunohistochemical slides in anatomic pathology laboratories that handle central nervous system gliomas. Participants receive laboratory-specific evaluations and participant summaries with peer comparison data.

Program Information

- Participant laboratories may submit up to five stained coverslipped glass slides per mailing from the list of challenges.
- Two shipments per year

CAP/NSH HistoQIP Non-small Cell Lung Carcinoma Program HQNSC

Stain/Tissue	Program Code	Challenges per Shipment	
	HQNSC	A	B
H&E - Lung adenocarcinoma	■	1	
IHC - TTF-1, lung adenocarcinoma	■	1	
IHC - Napsin A, lung adenocarcinoma	■	1	
H&E - Lung adenocarcinoma	■	1	
IHC - ALK, lung adenocarcinoma	■	1	
H&E - Lung squamous cell carcinoma	■		1
IHC - p40 or p63, lung squamous cell carcinoma	■		1
IHC - CK5 or CK5/6, lung squamous cell carcinoma	■		1
H&E - Lung squamous cell carcinoma	■		1
IHC - PD-L1, lung squamous cell carcinoma	■		1

This program augments efforts to improve the preparation of H&E and immunohistochemical slides in anatomic pathology laboratories that handle non-small cell lung carcinoma. Participants receive laboratory-specific evaluations and participant summaries with peer comparison data.

Program Information

- Participant laboratories may submit up to five stained coverslipped glass slides per mailing from the list of challenges.
- Two shipments per year

CAP/NSH HistoQIP Pediatric Program HQPED

Stain/Tissue	Program Code	Challenges per Shipment	
	HQPED	A	B
H&E - Colon resection for Hirschsprung disease	■	1	
IHC - Calretinin, colon resection for Hirschsprung disease	■	1	
H&E - Wilms tumor renal resection	■	1	
IHC - WT1, Wilms tumor renal resection	■	1	
H&E - Rhabdomyosarcoma	■		1
IHC - Myogenin, rhabdomyosarcoma	■		1
H&E - Infantile hemangioma excision	■		1
IHC - GLUT1, infantile hemangioma excision	■		1

This program augments efforts to improve the preparation of H&E and immunohistochemical slides in anatomic pathology laboratories that handle pediatric specimens. Participants receive laboratory-specific evaluations and participant summaries with peer comparison data.

Program Information

- Participant laboratories may submit up to four stained coverslipped glass slides per mailing from the list of challenges.
- Two shipments per year

CAP/NSH HistoQIP Targeted Therapy Program HQTAR

Stain/Tissue	Program Code	Challenges per Shipment	
	HQTAR	A	B
H&E - Breast ductal carcinoma needle core biopsy	▮	1	
IHC - HER2, breast ductal carcinoma needle core biopsy	▮	1	
H&E - Breast lobular carcinoma resection	▮	1	
IHC - ER, breast lobular carcinoma resection	▮	1	
H&E - Gastroesophageal adenocarcinoma	▮		1
IHC - HER2, gastroesophageal adenocarcinoma	▮		1
H&E - Gastroesophageal adenocarcinoma	▮		1
IHC - Claudin 18.2, gastroesophageal adenocarcinoma	▮		1

This program augments efforts to improve the preparation of H&E and immunohistochemical slides in anatomic pathology laboratories that handle specimens undergoing analysis for targeted therapies. Participants receive laboratory-specific evaluations and participant summaries with peer comparison data.

Program Information

- Participant laboratories may submit up to four stained coverslipped glass slides per mailing from the list of challenges.
- Two shipments per year

CAP/NSH HistoQIP Whole Slide Image Program HQWSI

Stain/Tissue	Program Code	Challenges per Shipment	
	HQWSI	A	B
H&E - Kidney biopsy	▮	1	
H&E - Pancreas resection	▮	1	
Special Stain - Silver (Jones), kidney biopsy	▮	1	
IHC - Synaptophysin, pancreas resection	▮	1	
H&E - Prostate invasive adenocarcinoma biopsy	▮	1	
H&E - Ovary resection	▮		1
H&E - Lung biopsy	▮		1
Special Stain - AFB, control tissue	▮		1
IHC - TTF-1, lung biopsy	▮		1
H&E - Breast invasive carcinoma	▮		1

The program provides feedback to laboratories using whole slide imaging for clinical applications. Participants upload their scanned whole slide images to the CAP designated server. In this educational program, an expert panel of pathologists, histotechnologists, and histotechnicians evaluates whole slide images for histologic technique and image quality. Participants receive laboratory-specific evaluations and participant summaries with peer comparison data and detailed discussions, as well as annotated feedback directly on their uploaded images.

Program Information

- Participant laboratories may submit up to five stained coverslipped glass slides and corresponding scanned whole slide images per mailing from the list of challenges.
- Online whole slide images powered by DigitalScope technology
- Two shipments per year

General Immunohistochemistry

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

These immunohistochemistry programs assess instrument analytic and pathologist readout steps. For programs focusing on preanalytic steps, see the HistoQIP IHC programs on pages 290–297.

Immunohistochemistry MK

Procedure	Program Code	Challenges per Shipment
	MK	
Immunohistochemistry	▮	16

The MK program allows laboratories to compare their assay methodology and results with all participating laboratories. Case materials are donated and represent a variety of diagnostic entities. Markers will vary in each case and will provide a wide range of IHC testing for routine surgical pathology practices.

Program Information

- Five glass slides with unstained tissue sections from four separate cases; each case includes four slides for selected IHC markers and one slide for H&E.
- Two shipments per year

CD117 Immunohistochemistry Tissue Microarray PM1

Analyte	Program Code	Challenges per Shipment
	PM1	
CD117	▮	10

For ER/PgR testing, see the PM2 program on page 300.

Program Information

- One 10-core tissue microarray slide
- One shipment per year

Immunohistochemistry Tissue Microarray Series PM5

Analyte	Program Code	Challenges per Shipment
	PM5	
Claudin 18.2	▮	10
SF1	▮	10

Each year, the PM5 program will feature two different markers for immunohistochemistry laboratories to evaluate assay performance on a variety of tissue and/or tumor types. The IHC markers for this program may change from those listed above due to development constraints.

Program Information

- Two 10-core tissue microarray slides, one for Claudin 18.2 and one for SF1
- One shipment per year

p53 Immunohistochemistry Tissue Microarray P53

Analyte	Program Code	Challenges per Shipment
	P53	
p53	▮	10

The purpose of this program is to assess the laboratory's ability to detect various patterns of p53 staining, which is diagnostically useful in several tumor types.

Program Information

- One 10-core tissue microarray slide
- Two shipments per year

Dermatopathology Immunohistochemistry DPIHC

Procedure	Program Code	Challenges per Shipment
	DPIHC	
Dermatopathology	▮	8

This case-based program assesses the laboratory's ability to perform and interpret immunostains commonly used in dermatopathology practice.

Program Information

- Six glass slides with unstained tissue sections from two separate cases; each case includes four slides for selected IHC markers, one slide for H&E, and one slide for negative control.
- Two shipments per year

CAP/ACMG *ERBB2 (HER2)* Amplification by FISH, Interpretation Only CYHI

Analyte/Procedure	Program Code	Challenges per Shipment
	CYHI	
ERBB2 (HER2) amplification in breast cancer, interpretation only	▮	3

Additional Information

- *ERBB2 (HER2)* Amplification by FISH, Interpretation Only is not considered proficiency testing. This exercise may be used to meet the requirements for alternative assessment.
- This program is for laboratories that perform interpretation only for *ERBB2 (HER2)* FISH for breast cancer.
- For laboratories that perform both hybridization and interpretation for *ERBB2 (HER2)* FISH for breast cancer under the same CLIA number, see program CYH on page 257.

Program Information

- Three online interpretation challenges; your CAP shipping contact will be notified via email when the activity is available.
- Two shipments per year

ACMG
American College of Medical Genetics and Genomics
Translating Genes Into Health®

Immunohistochemistry Predictive Markers

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

HER2 Immunohistochemistry HER2

Analyte	Program Code	Challenges per Shipment
	HER2	
HER2	▮	20

The HER2 program fulfills the proficiency testing requirement stated in the ASCO/CAP HER2 Testing Guideline. Due to the unique nature of these human donor-based materials, the shipping date is subject to change. If this should occur, the CAP will provide notification prior to the originally scheduled shipping date.

Program Information

- Two 10-core tissue microarray slides
- Two shipments per year

Gastric HER2 GHER2

Analyte	Program Code	Challenges per Shipment
	GHER2	
HER2	▮	10

Additional Information

- The Gastric HER2 program fulfills the proficiency testing requirement stated in the CAP/ASCP/ASCO Gastroesophageal HER2 Testing Guideline.
- The interpretive criteria for HER2 immunohistochemistry performed on gastroesophageal adenocarcinomas differ significantly from breast carcinoma. The GHER2 program will help participating laboratories understand these differences.
- The Gastric HER2 program also fulfills the proficiency testing requirement for new "Pan-Tumor HER2" treatment indications, since the assay-scoring system combination is the same for both Pan-Tumor and Gastric HER2.

Program Information

- One 10-core microarray slide with tumor tissue and/or cell line derived cores
- Two shipments per year

ER/PgR Immunohistochemistry Tissue Microarray PM2

Analyte	Program Code	Challenges per Shipment
	PM2	
Estrogen receptor (ER)	▮	20
Progesterone receptor (PgR)	▮	20

The PM2 program fulfills the ER proficiency testing requirement and the PgR alternative assessment requirement stated in the ASCO/CAP ER/PgR Testing Guideline. Due to the unique nature of these human donor-based materials, the shipping date is subject to change. If this should occur, the CAP will provide notification prior to the originally scheduled shipping date.

Program Information

- Four 10-core microarray slides, two for ER and two for PgR
- Two shipments per year

CD20 Immunohistochemistry Tissue Microarray PM3

Analyte	Program Code	Challenges per Shipment
	PM3	
CD20	▮	10

For ER/PgR testing, see the PM2 program on page 300.

Program Information
- One 10-core tissue microarray slide
- Two shipments per year

Highly Sensitive Anaplastic Lymphoma Kinase IHC PM6

Analyte	Program Code	Challenges per Shipment
	PM6	
Highly sensitive anaplastic lymphoma kinase IHC (ALK)	▮	10

This program assesses the laboratory's ability to detect ALK-rearranged lung cancers using highly sensitive ALK immunohistochemistry. The ALK1 clone is NOT highly sensitive and should not be used in this program.

Program Information
- One 10-core tissue microarray slide
- Two shipments per year

BRAF V600E BRAFV

Analyte	Program Code	Challenges per Shipment
	BRAFV	
BRAF V600E	▮	10

The purpose of this program is to assess the laboratory's ability to detect BRAF V600E mutant tumors using mutation-specific immunohistochemistry.

Program Information
- One 10-core tissue microarray slide
- Two shipments per year

CD30 Immunohistochemistry Tissue Microarray CD30

Analyte	Program Code	Challenges per Shipment
	CD30	
CD30	▮	10

This program assesses the laboratory's ability to detect CD30 expression in lymphomas, which has emerged as a key therapeutic target.

Program Information
- One 10-core tissue microarray slide
- Two shipments per year

DNA Mismatch Repair MMR

Procedure	Program Code	Challenges per Shipment
	MMR	
MLH1 by IHC	▮	10
MSH2 by IHC	▮	10
MSH6 by IHC	▮	10
PMS2 by IHC	▮	10

If your laboratory performs DNA mismatch repair by molecular methods, see the MSI program on page 276.

Program Information

- Four unstained cell line/tissue microarray slides for the immunohistochemical analysis of DNA mismatch repair proteins MLH1, MSH2, MSH6, and PMS2
- Two shipments per year

PD-L1 Immunohistochemistry PDL1

Analyte	Program Code	Challenges per Shipment
	PDL1	
PD-L1	▮	10

The purpose of this program is to assess the laboratory's ability to detect PD-L1 expression and apply various PD-L1 scoring systems.

Program Information

- One 10-core tissue microarray slide; additional slide provided for H&E
- Two shipments per year

Laboratory Administration for Pathologists, Second Edition

Designed to provide an overview of the fundamentals of management and leadership, *Laboratory Administration for Pathologists* addresses the specific role and responsibility of the pathologist in directing the laboratory.

- Provides information for both clinical and anatomic pathology practices
- Includes an overview of patient safety not available in the first edition
- Covers financial management of the laboratory and the pathology practice
- Geared for trainees and those entering practice while appropriate for all pathologists

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Navigating Multimodality Biomarker Assessment NMBA/NMB1

Program Name	Program Code	Cases per Mailing
	NMBA/NMB1	
Multimodality biomarker assessment case analysis	▮	2

Biomarkers can be tested through a variety of methodologies (eg, flow cytometry, immunohistochemistry, next-generation sequencing, PCR-based testing, karyotype, FISH, clinical chemistry). Each modality has different technical strengths and weaknesses, along with varied analytical and clinical specifications such as sensitivity and specificity. Results may not be clearly concordant across the modalities. This program will challenge pathologists to resolve discrepancies between different methods or "multimodality" biomarker testing.

Program Information

- NMBA - Online program, whole slide images powered by DigitalScope technology (if available); NMBA provides CME or CE credit for one pathologist or laboratory professional.
- NMB1 - Reporting option with CME or CE credit for each additional pathologist or laboratory professional (within the same institution); must order in conjunction with program NMBA.
- Two mailings per year with two cases each mailing
- Earn a maximum of five CME credits (*AMA PRA Category 1 Credits™*) per pathologist and a maximum of five CE credits per laboratory professional per year.
- This activity meets the ABPath CC requirements for Improvement in Health and Health Care (IHHC).
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

Immunohistochemistry Prognostic Markers

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

c-Myc/Bcl-2 Immunohistochemistry Tissue Microarray MYCB

Analyte	Program Code	Challenges per Shipment
	MYCB	
c-Myc	▮	10
Bcl-2	▮	10

This program assesses the laboratory's ability to detect c-Myc and Bcl-2-positivity in large B-cell lymphomas, which have emerged as critical prognostic markers.

Program Information

- Two 10-core tissue microarray slides, one for c-Myc and one for Bcl-2
- Two shipments per year

p16 Immunohistochemistry Tissue Microarray P16

Analyte	Program Code	Challenges per Shipment
	P16	
p16	▮	10

This program assesses the laboratory's ability to detect p16 overexpression in squamous cell carcinomas, mainly as a surrogate for HR-HPV detection in head and neck tumors.

Program Information

- One 10-core tissue microarray slide
- Two shipments per year

Ki-67 Immunohistochemistry Tissue Microarray KI67

Procedure	Program Code	Challenges per Shipment
	KI67	
Ki-67	▮	10

The purpose of this program is to assess the laboratory's ability to accurately quantify the Ki-67 proliferation index, which is prognostically significant and emerging as a companion diagnostic.

Program Information

- One 10-core cell line tissue microarray slide
- Two shipments per year

Immunohistochemistry Interpretation Only Programs

Gastric, Pan Tumor HER2, Interpretation Only GPH/GPH1

NEW

Analyte/Procedure	Program Code	Challenges per Shipment
	GPH/GPH1	
GPH online image review	▮	10

Additional Information

- This program is designed for analyte-specific assessment of Gastric and Pan Tumor (non-breast) HER2 interpretation. Gastric, Pan Tumor HER2, Interpretation Only is an exercise and not considered proficiency testing.
- For laboratories that perform both staining and interpretation for GHER2 under the same CLIA number, see page 300.

Program Information

- GPH - Ten online whole slide images for GPH by IHC interpretation only
- Ten whole slide H&E images for GPH
- GPH1 - Reporting option for each additional pathologist (within the same institution)
- Powered by DigitalScope technology
- This activity meets CAP Checklist requirement ANP.10010 for Professional Competency.
- One online activity per year; your CAP shipping contact will be notified via email when the activity is available.

HER2 and ER Immunohistochemistry, Interpretation Only HERI/HERI1

NEW

Analyte/Procedure	Program Code	Challenges per Shipment
	HERI/HERI1	
HER2 online image review	▮	10
ER online image review	▮	10

Additional Information

- This program is designed for analyte-specific assessment of HER2 and ER interpretation in breast cancer. HER2 and ER Immunohistochemistry Interpretation Only is an exercise and not considered proficiency testing.
- For laboratories that perform both staining and interpretation for HER2 and ER under the same CLIA number, see page 300.
- This program will include the revised scoring categories for Negative (0), allowing for reporting of HER2 “ultralow” in breast cancer.

Program Information

- HERI - Ten online whole slide images each for HER2 and ER by IHC interpretation only; 10 whole slide images for H&E
- HERI1 - Reporting option for each additional pathologist (within the same institution)
- Powered by DigitalScope technology
- This activity meets CAP Checklist requirement ANP.10010 for Professional Competency.
- One online activity per year; your CAP shipping contact will be notified via email when the activity is available.

NEW

PD-L1 Tumor Proportion Score IHC, Interpretation Only TPS/TPS1

Analyte/Procedure	Program Code	Challenges per Shipment
	TPS/TPS1	
PD-L1 TPS online image review	▮	10

Additional Information

- This program is designed for analyte-specific assessment of PD-L1 Tumor Proportion Score IHC Interpretation Only (in lung tumors). PD-L1 Tumor Proportion Score IHC Interpretation Only is an exercise and not considered proficiency testing.
- For laboratories that perform both staining and interpretation for PD-L1 under the same CLIA number, see page 302.

Program Information

- Ten whole slide H&E images for PD-L1 TPS
- TPS1 - Reporting option for each additional pathologist (within the same institution)
- Powered by DigitalScope technology
- This activity meets CAP Checklist requirement ANP.10010 for Professional Competency.
- One online activity per year; your CAP shipping contact will be notified via email when the activity is available.

Specialty Anatomic Pathology

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Autopsy Pathology AUP/AUP1

Procedure	Program Code	Challenges per Shipment
	AUP/AUP1	
Autopsy online case analysis	▮	5

- Program AUP prepares pathologists and pathologist's assistants to succeed by providing ongoing diagnostic learning in autopsy pathology.
- Each case includes case description, gross and/or microscopic images, and case discussion with sample death certificate, key teaching points, and current references.

Program Information

- AUP - Online activity providing five cases; an activity including an additional mini-symposium; reporting with CME or CE credit is available for one pathologist or pathologist's assistant; for each additional pathologist/pathologist's assistant, order AUP1.
- Includes the option to download program content
- AUP1 - Reporting option with CME or CE credit for each additional pathologist or pathologist's assistant (within the same institution); must order in conjunction with program AUP.
- Earn a maximum of 12.5 CME credits *(AMA PRA Category 1 Credits)* per pathologist and a maximum of 12.5 CE credits per pathologist's assistant for completion of entire year.
- This activity meets the ABPath CC requirements for Improvement in Health and Health Care (IHHC).
- Online whole slide images powered by DigitalScope technology (if available)
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

CME CE credit

Digital Slide Program—Dermatopathology DPATH/DPATH1

Program	Program Code	Challenges per Shipment
	DPATH/DPATH1	
Online dermatopathology case review	▮	6

Additional Information

- Program DPATH prepares pathologists, dermatopathologists, and dermatologists to succeed by providing ongoing diagnostic learning in dermatopathology.
- Cases include static images.
- See system requirements on page 12.

Program Information

- DPATH - Six diagnostic challenges/whole slide images with clinical history; reporting with CME credit is available for one pathologist; for each additional pathologist, order DPATH1.
- DPATH1 - Reporting option with CME credit for each additional pathologist (within the same institution); must order in conjunction with program DPATH.
- Earn a maximum of 15 CME credits *(AMA PRA Category 1 Credits)* per pathologist for completion of an entire year.
- This activity meets the ABPath CC requirements for Improvement in Health and Health Care (IHHC).
- Powered by DigitalScope technology
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

CME credit

Hematopathology Online Education HPATH/HPATH1

Program	Program Code	Challenges per Shipment
	HPATH/HPATH1	
Hematopathology online case review	▮	5

Additional Information

HPATH/HPATH1 prepares pathologists and pathology trainees with an interest in hematopathology to succeed by providing ongoing diagnostic learning and self-assessment.

The program includes 10 challenge cases written by expert hematopathologists per year. For each case, the learner will:

- Review virtual whole slide image(s) in the context of a clinical scenario and relevant laboratory data.
- Select and interpret appropriate ancillary studies (IHC, flow cytometry, FISH, cytogenetics, molecular studies, etc) with real-time feedback.
- Simulate a real-world diagnostic workup to arrive at the appropriate diagnosis.
- Apply knowledge to answer three CME questions.

Cases span the breadth of benign and neoplastic hematopathology. Discussions incorporate current best practices in the workup, diagnosis, and subclassification of hematolymphoid diseases.

Neoplastic entities are discussed in the context of both the International Consensus Classification (ICC) and the fifth edition of the World Health Organization (WHO) classification.

See system requirements on page 12.

Program Information

- HPATH - Five diagnostic challenges per activity (two activities per year), with online whole slide images. Reporting with CME credit is available for one participant.
- HPATH1 - Reporting option with CME credit for each additional participant (within the same institution); must order in conjunction with program HPATH.
- Earn a maximum of 12.5 CME credits (*AMA PRA Category 1 Credits™*) per participant.
- This activity meets the ABPath CC requirements for Improvement in Health and Health Care (IHHC).
- Powered by DigitalScope technology
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

CME CE credit

Neuropathology Program NP/NP1

Program	Program Code	Challenges per Shipment
	NP/NP1	
Neuropathology online case review	▮	8

Program NP prepares anatomic pathologists, neuropathologists, and trainees to succeed by providing ongoing diagnostic learning in neuropathology. Each educational program includes eight cases that cover the spectrum of neoplastic and nonneoplastic disorders affecting the central and peripheral nervous systems, including infectious, degenerative, developmental, demyelinating, traumatic, toxic-metabolic, vascular, and neuromuscular diseases. In addition, each program offering will include a mini-symposium focusing on a specific problem area in neuropathology that relates to at least four of the eight cases.

Program Information

- NP - Online activity providing eight cases and a mini-symposium; reporting with CME credit is available for one pathologist; for each additional pathologist, order NP1.
- Includes option to download program content
- NP1 - Reporting option with CME credit for each additional pathologist (within the same institution); must order in conjunction with program NP.
- Earn a maximum of 10 CME credits *(AMA PRA Category 1 Credits)* per pathologist.
- This activity meets the ABPath CC requirements for Improvement in Health and Health Care (IHHC).
- Powered by DigitalScope technology
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

CME credit

Cytopathology

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Glass Slide Gynecologic Cytopathology PT Program With Glass Slide PAP Education PAP PT

Slide Type	Program Code					Challenges per Year	
	PAPCPT	PAPKPT	PAPMPT	PAPLPT	PAPJPT	Proficiency Testing	Education
Conventional	▮				▮	10	10
SurePath		▮		▮	▮		
ThinPrep			▮	▮	▮		
Individual Participant Response Form	APAPCPT	APAPKPT	APAPMPT	APAPLPT	APAPJPT		

Programs PAPCPT, PAPKPT, PAPMPT, PAPLPT, and PAPJPT prepare pathologists and cytotechnologists to succeed by providing ongoing diagnostic learning in gynecologic cytopathology.

Ordering Information

You will receive one shipment for proficiency testing (10 slides) and two additional shipments for your education (five slides each).

Follow these steps to order your PAP Proficiency Testing and PAP Education:

1. Choose the following:
   a. Slide type program code (refer to table above)
   b. PAP Education series shipment dates (choose one)
      - Series 1
        - A mailing ships in February
        - B mailing ships in August
      - Series 2
        - A mailing ships in May
        - B mailing ships in November
   c. Add the PAP Education series number after the slide type program code (eg, PAPCPT1, PAPCPT2).
2. Order one Individual Participant Response Form code for each participating pathologist/cytotechnologist. Include the PAP Education Series number after the program code (eg, APAPCPT1).
3. Select one primary testing session option with two alternative date options using the Gynecologic Cytology Proficiency Testing Order Details Form.
4. PPTENR is required by CMS as verification that personnel required to participate in PAP PT under its CLIA number are taking the examination at another laboratory.

Additional Information

- Participants will receive an evaluation via email shortly after submitting results.
- The PAP Education component meets the CAP Laboratory Accreditation Program requirement for participation in a peer educational program.

Program Information

- Ten glass slides for proficiency testing and 10 glass slides for education
- APAPCPT, APAPKPT, APAPMPT, APAPLPT, APAPJPT - Reporting option with CME or CE credit for each pathologist/cytotechnologist (within the same institution); must order in conjunction with PAPCPT, PAPKPT, PAPMPT, PAPLPT, PAPJPT.
- Earn a maximum of eight CME credits (*AMA PRA Category 1 Credits*) per pathologist and a maximum of eight CE credits per cytotechnologist for completing all challenges.
- This activity meets the ABPath CC requirements for Improvement in Health and Health Care (IHHC).
- Three shipments per year; one shipment for proficiency testing (10 slides) and two shipments for education (five slides each)

Cytopathology Glass Slide Education Program PAPCE, PAPJE, PAPKE, PAPLE, PAPME Series 1 or 2

Slide Type	Program Code					Education Challenges per Year
	PAPCE	PAPKE	PAPME	PAPLE	PAPJE	
Conventional	▮				▮	10
SurePath		▮		▮	▮	
ThinPrep			▮	▮	▮	
Individual Participant Response Form	APAPCE	APAPKE	APAPME	APAPLE	APAPJE	

Programs PAPCE, PAPKE, PAPME, PAPLE, and PAPJE prepare pathologists and cytotechnologists to succeed by providing ongoing diagnostic learning in cytopathology.

Ordering Information

Follow these steps to order your PAP Education:

1. Choose the following:
   a. Slide type program code (refer to table above)
   b. PAP Education series shipment dates (choose one)
      - Series 1
        - A mailing ships in February
        - B mailing ships in August
      - Series 2
        - A mailing ships in May
        - B mailing ships in November
   c. Add the PAP Education series number after the slide type program code (eg, PAPCE1, PAPCE2).
2. Order one Individual Participant Response Form code for each participating pathologist/cytotechnologist. Include the PAP Education series number after the program code (eg, APAPCE1).

Additional Information

- Participants will receive an evaluation via email shortly after submitting the laboratory form via fax.
- The PAP Education component meets the CAP Laboratory Accreditation Program requirement for participation in a peer educational program.

Program Information

- Ten glass slides for education
- APAPCE, APAPJE, APAPKE, APAPLE, APAPME - Reporting option with CME or CE credit for each pathologist/cytotechnologist (within the same institution); must order in conjunction with programs PAPCE, PAPJE, PAPKE, PAPLE, PAPME.
- Earn a maximum of eight CME credits (*AMA PRA Category 1 Credits*) per pathologist and a maximum of eight CE credits per cytotechnologist for completing all challenges.
- This activity meets the ABPath CC requirements for Improvement in Health and Health Care (IHHC).
- Two shipments (five slides each)

Human Papillomavirus (High Risk) for Cytopathology CHPV

NEW

Analyte/Procedure	Program Code	Challenges per Shipment
	CHPV	
HPV	▮	5
High-risk HPV genotyping (optional)	▮	5

Additional Information

- The specimens in this program are not intended to be specific to a transport medium. Laboratories should perform testing using the transport media used in their facility.
- For laboratories that perform high-risk HPV (HrHPV) genotyping in-house, this program provides opportunities to report specific HPV genotypes, which are educational.
- The CAP does not report genotyping responses to the CMS.

Program Information

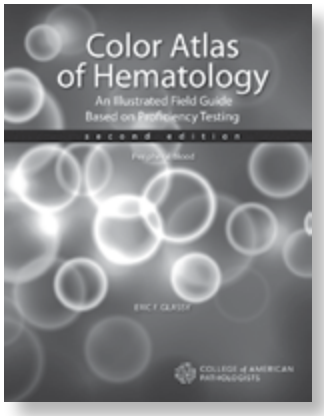
- Five simulated cervical swab specimens
- For use in molecular testing
- Three shipments per year

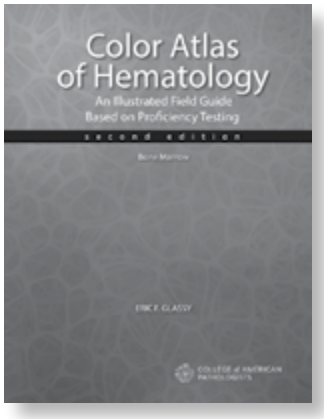
Color Atlas of Hematology—Vol 1. Peripheral Blood
Color Atlas of Hematology—Vol 2. Bone Marrow

The second edition of *Color Atlas of Hematology* has now expanded to two volumes, with the addition of bone marrow pathology.

Volume 1 presents keen insights into peripheral blood pathology with links to 18 engaging videos. View 100+ peripheral blood smears online with DigitalScope® technology.

Volume 2 is a useful and instructional reference guide to bone marrow pathology. Explore the detailed "A Closer Look At..." sections. Access the links to interactive slide images.





Vol 1. Peripheral Blood
Item number: PUB222 Hardcover; 480 pages; 2018

Vol 2. Bone Marrow
Item number: PUB229 Hardcover; 408 pages; 2023

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- printed books at estore.cap.org

Nongynecologic Cytopathology Education Program NGC/NGC1

Procedure	Program Code	Challenges per Shipment
	NGC/NGC1	
Nongynecologic cytopathology case review – glass slides	▮	5
Nongynecologic cytopathology case review – online	▮	5 per year

Additional Information

- Designed to help pathologists and cytotechnologists get ready to succeed, the Nongynecologic Cytopathology Education Program (NGC) is an interlaboratory educational opportunity to assess participants' screening and interpretive skills. The NGC program is unsuitable for proficiency testing as these cases are chosen for their educational value. Cases may incorporate static online images that include radiology and multiple aspects of pathology to enhance the interpretation.
- Participants will receive an evaluation via email shortly after submitting the laboratory form via fax.
- Additional online advanced education cases provide immediate feedback on interpretation selection, follow-up recommendations, and case-related educational questions.
- See system requirements on page 12.

Program Information

- NGC - Five glass slides per shipment; five online cases; one laboratory response form and two individual response forms
- NGC1 - Reporting option with CME or CE credit for each additional pathologist/cytotechnologist (within the same institution); must order in conjunction with program NGC.
- Earn a maximum of 25 CME credits *(AMA PRA Category 1 Credits)* per pathologist and a maximum of 25 CE credits per cytotechnologist for completing the glass slides and online cases.
- This activity meets the ABPath CC requirements for Improvement in Health and Health Care (IHHC).
- One complimentary online activity with whole slide images powered by DigitalScope technology
- Four shipments of glass slides per year

CME CE credit

Digital Slide Program in Fine-Needle Aspiration FNA/FNA1

Procedure	Program Code	Challenges per Shipment
	FNA/FNA1	
Online program in fine-needle aspiration case review	▮	5

Additional Information

- The FNA program gets pathologists and cytotechnologists ready to succeed by focusing on fine-needle aspiration diagnostic dilemmas in practice. Online cases, which consist of whole slide images and static images, provide immediate feedback on interpretation selection, ancillary studies selection, and case-related educational questions.
- Cases will focus on fine-needle aspiration of lymph node and GI EUS/liver/abdominal topics.
- May include rarely captured cases that may not be available on the glass slide
- See system requirements on page 12.

Program Information

- FNA - Five online diagnostic challenges; FNA provides CME or CE credit for one pathologist or cytotechnologist; for each additional pathologist or cytotechnologist, order FNA1.
- FNA1 - Reporting option with CME or CE credit for each additional pathologist/cytotechnologist (within the same institution); must order in conjunction with program FNA.
- Earn a maximum of 10 CME credits *(AMA PRA Category 1 Credits)* per pathologist and a maximum of 10 CE credits per cytotechnologist.
- This activity meets the ABPath CC requirements for Improvement in Health and Health Care (IHHC).
- Online whole slide images powered by DigitalScope technology
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

Fine-Needle Aspiration Glass Slide FNAG/FNAG1

Procedure	Program Code	Challenges per Shipment
	FNAG/FNAG1	
Fine-needle aspiration glass slide case review	▮	5

Additional Information

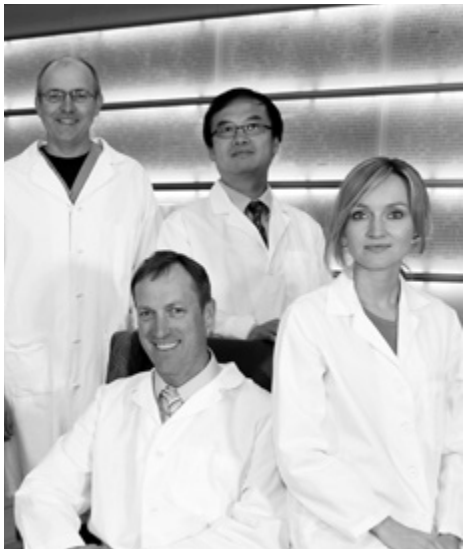
- The Fine-Needle Aspiration Glass Slide program gets pathologists and cytotechnologists ready to succeed through an interlaboratory educational opportunity to assess participants' screening and interpretive skills. Program FNAG cases may include more than one slide of varying stains and/or preparations used on fine-needle aspirations.
- Cases may include static online images that incorporate radiology and multiple aspects of pathology to support the interpretation.
- Participants will receive an evaluation via email shortly after submitting the laboratory form via fax.

Program Information

- FNAG - Five cases consisting of glass slides and selected online images, representing a variety of conditions; one laboratory response form and two individual response forms
- FNAG1 - Reporting option with CME or CE credit for each additional pathologist/cytotechnologist (within the same institution); must order in conjunction with program FNAG.
- Earn a maximum of 10 CME credits *(AMA PRA Category 1 Credits)* per pathologist and a maximum of 10 CE credits per cytotechnologist.
- This activity meets the ABPath CC requirements for Improvement in Health and Health Care (IHHC).
- Two shipments per year

CME CE credit

21 Forensic Sciences



Benefit from the support of experts in laboratory medicine.

These experts spend countless hours monitoring testing trends to:

- Determine specimen specifications for PT programs to challenge participants.
- Keep our offerings contemporary with new analytes and programs.
- Provide peer-reviewed continuing medical education, continuing education, and self-assessment modules.

Forensic Sciences

Analytes/procedures in **bold** type are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Forensic Pathology FR/FR1

Procedure	Program Code	Challenges per Shipment
	FR/FR1	
Forensic pathology cases	▮	5

Additional Information

- Cases may include or reflect anthropologic materials, ballistics, dental identification, DNA identification, environmental pathology, forensic evidence, injury pattern, medicolegal issues, toxicology, and trace evidence.
- FR prepares hospital-based pathologists, forensic pathologists, residents, fellows, and medical examiners/coroners for success by keeping them current in forensic pathology techniques and practices. This educational program is also designed for investigators, analysts, and technicians/technologists.

Program Information

- FR - Online activity containing five case studies illustrating gross and/or microscopic slides and questions related to medicolegal decision making; CME or CE credit is available for one pathologist or investigator. For each additional pathologist or investigator, order FR1.
- FR1 - Additional pathologist or investigator (within the same institution) reporting option with CME or CE credit; must order in conjunction with program FR.
- Includes option to download program content
- Earn a maximum of 12.5 CME credits (*AMA PRA Category 1 Credits™*) per pathologist and a maximum of 12.5 CE credits per investigator for completion of an entire year.
- This activity meets the ABPath CC requirements for Improvement in Health and Health Care (IHHC).
- Two online activities per year; your CAP shipping contact will be notified via email when the activity is available.

Vitreous Fluid, Postmortem VF

Analyte	Program Code	Challenges per Shipment
	VF	
Acetone	▮	3
Chloride	▮	3
Creatinine	▮	3
Ethanol	▮	3
Glucose	▮	3
Potassium	▮	3
Sodium	▮	3
Vitreous urea nitrogen	▮	3

Program Information

- Three 5.0-mL synthetic vitreous fluid specimens
- For forensic and other toxicology laboratories that perform quantitative analysis of vitreous fluid
- Conventional and International System of Units (SI) reporting offered
- Two shipments per year

CE credit

Forensic Pathology: Principles and Pitfalls

Joseph A. Prahlow, MD, FCAP, FNAME, FAAFS
Erin G. Brooks, MD, FCAP, FNAME, FAAFS

NEW

This comprehensive, expert-driven review of forensic pathology features real-world cases, full-color photographs, and key takeaways. It's an essential resource offering evidence-based, practical approaches to complex challenges—from cause-of-death analysis to courtroom testimony. A must-have for pathologists, trainees, and forensic professionals!

Topics include:

- The science of death investigation and the technical skills involved
- Case examples of various scenarios including traffic fatalities, bodies in water, and mass casualties
- Organization of reliable reports and testimony
- Summary of best practices

Item number: PUB132
Hardcover; 956 pages; 2025

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Forensic Toxicology, Criminalistics FTC

Analyte	Program Code	Challenges per Shipment
	FTC	
See drug listing below	▮	5

Program Information

- Five 20.0-mL whole blood specimens
- For crime and hospital laboratories that have forensic toxicology divisions performing qualitative and quantitative analysis of drugs in whole blood specimens
- Three shipments per year

CE credit

FTC Program Drug Listing

Challenges will include a mix of drugs from the list below.

6-acetylmorphine (6-AM)
7-aminoclonazepam
7-aminoflunitrazepam
7-hydroxymitragynine
Acetaminophen
Alpha-hydroxyalprazolam
Alprazolam
Amitriptyline
Amphetamine
Aripiprazole
Atenolol
Atropine
Benzoylecgonine
Brompheniramine
Buprenorphine
Bupropion
Butalbital
Carbamazepine
Carbamazepine-10, 11-epoxide
Carisoprodol
Chlordiazepoxide
Chlorpheniramine
Citalopram
Clomipramine
Clonazepam
Clozapine
Cocaethylene
Cocaine
Codeine
Cyclobenzaprine*
Delta-9-THC
Delta-9-THC-COOH
Demoxepam
Desipramine
Desmethylclomipramine
Desmethylsertraline
Dextromethorphan
Diazepam
Dihydrocodeine
Diltiazem
Diphenhydramine
Doxepin
Doxylamine
Duloxetine
Ecgonine ethyl ester
Ecgonine methyl ester
Ephedrine
Fentanyl*
Flunitrazepam
Fluoxetine
Gabapentin
Gamma-hydroxybutyrate (GHB)
Hydrocodone
Hydromorphone
Hydroxybupropion
Hydroxyzine
Ibuprofen
Imipramine
Ketamine
Lamotrigine
Levetiracetam
Lidocaine
Lorazepam
Lysergic acid diethylamide (LSD)
Meperidine*
Mephedrone
Meprobamate
Methadone
Methadone metabolite (EDDP)
Methamphetamine
Methylenedioxyamphetamine (MDA)
Methylenedioxymethamphetamine (MDMA)
Methylenedioxypyrovalerone (MDPV)
Methylphenidate
Metoprolol
Midazolam
Mirtazapine
Mitragynine (Kratom)
Morphine*
N-desmethyltramadol
Naproxen
Norbuprenorphine
Norchlordiazepoxide
Norclomipramine
Norcodeine
Norcyclobenzaprine
Nordiazepam
Nordoxepin
Norfentanyl
Norfluoxetine
Norketamine
Normeperidine
Normirtazapine
Noroxycodone
Norpropoxyphene
Norsertraline
Nortrimipramine
Nortriptyline
Norverapamil
O-desmethyltramadol
Olanzapine
Oxazepam
Oxycodone
Oxymorphone
Paroxetine
Pentobarbital
Phencyclidine
Phenethylamine
Pheniramine
Phenobarbital
Phentermine
Phenylephrine
Phenytoin
Pregabalin
Propoxyphene
Propranolol
Pseudoephedrine
Quetiapine
Quinine
Ranitidine
Ritalinic acid
Salicylate
Sertraline
Strychnine
Tapentadol
Temazepam
Topiramate
Tramadol
Trazodone
Trimipramine
Valproic acid
Venlafaxine
Verapamil
Zolpidem

*and/or metabolite(s)

22 Analyte/Procedure Index

Performance Analytics Dashboard: Bringing it all together

The complimentary dashboard helps you monitor your CAP PT/EQA and accreditation performance.

- Access all graded PT/EQA result forms, evaluations, and participant summaries from one location.
- Benchmark your laboratory against your peers' and CAP-wide performance.
- View performance to quickly identify trends/patterns to mitigate risk.

Analyte/Procedure Index

The following Analyte/Procedure Index is a comprehensive listing of analytes and corresponding CAP program options. It also includes Calibration Verification/Linearity (CVL) and Quality Cross Check (QCC) programs.

Analytes/procedures in bold type whose corresponding program codes are bold are regulated for proficiency testing by the Centers for Medicare & Medicaid Services (CMS).

Laboratories must perform five challenges three times per year (as noted by boldface) for analytes that are regulated by the CMS.

The X in the LAP ENR column denotes the CAP programs that can be used to fulfill the proficiency testing enrollment requirements for CAP-accredited laboratories. Use this index to identify the correct PT programs that match up to your laboratory's activity menu to meet accreditation requirements. For CAP-accredited laboratories outside the US, enrollment in CAP PT/EQA is required for all tests/activities if a program is available. Refer to program descriptions in this catalog to determine compatibility with your specific methodologies.

Analyte/Procedure	LAP ENR	Program Code	Description	Page
1,25-dihydroxy vitamin D (See Vitamin D, 1,25-dihydroxy)				
1,5-anhydroglucitol		AG	1,5-Anhydroglucitol	71
3-methoxytyramine		N	Urine Chemistry—Special	69
4-hydroxytriazolam		DFC	Drug-Facilitated Crime	109
5-hydroxyindoleacetic acid, qualitative		N	Urine Chemistry—Special	69
5-hydroxyindoleacetic acid, quantitative	X	N	Urine Chemistry—Special	69
6-acetylmorphine (6-AM)		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UDS, UDS6	Urine Drug Screen	98
		UT	Urine Toxicology	96
7-aminoclonazepam		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
7-aminoflunitrazepam		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
7-hydroxymitragynine		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
11-deoxycortisol		Y/YY	Sex Hormones	83
11-hydroxy-THC		THCB	Blood Cannabinoids	107
17-hydroxycorticosteroids		N	Urine Chemistry—Special	69
17-hydroxyprogesterone	X	Y/YY	Sex Hormones	83
17-ketosteroids		N	Urine Chemistry—Special	69
25-OH vitamin D, total (See Vitamin D, 25-OH)				
50:50 mixing study, aPTT		CGE/CGEX	Coagulation, Extended	165
		CGS1	Coag Special, Series 1	166
50:50 mixing study, PT		CGE/CGEX	Coagulation, Extended	165
		CGS1	Coag Special, Series 1	166
ABO grouping	X	**J, JXM, J1**	Transfusion Medicine	234
	X	**JAT, JATXM**	Transfusion Medicine, Automated	235
		JATE1	Transfusion Medicine, Automated, Educational	235
		JATQ	QCC, Transfusion Medicine	48
		TMCA	Transfusion Medicine, Competency Assessment	241
ABO subgroup typing		ABOSG	ABO Subgroup Typing	237
		J, JXM	Transfusion Medicine	234
		JAT, JATXM	Transfusion Medicine, Automated	235
ABO typing, molecular		DML	Class I & II HLA Molecular Typing	251
Acetaminophen	X	**CZ/CZX/CZ2X, Z**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		FTC	Forensic Toxicology, Criminalistics	105
		LN3	TDM CVL	123
		SDS	Serum Drug Screen	102
		T	Toxicology	96
		UT	Urine Toxicology	96
Acetone	X	AL1	Whole Blood Alcohol/Volatiles	102

Analyte/Procedure	LAP ENR	Program Code	Description	Page
Acetone (cont.)	X	AL2	Serum Alcohol/Volatiles	102
		SDS	Serum Drug Screen	102
		VF	Vitreous Fluid, Postmortem	102
Acid phosphatase		C3/C3X, CZ/CZX/CZ2X	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
Acid-fast smear	X	**E**	Mycobacteriology	191
	X	**E1**	Mycobacteriology, Ltd	191
***Acinetobacter calcoaceticus-baumannii* complex**	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
Activated clotting time	X	CT1, CT2, CT3, CT5	ACT	168
		CT1Q, CT2Q, CT3Q, CT5Q	QCC, ACT	46
		POC14, POC15	Competency Activated Clotting Time	51
Activated partial thromboplastin time		APXBN	Anticoagulant Monitoring, Apixaban	168
	X	**CGB**	Basic Coagulation	164
		CGE/CGEX	Coagulation, Extended	165
	X	**CGL**	Coagulation, Limited	164
		CGLQ	QCC, Coagulation, Limited	46
		CGS1	Coag Special, Series 1	166
		CGS3	Coag Special, Series 3	166
		CGS4	Coag Special, Series 4	166
		DBGN	Anticoagulant Monitoring, Dabigatran	168
		FNPX	Anticoagulant Monitoring, Fondaparinux	168
		RVBN	Anticoagulant Monitoring, Rivaroxaban	168
Activated protein C resistance		CGE/CGEX	Coagulation, Extended	165
		CGS2	Coag Special, Series 2	166
Active vitamin B_{12} (See Vitamin B_{12}, active)				
Acylcarnitine		BGL	Biochemical Genetics	259
Acylcarnitine quantitation		BGL4	Acylcarnitine Quantitation for Inherited Metabolic Disorders	261
ADAMTS13		CGS7	ADAMTS13	166
Adenovirus		GIP	Gastrointestinal Panel	212
	X	**GIP5**	Gastrointestinal Panel, 5 Challenge	212
		GIPN	Gastrointestinal Panel, Global	213
		ID2	Nucleic Acid Amp, Respiratory	203
Adenovirus (cont.)	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
	X	**IDR**	Infectious Disease, Respiratory Panel	210
		VLS2	Viral Load	205
	X	**VR1**	Virology Culture	199
	X	**VR2**	Viral Antigen by DFA	199
	X	**VR4**	Viral Antigen by EIA and Latex	199
Adenovirus 40/41		SP, SPN	Stool Pathogen	187
Adrenocorticotropic hormone (ACTH)	X	TM/TMX	Tumor Markers	88
Alanine aminotransferase (ALT/SGPT)	X	**C1, C3/C3X, CZ/CZX/CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
Alanine, quantitative		BGL2	Amino Acid Quantitation for Inherited Metabolic Disorders	260
Albumin		ABS	Accuracy-Based Testosterone and Estradiol	113
	X	**C1, C3/C3X, CZ/CZX/CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
		SPE	Protein Electrophoresis	75
Albumin, body fluid		FLD	Body Fluid	71
		FLDQ	QCC, Body Fluid Chemistry	38
Albumin, CSF	X	M, OLI	CSF Chemistry and Oligoclonal Bands	73
Albumin, urine		ABU	Accuracy-Based Urine	113
		LN20	Urine Albumin	128
	X	U	Urine Chemistry—General	68
	X	UMC	Urine Albumin Creatinine	158
Albumin:creatinine ratio, urine		ABU	Accuracy-Based Urine	113
		LN20	Urine Albumin CVL	128
		U	Urine Chemistry—General	68

Analyte/Procedure	LAP ENR	Program Code	Description	Page
Albumin:creatinine ratio, urine (cont.)		UMC	Urine Albumin Creatinine	158
Alcohol, serum	X	**AL2**	Serum Alcohol/Volatiles	102
		LN11	Serum Ethanol CVL	125
Alcohol, whole blood	X	**AL1**	Whole Blood Alcohol/ Volatiles	102
Aldolase		ADL	Aldolase	71
Aldosterone, serum	X	RAP	Renin and Aldosterone	87
Aldosterone, urine		N	Urine Chemistry—Special	69
Alkaline phosphatase (ALP)	X	**C1, C3/C3X, CZ/CZX/ CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
Alkaline phosphatase (ALP), body fluid		FLD2	Body Fluid Chemistry 2	72
Allergens (specific) (See IgE allergen-specific, quantitative)				
Alloisoleucine, quantitative		BGL2	Amino Acid Quantitation for Inherited Metabolic Disorders	260
Alpha-1 antitrypsin	X	**IG/IGX**	Immunology, General	218
		LN7	Immunology CVL	124
Alpha-1 antitrypsin genotyping *(SERPINA1)* gene	X	AAT	Alpha-1 Antitrypsin Genotyping	261
Alpha-1 globulin		SPE	Protein Electrophoresis	75
Alpha-2 antiplasmin		CGE/CGEX	Coagulation, Extended	165
Alpha-2 globulin		SPE	Protein Electrophoresis	75
Alpha-2 macroglobulin		A2MG	Alpha-2-Macroglobulin	220
Alpha-fetoprotein (AFP), amniotic fluid	X	FP/FPX	Maternal Screen	86
Alpha-fetoprotein (AFP), serum	X	**FP/FPX**	Maternal Screen	86
	X	**K/KK**	Ligand—General	82
		LN5	Ligand CVL	123
		LN5S	Ligand CVL – all Siemens ADVIA (Centaur, CP, and XP) and Atellica IM	123
Alpha-hydroxyalprazolam		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96

Analyte/Procedure	LAP ENR	Program Code	Description	Page
Alpha-hydroxyalprazolam (cont.)		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UT	Urine Toxicology	96
Alpha-thalassemia		HGM	Hemoglobinopathies, Molecular Methods	263
Alprazolam		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UT	Urine Toxicology	96
Aluminum	X	R	Trace Metals	77
Aluminum, urine		TMU	Trace Metals, Urine	104
Amikacin	X	CZ/CZX/ CZ2X, Z	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN3	TDM CVL	123
Amino acids, qualitative	X	BGL	Biochemical Genetics	259
Amino acids, quantitative		BGL	Biochemical Genetics	259
		BGL2	Amino Acid Quantitation for Inherited Metabolic Disorders	260
Amitriptyline		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
	X	ZT	TDM, Special	59
Ammonia		C3/C3X, CZ/ CZX/CZ2X	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN32	Ammonia CVL	130
Amniotic fluid leakage (nitrazine)		AFL	Amniotic Fluid Leakage	152
Amobarbital		DFC	Drug-Facilitated Crime	109
Amphetamine		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UDS, UDS6	Urine Drug Screen	98
		UT	Urine Toxicology	96
		UTCO	Urine Toxicology Carryover	135
Amphetamine group		DMPM	Drug Monitoring for Pain Management	108

Analyte/Procedure	LAP ENR	Program Code	Description	Page
Amphetamine group (cont.)		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UDS, UDS6	Urine Drug Screen	98
		UT	Urine Toxicology	96
Amylase	X	**C1, C3/C3X, CZ/CZX/ CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
Amylase, body fluid		FLD	Body Fluid	71
		FLDQ	QCC, Body Fluid Chemistry	38
Amylase, pancreatic	X	**C1, C3/C3X, CZ/CZX/ CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
Amylase, urine		LN6	Urine Chemistry CVL	124
	X	U	Urine Chemistry—General	68
Anaerococcus prevotii/ vaginalis		JIP	Joint Infection Panel	208
Anaplasma phagocytophilum		TTD	Tick-Transmitted Diseases	215
Anaplastic lymphoma kinase	X	PM6	Anaplastic Lymphoma Kinase IHC	301
Androstenedione	X	Y/YY	Sex Hormones	83
Angiotensin converting enzyme		ACE	Angiotensin Converting Enzyme	71
Anti ADAMTS13 IgG		CGS7	ADAMTS13	166
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		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
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Butalbital		DFC	Drug-Facilitated Crime	109
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		FTC	Forensic Toxicology, Criminalistics	105
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		CZQ	QCC, Chemistry and TDM	37
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		CZQ	QCC, Chemistry and TDM	37
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	X	C3/C3X, CZ/CZX/CZ2X	Chemistry and TDM	54–56
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		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
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		SOQ	QCC, Blood Oximetry	42
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		LN22	Flow Cytometry CVL	128
CD8	X	FL, FL1	Lymphocyte Subset Immunophenotyping	226
		LN22	Flow Cytometry CVL	128
CD20		PM3	Immunohistochemistry	301
CD30		CD30	CD30 Immunohistochemistry	301
		RFAV3	Rare Flow Antigen Validation, CD30	231
CD34		CBT	Cord Blood Testing	242
	X	FL4	Flow Cytometry CD34+	226
		SCP	Stem Cell Processing	242
CD45		FL4	Flow Cytometry CD34+	226
		SCP	Stem Cell Processing	242
CD49d		ZAP70	ZAP-70 Analysis by Flow Cytometry	232
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Analyte/Procedure	LAP ENR	Program Code	Description	Page
CEA	X	**K/KK**	Ligand—General	82
		LN5	Ligand CVL	123
		LN5S	Ligand CVL – all Siemens ADVIA (Centaur, CP, and XP) and Atellica IM	123
CEA, body fluid		FLD	Body Fluid	71
		FLDQ	QCC, Body Fluid Chemistry	38
Cell-free DNA		CFDNA	Cell-Free Tumor DNA	278
Cell-free DNA screening for fetal aneuploidy		NIPT	Noninvasive Prenatal Testing	87
Ceruloplasmin	X	S2, S4	Immunology, Special	219
CFU-GM		CBT	Cord Blood Testing	242
		SCP	Stem Cell Processing	242
CH50		CH50	Total Hemolytic Complement	224
Chlamydia pneumoniae		IDN, IDO	Nucleic Acid Amp, Organisms	207
	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
	X	**IDR**	Infectious Disease, Respiratory Panel	210
Chlamydia trachomatis	X	HC3	*C. trachomatis* by EIA	185
		VR1	Virology Culture	199
***Chlamydia trachomatis*, molecular**	X	**HC6, HC6X**	*C. trachomatis*/GC by Nucleic Acid Amp	189
	X	**HC7**	*C. trachomatis*/GC DNA by NAA	189
	X	**STIM**	Sexually Transmitted Infection Detection, Molecular	190
Chlordiazepoxide		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Chloride	X	**AQ, AQH, AQIS**	Critical Care Blood Gas	90–91
		AQQ, AQHQ, AQSQ	QCC, Critical Care Blood Gas Series	41
	X	**C1, C3/C3X, C4, CZ/CZX/ CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN13C	Blood Gas CVL	126
		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
		POC10, POC11	POC Competency Blood Gases	51

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Chloride, body fluid		FLD2	Body Fluid Chemistry 2	72
Chloride, sweat	X	SW2, SW4	Sweat Analysis Series	78
Chloride, urine		LN6	Urine Chemistry CVL	124
	X	U	Urine Chemistry—General	68
Chloride, vitreous fluid		VF	Vitreous Fluid, Postmortem	102
Chlorpheniramine		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Cholesterol		ABL	Accuracy-Based Lipids	112
	X	**C1, C3/C3X, C4, CZ/CZX/ CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
	X	LCW	Chemistry—Ltd, Waived	63
		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
Cholesterol, body fluid		FLD	Body Fluid	71
		FLDQ	QCC, Body Fluid Chemistry	38
Chromium	X	R	Trace Metals	77
Chromium, urine		TMU	Trace Metals, Urine	104
Chromium, whole blood		TMWB	Trace Metals, Whole Blood	104
Chromosomal abnormalities	X	CY, CYBK	Cytogenetics	256
Citalopram		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Citrate		KSA	Kidney Stone Risk Assessment	69
Citrobacter spp.		JIP	Joint Infection Panel	208
Citrulline, quantitative		BGL2	Amino Acid Quantitation for Inherited Metabolic Disorders	260
CK isoenzymes	X	**CRTI, HCRTI**	Cardiac Markers	60
CK2 (MB)		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122

Analyte/Procedure	LAP ENR	Program Code	Description	Page
CK-MB (immunochemical)	X	**CRT, CRTI, HCRT, HCRTI**	Cardiac Markers	60
		CRTQ	QCC, Cardiac Markers	38
		HCRQ	QCC, High-Sensitivity Cardiac Markers	39
		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
	X	**PCARM/ PCARMX**	Point-of-Care Cardiac Markers	64
		POC12	POC Cardiac Markers Competency	51
Claudin		PM5	Immunohistochemistry Tissue Microarray	298
Clinical pathology improvement program		CPIP/CPIP1	Quality Management, Education	14
Clobazam		DFC	Drug-Facilitated Crime	109
		ZE	Therapeutic Drug Monitoring, Extended	59
Clomipramine		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Clonazepam		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Clonidine		DFC	Drug-Facilitated Crime	109
***Clostridioides (Clostridium) difficile* antigen**		CDF2	*Clostridioides (Clostridium) difficile* Detection	185
	X	**CDF5**	*Clostridioides (Clostridium) difficile* Detection	185
	X	**D**	Bacteriology-Antigen Detection	175
		SP, SPN	Stool Pathogens—Rapid and Molecular	187
***Clostridioides (Clostridium) difficile* toxin**		CDF2	*Clostridioides (Clostridium) difficile* Detection	185
	X	**CDF5**	*Clostridioides (Clostridium) difficile* Detection	185
	X	**D**	Bacteriology-Toxin Detection	175
		GIP	Gastrointestinal Panel	212

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Clostridioides (Clostridium) difficile toxin (cont.)	X	**GIP5**	Gastrointestinal Panel, 5 Challenge	212
		GIPN	Gastrointestinal Panel, Global	213
		SP, SPN	Stool Pathogens—Rapid and Molecular	187
Clozapine		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
		ZE	Therapeutic Drug Monitoring, Extended	59
CMV (See Cytomegalovirus)				
CMV, IgG, IgM	X	VR3	Infectious Disease Serology	215
CMV, total	X	VM3	Viral Markers Series 3	245
	X	VR3	Infectious Disease Serology	215
c-Myc/Bcl-2 immunohistochemistry tumor markers		MYCB	c-Myc/Bcl-2 Immunohistochemistry TMA	304
CO_2 (See Carbon dioxide, pCO_2, and tCO_2)				
Cobalt		TMU	Trace Metals, Urine	104
Cobalt, whole blood		TMWB	Trace Metals, Whole Blood	104
Cocaethylene		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Cocaine		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UDS, UDS6	Urine Drug Screen	98
		UT	Urine Toxicology	96
Codeine		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UT	Urine Toxicology	96

Analyte/Procedure	LAP ENR	Program Code	Description	Page
Compatibility testing	X	**J, JXM, JAT, JATXM**	Transfusion Medicine	234–235
		JATE1	Transfusion Medicine, Automated, Educational	235
		TMCA	Transfusion Medicine, Competency Assessment	241
Complement C3	X	**IG/IGX**	Immunology, General	218
		LN7	Immunology CVL	124
Complement C4	X	**IG/IGX**	Immunology, General	218
		LN7	Immunology CVL	124
Complexed PSA		K/KK	Ligand—General	82
COMT		PGX1	Pharmacogenetics	266
Conductivity, sweat	X	SW2, SW4	Sweat Analysis Series	78
Connexin 26 (*GJB2* gene)	X	MGL3	Molecular Genetics	264–265
Copper	X	R	Trace Metals	77
Copper, urine		TMU	Trace Metals, Urine	104
Copper, whole blood		TMWB	Trace Metals, Whole Blood	104
Coproporphyrins	X	N	Urine Chemistry—Special	69
Copy number variant		CNVST	Copy Number Variant—Solid Tumor	275
Coronavirus		ID2	Nucleic Acid Amp, Respiratory	203
	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
	X	**IDR**	Infectious Disease, Respiratory Panel	210
Cortisol		ABS	Accuracy-Based Testosterone and Estradiol	113
	X	**C1, C3/C3X, CZ/CZX/CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
	X	**K/KK**	Ligand—General	82
		LN5	Ligand CVL	123
		LN5S	Ligand CVL – all Siemens ADVIA (Centaur, CP, and XP) and Atellica IM	123
Cortisol, salivary		SALC	Salivary Cortisol	76
Cortisol, urinary free	X	N	Urine Chemistry—Special	69
Cotinine		NTA	Nicotine and Tobacco Alkaloids	103
		OFD	Oral Fluid for Drugs of Abuse	101
COVID-19 (See SARS-CoV-2)				

Analyte/Procedure	LAP ENR	Program Code	Description	Page
C-peptide	X	ABGIC	Accuracy-Based Glucose, Insulin, and C-peptide	116
		LN46	C-peptide/Insulin CVL	133
C-reactive protein (CRP)	X	CRP, IL	Immunology	218
		LN12	C-reactive Protein CVL	126
C-reactive protein, high-sensitivity (hsCRP) (See High-sensitivity C-reactive protein)				
Creatine kinase (CK)	X	**C1, C3/C3X, CZ/CZX/CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
Creatinine	X	**AQ, AQH, AQIS**	Critical Care Blood Gas	90–91
		AQQ, AQHQ, AQSQ	QCC, Critical Care Blood Gas Series	41
	X	**C1, C3/C3X, C4, CZ/CZX/CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN24	Creatinine Accuracy Cal CVL	129
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
		SCO	Serum Carryover	135
Creatinine, body fluid		FLD	Body Fluid	71
		FLDQ	QCC, Body Fluid Chemistry	38
Creatinine, urine		ABU	Accuracy-Based Urine	113
	X	CD	Cadmium	103
		DAI	Urine Drug Adulterant/Integrity Testing	99
		LN20	Urine Albumin CVL	128
		LN6	Urine Chemistry CVL	124
	X	U	Urine Chemistry—General	68
		UDC	Forensic Urine Drug Testing, Confirmatory	100
	X	UMC	Urine Albumin/Creatinine	158
Creatinine, vitreous fluid		VF	Vitreous Fluid, Postmortem	102

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Creatinine, whole blood	X	**WBCR**	Whole Blood Creatinine	67
Crossmatching	X	**J, JXM, JAT, JATXM**	Transfusion Medicine	234–235
		TMCA	Transfusion Medicine, Competency Assessment	241
Crossmatching (See HLA (classI/II) crossmatching)				
Cryptococcal antigen detection	X	**CRYP**	Cryptococcal Antigen Detection	193
	X	**F**	Mycology and Aerobic Actinomycetes	192
	X	**F1**	Yeast	192
Cryptococcus neoformans/gatti	X	**IDM5**	Meningitis/Encephalitis Panel	209
		IDME	Meningitis/Encephalitis Panel	209
Cryptosporidium		GIP	Gastrointestinal Panel	212
	X	**GIP5**	Gastrointestinal Panel, 5 Challenge	212
		GIPN	Gastrointestinal Panel, Global	213
***Cryptosporidium* immunoassay, preserved specimen**	X	**P,** P3, **P4, P5**	Parasitology	195
Crystal identification, body fluid		BFC	Body Fluid Crystals	155
Crystal identification, urine		URC	Urine Crystals	155
Crystals, urine (semiquantitative)		UAA	Automated Urinalysis	154
CSF antigen detection (See spinal fluid meningitis antigen panel)				
CSF IgG calculations		OLI	CSF Chemistry and Oligoclonal Bands	73
C-telopeptide (CTX)		BMV5	Bone Markers and Vitamin	85
Cutibacterium avidum/granulosum		JIP	Joint Infection Panel	208
Cyclic citrullinated peptide antibody		CCP	Cyclic Citrullinated Peptide Antibody	222
Cyclobenzaprine		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Cyclospora cayatanensis		GIP	Gastrointestinal Panel	212
	X	**GIP5**	Gastrointestinal Panel, 5 Challenge	212
		GIPN	Gastrointestinal Panel, Global	213
Cyclosporine	X	CS	Immunosuppressive Drugs	58
Cyclosporine (cont.)		LN31	Immunosuppressive Drugs CVL	129
CYP2B6		PGX	Pharmacogenetics	266
CYP2C9	X	PGX	Pharmacogenetics	266
CYP2C19	X	PGX	Pharmacogenetics	266
CYP2D6		PGX	Pharmacogenetics	266
CYP3A4		PGX	Pharmacogenetics	266
CYP3A5		PGX	Pharmacogenetics	266
CYP4F2		PGX	Pharmacogenetics	266
Cystatin C		CYS	Cystatin C	73
		LN49	Cystatin C CVL	133
Cystic fibrosis (*CFTR* gene)	X	MGL2, MGL5	Molecular Genetics	264–265
Cystine		KSA	Kidney Stone Risk Assessment	69
Cystine, quantitative		BGL2	Amino Acid Quantitation for Inherited Metabolic Disorders	260
Cytogenomic microarray for constitutional abnormalities		CYCGH	Constitutional Microarray Analysis	258
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Cytology proficiency testing (See Cytopathology GYN proficiency testing)				
Cytomegalovirus (CMV)		ID1	Nucleic Acid Amp, Viruses	200
	X	**IDM5**	Meningitis/Encephalitis Panel	209
		IDME	Meningitis/Encephalitis Panel	209
		LN38	CMV Viral Load CVL	131
		VLS, VLS2	Viral Load	205
	X	VM3	Viral Markers—Series 3	245
	X	**VR1**	Virology Culture	199
	X	**VR2**	Virology by DFA	199
Cytopathology GYN education		PAPCE1	PAP Edu, Conventional	
		PAPJE1	PAP Edu, All Technologies	
		PAPKE1	PAP Edu, SurePath	
		PAPME1	PAP Edu, ThinPrep	
Cytopathology GYN proficiency testing		**PAPCPT**	PAP PT, Conventional	311
		PAPJPT	PAP PT, Combination	311
		PAPKPT	PAP PT, SurePath	311
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Cytopreparation differential manual (See Differential (fluid), manual)				
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		CGL	Coagulation, Limited	164
D-dimer, quantitative	X	CGDF	Coagulation, D-dimer/FDP	164
	X	CGL	Coagulation, Limited	164
		CGLQ	QCC, Coagulation, Limited	46
		LN42	D-dimer CVL	132
	X	PCARM/PCARMX	Point-of-Care Cardiac Markers	64
		POC12	POC Cardiac Markers Competency	51
Delta-8-THC		THCB	Blood Cannabinoids	107
Delta-8-THC-COOH		THCB	Blood Cannabinoids	107
Delta-9-THC		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		THCB	Blood Cannabinoids	107
		UT	Urine Toxicology	96
Delta-9-THC-COOH		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		THCB	Blood Cannabinoids	107
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UDS, UDS6	Urine Drug Screen	98
		UT	Urine Toxicology	96
		UTCO	Urine Toxicology Carryover	135
Delta-10-THC		THCB	Blood Cannabinoids	107
Demoxepam		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Dengue serology IgG/IgM		DENS	Dengue Virus Serology	216

Analyte/Procedure	LAP ENR	Program Code	Description	Page
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Dermatopathology immunohistochemistry		DPIHC	Dermatopathology Immunohistochemistry	299
Dermatophyte identification (See Fungus, yeast, mold and aerobic actinomycetes identification)				
Desipramine		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
	X	ZT	TDM, Special	59
Desmethylclomipramine		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Desmethylsertraline		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Dextromethorphan		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
DHEA sulfate	X	Y/YY	Sex Hormones	83
DIA (See Dimeric inhibin A)				
Diazepam		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UT	Urine Toxicology	96
Differential (bone marrow), manual		BMD	Bone Marrow Cell Differential	142
Differential (fluid), manual		HFC, HFCI	Hemocytometer Fluid Count	156
Differential (peripheral blood), manual (See WBC differential, manual)				
Differential (peripheral blood), manual, virtual (See WBC differential, manual, virtual)				
Differential, automated (See WBC differential, automated)				

Analyte/Procedure	LAP ENR	Program Code	Description	Page
Digital slide program in fine-needle aspiration, online (See Fine-needle aspiration, digital slide program)				
Digoxin	X	**CZ/CZX/ CZ2X, Z**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN3	TDM CVL	123
Digoxin, free		CZ/CZX/ CZ2X, Z	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
Dihydrocodeine		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Diltiazem		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Dilute prothrombin time		CGE/CGEX	Coagulation, Extended	165
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Dimeric inhibin A (DIA)	X	FP/FPX	Maternal Screen	86
Diphenhydramine		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Diphenylhydantoin (See Phenytoin)				
Direct antiglobulin testing	X	DAT	Direct Antiglobulin Testing	239
		TMCAD	Transfusion Medicine, Competency Assessment	241
Direct antiglobulin testing, automated		ADAT	Direct Antiglobulin Testing—Automated	239
Direct bilirubin (See Bilirubin, direct)				
Disease association/ drug risk (See individual markers)				
Disopyramide		CZ/CZX/ CZ2X, Z	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
DMD/Becker (*DMD* gene)	X	MGL2	Molecular Genetics	264–265
DNA analysis (See Parentage/relationship testing)				
DNA content/cell cycle analysis		FL, FL2	Flow Cytometry	226
DNA extraction and amplification		MHO5	Molecular Oncology Hematologic	276, 281
DNA mismatch repair		HQMMR	HistoQIP Mismatch Repair IHC	295
		MMR	DNA Mismatch Repair	302
DNA sequencing		SEC, SEC1	DNA Sequencing	266
DNA typing		IDN, IDO	Nucleic Acid Amp, Organisms	207
Dopamine	X	N	Urine Chemistry—Special	69
Doxepin		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Doxylamine		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
DPYD		PGX3	Pharmacogenetics	266
Duloxetine		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
E. coli O157 (See *Escherichia coli* O157)				
EBV (See Epstein-Barr virus)				
Ecgonine ethyl ester		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Ecgonine methyl ester		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
eGFR		LN24	Creatinine Accuracy CVL	129
EGFR (See Epidermal growth factor receptor)				
Electronic crossmatch		JXM, JATXM	Transfusion Medicine	234–235
Electrophoresis (See individual analytes)				
Elution, antibody		ELU	Eluate	240
		TMCAE	Eluate Competency Assessment	241
Embryology		EMB	Embryology	161
Entameoba histolytica		GIP	Gastrointestinal Panel	212
	X	**GIP5**	Gastrointestinal Panel, 5 Challenge	212
		GIPN	Gastrointestinal Panel, Global	213

Analyte/Procedure	LAP ENR	Program Code	Description	Page
Enteroaggregative *E. coli* (EAEC)		GIP	Gastrointestinal Panel	212
	X	**GIP5**	Gastrointestinal Panel, 5 Challenge	212
		GIPN	Gastrointestinal Panel, Global	213
***Enterobacter cloacae* complex**	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
		JIP	Joint Infection Panel	208
Enterococcus faecalis		JIP	Joint Infection Panel	208
Enterococcus faecium		JIP	Joint Infection Panel	208
Enteropathogenic *E. coli* (EPEC)		GIP	Gastrointestinal Panel	212
	X	**GIP5**	Gastrointestinal Panel, 5 Challenge	212
		GIPN	Gastrointestinal Panel, Global	213
Enterotoxigenic *E. coli* (ETEC)		GIP	Gastrointestinal Panel	212
	X	**GIP5**	Gastrointestinal Panel, 5 Challenge	212
		GIPN	Gastrointestinal Panel, Global	213
Enterovirus		ID1	Nucleic Acid Amp, Viruses	200
	X	**IDM5**	Meningitis/Encephalitis Panel	209
		IDME	Meningitis/Encephalitis Panel	209
	X	**IDR**	Infectious Disease, Respiratory Panel	210
	X	**VR1**	Virology Culture	199
Eosinophils, urine (See Urine eosinophils, Wright stain)				
Ephedrine		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Epidermal growth factor receptor (*EGFR*)	X	EGFR	Mutation Testing	278
Epidermal growth factor receptor (*EGFR*), gDNA	X	MTP	Multigene Tumor Panel, gDNA	279
Epinephrine	X	N	Urine Chemistry—Special	69
Epithelial cells, urine, semiquantitative		UAA1	Automated Urinalysis	154
Epstein-Barr virus (EBV)		ID1	Nucleic Acid Amp, Viruses	200
		VLS, VLS2	Viral Load	205
Epstein-Barr virus (EBV) antibodies		VR3	Infectious Disease Serology	215
Epstein-Barr virus (EBV), ISH	X	ISH	In Situ Hybridization	276

Analyte/Procedure	LAP ENR	Program Code	Description	Page
ER by immunohistochemistry (See Estrogen receptors by immunohistochemistry)				
ERBB2 (HER2) gene amplification by ISH	X	ISH2	In Situ Hybridization	276
Erythrocyte sedimentation rate		ESR, ESR1, ESR2, ESR3	Erythrocyte Sedimentation Rate	142
Erythropoietin		EPO	Erythropoietin	87
Escherichia coli	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
		JIP	Joint Infection Panel	208
***Escherichia coli* K1**	X	**IDM5**	Meningitis/Encephalitis Panel	209
		IDME	Meningitis/Encephalitis Panel	209
***Escherichia coli* O157**		GIP	Gastrointestinal Panel	212
	X	**GIP5**	Gastrointestinal Panel, 5 Challenge	212
Estazolam		DFC	Drug-Facilitated Crime	109
Estradiol		ABS	Accuracy-Based Testosterone and Estradiol	113
		LN8	Reproductive Endocrinology CVL	125
	X	**Y/YY**	Sex Hormones	83
Estriol, unconjugated (uE3)	X	FP/FPX	Maternal Screen	86
	X	Y/YY	Sex Hormones	83
Estrogen receptors by immunohistochemistry	X	PM2	ER, PgR by Immunohistochemistry	300
Estrogen receptors (ER) by immunohistochemistry, interpretation only		HERI, HERI1	HER2 and ER Immunohistochemistry Interpretation Only	305
Ethanol (See Alcohol, serum)				
Ethanol, urine		UDS, UDS6	Urine Drug Screen	98
Ethanol, vitreous fluid		VF	Vitreous Fluid, Postmortem	102
Ethanol, whole blood (See Alcohol, whole blood)				
Ethosuximide		CZ/CZX/ CZ2X, Z	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
Ethyl glucuronide (EtG)		ETB	Ethanol Biomarkers	103
Ethyl sulfate (EtS)		ETB	Ethanol Biomarkers	103
Ethylene glycol		AL2	Serum Alcohol/Volatiles	102
Ethylene glycol, whole blood		AL1	Whole Blood Alcohol/ Volatiles	102
Etizolam		DFC	Drug-Facilitated Crime	109
		T	Toxicology	96
		UT	Urine Toxicology	96

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Everolimus		EV	Everolimus	58
Factor II		CGE/CGEX	Coagulation, Extended	165
		ECF	Expanded Coagulation Factors	165
Factor II (*F2* gene)	X	MGL1	Molecular Genetics	264–265
	X	TPM	Thrombophilia Mutations	267
Factor V		CGE/CGEX	Coagulation, Extended	165
		ECF	Expanded Coagulation Factors	165
Factor V Leiden (*F5* gene)	X	MGL1	Molecular Genetics	264–265
	X	TPM	Thrombophilia Mutations	267
Factor VII		CGE/CGEX	Coagulation, Extended	165
		ECF	Expanded Coagulation Factors	165
Factor VIII		CGE/CGEX	Coagulation, Extended	165
		CGS3	Coag Special, Series 3	166
		ECF	Expanded Coagulation Factors	165
		LN51	Factor VIII CVL	131
Factor VIII inhibitor		CGS3	Coag Special, Series 3	166
Factor IX		CGE/CGEX	Coagulation, Extended	165
		ECF	Expanded Coagulation Factors	165
Factor X		CGE/CGEX	Coagulation, Extended	165
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Factor XI		CGE/CGEX	Coagulation, Extended	165
		ECF	Expanded Coagulation Factors	165
Factor XII		CGE/CGEX	Coagulation, Extended	165
		ECF	Expanded Coagulation Factors	165
Factor XIII		CGE/CGEX	Coagulation, Extended	165
		ECF	Expanded Coagulation Factors	165
Familial dysautonomia (*ELP1* gene)	X	MGL4	Molecular Genetics	264–265
Fanconi anemia, complementation grp. C (*FANCC* gene)	X	MGL4	Molecular Genetics	264–265
Fecal calprotectin		FCAL	Fecal Calprotectin	73
Fecal fat, qualitative		FCFS	Fecal Fat	74
Fecal lactoferrin		FLAC	Fecal Lactoferrin	185
Fecal occult blood (See Occult blood, fecal)				
Fentanyl		DFC	Drug-Facilitated Crime	109
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Fentanyl (cont.)		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
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Fern test (vaginal)	X	CMMP	Clinical Microscopy, Misc	151
Ferritin	X	**C3/C3X, CZ/CZX/CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
	X	**K/KK**	Ligand—General	82
		LN5	Ligand CVL	123
		LN5S	Ligand CVL – all Siemens ADVIA (Centaur, CP, and XP) and Atellica IM	123
Fetal fibronectin	X	FF	Fetal Fibronectin	87
Fetal hemoglobin (gastric fluid)		APT	Fetal Hemoglobin	155
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Fetal red cell quantitation	X	HBF	Fetal Red Cell Detection	240
		TMCAF	Transfusion Medicine, Competency Assessment	241
Fetal screen (Rosette testing)	X	HBF	Fetal Red Cell Detection	240
		TMCAF	Transfusion Medicine, Competency Assessment	241
Fibrin degradation products, plasma		CGDF	Coagulation, D-dimer/FDP	164
		CGL	Coagulation, Limited	164
		CGLQ	QCC, Coagulation, Limited	46
Fibrin monomer		CGDF	Coagulation, D-dimer/FDP	164
		CGL	Coagulation, Limited	164
Fibrinogen	X	**CGL**	Coagulation, Limited	164
		CGLQ	QCC, Coagulation, Limited	46
		LN44	Fibrinogen, CVL	132
Fibrinogen antigen		CGE/CGEX	Coagulation, Extended	165
Finegoldia magna		JIP	Joint Infection Panel	208
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FISH for brain/glioma		CYJ	Fluorescence In Situ Hybridization and Interpretation on Site, Brain/Glioma Tissue	257
FISH for breast carcinoma, interpretation only, *ERBB2 (HER2)* gene amplification		CYHI	FISH for *ERBB2* (*HER2*) Amplification, Interpretation Only Exercise	257
FISH for breast carcinoma hybridization and interpretation on site *ERBB2 (HER2)* amplification	X	CYH	FISH for *ERBB2* (*HER2*) Amplification	257
FISH for constitutional and hematologic disorders		CYF	Fluorescence In Situ Hybridization and Interpretation on Site	256
FISH for lung cancer, *ALK* rearrangement		CYALK	Fluorescence In Situ Hybridization and Interpretation on Site, Lung Cancer	257
FISH for lymphoma		CYL	Fluorescence In Situ Hybridization and Interpretation on Site, Lymphoma	257
FISH for solid tumor		CYK	Fluorescence In Situ Hybridization and Interpretation on Site, Solid Tumor	257
FISH for urothelial carcinoma hybridization and interpretation	X	CYI	Fluorescence In Situ Hybridization and Interpretation on Site, Urothelial Carcinoma	256
Flow cytometry, post-immunotherapy analysis (See Post-immunotherapy analysis, flow cytometry)				
Fluconazole		AFD	Antifungal Drugs Monitoring	107
Flunitrazepam		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Fluorescent microscope check		I	Instrumentation	135
Fluoxetine		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Folate, RBC (See RBC folate)				
Folate, serum	X	**K/KK**	Ligand—General	82
		LN5	Ligand CVL	123
Folate, serum (cont.)		LN5S	Ligand CVL – all Siemens ADVIA (Centaur, CP, and XP) and Atellica IM	123
Follicle-stimulating hormone (FSH)		ABS	Accuracy-Based Testosterone, Estradiol	113
		LN8	Reproductive Endocrinology CVL	125
	X	**Y/YY**	Sex Hormones	83
Fondaparinux		FNPX	Anticoagulant Monitoring, Fondaparinux	168
Forensic pathology		FR/FR1	Forensic Pathology	318
Forensic toxicology		FTC	Forensic Toxicology, Criminalistics	105
Fragile X (*FMR1* gene)	X	MGL1	Molecular Genetics	264–265
Free beta hCG		FP1B	First Trimester Maternal Screening, Free Beta	86
Free Kappa/Lambda ratio		SFLC	Serum Free Light Chains	225
Free testosterone		Y/YY	Sex Hormones	83
Friedreich ataxia (*FXN* gene)	X	MGL2	Molecular Genetics	264–265
Fructosamine		FT	Fructosamine	74
Fungal culture, cord blood		CBT	Cord Blood Testing	242
Fungal culture, stem cell		SCP	Stem Cell Processing	242
Fungal identification, *Candida* (See *Candida* culture)				
Fungal identification, molecular (See individual analytes)				
Fungal identification, yeast, mold and aerobic actinomycetes identification	X	**F**	Mycology and Aerobic Actinomycetes	192
Fungal identification, yeast (See Yeast identification)				
Fungal identification blood culture, molecular (See Yeast identification, blood culture)				
Fungal serology		FSER	Fungal Serology	194
G6PD		PGX1	Pharmacogenetics	266
Gabapentin		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UDS, UDS6	Urine Drug Screen	98

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Gabapentin (cont.)		UT	Urine Toxicology	96
		ZE	Therapeutic Drug Monitoring, Extended	59
Galactomannan		FGAL	Galactomannan	193
Gamma globulin		M, OLI	CSF Chemistry	73
		SPE	Serum Electrophoresis	75
Gamma glutamyl transferase (GGT)	X	**C1, C3/C3X, CZ/CZX/ CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
Gamma hydroxybutyrate (GHB)		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
***Gardnerella vaginalis*, DNA probe**	X	**VS**	Vaginitis Screen	188
Gastric occult blood (See Occult blood, gastric)				
Gastric pH		GOCB	Gastric Occult Blood	155
Gastrin		ABGIC	Accuracy-Based Glucose, Insulin and C-peptide	116
Gastrointestinal panel, molecular (See individual analytes)				
Gaucher disease (*GBA* gene)	X	MGL4	Molecular Genetics	264–265
GDH antigen (See *Clostridioides (Clostridium)* difficile antigen)				
Genomic copy number array		CYCGH	Constitutional Microarray Analysis	258
Gentamicin	X	**CZ/CZX/ CZ2X, Z**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN3	TDM CVL	123
Giardia		GIP	Gastrointestinal Panel	212
	X	**GIP5**	Gastrointestinal Panel, 5 Challenge	212
		GIPN	Gastrointestinal Panel, Global	213
***Giardia* immunoassay, preserved specimen**	X	**P,** P3, **P4, P5**	Parasitology	195
Giemsa stain (See Blood parasite)				
Giemsa stain for blood parasite (See Blood parasite)				
Glioma by FISH (See FISH for brain/glioma)				
Glucose		ABGIC	Accuracy-Based Glucose, Insulin, and C-peptide	116
	X	**AQ, AQH, AQIS**	Critical Care Blood Gas	90–91
		AQQ, AQHQ, AQSQ	QCC, Critical Care Blood Gas Series	41
	X	**C1, C3/C3X, C4, CZ/CZX/ CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN13C	Blood Gas CVL	126
		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
Glucose, body fluid		FLD	Body Fluid	71
		FLDQ	QCC, Body Fluid Chemistry	38
Glucose, CSF	X	M, OLI	CSF Chemistry and Oligoclonal Bands	73
Glucose, urine	X	CMP, CMP1	Clinical Microscopy	150
		CMQ	QCC, Urinalysis	44
	X	HCC2, HCC3	Waived Combination	66
		LN6	Urine Chemistry CVL	124
		POC3	POC Urine Dipstick Competency	50
	X	U	Urine Chemistry—General	68
Glucose, vitreous fluid		VF	Vitreous Fluid, Postmortem	102
Glucose, whole blood	X	HCC	Waived Combination	65
		HCC2, HCC4	Waived Combination	66
	X	LCW	Chemistry—Ltd, Waived	63
		LN17	Whole Blood Glucose CVL	127
		POC2	POC Glucose Competency	50
		POC7	POC/Waived Glucose and Hemoglobin Competency	50
		WBGQ	QCC, Whole Blood Glucose	37

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Glucose-6-phosphate dehydrogenase, qualitative and quantitative		G6PDS	Glucose-6 Phosphate Dehydrogenase	74
Glutamic acid, quantitative		BGL2	Amino Acid Quantitation for Inherited Metabolic Disorders	260
Glutamine, quantitative		BGL2	Amino Acid Quantitation for Inherited Metabolic Disorders	260
Glutaraldehyde, urine		DAI	Urine Drug Adulterant/ Integrity Testing	99
Glycated serum albumin		GSA	Glycated Serum Albumin	62
Glycine, quantitative		BGL2	Amino Acid Quantitation for Inherited Metabolic Disorders	260
Glycogen storage disease type Ia (*G6PC* gene)	X	MGL4	Molecular Genetics	264–265
Glycohemoglobin (See Hemoglobin A1c)				
Glycohemoglobin, waived (See Hemoglobin A1c, waived)				
Glycosaminoglycans (mucopolysaccharides)	X	BGL	Biochemical Genetics	259
Gram stain	X	**D**	Bacteriology	175
	X	**D2, D3, RMC**	Throat, Urine, GC Cultures	177–178
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Gram stain, virtual		VGS1	Virtual Gram Stain Basic	180
		VGS2	Virtual Gram Stain Advanced	180
Gravimetric pipette calibration (See Pipette calibration, gravimetric)				
Group A *Streptococcus* antigen detection	X	**D**	Bacteriology	175
	X	**D6**	Rapid Group A Strep	180
	X	MC4	Urine Colony Count Combination	178
		POC4	POC Strep Screen Competency	50
	X	**RMC**	Routine Microbiology Combination	178
Group A *Streptococcus* antigen detection, waived	X	D9	Rapid Group A Strep, Waived	180
Group B *Streptococcus*	X	**D8**	Group B Strep	181
Growth hormone	X	Y/YY	Sex Hormones	83
GYN cytopathology (See Cytopathology GYN proficiency testing)				
GYN cytopathology education (See Cytopathology GYN education)				
H5N1 influenza (See Influenza, H5N1)				
Haemophilus influenzae	X	**IDM5**	Meningitis/Encephalitis Panel	209
		IDME	Meningitis/Encephalitis Panel	209
	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
		JIP	Joint Infection Panel	208
Haptoglobin	X	IG/IGX	Immunology, General	218
	X	S2/S4	Immunology, Special	219
HBeAg	X	**VM2**	Viral Markers—Series 2	245
HBsAg	X	**VM1**	Viral Markers—Series 1	245
HBV, molecular (See Hepatitis B virus, molecular)				
HCG (See Human chorionic gonadotropin)				
HCV, molecular (See Hepatitis C virus, molecular)				
HDL cholesterol		ABL	Accuracy-Based Lipid	112
	X	**C1, C3/C3X, C4, CZ/CZX/ CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
	X	LCW	Chemistry—Ltd, Waived	63
		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
Helicobacter pylori	X	HPS	*H. pylori* Antigen, Stool	185
		S2, S4	*H. pylori* IgG Antibody	219
		S5	*H. pylori* IgG Antibody	219
Helicobacter pylori antibodies		VR3	*H. pylori* IgG Antibody Infectious Disease Serology	215
Helicobacter pylori breath test		HPBT	*H. pylori* Breath Test	74
Hematocrit	X	**AQH, AQIS**	Critical Care Blood Gas	90–91
		AQHQ, AQSQ	QCC, Critical Care Blood Gas Series	41
	X	**FH1–FH4, FH9–FH10, FH13, FH16–FH17**	Hematology Automated Differential	138
		FH3Q, FH9Q, FH13Q	QCC, Automated Hematology Series	43

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Hematocrit (cont.)	X	HCC2, HCC3	Waived Combination	66
	X	**HE**	Basic Hematology	138
		POC10, POC11	POC Competency Blood Gases	51
		SCP	Stem Cell Processing	242
	X	**SO**	Blood Oximetry	93
		SOQ	QCC, Blood Oximetry	42
Hematologic disorders by FISH (See FISH for contitutional and hematologic disorders)				
Hematology peripheral blood case studies (See Blood cell identification, expanded)				
Hematopathology online education		HPATH, HPATH1	Hematopathology Online Education	149
Hemochromatosis (*HFE* gene)	X	MGL1	Molecular Genetics	264–265
Hemocytometer fluid count (See individual analytes)				
Hemoglobin	X	**FH1–FH4, FH9–FH10, FH13, FH16–FH17**	Hematology Automated Differential	138
		FH3Q, FH9Q, FH13Q	QCC, Automated Hematology Series	43
	X	HCC	Waived Combination	65
	X	HCC1	Waived Hemoglobin	65
	X	HCC2, HCC3	Waived Combination	66
	X	**HE**	Basic Hematology	138
		LN9	Hematology CVL	125
		POC7	POC/Waived Glucose and Hemoglobin Competency	50
		SCP	Stem Cell Processing	242
	X	**SO**	Blood Oximetry	93
		SOQ	QCC, Blood Oximetry	42
Hemoglobin A1c	X	**GH5**	Hemoglobin A1c, Accuracy -Based	62
	X	**GH5I**	Hemoglobin A1c, International	62
		GHQ	QCC, Hemoglobin A1c	38
		LN15	Hemoglobin A1c CVL	126
Hemoglobin A1c, waived	X	GH2	Hemoglobin A1c, Waived	61
Hemoglobin A2 quantitation	X	HG	Hemoglobinopathy	144
Hemoglobin electrophoresis (See individual analytes)				
Hemoglobin F quantitation	X	HG	Hemoglobinopathy	144
Hemoglobin identification and quantitation	X	HG	Hemoglobinopathy	144
Hemoglobin S/C	X	HGM	Hemoglobinopathies Genotyping	263
	X	MGL2	Molecular Genetics	264–265
Hemoglobin, estimated	X	**AQH, AQIS**	Critical Care Blood Gas	90–91
		AQHQ, AQSQ	QCC, Critical Care Blood Gas Series	41
		POC10, POC11	POC Competency Blood Gases	51
Hemoglobin, plasma		PHG	Plasma Hemoglobin	75
Hemoglobin, urine	X	CMP, CMP1	Clinical Microscopy	150
		CMQ	QCC, Urinalysis	44
	X	HCC2, HCC3	Waived Combination	66
		POC3	POC Urine Dipstick Competency	50
Hemolytic complement, total (See Total hemolytic complement)				
Hemosiderin, urine (See Urine hemosiderin, Prussian blue stain)				
Heparin assay		CGS4	Coag Special, Series 4	166
Heparin, low molecular weight		LN36	Heparin CVL	131
Heparin, unfractionated		LN36	Heparin CVL	131
Heparin/platelet Factor IV		CGS5	Coag Special, HIT	166
Heparin-induced thrombocytopenia		CGE/CGEX	Coagulation, Extended	165
		CGS5	Coag Special, HIT	166
Hepatitis B virus, molecular	X	HBVL, HBVL5	Hepatitis Viral Load	205
		LN52	HBV Viral Load CVL	131
	X	NAT	Nucleic Acid Testing	247
Hepatitis C virus, molecular	X	HCV2	Hepatitis Viral Load, Genotyping and Qualitative	205
		LN45	HCV Viral Load CVL	131
	X	NAT	Nucleic Acid Testing	247
HER2 (ERBB2) gene amplification by FISH, hybridization and interpretation on site (See FISH for breast carcinoma hybridization and interpretation on site *ERBB2 (HER2)* amplification)				

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HER2 (ERBB2) gene amplification by FISH, interpretation only (See FISH for breast carcinoma, interpretation only, ERBB2 (HER2) gene amplification)				
HER2 (ERBB2) gene amplification by ISH	X	ISH2	In Situ Hybridization	276
HER2, gastric, pan tumor interpretation		GPH, GPH1	Gastric, Pan Tumor *HER2*, Interpretation Only	305
HER2 by immunohistochemistry	X	HER2	*HER2* by Immunohistochemistry	300
HER2 by immunohistochemistry, interpretation only		HERI, HERI1	*HER2* and ER Immunohistochemistry, Interpretation Only	305
HER2 by molecular testing, gDNA	X	MTP	Multigene Tumor Panel, gDNA	279
HER2, gastric	X	GHER2	Gastric *HER2*	300
Herpes simplex virus (HSV)		ID1	Nucleic Acid Amp, Viruses	200
	X	**ID5**	HSV, Molecular	204
	X	**IDM5**	Meningitis/Encephalitis Panel	209
		IDME	Meningitis/Encephalitis Panel	209
	X	**VR2**	Viral Antigen by DFA	199
Herpes simplex virus (HSV) antibodies	X	VR3	Infectious Disease Serology	215
Herpes simplex virus (HSV) culture	X	**HC4**	HSV Culture	200
	X	**VR1**	Virology Culture	199
HHV6 (See Human herpesvirus 6)				
HHV8 (See Human herpesvirus 8)				
High-sensitivity C-reactive protein	X	**HSCRP**	hsCRP	63
		LN21	High-Sensitivity C-reactive Protein CVL	128
Histidine		BGL2	CAP/ACMB Amino Acid Quantitation	260
Histotechnology quality improvement		HQIP	HistoQIP Histotechnology Quality Improvement	290
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		HQBX1	Gastrointestinal	292
		HQBX2	Dermatopathology	292
		HQBX3	Urogenital Tract	292
		HQBX4	Gynecological	292

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Histotechnology quality improvement, central nervous system		HQNEU	HistoQIP Central Nervous System	295
Histotechnology quality improvement, IHC		HQIHC	HistoQIP Immunohistochemistry	293
Histotechnology quality improvement, ISH		HQISH	HistoQIP In Situ Hybridization	293
Histotechnology quality improvement, dermatopathology		HQMEL	HistoQIP Dermatopathology	294
Histotechnology quality improvement, mismatch repair IHC		HQMMR	HistoQIP Mismatch Repair IHC	295
Histotechnology quality improvement, non-small cell lung carcinoma		HQNSC	HistoQIP Non-small Cell Lung Carcinoma	296
Histotechnology quality improvement, pediatric program		HQPED	CAP/NSH HistoQIP Pediatric	296
Histotechnology quality improvement, targeted therapy		HQTAR	HistoQIP Targeted Therapy	297
Histotechnology quality improvement, whole slide image		HQWSI	HistoQIP Whole Slide Image	297
HIV (See Human immunodeficiency virus)				
HIV-1 p24 antigen	X	VM3	Viral Markers—Series 3	245
HIV-1 p24 antigen, **anti-HIV-1/2**	X	**VM6/VM6X**	Viral Markers—Series 6	246
HLA molecular typing (See Molecular HLA typing)				
HLA (class I/II) antibody identification	X	MXC, MXEP	HLA Analysis, Class I/II	250
HLA (class I/II) antibody screen		MXC, MXEP, MXS	HLA Analysis, Class I/II	250
HLA (class I/II) crossmatching	X	MXC, MXEP	HLA Analysis, Class I/II	250
HLA-A*02:01		DADR1	Disease Association, Drug Risk	253
HLA-A*31:01		DADR1	Disease Association, Drug Risk	253
HLA-B*57:01		DADR1	Disease Association, Drug Risk	253
HLA-B*58:01		DADR1	Disease Association, Drug Risk	253
HLA-B27 typing	X	B27	HLA-B27 Typing	251
HLA-DQA1*03/DQB1*03:02		DADR2	Disease Association, Drug Risk	253
HLA-DQA1*05/DQB1*02		DADR2	Disease Association, Drug Risk	253

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Homocysteine, quantitative		BGL2	Amino Acid Quantitation for Inherited Metabolic Disorders	260
	X	HMS	Homocysteine	63
		LN16	Homocysteine CVL	127
Homovanillic acid	X	N	Urine Chemistry—Special	69
HPV (cytopathology), high risk (See Human papillomavirus (cytology) high risk)				
HSV (See Herpes simplex virus)				
Human chorionic gonadotropin (hCG), serum	X	**C1, C3/C3X, C4, CZ/CZX/CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
	X	**FP/FPX, FP1T**	Maternal Screen	86
	X	**HCG, IL**	Immunology	218
	X	**K/KK**	Ligand—General	82
		LN8	Reproductive Endocrinology CVL	125
		SCO	Serum Carryover	135
Human chorionic gonadotropin (hCG), urine	X	CMP, CMP1	Clinical Microscopy	150
		CMQ	QCC, Urinalysis	44
	X	HCC2, HCC3	Waived Combination	66
		POC1	POC hCG Competency	50
		POC3	POC Urine Dipstick Competency	50
	X	UHCG	Urine HCG	158
Human epididymis protein 4		HUEP	Human Epididymis Protein 4	88
Human herpesvirus 6		ID1	Nucleic Acid Amp, Viruses	200
	X	**IDM5**	Meningitis/Encephalitis Panel	209
		IDME	Meningitis/Encephalitis Panel	209
		VLS2	Viral Load	205
Human herpesvirus 8		ID1	Nucleic Acid Amp, Viruses	200
Human immuno-deficiency virus (HIV)	X	HV2	HIV Viral Load	205
		LN39	HIV Viral Load CVL	131
Human immuno-deficiency virus (HIV) detection	X	NAT	Nucleic Acid Testing	247
Human immuno-deficiency virus (HIV) genotyping		HIVG	HIV Genotyping	205
Human immuno-deficiency virus 1 (HIV-1) detection		HVDD	HIV-1/HIV-2 Qualitative Detection and Differentiation, Molecular	204
Human immuno-deficiency virus 2 (HIV-2) detection		HVDD	HIV-1/HIV-2 Qualitative Detection and Differentiation, Molecular	204
Human metapneumovirus		ID2	Nucleic Acid Amp, Respiratory	203
	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
	X	**IDR**	Infectious Disease, Respiratory Panel	210
Human papillomavirus (cytology) high risk	X	**CHPV**	Human Papillomavirus (High Risk) for Cytopathology	313
		HPV	Digene Hybrid Capture Technology Only	200
Human papillomavirus (cytology) high risk, ISH	X	ISH	In Situ Hybridization	276
Human papillomavirus (high risk) for cytopathology genotyping		CHPV	Human Papillomavirus (High Risk) for Cytopathology	313
Human parechovirus	X	**IDM5**	Meningitis/Encephalitis Panel	209
		IDME	Meningitis/Encephalitis Panel	209
Huntington disease (*HTT* gene)	X	MGL2	Molecular Genetics	264–265
Hydrocodone		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UDS, UDS6	Urine Drug Screen	98
		UT	Urine Toxicology	96
Hydromorphone		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UT	Urine Toxicology	96

Analyte/Procedure	LAP ENR	Program Code	Description	Page
Hydroxybupropion		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Hydroxyproline, quantitative		BGL2	Amino Acid Quantitation for Inherited Metabolic Disorders	260
Hydroxyzine		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Ibuprofen		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
IDH1	X	GLI	Glioma	280
IDH2	X	GLI	Glioma	280
IgA	X	**IG/IGX**	Immunology, General	218
		LN7	Immunology CVL	124
IgA, electrophoresis		SPE	Protein Electrophoresis	75
IgD		S2, S4	Immunology, Special	219
IgE	X	**IG/IGX**	Immunology, General	218
	X	**K/KK**	Ligand—General	82
	X	**SE**	Diagnostic Allergy	223
IgE allergen-specific, quantitative		SE	Diagnostic Allergy	223
IgE multi-allergen screen	X	SE	Diagnostic Allergy	223
IGF-1 (somatomedin C)	X	BGS	Bone and Growth	84
	X	Y/YY	Sex Hormones	83
IgG	X	**IG/IGX**	Immunology, General	218
		LN7	Immunology CVL	124
		S2, S4	Immunology, Special	219
IgG subclass proteins		S2, S4	Immunology, Special	219
IgG, CSF	X	M, OLI	CSF Chemistry and Oligoclonal Bands	73
IgG, electrophoresis		SPE	Protein Electrophoresis	75
IGHV	X	IGHV	Mutation Analysis	282
IgM	X	**IG/IGX**	Immunology, General	218
		LN7	Immunology CVL	124
IgM, electrophoresis		SPE	Protein Electrophoresis	75
IL-2		CTKN	Cytokines	222
IL-6		CTKN	Cytokines	222
IL-8		CTKN	Cytokines	222
IL-10		CTKN	Cytokines	222
IL28B		PGX1	Pharmacogenetics	266
Imipramine		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
	X	ZT	TDM, Special	59

Analyte/Procedure	LAP ENR	Program Code	Description	Page
Immature granulocyte parameter		FH9	Hematology Automated Differential	
		FH9Q	QCC, Hematology	43
Immature platelet fraction (IPF)		FH9	Hematology Automated Differential	
		FH9Q	QCC, Hematology	43
Immature reticulocyte fraction (IRF)		RT, RT3, RT4	Reticulocyte	143
Immunohistochemistry (See individual analytes)				
In situ hybridization (See individual analytes)				
India ink		IND	India Ink	194
Infectious mononucleosis (IM)	X	**IL, IM**	Immunology	218
	X	IMW	Infectious Mononucleosis, Waived	219
Influenza virus		ID2	Nucleic Acid Amp, Resp	203
	X	**ID3**	Nucleic Acid Amplification, Respiratory Limited	203
		ID3Q	QCC, Nucleic Acid Amplification, Respiratory Limited	47
	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
	X	**IDR**	Infectious Disease, Respiratory Panel	210
		POC8	POC Influenza A/B Ag	50
	X	**VR1**	Virology Culture	199
	X	**VR2**	Viral Antigen Detection by DFA	199
	X	**VR4**	Viral Antigen Detection by EIA and Latex	199
Influenza virus, H5N1		FLUA	H5N1 Influenza A Detection and Subtyping	204
Inherited cancer sequencing panel		ICSP	Inherited Cancer Sequencing Panel	263
Instrument linearity (See individual analytes)				
Insulin	X	ABGIC	Accuracy-Based Glucose, Insulin, and C-peptide	116
		LN46	C-peptide/Insulin CVL	133
Interleukin (IL)-1 beta		CTKN	Cytokines	222
International normalized ratio (INR)	X	**CGB**	Basic Coagulation	164
	X	**CGL**	Coagulation, Limited	164
		CGS1	Coag Special, Series 1	166
		CGS4	Coag Special, Series 4	166
		POC6	POC PT/INR, CoaguChek XS Plus	50
		WP10	Whole Blood Coagulation	

Analyte/Procedure	LAP ENR	Program Code	Description	Page
International normalized ratio (INR) (cont.)	X	**WP3, WP4, WP6, WP9**	Whole Blood Coagulation	171
Ionized calcium	X	AQ, AQH, AQIS	Critical Care Blood Gas	90–91
		AQQ, AQHQ, AQSQ	QCC, Critical Care Blood Gas Series	41
	X	C3/C3X, CZ/CZX/CZ2X	Chemistry and TDM	54–56
		POC10, POC11	POC Competency Blood Gases	51
Iron	X	**C1, C3/C3X, CZ/CZX/CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
Isoleucine, quantitative		BGL2	Amino Acid Quantitation for Inherited Metabolic Disorders	260
Isopropanol	X	AL2	Serum Alcohol/Volatiles	102
Isopropanol, whole blood	X	AL1	Whole Blood Alcohol/Volatiles	102
Itraconazole		AFD	Antifungal Drugs Monitoring	107
JC virus		ID1T	Nucleic Acid Amp, JC and BK	200
Jo-1 (antihistidyl t-RNA synthetase) (See Anti-Jo-1 (antihistidyl t-RNA synthetase))				
Joint infection panel, molecular (See individual analytes)				
Kappa/Lambda, ISH	X	ISH	In Situ Hybridization	276
Kappa/Lambda ratio		IG/IGX	Immunology, General	218
		S2, S4	Immunology, Special	219
Karyotype nomenclature	X	CY, CYBK	Cytogenetics	256
Ketamine		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Ketones, serum		KET	Ketones	63
Ketones, urine	X	CMP, CMP1	Clinical Microscopy	150
		CMQ	QCC, Urinalysis	44
	X	HCC2, HCC3	Waived Combination	66
		POC3	POC Urine Dipstick Competency	50
Ki-67		KI67	Ki-67 Immunohistochemistry TMA	304
Kidney stone risk assessment (See individual analytes)				
Kingella kingae		JIP	Joint Infection Panel	208
KIT	X	KIT	*KIT/PDGFRA*	278
KIT, gDNA	X	MTP	Multigene Tumor Panel, gDNA	279
Klebsiella aerogenes	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
		JIP	Joint Infection Panel	208
Klebsiella oxytoca	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
***Klebsiella pneumoniae* group**	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
		JIP	Joint Infection Panel	208
KOH prep (skin or vaginal)	X	CMMP	Clinical Microscopy, Misc	151
	X	FSM	Fungal Smear	194
KRAS	X	KRAS	Colorectal Cancer Mutation	278
KRAS, gDNA	X	MTP	Multigene Tumor Panel, gDNA	279
Laboratory preparedness exercise		LPX	Laboratory Preparedness Exercise	187
Lacosamide		ZE	Therapeutic Drug Monitoring, Extended	59
Lactate	X	AQ, AQH, AQIS	Critical Care Blood Gas	90–91
		AQQ, AQHQ, AQSQ	QCC, Critical Care Blood Gas Series	41
	X	C3/C3X, CZ/CZX/CZ2X	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN13C	Blood Gas CVL	126
		POC10, POC11	POC Competency Blood Gases	51
Lactate, body fluid		FLD	Body Fluid	71
		FLDQ	QCC, Body Fluid Chemistry	38
Lactate, CSF	X	M, OLI	CSF Chemistry and Oligoclonal Bands	73
Lactate dehydrogenase (LD)	X	**C1, C3/C3X, CZ/CZX/CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122

Analyte/Procedure	LAP ENR	Program Code	Description	Page
Lactate dehydrogenase (LD) (cont.)		SCO	Serum Carryover	135
Lactate dehydrogenase (LD), body fluid		FLD	Body Fluid	71
		FLDQ	QCC, Body Fluid Chemistry	38
Lactate dehydrogenase (LD), CSF	X	M, OLI	CSF Chemistry and Oligclonal Bands	73
Lamellar body count		LBC	Lamellar Body Count	156
Lamotrigine		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
		ZE	Therapeutic Drug Monitoring, Extended	59
Large unstained cells (LUC)		FH4	Hematology Automated Differential	
LD isoenzymes		CRTI, HCRTI	Cardiac Markers	60
LD1/LD2 ratio		CRTI, HCRTI	Cardiac Markers	60
LDL cholesterol, calculated		ABL	Accuracy-Based Lipid	112
LDL cholesterol, measured		ABL	Accuracy-Based Lipid	112
	X	**C1, C3/C3X, C4, CZ/CZX/ CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
LDL cholesterol, waived		LCW	Chemistry—Ltd, Waived	63
Lead (blood)	X	**BL**	Blood Lead	103
Lead, urine		TMU	Trace Metals, Urine	104
Legionella pneumophila		IDN, IDO	Nucleic Acid Amp, Organisms	207
	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
	X	**IDR**	Infectious Disease, Respiratory Panel	210
Legionella pneumophila antigen		LBAS	*Legionella* Ag	181
Leucine, quantitative		BGL2	Amino Acid Quantitation for Inherited Metabolic Disorders	260
Leukemia/lymphoma immunophenotype		FL3	Flow Cytometry	226
Leukemia/lymphoma, interpretation only		FL5	Flow Cytometry Interpretation Only	227
Leukocyte, stool, Wright-Giemsa		CMMP	Clinical Microscopy, Misc	151
Leukocyte esterase, urine	X	CMP, CMP1	Clinical Microscopy	150
		CMQ	QCC, Urinalysis	44
	X	HCC2, HCC3	Waived Combination	66
		POC3	POC Urine Dipstick Competency	50

Analyte/Procedure	LAP ENR	Program Code	Description	Page
Leukocyte-reduced platelets (See individual analytes)				
Leukocyte-reduced RBC (See individual analytes)				
Levetiracetam		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
		ZE	Therapeutic Drug Monitoring, Extended	59
Levorphanol		T	Toxicology	96
		UT	Urine Toxicology	96
Lidocaine	X	CZ/CZX/ CZ2X, Z	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		FTC	Forensic Toxicology, Criminalistics	105
		LN3	TDM CVL	123
		T	Toxicology	96
		UT	Urine Toxicology	96
Lipase	X	C3/C3X, CZ/ CZX/CZ2X	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
Lipase, body fluid		FLD2	Body Fluid Chemistry 2	72
Lipids	X	**C1, C3/C3X, CZ/CZX/ CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
Lipoprotein (a)	X	ABL	Accuracy-Based Lipid	112
	X	C1, C3/C3X, CZ/CZX/ CZ2X	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
Lipoprotein electrophoresis		LPE	Lipoprotein Electrophoresis	74
Lipoprotein-associated phospholipase		PLA	Lipoprotein-Associated Phospholipase A_2	74
Listeria monocytogenes	X	**IDM5**	Meningitis/Encephalitis Panel	209
		IDME	Meningitis/Encephalitis Panel	209
Lithium	X	**C1, C3/C3X, CZ/CZX/ CZ2X, Z**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN3	TDM CVL	123

Analyte/Procedure	LAP ENR	Program Code	Description	Page
Liver-kidney microsomal antibody (See Anti-LKM)				
Lorazepam		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UT	Urine Toxicology	96
Lupus anticoagulant (screen, confirmation)		CGS1	Coag Special, Series 1	166
Luteinizing hormone (LH)		ABS	Accuracy-Based Testosterone, Estradiol	113
		LN8	Reproductive Endocrinology CVL	125
	X	**Y/YY**	Sex Hormones	83
Lyme disease (See *Borrelia burgdorferi)*				
Lymphocyte immunophenotyping	X	FL, FL1	Flow Cytometry	226
Lymphoma by FISH (See FISH for lymphoma)				
Lysergic acid diethylamide (LSD)		FTC	Forensic Toxicology, Criminalistics	105
		UDS, UDS6	Urine Drug Screen	98
Lysine, quantitative		BGL2	Amino Acid Quantitation for Inherited Metabolic Disorders	260
Magnesium	X	**C1, C3/C3X, CZ/CZX/ CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
Magnesium, ionized	X	AQ, AQH	Critical Care Blood Gas	90
		AQQ, AQHQ	QCC, Critical Care Blood Gas Series	41
		POC10, POC11	POC Competency Blood Gases	51
Magnesium, urine	X	U	Urine Chemistry—General	68
Malaria, rapid detection		RMAL	Rapid Malaria	196
	X	**RML5**	Rapid Malaria, 5 Challenge	196
Manganese		R	Trace Metals	77
Manganese, urine		TMU	Trace Metals, Urine	104
Manganese, whole blood		TMWB	Trace Metals, Whole Blood	104
MCAD	X	IMD2	MCAD	265
MCH		FH1–FH4, FH9–FH10, FH13, FH16–FH17	Hematology Automated Differential	138
		FH3Q, FH9Q, FH13Q	QCC, Automated Hematology Series	43
		HE	Basic Hematology	138
MCHC		FH1–FH4, FH9–FH10, FH13, FH16–FH17	Hematology Automated Differential	138
		FH3Q FH9Q, FH13Q	QCC, Automated Hematology Series	43
		HE	Basic Hematology	138
MCV		FH1–FH4, FH9–FH10, FH13, FH16–FH17	Hematology Automated Differential	138
		FH3Q, FH9Q, FH13Q	QCC, Automated Hematology Series	43
		HE	Basic Hematology	138
Measurable residual disease B-ALL		BALL	Flow Cytometry B-ALL Measurable Residual Disease	229
Measurable residual disease *BCR::ABL1* p190		MRD1	Measurable Residual Disease, *BCR/ABL1* p190	282
Measurable residual disease BCR::ABL1 p210		MRD	Measurable Residual Disease, *BCR/ABL1* p210	282
Measurable residual disease *PML::RARA*		MRD2	Measurable Residual Disease, *PML/RARA*	282
Measurable residual disease, flow cytometry mature B-cell leukemia/ lymphoma		FL8	Flow Cytometry Mature B-cell Leukemia/ Lymphoma Measurable Residual Disease	229
Measurable residual disease, flow cytometry plasma cell myeloma		FL9	Flow Cytometry Plasma Cell Myeloma Measurable Residual Disease	230
MECP2 deletion/ duplication analysis (See Rett syndrome (*MECP2* gene) duplication detection analysis)				
MECP2 genotyping (See Rett syndrome (*MECP2*) gene)				
MEN2 (*RET* gene) (See Multiple endocrine neoplasia type 2 (*RET* gene))				

Analyte/Procedure	LAP ENR	Program Code	Description	Page
Meningitis/encephalitis panel, molecular (See individual analytes)				
Meperidine		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UDS, UDS6	Urine Drug Screen	98
		UT	Urine Toxicology	96
Mephedrone		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Meprobamate		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Meprobamate/ carisoprodol		UDS, UDS6	Urine Drug Screen	98
Mercury, urine		TMU	Trace Metals, Urine	104
Mercury, whole blood		TMWB	Trace Metals, Whole Blood	104
Metabolic disease testing (See individual analytes)				
Meta-chlorophenylpiperazine (m-CPP)		DFC	Drug-Facilitated Crime	109
		T	Toxicology	96
		UT	Urine Toxicology	96
Metanephrine	X	N	Urine Chemistry—Special	69
Methadone		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UDS, UDS6	Urine Drug Screen	98
		UT	Urine Toxicology	96
Methadone metabolite (EDDP)		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
Methadone metabolite (EDDP) (cont.)		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UDS, UDS6	Urine Drug Screen	98
		UT	Urine Toxicology	96
Methamphetamine		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UDS, UDS6	Urine Drug Screen	98
		UT	Urine Toxicology	96
Methanol	X	AL2	Serum Alcohol/Volatiles	102
Methanol, whole blood	X	AL1	Whole Blood Alcohol/ Volatiles	102
Methaqualone		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UDS, UDS6	Urine Drug Screen	98
Methemoglobin	X	SO	Blood Oximetry	93
		SOQ	QCC, Blood Oximetry	42
Methicillin-resistant *Staphylococcus aureus* (MRSA)		IDN, IDO	Nucleic Acid Amp, Organisms	207
		MRS	Methicillin-Resistant *S. aureus* Screen	186
	X	**MRS5**	Methicillin-Resistant *S. aureus* Screen	186
Methicillin-resistant *Staphylococcus aureus* (MRSA), blood culture		BCS1	Blood Culture *Staphylococcus aureus*	182
Methicillin-resistant *Staphylococcus aureus* (MRSA), molecular		MRS2M	MRSA Screen, Molecular, 2 Challenge	186
	X	**MRS5M**	MRSA Screen, Molecular, 5 Challenge	186
Methionine, quantitative		BGL2	Amino Acid Quantitation for Inherited Metabolic Disorders	260
Methotrexate	X	CZ/CZX/ CZ2X, Z	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
Methylenedioxy-amphetamine (MDA)		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105

Analyte/Procedure	LAP ENR	Program Code	Description	Page
Methylenedioxy-amphetamine (MDA) (cont.)		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UT	Urine Toxicology	96
Methylenedioxyethyl-amphetamine (MDEA)		UDC	Forensic Urine Drug Testing, Confirmatory	100
Methylenedioxymeth-amphetamine (MDMA)		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UDS, UDS6	Urine Drug Screen	98
		UT	Urine Toxicology	96
Methylenedioxy-pyrovalerone (MDPV)		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Methylenetetra-hydrofolate reductase (*MTHFR* gene)		MGL1	Molecular Genetics	264–265
Methylmalonic acid		MMA	MMA and Active B_{12}	82
Methylphenidate		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Metoprolol		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
MGMT		GLI	Glioma	280
Microalbumin, urine		LN20	Urine Albumin CVL	128
	X	U	Urine Chemistry—General	68
	X	UMC	Urine Albumin (Microalbumin)/Creatinine	158
Microarray, constitutional disorders (See Cytogenomic microarray for constitutional abnormalities)				
Microarray, neoplastic disorders (See Cytogenoic microarray for oncologic abnormalities)				
Microsatellite instability	X	MSI	Microsatellite Instability	276
Microtiter plate reader linearity		I	Instrumentation	135
Midazolam		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
Mirtazapine		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Mite identification		TMO	Ticks, Mites, and Other Arthropods	196
Mitochondrial cytopathies	X	IMD3	Mitochondrial Cytopathies	265
Mitochondrial DNA deletion syndromes	X	IMD1	Mitochondrial DNA Deletion Syndromes	265
Mitragynine (Kratom)		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Mixing studies, aPTT		CGE/CGEX	Coagulation, Extended	165
		CGS1	Coag Special, Series 1	166
Mixing studies, PT		CGE/CGEX	Coagulation, Extended	165
		CGS1	Coag Special, Series 1	166
MLH1 promoter methylation analysis	X	MSI	Defective DNA Mismatch Repair/Hereditary Nonpolyposis Colorectal Cancer (HNPCC)	276
Modified acid-fast stain	X	P, P3, P4, P5	Parasitology	195
Mold identification (See Fungus, yeast, mold, and aerobic actinomycetes identification)				
Molecular genetics (See individual analytes)				
Molecular hematologic oncology	X	MHO, MHO1, MHO2, MHO3	Molecular Hematologic Oncology	281
Molecular hematologic oncology (See DNA extraction and ampllification)				
Molecular HLA typing	X	DML	HLA Molecular Typing	251
Monitoring engraftment	X	ME	Monitoring Engraftment	251
Mononuclear cell count		SCP	Stem Cell Processing	242
Mononuclear cell count, cord blood		CBT	Cord Blood Testing	242

Analyte/Procedure	LAP ENR	Program Code	Description	Page
Moraxella catarrhalis	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
Morganella morganii		JIP	Joint Infection Panel	208
Morphine		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UT	Urine Toxicology	96
M-protein (paraprotein) identification	X	SPE	Protein Electrophoresis	75
MPL		MHO2, MHO3	Molecular Hematologic Oncology	281
Mpox (monkeypox virus) detection		MPOX	Mpox Molecular	201
MPV		FH1–FH4, FH9–FH10, FH13, FH16–FH17	Hematology Automated Differential	138
		FH3Q, FH9Q, FH13Q	QCC, Automated Hematology Series	43
		HE	Basic Hematology	138
MRSA (See Methicillin-resistant *Staphylococcus aureus*)				
Mucolipidosis IV (*MCOLN1* gene)	X	MGL4	Molecular Genetics	264–265
Mucopolysaccharide (Glycosaminoglycan)	X	BGL	Biochemical Genetics	259
Multimodality biomarker assessment		NMBA, NMB1	Navigating Multimodality Biomarker Assessment	303
Multiple endocrine neoplasia type 2 (*RET* gene)	X	MGL3	Molecular Genetics	264–265
Mumps-IgG		VR3M	Virology	215
Mycobacterial culture	X	**E1**	Mycobacteriology, Ltd	191
Mycobacterial identification	X	**E**	Mycobacteriology	191
Mycobacterium tuberculosis		IDO	Nucleic Acid Amp, Organisms	207
Mycobacterium tuberculosis antibody detection		QF	*M. tuberculosis* Infection Detection	223
***Mycobacterium tuberculosis* detection and resistance detection**		MTBR	Molecular MTB Detection and Resistance	191
***Mycobacterium tuberculosis* detection and resistance detection** (cont.)	X	**MTR5**	Molecular MTB Detection and Resistance, 5 Challenge	191
Mycophenolic acid	X	MPA	Mycophenolic Acid	59
Mycoplasma genitalium		MGEN	*Mycoplasma genitalium*, Molecular	189
	X	**STIM**	Sexually Transmitted Infection Detection, Molecular	190
Mycoplasma pneumoniae		IDN, IDO	Nucleic Acid Amp, Organisms	207
	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
	X	**IDR**	Infectious Disease, Respiratory Panel	210
Mycoplasma pneumoniae antibodies		VR3	Infectious Disease Serology	215
Myoglobin	X	CRT, CRTI, HCRT, HCRTI	Cardiac Markers	60
		CRTQ	QCC, Cardiac Markers	38
		HCRQ	QCC, High-Sensitivity Cardiac Markers	39
		LN33	Serum Myoglobin CVL	130
	X	PCARM/ PCARMX	Point-of-Care Cardiac Markers	64
		POC12	POC Cardiac Markers Competency	51
Myoglobin, urine		MYG	Myoglobin, Urine	69
Myotonic dystrophy (*DMPK* gene)	X	MGL2	Molecular Genetics	264–265
N-acetylprocainamide (NAPA)		CZ/CZX/ CZ2X, Z	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
Naloxone		DMPM	Drug Monitoring for Pain Management	108
		T	Toxicology	96
		UT	Urine Toxicology	96
Naproxen		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Nasal smears, eosinophil		CMMP	Clinical Microscopy, Misc	151
N-desmethyltramadol		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
***Neisseria gonorrhoeae* culture**	X	**D3, RMC**	GC Cultures	177–178

Analyte/Procedure	LAP ENR	Program Code	Description	Page
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	X	**HC7**	*C. trachomatis*/GC DNA by NAA	189
		JIP	Joint Infection Panel	208
	X	**STIM**	Sexually Transmitted Infection Detection, Molecular	190
Neisseria meningitidis	X	**IDM5**	Meningitis/Encephalitis Panel	209
		IDME	Meningitis/Encephalitis Panel	209
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Neutral fats fecal (See Fecal fat qualitative)				
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		NGSB3	NGS Hematologic Malignancies Bioinformatics	271
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		NGSE	NGS Undiagnosed Disorders—Exome	273
		NGSET	NGS Undiagnosed Disorders—Trio Analysis	274
	X	NGSHM	NGS—Hematologic Malignancies	268
	X	NGSST	NGS—Solid Tumor	268
Nicotine		NTA	Nicotine and Tobacco Alkaloids	103
Niemann-Pick type A/B (*SMPD1* gene)	X	MGL4	Molecular Genetics	264–265
NIPT (See Cell-free DNA screening for fetal aneuploidy)				
Nitrite, urine	X	CMP, CMP1	Clinical Microscopy	150
		CMQ	QCC, Urinalysis	44
		DAI	Urine Drug Adulterant/Integrity Testing	99
	X	HCC2, HCC3	Waived Combination	66
		POC3	POC Urine Dipstick Competency	50
Nitrogen, urine, total		U	Urine Chemistry—General	68

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Norbuprenorphine		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UT	Urine Toxicology	96
Norchlordiazepoxide		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Norclomipramine		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Norcodeine		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Norcyclobenzaprine		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Nordiazepam		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UT	Urine Toxicology	96
Nordoxepin		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Norepinephrine	X	N	Urine Chemistry—Special	69

Analyte/Procedure	LAP ENR	Program Code	Description	Page
Norfentanyl		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UT	Urine Toxicology	96
Norfluoxetine		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Norhydrocodone		DMPM	Drug Monitoring for Pain Management	108
Norketamine		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Normeperidine		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Normetanephrine	X	N	Urine Chemistry—Special	69
Normirtazapine		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Nornaloxone		T	Toxicology	96
		UT	Urine Toxicology	96
Norovirus		GIP	Gastrointestinal Panel	212
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Noroxycodone		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Noroxymorphone		DMPM	Drug Monitoring for Pain Management	108
Norpropoxyphene		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UT	Urine Toxicology	96
Norsertraline		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Nortrimipramine		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Nortriptyline		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
	X	ZT	TDM—Special	59
Norvenlafaxine		DFC	Drug-Facilitated Crime	109
Norverapamil		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
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NRAS, gDNA	X	MTP	Multigene Tumor Panel, gDNA	279
NT-pro B-natriuretic peptides	X	**BNP5**	B-type Natriuretic Peptides	60
		BNPQ	QCC, B-type Natriuretic Peptides	37
		LN30	BNP CVL	129
	X	**PCARM/ PCARMX**	Point-of-Care Cardiac Markers	64
Nucleated cells, total (See Total nucleated cells)				
Nucleated cells, total, body fluid		ABF3	Automated Body Fluid	152
Nucleated red blood cell count		FH3, FH9, FH13, FH16–FH17	Hematology Automated Differential	138
		FH3Q, FH9Q, FH13Q	QCC, Automated Hematology Series	43
Nucleated red cells, total		CBT	Cord Blood Testing	242

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NUDT15		PGX3	Pharmacogenetics	266
Nugent scoring		VS2	Vaginitis Screen, Virtual Gram Stain	190
Occult blood, fecal		OCB	Occult Blood	157
		OCBQ	QCC, Occult Blood	45
		POC9	POC Fecal Occult Blood	50
Occult blood, gastric		GOCB	Gastric Occult Blood	155
O-desmethyltramadol		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
O-desmethylvenlafaxine		T	Toxicology	96
		UT	Urine Toxicology	96
Olanzapine		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Oligoclonal bands		OLI	Oligoclonal Bands	73
Opiate group		DMPM	Drug Monitoring for Pain Management	108
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UDS, UDS6	Urine Drug Screen	98
		UT	Urine Toxicology	96
		UTCO	Urine Toxicology Carryover	135
OPRM1		PGX1	Pharmacogenetics	266
Optical genome mapping		OGM	Optical Genome Mapping	258
Organic acids, urine; qualitative	X	BGL	Biochemical Genetics	259
Organic acids, urine; quantitative		BGL	Biochemical Genetics	259
Ornithine, quantitative		BGL2	Amino Acid Quantitation for Inherited Metabolic Disorders	260
Osmolality, measured	X	C3/C3X, CZ/CZX/CZ2X	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
Osmolality, urine	X	CMP, CMP1	Clinical Microscopy	150
Osmolality, urine (cont.)		CMQ	QCC, Urinalysis	44
		LN6	Urine Chemistry CVL	124
		POC3	POC Urine Dipstick Competency	50
	X	U	Urine Chemistry—General	68
Osteocalcin		BGS	Bone and Growth	84
Oxalate		KSA	Kidney Stone Risk Assessment	69
Oxazepam		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UT	Urine Toxicology	96
Oxcarbazepine		ZE	Therapeutic Drug Monitoring, Extended	59
Oxcarbazepine metabolite		ZE	Therapeutic Drug Monitoring, Extended	59
Oxidants, urine		DAI	Urine Drug Adulterant/Integrity Testing	99
Oxycodone		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UDS, UDS6	Urine Drug Screen	98
		UT	Urine Toxicology	96
Oxyhemoglobin	X	SO	Blood Oximetry	93
		SOQ	QCC, Blood Oximetry	42
Oxymorphone		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UT	Urine Toxicology	96
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Analyte/Procedure	LAP ENR	Program Code	Description	Page
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Pancreatic amylase (See Amylase, pancreatic)				
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		FP1T	First Trimester Maternal Screening, Total hCG	86
Parainfluenza virus		ID2	Nucleic Acid Amp, Respiratory	203
	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
	X	**IDR**	Infectious Disease, Respiratory Panel	210
	X	**VR1**	Virology Culture	199
	X	**VR2**	Viral Antigen Detection by DFA	199
Paraprotein identification	X	SPE	Protein Electrophoresis	75
Parasite identification	X	**P,** P3, **P4, P5**	Parasitology	195
Parasite identification, expanded		PEX	Expanded Parasitology	196
Parasite identification, gastrointestinal panel (See individual analytes)				
Parathyroid hormone (PTH)	X	**PTH**	Parathyroid Hormone	85
		PTHQ	QCC, PTH	40
Parentage/relationship testing	X	PARF	Parentage/Relationship	248
Paroxetine		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Parvimonas micra		JIP	Joint Infection Panel	208
Parvovirus B19		ID1	Nucleic Acid Amp, Viruses	200
pCO_2	X	**AQ, AQH, AQIS**	Critical Care Blood Gas	90–91
		AQQ, AQHQ, AQSQ	QCC, Critical Care Blood Gas Series	41
		LN13, LN13C	Blood Gas CVL	126
		POC10, POC11	POC Competency Blood Gases	51
PDGFRA	X	KIT	*KIT/PDGFRA*	278
PDGFRA, gDNA	X	MTP	Multigene Tumor Panel, gDNA	279
PD-L1	X	PDL1	PD-L1 Immunohistochemistry	302
PD-L1 TPS by IHC, interpretation only		TPS, TPS1	PD-L1 Tumor Proportion Score IHC, Interpretation Only	306
Pentobarbital		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Peptoniphilus spp.		JIP	Joint Infection Panel	208
Peptostreptococcus anaerobius		JIP	Joint Infection Panel	208
Performance improvement program in surgical pathology		PIP/PIP1, PIPW/ PIPW1	Performance Improvement Program in Surgical Pathology	286–287
Peripheral blood cell identification (See Blood cell identification, expanded)				
Peripheral blood smear, virtual		VPBS	Virtual Peripheral Blood Smear	147
pH	X	**AQ, AQH, AQIS**	Critical Care Blood Gas	90–91
		AQQ, AQHQ, AQSQ	QCC, Critical Care Blood Gas Series	41
		LN13, LN13C	Blood Gas CVL	126
		POC10, POC11	POC Competency Blood Gases	51
pH, amniotic fluid		AFL	Amniotic Fluid Leakage	152
pH, body fluid		FLD	Body Fluid	71
		FLDQ	QCC, Body Fluid Chemistry	38
pH, gastric (See Gastric pH)				
pH interpretation, amniotic fluid		AFL	Amniotic Fluid Leakage	152
pH meters		I	Instrumentation	135
pH, urine	X	CMP, CMP1	Clinical Microscopy	150
		CMQ	QCC, Urinalysis	44
		DAI	Urine Drug Adulterant/ Integrity Testing	99
	X	HCC2, HCC3	Waived Combination	66
		POC3	POC Urine Dipstick Competency	50
		UDC	Forensic Urine Drug Testing, Confirmatory	100
Phencyclidine		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96

Analyte/Procedure	LAP ENR	Program Code	Description	Page
Phencyclidine (cont.)		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UDS, UDS6	Urine Drug Screen	98
		UT	Urine Toxicology	96
Phenethylamine		FTC	Forensic Toxicology, Criminalistics	105
Pheniramine		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Phenobarbital	X	**CZ/CZX/ CZ2X, Z**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		LN3	TDM CVL	123
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UT	Urine Toxicology	96
Phentermine		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Phenylalanine, quantitative		BGL2	Amino Acid Quantitation for Inherited Metabolic Disorders	260
Phenylephrine		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Phenytoin	X	**CZ/CZX/ CZ2X, Z**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		LN3	TDM CVL	123
		SCO	Serum Carryover	135
		T	Toxicology	96
		UT	Urine Toxicology	96
Phenytoin, free	X	CZ/CZX/ CZ2X, Z	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
Phosphorus	X	**C1, C3/C3X, CZ/CZX/ CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN2	Chemistry, Lipid, Enzyme CVL	122
Phosphorus (cont.)		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
Phosphorus, urine		LN6	Urine Chemistry CVL	124
	X	U	Urine Chemistry—General	68
PIK3CA, gDNA	X	MTP	Multigene Tumor Panel, gDNA	279
Pinworm prep	X	CMMP	Clinical Microscopy, Misc	151
Pipette calibration, gravimetric		I	Instrumentation	135
Plasma cell neoplasms		PCNEO	Flow Cytometry, Plasma Cell Neoplasms	230
Plasma hemoglobin		PHG	Plasma Hemoglobin	75
Plasminogen activator inhibitor		CGE/CGEX	Coagulation, Extended	165
Plasminogen activator inhibitor (PAI)-1 (*SERPINE1* gene)		MGL1	Molecular Genetics	264–265
Plasminogen antigen		CGE/CGEX	Coagulation, Extended	165
Plasmodium falciparum antigen		RMAL	Rapid Malaria	196
	X	**RML5**	Rapid Malaria, 5 Challenge	196
Platelet aggregation		PF	Platelet Function	169
Platelet antibody detection	X	PS	Platelet Serology	240
Platelet calculator		TRC	Transfusion-Related Cell Count	239
Platelet count	X	**FH1–FH4, FH9–FH10, FH13, FH16–FH17**	Hematology Automated Differential	138
		FH3Q, FH9Q, FH13Q	QCC, Automated Hematology Series	43
	X	**HE**	Basic Hematology	138
		LN9	Hematology CVL	125
Platelet count (platelet-rich plasma)	X	TRC	Transfusion-Related Cell Count	239
Platelet count, estimated		EHE1	Expanded Virtual Peripheral Blood Smear	148
Platelet count, estimated, virtual		VPBS	Virtual Peripheral Blood Smear	147
Platelet crossmatch		PS	Platelet Serology	240
Platelet function		PF1	Platelet Function	169
Platelet mapping		PLTM	Platelet Mapping	172
Plesiomonas shigelloides		GIP	Gastrointestinal Panel	212
	X	**GIP5**	Gastrointestinal Panel, 5 Challenge	212
		GIPN	Gastrointestinal Panel, Global	213

Analyte/Procedure	LAP ENR	Program Code	Description	Page
PML::RARA		MHO2, MHO3	Molecular Hematologic Oncology	281
PML::RARA (See Measurable residual disease, *PML::RARA)*				
Pneumocystis detection		PCP1	*Pneumocystis jirovecii,* Calcofluor White Stain	194
		PCP2	*Pneumocystis jirovecii,* DFA Stain	194
		PCP4	*Pneumocystis jirovecii,* GMS Stain	194
Pneumonia panel, molecular (See individual analytes)				
PNH immunophenotype		PNH	Paroxysmal Nocturnal Hemoglobinuria	231
pO_2	X	**AQ, AQH, AQIS**	Critical Care Blood Gas	90–91
		AQQ, AQHQ, AQSQ	QCC, Critical Care Blood Gas Series	41
		LN13, LN13C	Blood Gas CVL	126
		POC10, POC11	POC Competency Blood Gases	51
Porphobilinogen, urine		UPBG	Porphobilinogen, Urine	70
Posaconazole		AFD	Antifungal Drugs Monitoring	107
Postanalytical DNA sequencing (See DNA sequencing)				
Post-immunotherapy analysis, flow cytometry		FL6	Post-immunotherapy Flow Analysis	227
Postvasectomy sperm count, automated		PV1	Postvasectomy Sperm Count	160
Postvasectomy sperm count, manual		PV	Postvasectomy Sperm Count	160
Postvasectomy sperm presence/absence, manual	X	PV	Postvasectomy Sperm Count	160
Potassium	X	**AQ, AQH, AQIS**	Critical Care Blood Gas	90–91
		AQQ, AQHQ, AQSQ	QCC, Critical Care Blood Gas Series	41
	X	**C1, C3/C3X, C4, CZ/CZX/ CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN13C	Blood Gas CVL	126
		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122

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Potassium (cont.)		POC10, POC11	POC Competency Blood Gases	51
Potassium, body fluid		FLD2	Body Fluid Chemistry 2	72
Potassium, urine		LN6	Urine Chemistry CVL	124
	X	U	Urine Chemistry—General	68
Potassium, vitreous fluid		VF	Vitreous Fluid, Postmortem	102
Prader-Willi/Angelman syndrome	X	MGL1	Molecular Genetics	264–265
Prealbumin	X	C3/C3X, CZ/CZX/CZ2X	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
	X	S2, S4	Immunology, Special	219
Predictive markers by immunohistochemistry (See individual markers)				
Pregabalin		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
		ZE	Therapeutic Drug Monitoring, Extended	59
Prekallikrein		CGE/CGEX	Coagulation, Extended	165
Primidone		CZ/CZX/ CZ2X, Z	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
Pro B-natriuretic peptides (See NT-pro B-natriuretic peptides)				
Procainamide		CZ/CZX/ CZ2X, Z	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
Procalcitonin		LN41	Procalcitonin CVL	132
	X	PCT	Procalcitonin	75
Progesterone		LN8	Reproductive Endocrinology CVL	125
	X	**Y/YY**	Sex Hormones	83
Progesterone receptors by immunohistochemistry		PM2	ER, PgR by Immunohistochemistry	300
Prolactin		LN8	Reproductive Endocrinology CVL	125
	X	**Y/YY**	Sex Hormones	83
Proline, quantitative		BGL2	Amino Acid Quantitation for Inherited Metabolic Disorders	260
Promethazine		DFC	Drug-Facilitated Crime	109
Propoxyphene		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108

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Propoxyphene (cont.)		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UDS, UDS6	Urine Drug Screen	98
		UT	Urine Toxicology	96
Propranolol		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Prostate-specific antigen (PSA)		ABS	Accuracy-Based Testosterone, Estradiol	113
	X	**K/KK**	Ligand—General	82
		LN23	PSA CVL	128
Prostate-specific antigen, complexed (cPSA)		K/KK	Ligand—General	82
Prostate-specific antigen (PSA), free, measured	X	K/KK	Ligand—General	82
Prostatic acid phosphatase (PAP)	X	K/KK	Ligand—General	82
Protein C		CGE/CGEX	Coagulation, Extended	165
		CGS2	Coag Special, Series 2	166
		LN35	Thrombophilia CVL	131
Protein electrophoresis, serum, interpretation (See individual analytes)				
Protein S		CGE/CGEX	Coagulation, Extended	165
		CGS2	Coag Special, Series 2	166
Protein, confirmatory urine		DSC	Dipstick Confirmatory	155
Protein, CSF	X	M, OLI	CSF Chemistry and Oligoclonal Bands	73
Protein, total (See Total protein)				
Protein, total, body fluid		FLD	Body Fluid	71
		FLDQ	QCC, Body Fluid Chemistry	38
Protein, urine		ABU	Accuracy-Based Urine	113
	X	CMP, CMP1	Clinical Microscopy	150
		CMQ	QCC, Urinalysis	44
	X	HCC2, HCC3	Waived Combination	66
		LN6	Urine Chemistry CVL	124
		POC3	POC Urine Dipstick Competency	50
	X	U	Urine Chemistry—General	68

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***Proteus* spp.**	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
		JIP	Joint Infection Panel	208
Prothrombin mutation (*F2* gene) (See Factor II (F2 gene))				
Prothrombin time		APXBN	Anticoagulant Monitoring, Apixaban	168
	X	**CGB**	Basic Coagulation	164
	X	**CGL**	Coagulation, Limited	164
		CGLQ	QCC, Coagulation, Limited	46
		CGS1	Coag Special, Series 1	166
		CGS4	Coag Special, Series 4	166
		DBGN	Anticoagulant Monitoring, Dabigatran	168
		FNPX	Anticoagulant Monitoring, Fondaparinux	168
		POC6	POC PT/INR, CoaguChek XS Plus	50
		RVBN	Anticoagulant Monitoring Rivaroxaban	168
	X	**WP3, WP4, WP6, WP9**	Whole Blood Coagulation	171
Prothrombin time, dilute		CGE/CGEX	Coagulation, Extended	165
Provider-performed microscopy (See individual analytes)				
PRU test		PIA/PIAX	Drug-Specific Platelet Aggregation	171
Pseudocholinesterase		C7	Pseudocholinesterase	75
Pseudoephedrine		FTC	Forensic Toxicology, Criminalistics	105
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Pseudomonas aeruginosa	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
		JIP	Joint Infection Panel	208
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		QPB10, QPB25	Assessment of Consistency of Body Fluid Morphologic Observations	26
		QPC10, QPC25	Assessment of Consistency of Peripheral Blood Morphologic Observations	27

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Quality management tools (cont.)		QPD10, QPD25	Assessment of Consistency of Gram Stain Morphologic Observations	28
		QT2	Blood Culture Contamination	30
		QT3	Laboratory Specimen Acceptability	30
		QT4	In-Date Blood Product Wastage	31
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Quetiapine		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
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		UT	Urine Toxicology	96
Quinidine		CZ/CZX/ CZ2X, Z	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
Quinine		FTC	Forensic Toxicology, Criminalistics	105
Ranitidine		FTC	Forensic Toxicology, Criminalistics	105
Rapamycin (sirolimus)	X	CS	Immunosuppressive Drugs	58
Rapid group A strep (See Group A *Streptococcus* antigen detection)				
RBC count	X	**FH1–FH4, FH9–FH10, FH13, FH16–FH17**	Hematology Automated Differential	138
		FH3Q, FH9Q, FH13Q	QCC, Automated Hematology Series	43
	X	**HE**	Basic Hematology	138
		LN9	Hematology CVL	125
RBC count, automated, body fluid		ABF1, ABF2, ABF3	Automated Body Fluid	152
RBC count, automated, urine; quantitative		UAA, UAA1	Automated Urinalysis	154
RBC folate		FOL	RBC Folate	87
RBC manual count, fluid	X	HFC, HFCI	Hemocytometer Fluid Count	156
RBC morphology, virtual		EHE1	Expanded Virtual Peripheral Blood Smear	148
RBC morphology, virtual (cont.)		VPBS	Virtual Peripheral Blood Smear	147
RDW		FH1–FH4, FH9–FH10, FH13, FH16–FH17	Hematology Automated Differential	138
		FH3Q, FH9Q, FH13Q	QCC, Automated Hematology Series	43
		HE	Basic Hematology	138
Red blood cell antigen detection		J, JXM, J1	Transfusion Medicine	234
Red blood cell antigen genotyping		RAG	Red Blood Cell Antigen Genotyping	237
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Red blood cell antigen typing, automated		ARCT	Red Blood Cell Antigen Typing, Automated	237
Reducing substance, urine		CMP, CMP1	Clinical Microscopy	150
		CMQ	QCC, Urinalysis	44
		HCC2, HCC3	Waived Combination	66
		POC3	POC Urine Dipstick Competency	50
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		ECF	Expanded Coagulation Factors	165
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Respiratory syncytial virus (RSV)		ID2	Nucleic Acid Amp, Respiratory	203
	X	**ID3**	Nucleic Acid Amplification, Respiratory Limited	203
		ID3Q	QCC, Nucleic Acid Amplification, Respiratory Limited	47
	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
	X	**IDR**	Infectious Disease, Respiratory Panel	210
	X	**VR2**	Viral Antigen Detection by DFA	199
	X	**VR4**	Virology Antigen Detection by EIA and Latex	199
Respiratory syncytial virus (RSV), culture	X	**VR1**	Virology Culture	199
Reticulocyte count, absolute	X	RT, RT2, RT3, RT4	Reticulocyte	143

Analyte/Procedure	LAP ENR	Program Code	Description	Page
Reticulocyte count, absolute (cont.)		RTQ, RT3Q, RT4Q	QCC, Reticulocyte	44
Reticulocyte count, percent		LN19, LN53	Reticulocyte CVL	127
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		RTQ, RT3Q, RT4Q	QCC, Reticulocyte	44
Reticulocyte hemoglobin (RET-He)		RT4	Reticulocyte	143
Reticulocyte hemoglobin concentration (CHr)		RT3	Reticulocyte	143
Rett syndrome (*MECP2* gene)	X	RETT	Rett Syndrome Genotyping	267
Rett syndrome (*MECP2* gene) duplication deletion analysis	X	RETT	Rett Syndrome Genotyping	267
RhD		MGL2	Molecular Genetics	264–265
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RhD typing		ABOSG	ABO Subgroup Typing	237
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		JATQ	QCC, Transfusion Medicine	48
		TMCA	Transfusion Medicine, Competency Assessment	241
Rheumatoid factor isotypes, IgA, IgG, and IgM		CCP	Cyclic Citrullinated Peptide Antibody	222
Rheumatoid factor, qualitative	X	**IL, RF/RFX**	Immunology	218
Rheumatoid factor, quantitative	X	IL, RF/RFX	Immunology	218
Rhinovirus		ID2	Nucleic Acid Amp, Respiratory	203
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Rifampin resistance		MTBR	Molecular MTB Detection and Resistance	191
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Ritalinic acid		FTC	Forensic Toxicology, Criminalistics	105
Rivaroxaban		RVBN	Anticoagulant Monitoring, Rivaroxaban	168
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		GIPN	Gastrointestinal Panel, Global	213
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	X	**VR4**	Viral Antigen Detection by EIA and Latex	199
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Rubella antibody, IgG; qualitative	X	**IL, RUB/ RUBX**	Immunology	218
Rubella antibody, IgG; quantitative	X	IL, RUB/ RUBX	Immunology	218
Rubeola antibody (English measles) antibodies	X	VR3	Infectious Disease Serology	215
Rufinamide		ZE	Therapeutic Drug Monitoring, Extended	59
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Russell's viper venom time, dilute		CGS1	Coagulation Special, Series 1	166
Salicylate	X	**CZ/CZX/ CZ2X, Z**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		FTC	Forensic Toxicology, Criminalistics	105
		LN3	TDM CVL	123
		SDS	Serum Drug Screen	102
		T	Toxicology	96
		UT	Urine Toxicology	96
Salmonella		GIP	Gastrointestinal Panel	212
	X	**GIP5**	Gastrointestinal Panel, 5 Challenge	212
		GIPN	Gastrointestinal Panel, Global	213
		JIP	Joint Infection Panel	208
Sapovirus (I, II, IV, V)		GIP	Gastrointestinal Panel	212
	X	**GIP5**	Gastrointestinal Panel, 5 Challenge	212
		GIPN	Gastrointestinal Panel, Global	213
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SARS-CoV-2 antibody		COVS	SARS-CoV-2 Serology	224
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		COVAQ	QCC, SARS-CoV-2 Antigen	47

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SARS-CoV-2 Antigen (cont.)	X	**CVAG**	SARS-CoV-2 Antigen, 5 Challenge	202
SARS-CoV-2 Molecular		COV2	SARS-CoV-2 Molecular	201
		COV2Q	QCC, SARS-CoV-2 Molecular	47
	X	**COVM**	SARS-CoV-2 Molecular, 5 Challenge	202
	X	**ID3**	Nucleic Acid Amplification, Respiratory Limited	203
		ID3Q	QCC, Nucleic Acid Amplification, Respiratory Limited	47
	X	**IDR**	Infectious Disease, Respiratory Panel	210
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Secobarbital		DFC	Drug-Facilitated Crime	109
		UDC	Forensic Urine Drug Testing, Confirmatory	100
Selenium	X	R	Trace Metals	77
Selenium, urine		TMU	Trace Metals, Urine	104
Selenium, whole blood		TMWB	Trace Metals, Whole Blood	104
Semen analysis (See Sperm count and post vasectomy sperm count)				
Semen analysis (See Sperm morphology, online)				
Semen analysis (See Sperm viability, online)				
Semen analysis (See Sperm count, online and Sperm motility, online)				
Serine, quantitative		BGL2	Amino Acid Quantitation for Inherited Metabolic Disorders	260
SERPINA1 genotyping	X	AAT	Alpha-1 Antitrypsin Genotyping	261
Serratia marcescens	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
		JIP	Joint Infection Panel	208
Sertraline		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Serum free light chains		SFLC	Serum Free Light Chains	225
Sex hormone-binding globulin (SHBG)		ABS	Testosterone and Estradiol Accuracy	113
Sex hormone-binding globulin (SHBG) (cont.)	X	Y/YY	Sex Hormones	83
SF1		PM5	Immunohistochemistry Tissue Microarray	298
Shiga toxin	X	**SP**	Stool Pathogens—Rapid and Molecular	187
	X	**ST, STX**	Shiga Toxin	188
Shiga-like toxin producing *E. coli* (STEC)		GIP	Gastrointestinal Panel	212
	X	**GIP5**	Gastrointestinal Panel, 5 Challenge	212
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	X	**GIP5**	Gastrointestinal Panel, 5 Challenge	212
		GIPN	Gastrointestinal Panel, Global	213
Sickle cell screen, qualitative	X	HG	Hemoglobinopathy	144
	X	SCS	Sickle Cell Screen	145
Sirolimus (rapamycin)	X	CS	Immunosuppressive Drugs	58
SLCO1B1		PGX	Pharmacogenetics	266
Sodium	X	**AQ, AQH, AQIS**	Critical Care Blood Gas	90–91
		AQQ, AQHQ, AQSQ	QCC, Critical Care Blood Gas Series	41
	X	**C1, C3/C3X, C4, CZ/CZX/CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
		LN13C	Blood Gas CVL	126
		POC10, POC11	POC Competency Blood Gases	51
Sodium, body fluid		FLD2	Body Fluid Chemistry 2	72
Sodium, urine		LN6	Urine Chemistry CVL	124
	X	U	Urine Chemistry—General	68
Sodium, vitreous fluid		VF	Vitreous Fluid, Postmortem	102
Soluble transferrin receptor		STFR	Soluble Transferrin Receptor	79
Somatomedin C (IGF-1)	X	Y/YY	Sex Hormones	83
Specific gravity	X	CMP, CMP1	Clinical Microscopy	150
		CMQ	QCC, Urinalysis	44
		DAI	Urine Drug Adulterant/Integrity Testing	99
	X	HCC2, HCC3	Waived Combination	66

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Specific gravity (cont.)		POC3	POC Urine Dipstick Competency	50
		UDC	Forensic Urine Drug Testing, Confirmatory	100
Spectrophotometer (stray light check)		I	Instrumentation	135
Sperm count, automated		PV1	Semen Analysis	160
	X	SC1	Semen Analysis	160
Sperm count, manual		PV	Postvasectomy Sperm Count	160
	X	SC	Semen Analysis	160
Sperm count, online	X	SMCD	Semen Analysis, Online	160
Sperm morphology, glass slide		SM	Semen Analysis	160
Sperm morphology, online		SM1CD	Semen Analysis, Online	160
Sperm motility, online		SMCD	Semen Analysis, Online	160
Sperm presence/ absence		SC	Semen Analysis	160
Sperm presence/ absence, postvasectomy, manual	X	PV	Semen Analysis	160
Sperm presence/ absence, vaginal		CMMP	Clinical Microscopy, Misc	151
Sperm viability, glass slide	X	SV	Semen Analysis	160
Sperm viability, online	X	SM2CD	Semen Analysis, Online	160
Spinal fluid meningitis antigen panel	X	**D**	Bacteriology	175
Spinal muscular atrophy (*SMN1* and *SMN2* genes)	X	MGL2	Molecular Genetics	264–265
Spinocerebellar ataxia (*ATXN1*, *ATXN2*, *ATXN3*, *CACNA1A*, and *ATXN7* genes)	X	MGL2	Molecular Genetics	264–265
Split fats (See Fecal fat qualitative)				
Staphylococcus aureus	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
		JIP	Joint Infection Panel	208
Staphylococcus aureus, blood culture	X	BCS1	Blood Culture *Staphylococcus aureus*	182
Staphylococcus lugdunensis		JIP	Joint Infection Panel	208
STEC (See Shiga-like toxin producing *E. coli*)				
Strep screen (See Group A *Streptococcus* antigen detection)				
***Streptococcus agalactiae*, molecular**	X	**IDM5**	Meningitis/Encephalitis Panel	209
		IDME	Meningitis/Encephalitis Panel	209
***Streptococcus agalactiae*, molecular** (cont.)	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
		JIP	Joint Infection Panel	208
Streptococcus agalactiae (See Group B *Streptococcus*)				
Streptococcus pneumoniae	X	**IDM5**	Meningitis/Encephalitis Panel	209
		IDME	Meningitis/Encephalitis Panel	209
	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
		JIP	Joint Infection Panel	208
		SBAS	*S. pneumoniae* Ag Detection	181
***Streptococcus pyogenes*,** molecular	X	**IDPN**	Infectious Disease, Pneumonia Panel	211
		JIP	Joint Infection Panel	208
Streptococcus pyogenes antigen (See Group A *Streptococcus* antigen detection)				
Streptococcus pyogenes (See Throat culture/ molecular)				
Strychnine		FTC	Forensic Toxicology, Criminalistics	105
Sulfosalicylic acid (SSA) (See Protein, confirmatory, urine)				
Surgical pathology		PIP/PIP1, PIPW/ PIPW1	Performance Improvement Program in Surgical Pathology	286–287
Synthetic cannabinoid/ designer drugs		SCDD	Synthetic Cannabinoid/ Designer Drugs	106
Syphilis	X	**G**	Syphilis Serology	224
T3, free (triiodothyronine) (See Triiodothyronine (T3), free)				
T3, total (triiodothyronine) (See Triiodothyronine (T3), total)				
T3, uptake and related tests	X	**C1, C3/C3X, CZ/CZX/ CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
	X	**K/KK**	Ligand—General	82
T4, free (thyroxine) (See Thyroxine (T4), free)				
T4, total (thyroxine) (See Thyroxine (T4), total)				
Tacrolimus	X	CS	Immunosuppressive Drugs	58

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Tapentadol		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		T	Toxicology	96
		UT	Urine Toxicology	96
Tapentadol-O-sulfate		DMPM	Drug Monitoring for Pain Management	108
Taurine, quantitative		BGL2	Amino Acid Quantitation for Inherited Metabolic Disorders	260
Tay-Sachs (*HEXA* gene)	X	MGL4	Molecular Genetics	264–265
tCO_2	X	**AQ, AQH, AQIS**	Critical Care Blood Gas	90–91
		AQSQ	QCC, Critical Care Blood Gas	41
Temazepam		DFC	Drug-Facilitated Crime	109
		DMPM	Drug Monitoring for Pain Management	108
		FTC	Forensic Toxicology, Criminalistics	105
		OFD	Oral Fluid for Drugs of Abuse	101
		T	Toxicology	96
		UDC	Forensic Urine Drug Testing, Confirmatory	100
		UT	Urine Toxicology	96
Teriflunomide		ZE	Therapeutic Drug Monitoring, Extended	59
Testosterone		ABS	Accuracy-Based Testosterone and Estradiol	113
		LN8	Reproductive Endocrinology CVL	125
	X	**Y/YY**	Sex Hormones	83
Testosterone, free, measured		Y/YY	Sex Hormones	83
Tetrahydrozoline		DFC	Drug-Facilitated Crime	109
Thallium, urine		TMU	Trace Metals, Urine	104
Thallium, whole blood		TMWB	Trace Metals, Whole Blood	104
Theophylline	X	**CZ/CZX/ CZ2X, Z**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN3	TDM CVL	123
Threonine, quantitative		BGL2	Amino Acid Quantitation for Inherited Metabolic Disorders	260
Throat culture/molecular	X	**D1**	Group A *Streptococcus* Culture/Molecular	177
Throat culture/molecular (cont.)	X	**MC4**	Urine Colony Count Combination	178
	X	**RMC**	Routine Microbiology Combination	178
Thrombin time		CGE/CGEX	Coagulation, Extended	165
		CGS4	Coag Special, Series 4	166
		DBGN	Dabigatran	168
		ECF	Expanded Coagulation Factors	165
Thrombophilia mutations (See individual analytes)				
Thyroglobulin	X	TM/TMX	Tumor Markers	88
Thyroid-stimulating hormone (TSH)		ABS	Accuracy-Based Testosterone and Estradiol	113
		ABTH	Harmonized Thyroid	114
	X	**C1, C3/C3X, CZ/CZX/ CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
	X	**K/KK**	Ligand—General	82
		LN50	Thyroid CVL	134
Thyroid-stimulating hormone (TSH) receptor binding antibody		TSHR	Thyroid-Stimulating Hormone (TSH) Receptor Binding Antibody	224
Thyroxine (T4), free		ABTH	Harmonized Thyroid	114
	X	**C1, C3/C3X, CZ/CZX/ CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
	X	**K/KK**	Ligand—General	82
Thyroxine (T4), total		ABTH	Harmonized Thyroid	114
	X	**C1, C3/C3X, CZ/CZX/ CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
	X	**K/KK**	Ligand—General	82
		LN50	Thyroid CVL	134
Tick identification		TMO	Ticks, Mites, and Other Arthropods	196
Tissue parasite identification (See Blood and tissue parasite, Giemsa stained)				
Tobramycin	X	**CZ/CZX/ CZ2X, Z**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN3	TDM CVL	123
Topiramate		DFC	Drug-Facilitated Crime	109
		FTC	Forensic Toxicology, Criminalistics	105
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		UT	Urine Toxicology	96

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Total bile acids		TBLA	Total Bile Acid	76
Total bilirubin (See Bilirubin, total)				
Total bilirubin, body fluid (See Bilirubin, total, body fluid)				
Total bilirubin, urine (See Bilirubin, urine)				
Total free fatty acids (See Fecal fat qualitative)				
Total hCG	X	**FP1T**	First Trimester Maternal Screening, Total hCG	86
Total hemolytic complement after complement 50% lysis		CH50	Total Hemolytic Complement	224
Total iron binding capacity, measured	X	**C3/C3X, CZ/CZX/CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
Total nitrogen, urine		U	Urine Chemistry—General	68
Total nucleated cells		CBT	Cord Blood Testing	242
		SCP	Stem Cell Processing	242
Total nucleated cells (WBC) automated count, (body fluid) (See WBC automated count, body fluid)				
Total nucleated cells manual differential count (body fluid) (See WBC/total nucleated cells, manual count, fluid)				
Total protein	X	**C1, C3/C3X, CZ/CZX/CZ2X**	Chemistry and TDM	54–56
		CZQ	QCC, Chemistry and TDM	37
		LN2	Chemistry, Lipid, Enzyme CVL	122
		LN2BV	Chemistry, Lipid, Enzyme CVL – all Beckman (except AU), Vitros	122
		SPE	Protein Electrophoresis	75
Total protein, body fluid (See Protein, total, body fluid)				
Total protein, CSF (See Protein, CSF)				
Total protein, urine (See Protein, urine)				
Total tricyclics (See Tricyclics, total)				
Toxicology, serum, qualitative	X	T	Toxicology	96
	X	SDS	Serum Drug Screen	102
Toxicology, urine, qualitative	X	DMPM	Drug Monitoring for Pain Management	108
	X	T	Toxicology	96
	X	UDS, UDS6	Urine Drug Screen	98
	X	UT	Urine Toxicology	96
Toxicology, urine, qualitative/quantitative	X	DMPM	Drug Monitoring for Pain Management	108
	X	UDC	Forensic Urine Drug Testing, Confirmatory	100
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		CZQ	QCC, Chemistry and TDM	37
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Triiodothyronine (T3), free		ABTH	Harmonized Thyroid	114
	X	C1, C3/C3X, CZ/CZX/ CZ2X	Chemistry and TDM	54–56
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Triiodothyronine (T3), total		ABTH	Harmonized Thyroid	114
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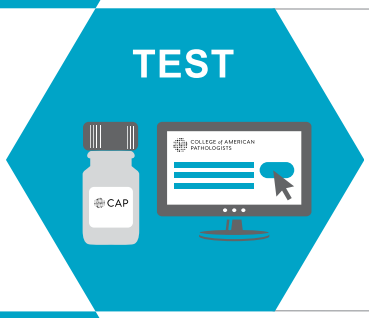

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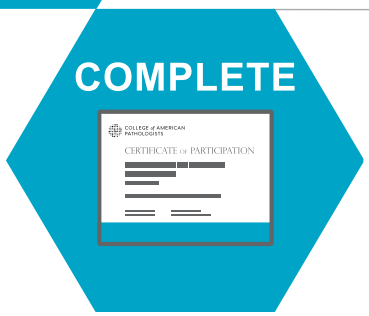

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LN13C*	126	MGL5	264–265	NGSST	268	PHG*	75
LN15*	126	MHO	281	NIPT	87	PIA*	171
LN16*	127	MHO1	281	NMB1	303	PIAX*	171
LN17*	127	MHO2	281	NMBA	303	PIP	287
LN19*	127	MHO3	281	NOB*	106	PIP1	287
LN20*	128	MHO5	276, 281	NP	310	PIPW	286
LN21*	128	MK	298	NP1	310	PIPW1	286
LN22*	128	MMA*	82	NTA*	103	PLA*	74
LN23*	128	MMR	302	OCB*	157	PLTM*	172
LN24*	129	MPA	59	OCBQ*	45	PM1	298
LN30*	129	MPOX	201	OFD*	101	PM2	300
LN31*	129	MRD	282	OGM	258	PM3	301
LN32*	130	MRD1	282	OLI*	73	PM5	298
LN33*	130	MRD2	282	P*	195	PM6	301
LN34*	130	MRS*	186	P3*	195	PNH*	231
LN35*	131	MRS2M*	186	P4*	195	POC1	50
LN36*	131	MRS5*	186	P5*	195	POC2	50
LN37*	131	MRS5M*	186	P16	304	POC3	50
LN38*	131	MSI	276	P53	299	POC4	50
LN39*	131	MTBR*	191	PAPCE	312	POC6	50
LN40*	132	MTP	279	PAPCPT	311	POC7	50

*Program is ISO/IEC 17043 accredited.

Program Code	Pg	Program Code	Pg	Program Code	Pg	Program Code	Pg
POC8	50	RT*	143	SV*	160	VES1*	170
POC9	50	RTQ*	44	SW2*	78	VF*	102
POC10	51	RT2*	143	SW4*	78	VGS1*	180
POC11	51	RT3*	143	T*	96	VGS2*	180
POC12	51	RT3Q*	44	TBLA*	76	VITD*	84
POC14	51	RT4*	143	THCB*	107	VLS*	205
POC15	51	RT4Q*	44	TM*	88	VLS2*	205
PS*	240	RUB*	218	TMB	275	VM1*	245
PTH*	85	RUBX*	218	TMCA	241	VM2*	245
PTHQ*	40	RUR*	187	TMCAD	241	VM3*	245
PV*	160	RVBN*	168	TMCAE	241	VM4*	246
PV1*	160	RWBC*	145	TMCAF	241	VM5*	246
QF*	223	S2*	219	TMO*	196	VM6*	246
QPA5	25	S4*	219	TMU*	104	VM6X*	246
QPA10	25	S5*	219	TMWB*	104	VPBS*	147
QPB10	26	SALC*	76	TMX*	88	VR1*	199
QPB25	26	SARC	277	TPM	267	VR2*	199
QPC10	27	SBAS*	181	TPS	306	VR3*	215
QPC25	27	SC*	160	TPS1	306	VR3M*	215
QPD10	28	SC1*	160	TRC*	239	VR4*	199
QPD25	28	SCDD*	106	TSHR	224	VRE*	190
QT2	30	SCM1*	157	TTD*	215	VS*	188
QT3	30	SCM2*	157	TVAG*	195	VS1*	188
QT4	31	SCO	135	TVG5*	195	VS2*	190
QT7	32	SCP*	242	U*	68	WBCR*	67
QT8	32	SCS*	145	UAA*	154	WBGQ*	37
QT10	33	SDS	102	UAA1*	154	WID*	197
QT16	34	SE*	223	UBJP*	75	WP3*	171
QT17	34	SEC	266	UDC*	100	WP4*	171
R*	77	SEC1	266	UDS*	98	WP6*	171
RAG*	237	SFLC*	225	UDS6*	98	WP9*	171
RAP*	87	SM*	160	UDSM	110	WP10*	171
RBCAT*	237	SM1CD*	160	UHCG*	158	WRHG	237
RDS*	223	SM2CD*	160	UMC*	158	Y*	83
RETT	267	SMCD*	160	UPBG*	70	YBC*	193
RF*	218	SO*	93	URC*	155	YVM	88
RFAV1	231	SOQ*	42	UT*	96	YY*	83
RFAV3	231	SP*	187	UTCO	135	Z*	54–56
RFX*	218	SP1*	187	UVM	70	ZAP70*	232
RHCVW*	247	SPE*	75	V*	225	ZE*	59
RMAL*	196	SPN*	187	VBDM*	206	ZT*	59
RMC*	178	ST*	188	VBF*	152		
RML5*	196	STFR*	79	VBP	288		
RNA	278	STIM*	190	VBP1	288		
ROM1*	157	STX	188	VES*	170		

*Program is ISO/IEC 17043 accredited.

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The College of American Pathologists (CAP), the leading organization of board-certified pathologists, serves patients, pathologists, and the public by fostering and advocating excellence in the practice of pathology and laboratory medicine worldwide.

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