CMS Measure ID/CMS QCDR ID: CAP 11

Measure Title: Accurate Human Epidermal Growth Factor Receptor 2 (HER2) Tumor Evaluation and Repeat Evaluation in Patients with Breast Carcinoma

Measure Specifications

Measure Description	Percentage of surgical pathology reports for breast carcinoma with appropriate human epidermal growth factor receptor 2 (HER2) breast tumor evaluation (Patient-Specific) Three rates are submitted. 1. Percentage of surgical pathology reports for breast carcinoma with a quantitative breast tumor evaluation using HER2 IHC or ISH, that had an HER2 result derived using the ASCO/CAP guideline optimal scoring algorithm 2. Percentage of surgical pathology reports for breast carcinoma with an equivocal HER2 result obtained using the ASCO/CAP guideline optimal scoring algorithm that had a subsequent repeat HER2 test completed 3. Percentage of surgical pathology reports for breast carcinoma with a quantitative breast tumor evaluation using HER2 IHC or ISH, that had an HER2 result derived using the ASCO/CAP guideline optimal scoring algorithm AND when an equivocal HER2 result was obtained, had a subsequent repeat HER2 test completed Performance rate 3 is the reported rate INSTRUCTIONS: This measure is to be reported each time a breast carcinoma report is finalized during the performance period. This measure may be submitted by eligible clinicians who perform the quality actions described in the measure based on the services provided and the measure-specific denominator coding.
Denominator Statement	All surgical pathology reports for breast carcinoma with a quantitative breast tumor evaluation using HER2 IHC or ISH. CPT®: 88305, 88307, 88309, 88173 **AND** ICD10: • C50.011: Malignant neoplasm of nipple and areola, right female breast • C50.012: Malignant neoplasm of nipple and areola, left female breast • C50.019: Malignant neoplasm of nipple and areola, unspecified female breast • C50.021: Malignant neoplasm of nipple and areola, right male breast • C50.022: Malignant neoplasm of nipple and areola, left male breast • C50.029: Malignant neoplasm of nipple and areola, unspecified male breast • C50.111: Malignant neoplasm of central portion of right female breast • C50.112: Malignant neoplasm of central portion of left female breast • C50.119: Malignant neoplasm of central portion of unspecified female

	breast • C50.121: Malignant neoplasm of central portion of right male breast • C50.122: Malignant neoplasm of central portion of left male breast • C50.129: Malignant neoplasm of central portion of unspecified male breast • C50.211: Malignant neoplasm of upper-inner quadrant of right female breast • C50.212: Malignant neoplasm of upper-inner quadrant of left female breast • C50.219: Malignant neoplasm of upper-inner quadrant of unspecified female breast • C50.221: Malignant neoplasm of upper-inner quadrant of right male breast • C50.222: Malignant neoplasm of upper-inner quadrant of left male breast • C50.229: Malignant neoplasm of upper-inner quadrant of unspecified male breast • C50.311: Malignant neoplasm of lower-inner quadrant of right female breast • C50.312: Malignant neoplasm of lower-inner quadrant of left female breast • C50.319: Malignant neoplasm of lower-inner quadrant of unspecified female breast • C50.321: Malignant neoplasm of lower-inner quadrant of right male breast • C50.322: Malignant neoplasm of lower-inner quadrant of left male breast • C50.329: Malignant neoplasm of lower-inner quadrant of unspecified male breast • C50.411: Malignant neoplasm of upper-outer quadrant of right female breast • C50.412: Malignant neoplasm of upper-outer quadrant of left female breast • C50.419: Malignant neoplasm of upper-outer quadrant of unspecified female breast • C50.421: Malignant neoplasm of upper-outer quadrant of right male breast • C50.422: Malignant neoplasm of upper-outer quadrant of left male breast • C50.429: Malignant neoplasm of upper-outer quadrant of unspecified male breast • C50.511: Malignant neoplasm of lower-outer quadrant of right female breast • C50.512: Malignant neoplasm of lower-outer quadrant of left female breast • C50.519: Malignant neoplasm of lower-outer quadrant of unspecified female breast

	• C50.521: Malignant neoplasm of lower-outer quadrant of right male breast • C50.522: Malignant neoplasm of lower-outer quadrant of left male breast • C50.529: Malignant neoplasm of lower-outer quadrant of unspecified male breast • C50.611: Malignant neoplasm of axillary tail of right female breast • C50.612: Malignant neoplasm of axillary tail of left female breast • C50.619: Malignant neoplasm of axillary tail of unspecified female breast • C50.621: Malignant neoplasm of axillary tail of right male breast • C50.622: Malignant neoplasm of axillary tail of left male breast • C50.629: Malignant neoplasm of axillary tail of unspecified male breast • C50.811: Malignant neoplasm of overlapping sites of right female breast • C50.812: Malignant neoplasm of overlapping sites of left female breast • C50.819: Malignant neoplasm of overlapping sites of unspecified female breast • C50.821: Malignant neoplasm of overlapping sites of right male breast • C50.822: Malignant neoplasm of overlapping sites of left male breast • C50.829: Malignant neoplasm of overlapping sites of unspecified male breast • C50.911: Malignant neoplasm of unspecified site of right female breast • C50.912: Malignant neoplasm of unspecified site of left female breast • C50.919: Malignant neoplasm of unspecified site of unspecified female breast • C50.921: Malignant neoplasm of unspecified site of right male breast • C50.922: Malignant neoplasm of unspecified site of left male breast • C50.929: Malignant neoplasm of unspecified site of unspecified male breast
Denominator Exclusions	None
Denominator Exceptions	None
Numerator Statement	Numerator 1: Pathology reports with an HER2 result derived using the ASCO/CAP guideline optimal scoring algorithm Numerator 2: Pathology reports with an equivocal HER2 result obtained using the ASCO/CAP guideline optimal scoring algorithm that had a subsequent repeat HER2 test completed

	Numerator 3: Pathology reports with an HER2 result derived using the ASCO/CAP guideline optimal scoring algorithm AND when an equivocal result was obtained, had a subsequent repeat HER2 test* Definition: Repeat HER2 test can be completed either by using a different methodology* or the same methodology with an alternative specimen. * in situ hybridization (ISH) assay or immunohistochemical (IHC) assay
Numerator Exclusions	None
Measure Information	
NQS Domain	Communication and Care Coordination
Meaningful Measures Area(s)	Transfer of Health Information and Interoperability
Meaningful Measure Rationale	Determining HER2 status is essential for the appropriate clinical management of breast cancer (1). HER2 gene amplification assessed by in situ hybridization (ISH) or protein overexpression assessed by IHC remains the primary predictor of responsiveness to HER2-targeted therapies in breast cancer (2). HER2 gene amplification and/or protein overexpression occurs in up to 20% of breast cancers (3). For women with breast cancer, an absent or faulty test defining HER2 status can alter their treatment course and clinical outcomes while increasing healthcare costs. 1. Stenehjem DD, Yoo M, Unni SK, Singhal M, Bauer H, Saverno K, et al. Assessment of HER2 testing patterns, HER2+ disease, and the utilization of HER2-directed therapy in early breast cancer. Breast Cancer. 2014 Oct 29;6:169-77. 2. Wolff AC, Hammond MEH, Allison KH, Harvey BE, Mangu PB, Bartlett JMS, et al. Human Epidermal Growth Factor Receptor 2 Testing in Breast Cancer: American Society of Clinical Oncology/College of American Pathologists Clinical Practice Guideline Focused Update. J Clin Oncol. 2018 Jul 10;36(20):2105-2122. 3. Moasser MM, Krop IE. The Evolving Landscape of HER2 Targeting in Breast Cancer. JAMA Oncol. 2015 Nov;1(8):1154-61.
Measure Type	Process
Data Source	Laboratory Information Systems; pathology reports
Summary of Performance Gap Evidence	Breast cancer is one of the most common cancers with an annual incidence of close to 270,000 in the US (1). According to the American Cancer Society, human epidermal growth factor receptor 2 (HER2) positive cancers grow and spread faster than other breast cancers and are much more likely to benefit from therapies that target the HER2 protein (2). Determining HER2 status is

	essential for the appropriate clinical management of breast cancer (3). HER2 gene amplification assessed by in situ hybridization (ISH) or protein overexpression assessed by IHC remains the primary predictor of responsiveness to HER2-targeted therapies in breast cancer (4). HER2 gene amplification and/or protein overexpression occurs in up to 20% of breast cancers (5). For women with breast cancer, an absent or faulty test defining HER2 status can alter their treatment course and clinical outcomes while increasing healthcare costs. Despite existing guidelines, data confirm less than optimal adherence to these recommendations. A review of registry data found that only 86% of patients had detailed information regarding HER2 testing documented (3). These data suggest that, based on current breast cancer incidence, approximately 38,000 breast cancer patients may not have proper testing and/or documentation of HER2 status to inform clinical management. 1. American Cancer Society. Cancer facts & figures 2018. Atlanta: American Cancer Society, 2018. 2. American Cancer Society. Breast Cancer HER2 Status. https://www.cancer.org/cancer/breast-cancer/understanding-a-breast-cancer-diagnosis/breast-cancer-her2-status.html 3. Stenehjem DD, Yoo M, Unni SK, Singhal M, Bauer H, Saverno K, et al. Assessment of HER2 testing patterns, HER2+ disease, and the utilization of HER2-directed therapy in early breast cancer. Breast Cancer. 2014 Oct 29;6:169-77. 4. Wolff AC, Hammond MEH, Allison KH, Harvey BE, Mangu PB, Bartlett JMS, et al. Human Epidermal Growth Factor Receptor 2 Testing in Breast Cancer: American Society of Clinical Oncology/College of American Pathologists Clinical Practice Guideline Focused Update. J Clin Oncol. 2018 Jul 10;36(20):2105-2122. 5. Moasser MM, Krop IE. The Evolving Landscape of HER2 Targeting in Breast Cancer. JAMA Oncol. 2015 Nov;1(8):1154-61.
Measure Owner	College of American Pathologists
NQF ID	N/A
Number of Performance Rates	1
Overall Performance Rate	1st Performance Rate
High-priority	Yes
Improvement Notation	Inverse Measure: No **Proportional Measure: Yes (Higher score indicates better quality)** Continuous Variable Measure: No Ratio Measure: No

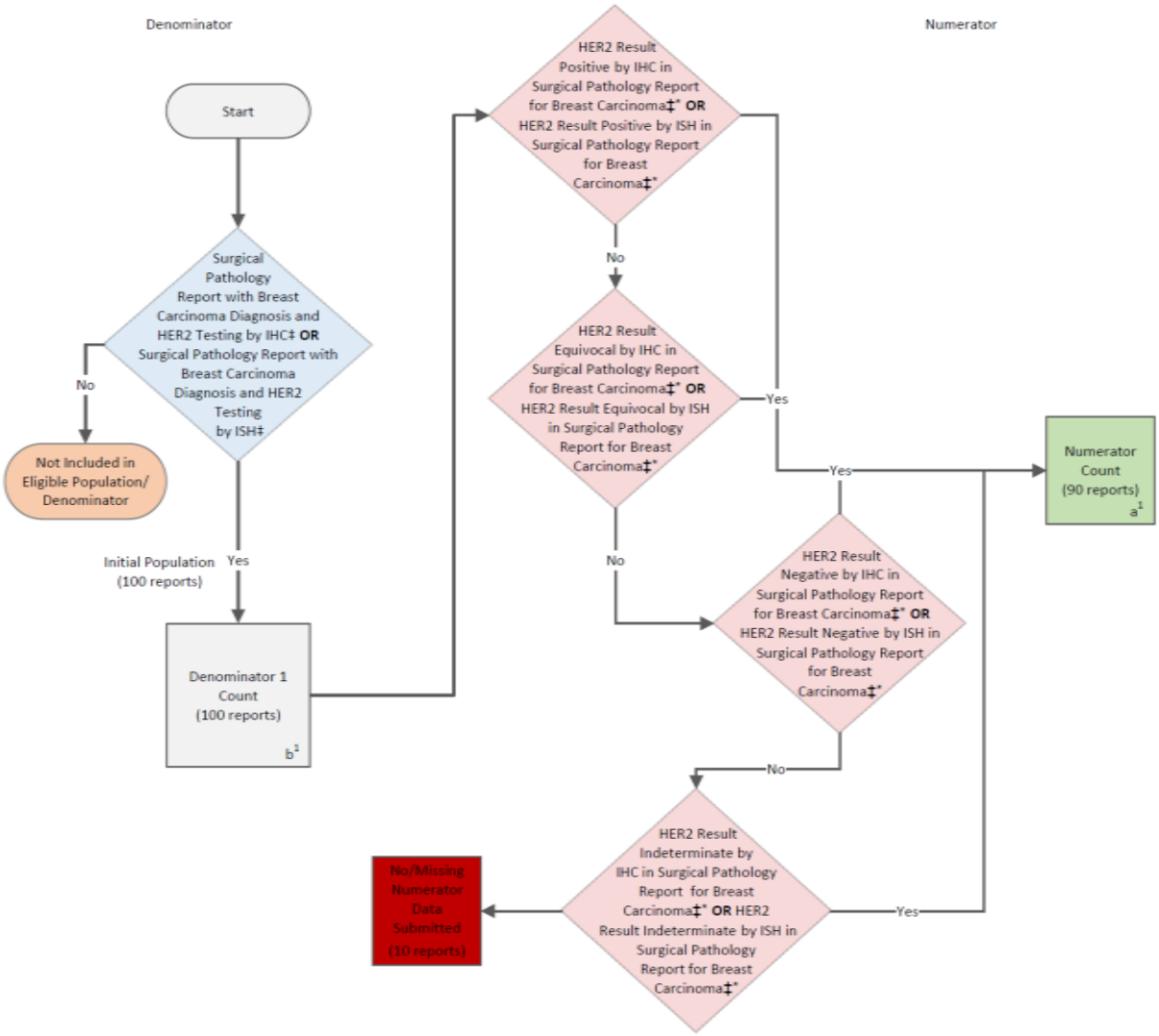
	Risk-adjusted: No
Specialty	Pathology
Current Clinical Guideline the Measure is Derived From	Key Recommendations for Pathologists: Report a HER2 test result as positive if: a) IHC 3+ positive (defined as circumferential membrane staining that is complete, intense, and in > 10% of tumor cells) OR b) ISH positive using either a single-probe ISH (defined as average HER2 copy number ≥ 6.0 signals/cell) or dual-probe ISH (defined as HER2/CEP17 ratio is ≥ 2.0 and average HER2 copy number is ≥ 4.0 signals/cell) Report a HER2 test result as equivocal and order reflex test on the same specimen (unless the pathologist has concerns about the specimen) using the alternative test if: a) IHC is 2+ which equates to “weak to moderate complete membrane staining observed in >10% of tumor cells” (Wolff, A.C.,2018). b) average HER2/CEP17 ratio of ≥ 2.0 but the average HER2 signals/cell is < 4.0 c) average of ≥ 6.0 HER2 signals/cell with a HER2/CEP17 ratio of < 2.0 d) average HER2 signals/tumor cell of ≥ 4.0 and < 6.0 and the HER2/CEP17 ratio is < 2.0 Report a HER2 test result as negative if a single test (or all tests) performed on a tumor specimen show: a) IHC 1+ (defined as incomplete membrane staining that is faint or barely perceptible and within > 10% of the invasive tumor cells) b) Note: There are some rare breast cancers (e.g., gland-forming tumors, micropapillary carcinomas) that show IHC 1+ staining that is intense but incomplete (basolateral or U shaped) and that are found to be HER2 amplified. The pathologist should consider also reporting these specimens equivocal and request reflex testing using the alternative test. (Wolff, A.C.,2013). c) IHC 0 (defined as no staining observed or membrane staining that is incomplete and is faint or barely perceptible and within < 10% of the invasive tumor cells d) ISH negative using single-probe ISH (defined as average HER2 copy number < 4.0 signals/cell) or dual-probe ISH (defined as HER2/CEP17 ratio is < 2.0 and average HER2 copy number of <4 signals/cell). Report a HER2 test result as indeterminate if technical issues prevent one or both tests (IHC and ISH) performed on a tumor specimen from being reported as positive, negative, or equivocal. This may occur if specimen handling was inadequate, if artifacts (crush or edge artifacts) make interpretation difficult, or if the analytic testing failed. Another specimen should be requested for testing, if possible, and a comment should be included in the pathology report documenting intended action (Strong recommendation). When using an alternative method following an initial equivocal result, the laboratory should perform it using sections from the same tissue sample used

	for the initial test and the slides from both ISH and IHC should be reviewed together to guide the selection of areas to score. a) If the IHC result is 3+, diagnosis is HER2 positive b) If the IHC result is 2+, recount ISH by having an additional observer, blinded to previous ISH results, count at least 20 cells that include the area of invasion with IHC 2+ staining. If reviewing the count by the additional observer changes the result into another ISH category, the result should be adjudicated per internal procedures to define the final category. - If the initial ISH results of HER2/CEP17 ratio < 2.0 with ≥ 6.0 HER2 signals/cell remains the same the diagnosis is HER2 positive - If the initial ISH results of HER2/CEP17 ratio ≥ 2.0 with < 4.0 HER2 signals/cell remains the same the diagnosis is HER2 negative - If the initial ISH results of HER2/CEP17 ratio < 2.0 with ≥ 4.0 and < 6.0 HER2 signals/cell remains the same the diagnosis is HER2 negative c) If the IHC result is 0 or 1+, diagnosis is HER2 negative with a comment 1. Wolff AC, Hammond MEH, Allison KH, Harvey BE, Mangu PB, Bartlett JMS, et al. Human Epidermal Growth Factor Receptor 2 Testing in Breast Cancer: American Society of Clinical Oncology/College of American Pathologists Clinical Practice Guideline Focused Update. J Clin Oncol. 2018 Jul 10;36(20):2105-2122.

Measure Flow

Note: This measure has three performance rates. Performance rate 3 is the reported rate.

Population Criteria 1 – Performance Rate 1



‡Please refer to the specific section of the measure specification to identify the associated value sets or direct reference codes for use in submitting this measure, or to identify the Definition of the criteria associated with population criteria.

*For the purposes of this measure, the HER2 result should be derived using the ASCO/CAP guideline optimal scoring algorithm outlined in the Clinical Recommendation Statement field. To meet the measure, either a quantitative HER2 result; or documentation of a descriptive result such as "positive", "equivocal", or "negative" with an additional reference indicating that the result was derived using the ASCO/CAP guideline, is required.

Performance Rate 1 =

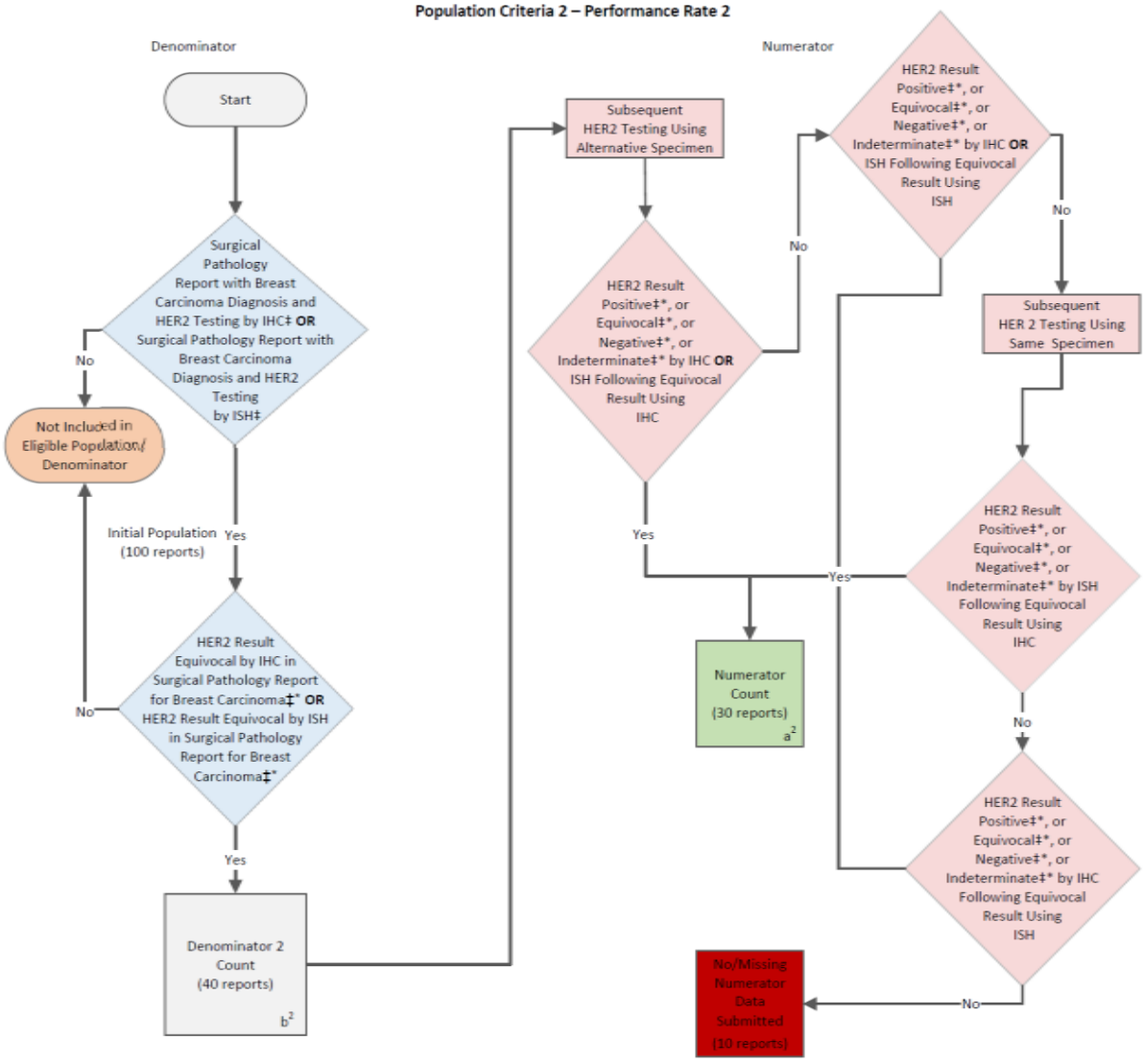
SAMPLE CALCULATION:

$$\frac{\text{Numerator } (a^1 = 90 \text{ reports})}{\text{Denominator } (b^1 = 100 \text{ reports})} = 90.0\%$$

DISCLAIMER: *Please refer to the measure specification for a complete listing of required data elements, value sets, direct reference codes, and logic definitions. The measure diagrams were developed as a supplement resource to be used in conjunction with the measure specifications. They should not be used alone or as a substitution for the measure specification.*

Note: This measure has three performance rates. Performance rate 3 is the reported rate.

Population Criteria 2 – Performance Rate 2



‡Please refer to the specific section of the measure specification to identify the associated value sets or direct reference codes for use in submitting this measure, or to identify the Definition of the criteria associated with population criteria.

*For the purposes of this measure, the HER2 result should be derived using the ASCO/CAP guideline optimal scoring algorithm outlined in the Clinical Recommendation Statement field. To meet the measure, either a quantitative HER2 result; or documentation of a descriptive result such as "positive", "equivocal", or "negative" with an additional reference indicating that the result was derived using the ASCO/CAP guideline, is required.

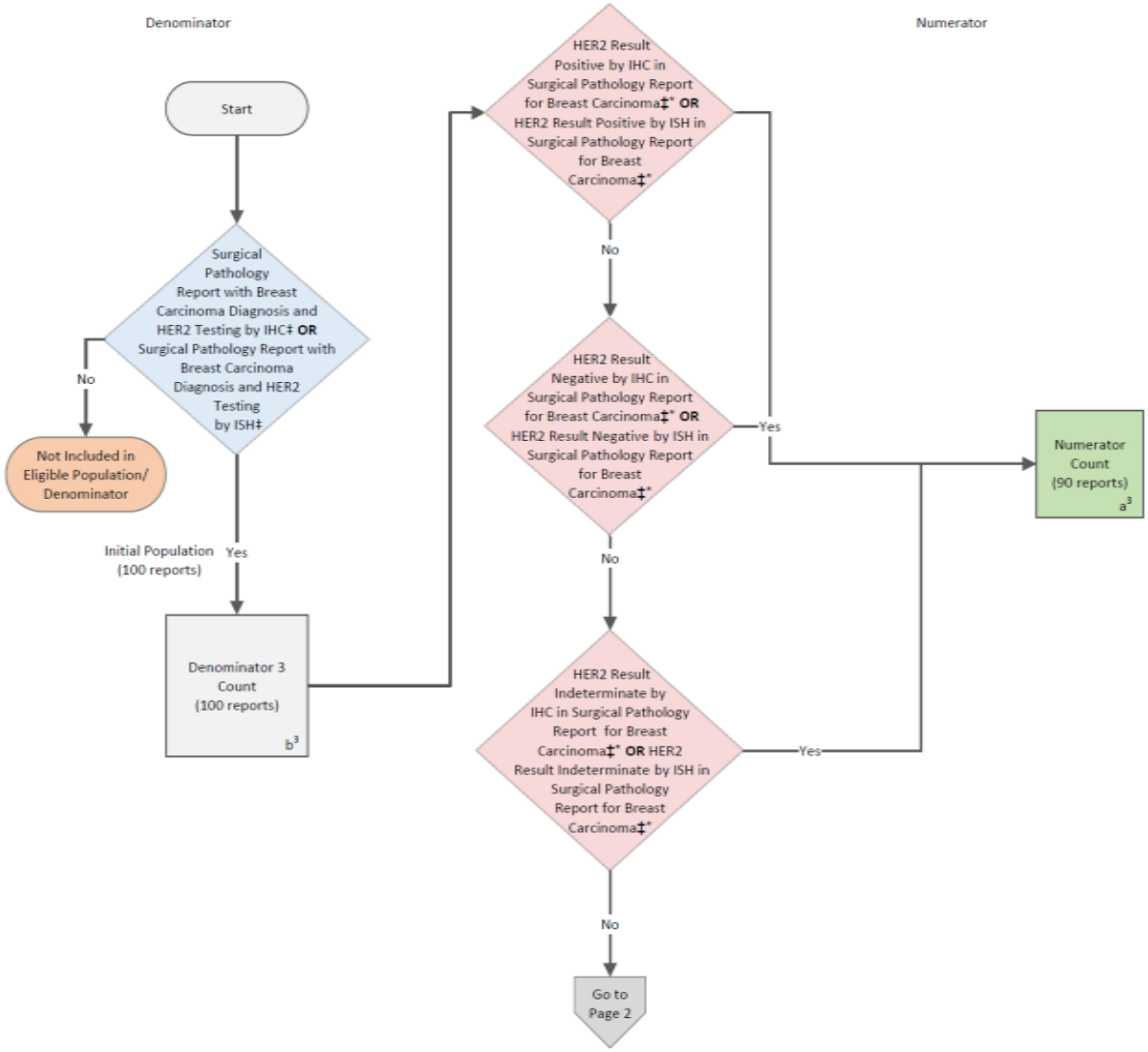
SAMPLE CALCULATION:

Performance Rate 2 = Numerator (a^3 = 30 reports) / Denominator (b^2 = 40 reports) = 75.0%

DISCLAIMER: *Please refer to the measure specification for a complete listing of required data elements, value sets, direct reference codes, and logic definitions. The measure diagrams were developed as a supplement resource to be used in conjunction with the measure specifications. They should not be used alone or as a substitution for the measure specification.*

Note: This measure has three performance rates. Performance rate 3 is the reported rate.

Population Criteria 3 – Performance Rate 3



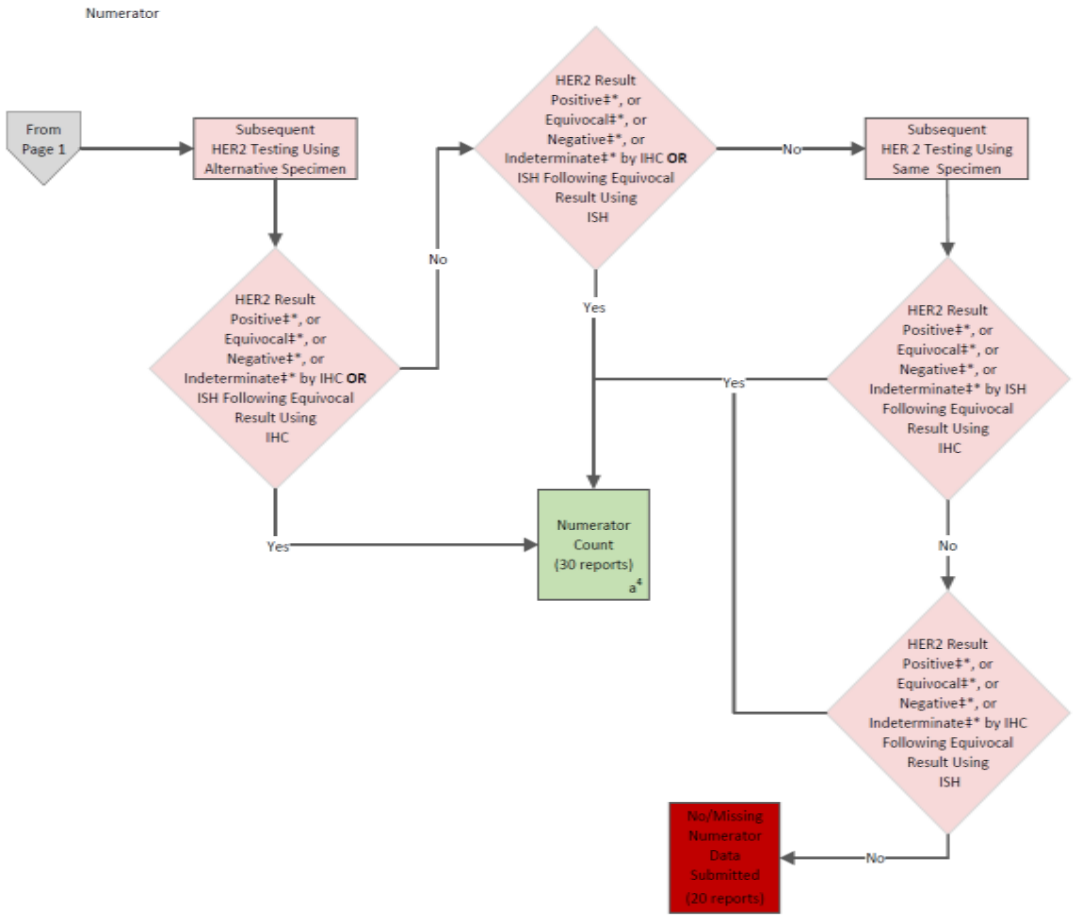
‡Please refer to the specific section of the measure specification to identify the associated value sets or direct reference codes for use in submitting this measure, or to identify the Definition of the criteria associated with population criteria.

*For the purposes of this measure, the HER2 result should be derived using the ASCO/CAP guideline optimal scoring algorithm outlined in the Clinical Recommendation Statement field. To meet the measure, either a quantitative HER2 result; or documentation of a descriptive result such as "positive", "equivocal", or "negative" with an additional reference indicating that the result was derived using the ASCO/CAP guideline, is required.

DISCLAIMER: *Please refer to the measure specification for a complete listing of required data elements, value sets, direct reference codes, and logic definitions. The measure diagrams were developed as a supplement resource to be used in conjunction with the measure specifications. They should not be used alone or as a substitution for the measure specification.*

Note: This measure has three performance rates. Performance rate 3 is the reported rate.

Population Criteria 3 – Performance Rate 3



‡Please refer to the specific section of the measure specification to identify the associated value sets or direct reference codes for use in submitting this measure, or to identify the Definition of the criteria associated with population criteria.

*For the purposes of this measure, the HER2 result should be derived using the ASCO/CAP guideline optimal scoring algorithm outlined in the Clinical Recommendation Statement field. To meet the measure, either a quantitative HER2 result; or documentation of a descriptive result such as "positive", "equivocal", or "negative" with an additional reference indicating that the result was derived using the ASCO/CAP guideline, is required.

SAMPLE CALCULATION:

Performance Rate 3 = $\frac{\text{Numerator } (a^3 + a^4 = 80 \text{ reports})}{\text{Denominator } (b^3 = 100 \text{ reports})} = 80.0\%$

DISCLAIMER: *Please refer to the measure specification for a complete listing of required data elements, value sets, direct reference codes, and logic definitions. The measure diagrams were developed as a supplement resource to be used in conjunction with the measure specifications. They should not be used alone or as a substitution for the measure specification.*