Protocol for the Examination of TURP and Enucleation Specimens From Patients With Carcinoma of the Prostate Gland

**Version:** 4.1.0.0  
**Protocol Posting Date:** June 2021

The use of this protocol is recommended for clinical care purposes but is not required for accreditation purposes.

This protocol may be used for the following procedures AND tumor types:

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TURP and enucleation specimens</td>
<td>Includes specimens designated transurethral resection of the prostate (TURP), and enucleation specimens (simple or subtotal prostatectomy)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tumor Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carcinoma</td>
<td>Includes all adenocarcinomas and histologic variants, neuroendocrine carcinomas, and others</td>
</tr>
</tbody>
</table>

The following should NOT be reported using this protocol:

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biopsy (consider Prostate Biopsy protocol)</td>
<td></td>
</tr>
<tr>
<td>Radical Prostatectomy (consider Prostate Radical Prostatectomy protocol)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tumor Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lymphoma (consider the Hodgkin or non-Hodgkin Lymphoma protocols)</td>
<td></td>
</tr>
<tr>
<td>Sarcoma (consider the Soft Tissue protocol)</td>
<td></td>
</tr>
</tbody>
</table>

**Authors**

Gladell P. Paner, MD*; John R. Srigley, MD*; Jason Pettus, MD; Giovanna Angela Giannico, MD; Joseph Sirintrapun, MD; Lara R. Harik, MD.

With guidance from the CAP Cancer and CAP Pathology Electronic Reporting Committees.

* Denotes primary author.
Accreditation Requirements
The use of this case summary is recommended for clinical care purposes but is not required for accreditation purposes. The core and conditional data elements are routinely reported. Non-core data elements are indicated with a plus sign (+) to allow for reporting information that may be of clinical value.

Summary of Changes

v 4.1.0.0

- General Reformatting
- Histologic Grade Updated
- New Section - IDC Incorporated into Grade
- Cribriform Glands Question Updated
- Tumor Quantitation Added
- Revised Margins Section
- Atypical Intraductal Proliferation (AIP) to added Additional Findings
- Equivocal response added to Periprostatic Fat Invasion and Seminal Vesicle Invasion
Reporting Template

Protocol Posting Date: June 2021
Select a single response unless otherwise indicated.

CASE SUMMARY: (PROSTATE GLAND: Transurethral Prostatic Resection (TURP), Enucleation Specimen (Simple or Subtotal Prostatectomy))

Standard(s): AJCC-UICC 8
This template is recommended for reporting TURP specimens, but is not required for accreditation purposes.

SPECIMEN

Procedure (Note A)
___ Transurethral resection of the prostate (TURP)
___ Enucleation (simple or subtotal prostatectomy)
___ Other (specify): _________________
___ Not specified

TUMOR

Histologic Type (Note B) (select all that apply)
___ Acinar adenocarcinoma
___ Ductal adenocarcinoma
___ Small-cell neuroendocrine carcinoma
___ Isolated intraductal carcinoma
___ Other histologic type not listed (specify): _________________
___ Cannot be determined (explain): _________________

+Histologic Type Comment: _________________

Histologic Grade (Note C)

Grade
___ Not applicable: _________________
___ Cannot be assessed: _________________
___ Grade group 1 (Gleason Score 3 + 3 = 6)
___ Grade group 2 (Gleason Score 3 + 4 = 7)

Percentage of Pattern 4
___ Less than or equal to 5%
___ 6 - 10%
___ 11 - 20%
___ 21 - 30%
___ 31 - 40%
___ Greater than 40%
___ Grade group 3 (Gleason Score 4 + 3 = 7)

Percentage of Pattern 4
___ Less than 61%
___ 61 - 70%
___ 71 - 80%
___ 81 - 90%
___ Greater than 90%
___ Grade group 4 (Gleason Score 4 + 4 = 8)
___ Grade group 4 (Gleason Score 3 + 5 = 8)
___ Grade group 4 (Gleason Score 5 + 3 = 8)
___ Grade group 5 (Gleason Score 4 + 5 = 9)
___ Grade group 5 (Gleason Score 5 + 4 = 9)
___ Grade group 5 (Gleason Score 5 + 5 = 10)

+If Gleason Score is Greater Than 7 Specify Percentage of Pattern 4: _________________ %

+If Gleason Score is Greater Than 7 Specify Percentage of Pattern 5: _________________ %

Intraductal Carcinoma (IDC) (Note D)
___ Not identified
___ Present
    IDC Incorporated into Grade
___ Yes
___ No
___ Cannot be determined (explain): _________________

Cribriform Glands (applicable to Gleason score 7 or 8 cancer only)
___ Not applicable
___ Not identified
___ Present
___ Cannot be determined (explain): _________________

Treatment Effect (select all that apply)
___ No known presurgical therapy
___ Not identified
___ Radiation therapy effect present: _________________
___ Hormonal therapy effect present: _________________
___ Other therapy effect(s) present (specify): _________________
___ Cannot be determined: _________________

TUMOR QUANTITATION (Note E)
Tumor Quantitation
___ For TURP Specimens
    Estimated Percentage of Prostate Involved by Tumor
___ Less than 1%
___ 1 - 5%
___ 6 - 10%
___ 11 - 20%
___ 21 - 30%
___ 31 - 40%
___ 41 - 50%
___ 51 - 60%
___ 61 - 70%
___ 71 - 80%
___ 81 - 90%
___ Greater than 90%
___ Cannot be determined (explain): _________________
+Number of Positive Chips: _________________
+Total Number of Chips: _________________

___ For Enucleation and Other Specimens

Greatest Dimension of Dominant Nodule in Millimeters (mm) (if present): _________________ mm

+Additional Dimension of Dominant Nodule in Millimeters (mm): ____ x ____ mm

Estimated Percentage of Prostatic Tissue Involved by Tumor: _________________ %

Periprostatic Fat Invasion (report if identified in specimen)

___ Not identified
___ Present
___ Equivocal (explain): _________________
___ Cannot be determined (explain): _________________

Seminal Vesicle Invasion (report if identified in specimen)

___ Not identified
___ Present
___ Equivocal (explain): _________________
___ Cannot be determined (explain): _________________

+Lymphovascular Invasion

___ Not identified
___ Present
___ Cannot be determined: _________________

+Perineural Invasion (Note F)

___ Not identified
___ Present

ADDITIONAL FINDINGS

+Additional Findings (select all that apply)

___ None identified
___ Atypical intraductal proliferation (AIP)
___ High-grade prostatic intraepithelial neoplasia (PIN)
___ Atypical adenomatous hyperplasia (adenosis)
___ Nodular prostatic hyperplasia
___ Inflammation (specify type): _________________
___ Other (specify): _________________

COMMENTS

Comment(s): _________________
Explanatory Notes

A. Submission of Tissue for Microscopic Evaluation in Transurethral Resection
Transurethral resection specimens that weigh 12 grams or less should be submitted in their entirety.\(^1\) For specimens that weigh more than 12 g, the initial 12 g are submitted, and 1 cassette may be submitted for every additional 5 g of remaining tissue.\(^2\)

In general, random chips are submitted; however, if some chips are firmer or have a yellow or orange-yellow appearance, they should be submitted preferentially.

If an unsuspected carcinoma is found in tissue submitted, and it involves 5% or less of the tissue examined, the remaining tissue may be submitted for microscopic examination, especially in younger patients.\(^3\) Involvement in 5% or less of the tissue is considered as T1a, whereas involvement in greater than 5% is considered as T1b.\(^4\)

References

B. Histologic Type
This protocol applies only to invasive adenocarcinomas of the prostate.\(^1\) Carcinomas other than adenocarcinoma are exceptionally uncommon, accounting for less than 1% of prostatic tumors. The protocol does not apply to pure squamous cell carcinoma, basal cell carcinoma, urothelial carcinoma, small cell neuroendocrine carcinoma, and large cell neuroendocrine carcinoma. If these rare subtypes of carcinoma, however, are mixed with acinar type adenocarcinoma, the protocol may be used.

Some adenocarcinoma variants have percentage cut-offs to render their diagnosis. Since examination of the entire tumor may not be amenable in TURP, a descriptive approach in their diagnosis should also be considered (e.g. adenocarcinoma with mucinous features, adenocarcinoma with signet ring-like cell features).

References
C. Histologic Grade

**Gleason Score**

The Gleason grading system is recommended for use in all prostatic specimens containing adenocarcinoma, with the exception of those showing treatment effects, usually in the setting of androgen deprivation and radiation therapy.\(^{1,2,3,4,5,6,7,8,9}\) Readers are referred to the recommendations of three ISUP consensus conferences and the GUPS position paper dealing with the contemporary usage of the Gleason system (also see Figure 1).\(^{4,6,7}\)

The Gleason score is the sum of the primary (most predominant in terms of surface area of involvement) Gleason grade and the secondary (second most predominant) Gleason grade. Where no secondary Gleason grade exists, the primary Gleason grade is doubled to determine a Gleason score. The primary and secondary grades should be reported in addition to the Gleason score, that is, Gleason score 7(3+4) or 7(3+4). In TURP or enucleation specimens, Gleason score is the sum of the primary (most predominant) Gleason grade and highest Gleason grade.

\[ \text{Gleason Score} = P + S \]

\( P \) is primary Gleason grade; \( S \) is secondary Gleason grade.

\[ \text{Gleason Score} = \begin{cases} 2P & \text{if } S = 1 \\ 2P + S & \text{if } S = 2, 3, 4, 5 \end{cases} \]

**Figure 1.** 2015 modified ISUP Gleason schematic diagram.\(^{5}\)

In TURP specimens, with a minor secondary component (less than 5% of tumor) and where the secondary component is of higher grade, the latter should be reported. For instance, a case showing more than 95% Gleason pattern 3 and less than 5% Gleason pattern 4 should be reported as Gleason score 7(3+4). Conversely, if a minor secondary pattern is of lower grade, it need not be reported. For instance, where there is greater than 95% Gleason pattern 4 and less than 5% Gleason pattern 3, the score should be reported as Gleason score 8(4+4).

In TURP specimens where more than 2 patterns are present, and the worst grade is neither the predominant nor the secondary grade, the predominant and highest grade should be chosen to arrive at a score (eg, 75% pattern 3, 20-25% pattern 4, less than 5% pattern 5 is scored as 3+5=8).
Another recommendation is that the percentage of pattern 4 should be reported in all Gleason score 7(3+4, 4+3) cases. This measurement further stratifies Gleason score 7 and allows identification of cases with limited pattern 4 (e.g., <10%) or extensive pattern 4 (e.g., >80%).

It is now recognized that Gleason pattern 4 has four basic architectures in cribriform, fused, poorly-formed and glomeruloid glands. Among these architectures, cribriform has been shown to be an independent predictor of poorer outcome particularly in Gleason score 7 tumors and its presence is now recommended to be reported in Gleason pattern 4 cancer. There are recent attempts to standardize the definition of cribriform pattern.

The presence treatment effects to cancer should be reported and is important especially if Gleason grading is rendered not applicable. It should be recognized that in post-treatment settings, grading may still be applied for prostate cancers lacking treatment effects particularly in new onset (de novo) cancers.

**Grade Group**

It is recognized that contemporary Gleason scores can be grouped into five prognostic categories, Grade groups 1-5. This grade grouping has also been subsequently validated by other independent studies in surgical cohorts showing significant correlation with outcome. The new grade grouping has been endorsed by ISUP, GUPS and in the 2016 WHO classification. The grade group is also referred to as ISUP grade or WHO grade in other publications. The grade group should be reported in parallel with the Gleason score.

**Table: Grade Groups**

<table>
<thead>
<tr>
<th>Grade Group</th>
<th>Gleason Score</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Less than or equal to 6</td>
<td>Only individual discrete well-formed glands</td>
</tr>
<tr>
<td>2</td>
<td>3+4=7</td>
<td>Predominantly well-formed glands with lesser component of poorly formed/fused/cribriform glands</td>
</tr>
<tr>
<td>3</td>
<td>4+3=7</td>
<td>Predominantly poorly formed/fused/cribriform glands with lesser component (#) of well-formed glands</td>
</tr>
<tr>
<td>4</td>
<td>4+4=8</td>
<td>Only poorly formed/fused/cribriform glands</td>
</tr>
<tr>
<td>5</td>
<td>3+5=8</td>
<td>Predominantly well-formed glands and lesser component (##) lacking glands (or with necrosis)</td>
</tr>
<tr>
<td></td>
<td>5+3=8</td>
<td>Predominantly lacking glands (or with necrosis) and lesser component (##) of well-formed glands</td>
</tr>
<tr>
<td></td>
<td>9-10</td>
<td>Lack gland formation (or with necrosis) with or without poorly formed/fused/cribriform glands (##)</td>
</tr>
</tbody>
</table>

*For cases with greater than 95% poorly formed/fused/cribriform glands on a core or at radical prostatectomy, the component of less than 5% well-formed glands is not factored into the grade; should therefore be graded as grade group 4.

Poorly formed/fused/cribriform glands can be a more minor component.

**References**

D. Intraductal Carcinoma (IDC)

Intraductal carcinoma (IDC) has independent prognostic significance and its reporting is recommended. Intraductal carcinoma is uncommon in TURP specimens and when present it is usually found within an invasive tumor. It is important to distinguish IDC from high-grade prostatic intraepithelial neoplasia (PIN) and atypical intraductal proliferation (AIP).

Both ISUP and GUPS recommend that Gleason scores or grade groups should not be assigned to pure IDC. However, grading invasive cancer with concomitant IDC is controversial. ISUP recommends incorporating IDC in determining the grade while GUPS recommends not to include IDC in determining the grade. It is recommended to specify which of these two approaches is applied when grading invasive cancer with concomitant IDC.
Distinction between IDC and invasive cribriform or comedonecrosis patterns should be based on morphological examination. In the approach where IDC is not incorporated in grading, immunohistochemistry for basal cells can be used if the results will change the grade.7

References

E. Quantitation of Tumor
Studies have shown that prostate cancer volume is a prognostic factor, although the data on its independent prognostic significance is conflicting.1,2,3,4,5 The designation of the percentage of cancer tissue in transurethral samples is important. When prostate cancer is discovered incidentally (ie, discovered in specimens submitted for clinically benign disease, usually benign prostate hyperplasia [BPH]), the percentage involvement is used to determine the clinical T1 substage, with less than or equal to 5% involvement being T1a and greater than 5% being T1b.6 In TURP and enucleations specimens, the percentage of tissue involved by tumor can also be quantified by simple visual inspection.

References
F. Perineural Invasion
Perineural invasion (PNI) in needle core biopsies has been associated with extraprostatic extension in some correlative radical prostatectomy studies. However, the significance of this finding as a predictor of stage and outcome is questionable in multivariate analysis.1,2,3,4,5 Presence of perineural invasion may also be reported in TURP specimens.

References