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# Prostate Core Needle Biopsy Histopathology Reporting Guide
## Part 1 - Clinical Information/Specimen Receipt

ICCR

Family/Last name | Date of birth DD – MM – YYYY

Given name(s)

Patient identifiers | Date of request DD – MM – YYYY | Accession/Laboratory number

Elements in **black text** are CORE. Elements in **grey text** are NON-CORE.

☐ indicates multi-select values ◯ indicates single select values

SCOPE OF THIS DATASET

**CLINICAL INFORMATION** (Note 1)

- ◯ Information not provided
- ◯ Information provided (select all that apply)
  - ☐ Previous history of prostate cancer (including the Gleason score or WHO/ISUP Grade/Grade Group of previous specimens if known, and if patient is on active surveillance), *specify*
  - ☐ Previous biopsy, *specify date and where performed*
  - ☐ Previous therapy, *specify*
  - ☐ Other clinical information, *specify*

**PRE-BIOPSY SERUM PSA** (Note 2)

ng/mL

**CLINICAL STAGE** (Note 3)

**BIOPSY PERFORMED** (select all that apply) (Note 4)

- ☐ Systematic
- ☐ Targeted
- ☐ Other (e.g., saturation), *specify*

**BLOCK IDENTIFICATION KEY** (Note 5)

*(List overleaf or separately with an indication of the nature and origin of all tissue blocks)*



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**SPECIMEN DETAILS** (Note 6)

*(For specimen level reporting, only one specimen will be reported on)*

| Specimen/container identification | Location from which taken, including if target lesion (if specified) | Total number of core(s) | Length of core(s) |
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# Definitions

**CORE elements**

CORE elements are those which are essential for the clinical management, staging or prognosis of the cancer. These elements will either have evidentiary support at Level III-2 or above (based on prognostic factors in the National Health and Medical Research Council (NHMRC) levels of evidence[1]). In rare circumstances, where level III-2 evidence is not available an element may be made a core element where there is unanimous agreement by the Dataset Authoring Committee (DAC). An appropriate staging system e.g., Pathological TNM staging would normally be included as a CORE element.

Non-morphological testing e.g., molecular or immunohistochemical testing is a growing feature of cancer reporting. However, in many parts of the world this type of testing is limited by the available resources. In order to encourage the global adoption of ancillary tests for patient benefit, International Collaboration on Cancer Reporting (ICCR) includes the most relevant ancillary testing in ICCR Datasets as CORE elements, especially when they are necessary for the diagnosis. Where the technical capability does not yet exist, laboratories may consider temporarily using these data elements as NON-CORE items.

The summation of all CORE elements is considered to be the minimum reporting standard for a specific cancer.

**NON-CORE elements**

NON-CORE elements are those which are unanimously agreed should be included in the dataset but are not supported by level III-2 evidence. These elements may be clinically important and recommended as good practice but are not yet validated or regularly used in patient management.

Key information other than that which is essential for clinical management, staging or prognosis of the cancer such as macroscopic observations and interpretation, which are fundamental to the histological diagnosis and conclusion e.g., macroscopic tumour details, may be included as either CORE or NON-CORE elements by consensus of the DAC.

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# Scope

The dataset has been developed for the examination of prostate core needle biopsies. The elements and associated commentary apply to invasive carcinomas of the prostate gland. Urothelial carcinomas arising in the bladder or urethra are dealt with in separate datasets.[2,3] Rare urothelial carcinomas arising within the prostate are included in a separate ICCR dataset.[2]

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## **Note 1 – Clinical information** (Core and Non-core)

It is the responsibility of the clinician requesting the pathological examination of a specimen to provide information that will have an impact on the diagnostic process or affect its interpretation. The use of a standard pathology requisition/request form including a checklist of important clinical information is strongly encouraged to help ensure that relevant clinical data is provided by the clinicians with the specimen. Information about prior biopsies or treatment aids interpretation of the microscopic findings and accurate pathological diagnosis.

There is a growing number of patients who have low to intermediate risk prostate cancers that are being put on active surveillance (AS).[4-7] Enrolment in AS is based on favourable clinical criteria and pathologic elements reported in these prostate biopsy datasets. These patients usually undergo yearly repeat biopsies to monitor for changes in elements that can reclassify the patients and warrant a definitive therapy. A subset of reclassified or AS-ineligible patients can also opt for observation (watchful waiting) and some of these patients may still undergo follow-up biopsies. Thus, the Gleason grade and score of prostate cancer in any previously submitted specimen should be provided by the clinician as this allows assessment of any progression of the tumour.

Prostate cancer can also be managed by non- or minimally invasive therapies such as radiation, hormonal or ablative therapies.[5,8-10] Radiation and endocrine therapy for prostate cancer has a profound effect on the morphology of both cancer and benign prostatic tissue. Following irradiation, benign acinar epithelium shows nuclear enlargement and nucleolar prominence, while basal cells may show cytological atypia, nuclear enlargement and nuclear smudging.[7,9,10] There can also be increased stromal fibrosis, which can resemble tumour-induced desmoplasia. These changes may persist for a considerable period, having been reported up to 72 months after treatment, and are more pronounced in patients who have undergone brachytherapy compared to those who have received external beam radiation therapy. Tumour appearance following radiotherapy can vary from having absent to marked histologic changes. Severe changes show infiltrative single to small clusters of cells with clear or pale vacuolated cytoplasm and nuclei with smudgy chromatin or prominent nucleoli. It is important to document any previous radiotherapy to help the pathologist to interpret changes accurately.

Likewise, neoadjuvant androgen deprivation therapy (ADT) may induce morphological changes in both prostate cancer and benign tissue.[9-12] Androgen blockade induces basal cell hyperplasia and cytoplasmic vacuolation in benign prostatic tissue, although this is unlikely to be confused with malignancy. More significantly from a diagnostic point of view, neoadjuvant ADT may increase the risk of overlooking acinar adenocarcinoma on low power microscopic examination due to collapse of glandular lumina, cytoplasmic pallor and shrinking of nuclei. The effect of androgen blockage on prostate cancer is variable and marked changes may lead to erroneous upgrading of the cancer. Hence, in biopsies undertaken following either radiotherapy or androgen deprivation therapy, tumours that show significant treatment effects should not be graded.

There is an increasing use of ablative therapies especially for intermediate risk prostate cancers as an alternative for surgery.[5,13] Examples of these minimally invasive therapies are high intensity focus ultrasound (HIFU), cryotherapy, interstitial laser ablation, and photodynamic therapy. They are usually performed to destroy part of the prostate (focal therapy or hemi-ablation) and can also be used to destroy the entire gland in salvage therapy.[9,10] Treated areas will show well demarcated areas with changes related to tissue damage. These changes include necrosis, stromal fibrosis, inflammation, and haemorrhage. Knowledge of the prior procedure performed is also important as residual tumour may persist especially in non-damaged areas. Unlike in radiotherapy or ADT, most residual cancer after ablative therapies can be graded.

Other therapies such as chemotherapy and immunotherapy are performed for high-risk or advanced prostate cancers and these patients may also have biopsies after treatment.[14,15] Morphological changes may occur in the tumour that could impact the assessment of grade.

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## Note 2 – Pre-biopsy serum PSA (Non-core)

The clinician requesting the pathological examination should provide information on the pre-biopsy serum prostate-specific antigen (PSA) level.[5,16,17] The use of a standard pathology requisition/request form including a checklist of important clinical information is strongly encouraged to help ensure that important clinical data is provided by the clinicians with the specimen. Despite criticisms about the utility of PSA-based prostate cancer screening, most prostate cancers are detected in asymptomatic men on the basis of PSA testing. Although PSA levels provide some indication of the likelihood of discovering cancer within a biopsy of the prostate, a diagnosis of malignancy should be based on histological findings and should not be influenced by PSA levels.

In addition, serum PSA is a key parameter in some nomograms widely used to pre-operatively predict the Union of International Cancer Control (UICC)/American Joint Committee on Cancer (AJCC) pathological T category of prostate cancer or the risk of recurrence following radical prostatectomy and to guide clinical decision making with respect to disease management.[18,19] Serum PSA is used, in addition to subsequent biopsy findings, for risk stratifications that will guide the choice of management.[5,17,20]

If the patient is on 5-alpha-reductase inhibitor medications, such as finasteride or dutasteride, this should be recorded as it may lower serum PSA levels and affect interpretation of serum PSA values for detecting prostate cancer.[21,22]

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## Note 3 – Clinical stage (Non-core)

The clinician requesting the pathological examination should provide information on the clinical stage.[18,19,23] The use of a standard pathology requisition/request form including a checklist of important clinical information is strongly encouraged to help ensure that important clinical data is provided by the clinicians with the specimen. Along with pre-biopsy serum PSA, clinical stage is a vital parameter in some nomograms widely used to pre-operatively predict the pathological T category of prostate cancer and to guide clinical decision making with respect to disease management.

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## Note 4 – Biopsy performed (Core)

Prostate needle biopsy is usually performed systematically (transrectally or transperineally) by sampling multiple sites using a template.[5,17,24,25] The extended (or standard) sampling technique of at least 12 sites is now preferred over the sextant (6 sites) biopsies because of higher cancer detection. If there is a suspicious lesion on imaging, magnetic resonance imaging (MRI)-targeted biopsy can also be performed.[26,27] Targeted biopsy increases the chance of sampling clinically significant cancers. Rarely, saturation biopsy is performed

wherein a greater number of cores per prostate area is taken to enhance cancer detection.[28,29] Occasionally, patients who are on high suspicion of harbouring higher grade cancer may undergo only limited sampling for histologic confirmation before proceeding to a definitive therapy. Knowledge of the biopsy procedure performed as systematic or targeted, and number of needle cores taken from each site aids in the pathological assessment of the involved cores.

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## Note 5 – Block identification key (Non-core)

The origin/designation of all tissue blocks should be recorded. This information should ideally be documented in the final pathology report and is particularly important should the need for internal or external review arise. The reviewer needs to be clear about the origin of each block in order to provide an informed specialist opinion. If this information is not included in the final pathology report, it should be available on the laboratory computer system and relayed to the reviewing pathologist. It may be useful to have a digital image of the specimen and record of the origin of the tumour blocks in some cases.

Recording the origin/designation of tissue blocks also facilitates retrieval of blocks for further immunohistochemical or molecular analysis, research studies or clinical trials.

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## Note 6 – Specimen details (Core)

Information on specimens submitted for histopathological examination, including location, number of needle cores and length of cores, is regarded as an integral and essential part of a pathology report.[4,7,20,24,30] The length of the cores should be measured in the wet specimen before tissue processing and paraffin embedding. Note that for specimen level reporting, details of the single specimen only are required.

Preferably there should be no more than two needle cores in each specimen jar. However, if there is some fragmentation and there are multiple needle cores submitted in one container, it may not be possible to reliably determine the number of involved cores. In this situation the urologist should state on the pathology request/requisition form how many cores were submitted in each jar to avoid counting fragments of the one core as separate cores (particularly with cores <6 millimetres long) and providing misleading information on tumour extent. Where more than five cores are submitted in a specimen jar, e.g., with saturation/template biopsies, a range may be submitted for length of the cores rather than measuring each one individually.

Pathologists should be proactive in discussing the optimal manner of prostate biopsy specimen submissions with the urologists taking the samples.

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