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REVIEW ARTICLE

**Association of Directors of Anatomic and Surgical Pathology**

# Recommendations for the reporting of resected neoplasms of the kidney

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**Abstract** The Association of Directors of Anatomic and Surgical Pathology has developed recommendations for the surgical pathology reporting of common malignant tumors. The recommendations for renal cell neoplasms are reported herein.

**Key word** Renal cell carcinoma

## Introduction

The Association of Directors of Anatomic and Surgical Pathology (ADASP) has named several committees to develop recommendations regarding the content of the surgical pathology report for common malignant tumors. A committee of individuals with special interest and expertise write the recommendations, which are reviewed and approved by the council of ADASP and subsequently by the entire membership.

The recommendations have been divided into the following four major areas: (1) items that provide an informative gross description; (2) additional diagnostic features that are recommended to be included in every report; if possible; (3) optional features that may be included in the final report; and (4) a checklist.

The purpose of these recommendations is to provide an informative report for the clinician. The recommendations are intended as suggestions, and adherence to them is completely voluntary. In special clinical circumstances, the recommendations may not be clinically applicable. The recommendations are intended as an educational resource rather than a mandate.

This report was prepared by an ad hoc committee composed of Lucien E. Nochomovitz (Chair), Sonny L. Johansson, Maria Merino, and Kevin O. Leslie

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## Features the association recommends be included in the final report

Because they are generally accepted as being of prognostic importance, the following are required for therapy or are traditionally expected (Table 1).

A. Gross description

1. Number of specimen containers.
2. Condition of specimen: fresh, in formalin, intact, incised by surgeon or pathologist.
3. Identification: patient name, case number, laterality, organ name.
4. Structures attached to kidney: ureter, adrenal gland, perinephric fat, hilar lymph nodes/blood vessels, other organs or parts of organs.
5. Dimensions of all specimens.
6. Tumor description:
   Site within kidney
   Tumor size, shape, consistency, color, cysts, necrosis, scar, hemorrhage
   Cortical vs medullary
   Preservation of outer renal contour
   Proximity to nearest margin
   Relationship to perinephric fat/Gerota's fascia
   Relationship to/distance from pelvis/ureter, if possible
   Satellite tumors, if present
   Gross involvement of
      renal vein/vena cava
      regional lymph nodes
      adjacent organs
      adrenal gland
      renal pelvis
      ureter
7. Other lesions of kidney (including pelvis) and ureter.
8. Tissue submitted for special investigation (e.g. flow cytometry) should be specified.

**Table 1** Neoplasms of the kidney: diagnostic checklist

Gross assessment of main tumor

Origin: ☐ Rt kidney ☐ Lt kidney ☐ Upper pole ☐ Lower pole ☐ Medullary ☐ Multicentric

Extent: ☐ Renal pelvis ☐ Renal veins ☐ Diffuse

Dimensions: ___ cm × ___ cm × ___ cm

Confined within kidney: ☐ Yes ☐ No

Extends to margin of perinephric at: ☐ Yes ☐ No

Histologic information

☐ Renal cell carcinoma ☐ Transitional cell carcinoma
☐ Transitional cell carcinoma with glandular metaplasia
☐ Transitional cell carcinoma with squamous metaplasia
☐ Squamous cell carcinoma ☐ Soft tissue neoplasm
☐ Oncocytoma ☐ Angiomyolipoma ☐ Wilms' precursor ☐ Wilms' tumor
☐ Congenital mesoblastic nephroma ☐ Malignant rhabdoid tumor
☐ Collecting duct carcinoma ☐ Clear cell sarcoma ☐ Interstitial cell tumor
☐ Juxtaglomerular cell tumor ☐ Metastasis

Other tumor type: _____
Type of soft tissue neoplasm: _____
Type/source of metastasis (if not primary in kidney): _____

Histologic information on renal cell carcinoma

Subtype: _____ Grade (1–4): _____
Perinephric fat penetration ☐ Yes ☐ No
Renal vein spread ☐ Yes ☐ No
Surgical margins tumor-free ☐ Yes ☐ No

Histologic information on transitional cell carcinoma (pelvic)

☐ Grade 1 ☐ Grade 2 ☐ Grade 3 ☐ Sarcomatoid ☐ Papillary ☐ Flat (CIS)
☐ Suburothelial invasion ☐ Lymphatic invasion ☐ Blood vessel invasion
☐ Pushing margin ☐ Infiltrating margin
☐ Surgical margin involved: ☐ Yes ☐ No

Histologic information on Wilms' tumor

☐ Blastema %: ___; ☐ Epithelium %: ___; ☐ Stroma % ___
☐ Heterologous epithelium: ☐ Yes ☐ No Specify type: ___
☐ Stromal differentiation: ☐ Adipose ☐ Cartilage ☐ Bone ☐ Skeletal muscle
☐ Osteoid ☐ Mature ganglion cells ☐ Neuroglia
Multipolar mitotic figures: ☐ Present ☐ Absent
Nuclear anaplasia: ☐ Focal ☐ Diffuse
Renal cell carcinoma component: ☐ Present ☐ Absent

Adrenal gland

☐ Not submitted/unidentifiable ☐ Unremarkable
☐ Direct tumor extension ☐ Metastatic neoplasm
☐ Other: _____

Special investigations

Flow cytometry: ☐ Yes ☐ No
Other (specify): _____ ☐ Yes ☐ No

Apply to all neoplasms

Surgical margins involved: ☐ Ureter ☐ Renal vein ☐ Soft tissue ☐ Renal parenchyma (partial nephrectomy)

Lymph node metastases: ___ of ___ Right retroperitoneal
___ of ___ Left retroperitoneal
___ of ___ Renal hilar

## B. Diagnostic information

1. Topography: left or right kidney.
2. Name of operation, as designated by surgeon (e.g. radical or partial nephrectomy).
3. Histologic type – the World Health Organization (WHO) classification of renal neoplasms is recommended [6, 7, 8]:
   Renal cell carcinoma (specify type)
   Transitional cell carcinoma

Squamous cell carcinoma
Wilms' tumor/precursors/histologic subtype
Congenital mesoblastic nephroma
Clear cell sarcoma
Squamous cell carcinoma
Angiomyolipoma
Malignant rhabdoid tumor
Renomedullary interstitial cell tumor
Collecting duct carcinoma
Juxtaglomerular cell tumor
Soft tissue neoplasm
Metastatic neoplasm

4. Histologic grade (as appropriate for specific tumor type) [1, 2].
5. Involvement of: renal pelvis, ureter, hilar veins, intrarenal veins, adrenal gland, perinephric fat [3, 8].
6. Hilar lymph node metastases, stated as number of involved nodes and total number of nodes [8, 9].
7. Histologic condition of renal pelvis/ureter (urothelial dysplasia/neoplasia; squamous metaplasia/dysplasia; microscopic papillary neoplasm).
8. Adequacy of local excision. Assessment of resection margins is performed as for cancers in general. In the kidney, this applies to the hilar vessels, to the ureter, and to the outer surface of the kidney (preferably inked) that overlies the tumor [4, 5, 9].
9. Other significant renal disease.

C. Features considered optional in the final report

These are optional because there may be specific institutional preferences with regard to staging, or because the features have inconclusive prognostic significance.

1. Stage. The data specified above should facilitate application of most staging systems. We believe that the AJCC/UICC (TNM) system is the least ambiguous, currently embodying most criteria required for prognosis and therapy.
2. Results of ancillary investigations (e.g. flow cytometry).
3. Specific lymph nodes (unless already specified and separately submitted by the surgeon).
4. Nature of the advancing edge (pushing vs infiltrative) [8, 10].
5. Presence and type of inflammatory infiltrate.
6. Multifocal microscopic tumor foci.

## Appendix

Grading system for renal cell carcinoma[a]

| Grade | |
|---|---|
| I | Nuclei round, uniform, approximately 10 μm; nucleoli inconspicuous or absent. |
| II | Nuclei slightly irregular, approximately 15 μm; nucleoli evident. |
| III | Nuclei very irregular, approximately 20 μm; nucleoli large and prominent. |
| IV | Nuclei bizarre and multilobated, 20 μm or greater; nucleoli prominent; chromatin clumped. |

Grading system for papillary urothelial carcinoma[b]

| Grade | |
|---|---|
| 1 | Tumors with the least degree of cellular anaplasia compatible with a diagnosis of malignancy. |
| 2 | Tumors with degrees of anaplasia intermediate between grades 1 and 3. |
| 3 | Tumors with the most severe degrees of cellular anaplasia. |

[a] See [2]
[b] See [6]. Flat urothelium showing cellular anaplasia corresponding to grade 3 transitional cell carcinoma in a papillary lesion is diagnosable as carcinoma in situ

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