

Pediatric Pathology Grossing Guidelines

WILMS TUMOR AND OTHER PEDIATRIC RENAL TUMORS

For intraoperative handling and submission of tissue for ancillary studies, please review the general pediatric pathology guidelines, and discuss the case with Dr. Goldstein or the Genitourinary-Peds attending, before proceeding.

UCLA is a participating member of the Children's Oncology Group (COG) and a tissue bank for pediatric neoplasms maintained at the COG Biopathology Center (BPC) at Nationwide Children's Hospital/Ohio State University. Many pediatric oncology patients will be randomized into therapeutic protocols. Since the protocols and trial studies often change, better to check if any special things need to be done BEFORE proceeding with dissection and fixation.

College of American Pathologists' pediatric tumor synoptic reports should be used, and the full CAP protocols may be reviewed for additional information.

All COG treatment protocols require central pathology review, and in some cases, an expedited rapid review is necessary to determine the correct initial treatment regimen for the child. Therefore, for all children registered on protocol, a complete duplicate set of sequential slides from each block should be ordered at the time of initial histologic processing.

For all pediatric tumors for which there is sufficient material available, after satisfying protocol requirements and our needs (including our TPCL), additional frozen tissue can be submitted to the BPC. TPCL personnel will be available during regular work hours to assist with the procurement of tissue for COG protocols and tissue banking.

Chromosomal Analysis

It is advisable to save the tissue for chromosomal and/or molecular analysis of the following neoplastic disorders:

1. Wilms tumor
2. Neuroblastoma
3. Rhabdomyosarcoma (especially alveolar subtype)
4. Ewing's sarcoma/PNET/Desmoplastic small round cell tumor
5. Burkitt and other non-Hodgkin lymphomas
6. Acute leukemia and granulocytic sarcoma
7. Germ cell tumors
8. Malignant brain tumors
9. Synovial sarcoma
10. Any rare, unusual or undiagnosed pediatric tumor

If chromosome analysis is needed on any pediatric tumor, obtain **RPMI medium** from tubes provided by the Flow Cytometry Laboratory in the Surgical Pathology refrigerator.

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Alternatively, the Cytogenetics Laboratory can provide RPMI media. You may call the Cytogenetics Lab at x41287 and they will provide you with the RPMI media. This lab is open Monday through Friday.

Specific Specimen Processing

Please refer to the diagrams attached for grossing illustrations and sample dictations (kindly provided by Dr. Florette K, Gray Hazard, Lucille Packard Children's Hospital, Stanford University School of Medicine.) "Pilot" sections of tumors obtained prior to fixation may be submitted for next day preview and preliminary diagnosis. Block maps on photographs similar to those in the illustrations are encouraged for large and complex specimens, or those following pre-operative chemotherapy.

Small Biopsies (Usually contraindicated as they result in upstaging):

1. The small biopsy specimens should be submitted entirely in formalin.
2. If there is adequate tissue, a portion should be frozen in liquid nitrogen.
3. If there is adequate tissue, a portion should be saved for chromosome analysis.
4. If there is adequate tissue, a portion should be saved for EM in glutaraldehyde. (The decision to process the EM specimen can be made later.)

Partial Nephrectomies (following preoperative chemotherapy for bilateral tumors):

1. Photograph the intact specimen before inking or slicing
2. Weigh the specimen before further manipulation,
3. Apply inks to the surgical margin surface and capsular surface
4. Slice the specimen carefully, choosing the plane of incision to provide optimal demonstration of the relationship between the tumor and the kidney
5. Perform a frozen section of the margin, if requested
6. Submit fresh tissue for special studies; cytologic touch preps and/or scrape preps may be useful to try to identify residual viable tumor regions following chemotherapy
 - Snap freeze normal kidney (if sufficient tissue present) and tumor for submission to the Biopathology Center (for patients registered on protocols) and/or submitted to our TPCL
 - Submit tissue for cytogenetic evaluation, when indicated
 - Place tissue in glutaraldehyde for electron microscopy, when indicated
7. Photograph the slices, may be done either before or after overnight fixation
8. Fix the slices overnight on paper towels to keep them flat, and submit the entire specimen

Caution: Nephrogenic rests often persist following chemotherapy, both in the periphery of a treated tumor and elsewhere in the kidney of children with bilateral tumors. Be

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careful when examining frozen sections of margins or additional lesions in this setting so as not to overcall this finding as persistent viable Wilms tumor.

Nephrectomies

9. Photograph all surfaces of the intact specimen before inking or bivalving,
10. Weigh the specimen before further manipulation,
11. Apply ink to the surface, and let this dry before making the initial bivalving cut,
12. Bivalve the specimen carefully, choosing the plane of incision to provide optimal demonstration of the relationship between the tumor and the kidney,
13. Do not strip the capsule from the cortical surfaces
14. Following the initial bivalving cut, submit fresh tissue for special studies
 - Snap freeze normal kidney and tumor for submission to the Biopathology Center and/or submitted to our TPCL
 - Submit tissue for cytogenetic evaluation, when indicated
 - Place tissue in gluteraldehyde for electron microscopy, when indicated
15. Submit initial pilot sections for microscopic diagnosis, when necessary
16. Submit ureteral and vascular margins of resection,
17. Search carefully in the hilar region for any lymph nodes that might be present.
18. Whenever possible, make parallel cuts of the specimen in a plane parallel to the original bivalving incision into slabs 2-3 cm. thick and place in a large container of formalin or other suitable fixative in a refrigerated environment, fixing several hours to overnight before taking staging sections. The additional time required for this step will enhance the quality of the staging sections, and facilitate accurate evaluation of capsules and margins.

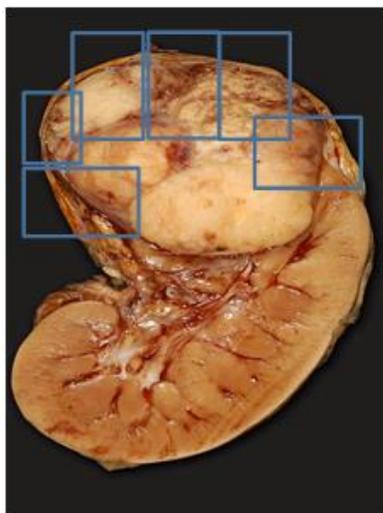
Sampling of nephrectomy specimen for histologic evaluation:

1. Several important considerations will enhance the quality of the final pathologic evaluation.
2. Before sampling, prepare a drawing, photograph or other mapping device on which to mark the exact site from which each section was obtained. This is of great importance in view of the definitions of focal and diffuse anaplasia. Include any distinctive internal tumor foci in the sample.
3. Take most random tumor sections from the periphery of the lesion, to show relationship between the tumor and the renal capsule, the specimen surfaces, the renal parenchyma and the renal sinus. Look closely for any distinctive changes in the renal parenchyma that might be nephrogenic rests. Sample normal renal parenchyma generously.
4. Submit a minimum of one generous section of tumor for every centimeter of greatest tumor diameter. For multicentric tumors, this rule can be applied in sampling each individual tumor.

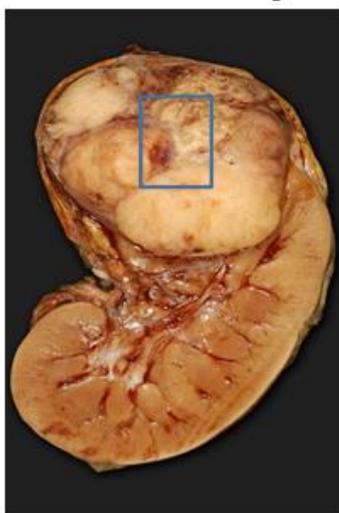
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Further information regarding microscopy, grading and staging may be obtained from the COG protocol; contact Dr. Goldstein for a digital copy.

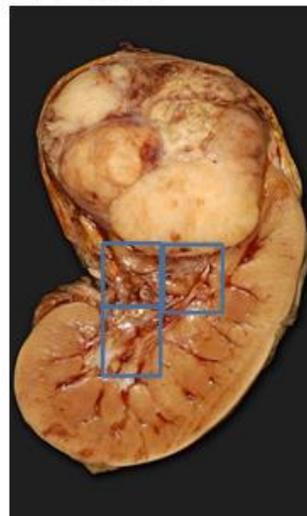
Pediatric Kidney Tumor



Capsule



Central



Hilar fat

Representative sections are submitted as described below and illustrated by the accompanying block map

- A1 – Random tumor (pilot section)
 - A2 – Hilar margins (ureter, renal artery, renal vein)
 - A3-AX – Tumor to capsule (most sections from here)
 - Ax- Center (1-2 sections) Hilar fat (all)
 - AX – Normal kidney
- Additional sections: Adrenal gland, nephrogenic rests, other abnormalities

Sample Gross Template Pediatric Kidney tumor

Received [fresh/in formalin] labeled with the patient's name, medical record number and designated "[***]" is a [***] g, [***] x [***] x [***] cm [irregular/round/oval] kidney [with/without] perinephric adipose tissue. The capsule is [intact/disrupted] and [does/does not] show a focus of possible rupture. The adrenal gland is [present/not present]. The ureter, renal artery and renal vein are located in the renal hilum [if not, please modify]. The distal margin of the ureter, renal artery and renal vein are removed and submitted within cassette A3, as described below. The external surface of the specimen is inked [insert color] [and the focus of possible rupture is inked [insert color]]. The specimen is bisected through the ureter to reveal [homogeneous/heterogeneous], [insert color], [firm, soft] tumoral tissue located in the [upper pole/middle/lower pole/diffusely effacing the renal parenchyma]. [#] tumor nodules are present. The tumor measures [***] x [***] x [***] cm. Foci of hemorrhage and necrosis [are/are not] present. [If present, describe location: distributed throughout, along the periphery]. [If the adrenal gland is present: Tumor [does/does not] invade the adrenal gland.] Tumor [does/does not] invade the renal capsule [if so, state where and to what extent]. The

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renal sinus adipose tissue [is/is not] involved by tumor. [If the renal sinus adipose tissue is involved, state the % of adipose tissue replaced by tumor.] Tumor [directly abuts/is present # cm from] the inked resection margin. The uninvolved renal parenchyma is [unremarkable/diffusely nodular/contains [#] well circumscribed nodules suspicious for nephrogenic rests]. [Photograph the cut surface.] Representative portions of fresh tissue are frozen at -80C for possible future ancillary studies and portions are submitted in RPMI for cytogenetic analysis. Pilot sections of fresh tumor are submitted in cassettes A1 and A2. Following fixation, the specimen is serially sectioned from anterior to posterior in the coronal plane to reveal [no additional lesions/ additional lesions (describe if present)]. [# /No] candidate hilar lymph nodes are identified. The entire renal sinus adipose tissue is submitted as described below. [Photograph any unusual features.]