When you get a case that should/could be for Pediatric Pathology, show it to the gross room supervisor or page Dr. Goldstein at 31418 before you cut it in. If it is the weekend or late at night, page the on-call attending to discuss the case. If Dr. Goldstein is not available during the day, page the person who is covering Pediatric Pathology, or the appropriate “organ-service” pathologist. It does not matter how trivial you feel the case is; if it is trivial, a simple discussion will confirm your assessment and you can proceed unabated. If, however, it appears not to be trivial, it can be a great learning experience for you and provide better care for your patient.

**Special Considerations**

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. Clinical protocols change all the time and the following tumors have or still require special tissue handling: **Wilms Tumor, neuroblastoma, rhabdomyosarcoma, lymphoma, germ cell tumors, and malignant brain tumors.** Many pediatric oncology patients will be randomized into therapeutic protocols. Since the protocols and trial studies are in flux, better to check if any special things need to be done BEFORE proceeding with cases in these categories or other situations that may seem unusual or rare (which occurs in pediatric-aged patients!)

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.
Specimen Procurement Kit (NOTE: This is used sporadically, not all cases!):
A special biology kit for pediatric tumors may be available in the for pediatric tumors to be sent to BPC. Usually, it is provided by request, typically from the Peds Heme/Onc team relayed to Dr. Goldstein or a service attending, who will contact you in the event this is needed. A kit may be obtained by calling the Peds Heme/Onc Clinical Research Associate (CRA) through their office, x56708. The kit is equipped with:

1. plastic tubes or aluminum for frozen tissue
2. truncated embedding molds for tumor frozen in OCT
3. formalin containers for fixed tissue
4. charged slides for touch imprints
5. culture tube with media for fresh tumor with separate mailing container
6. pre-printed Federal Express airbill
7. kit instructions, Specimen Transmittal Form, reimbursement invoice, Biohazard sticker, dry-ice label and a Federal Express sticker for Saturday Delivery

Additionally, a laminated wall chart is posted in the cutting area which illustrates how tissue should be processed using this special kit. The details for usage of kit materials is described in the instructions accompanying the kit.

Certain pediatric tumor cases have specialized diagnostic terms and criteria that assist decisions with treatment and protocol enrollment. These include neuroblastoma, Wilms tumor, hepatoblastoma, Ewing sarcoma/PNET and potentially other tumors, such as rhabdomyosarcoma, germ cell neoplasms and leukemias/lymphomas. College of American Pathologists’ pediatric tumor synoptic reports should be used, when applicable, and the full CAP protocols may be reviewed for additional information. Synoptic reports should be used for other tumors that occur in children and adolescents. For pediatric solid tumors not signed out by Dr. Goldstein, outside review and consultation may be required based upon a discussion with your signout attending.

Inquiries related to any pediatric tumor are to be directed to:

1. Jeffrey Goldstein, M.D., x57443, Beeper 31418;
2. The Hematopathology and Neuropathology fellow or attending-on-call, for those cases.
3. Peds Hem/Onc Clinical Research Associate (CRA), x56708.
4. The Peds Heme/Onc Fellow at x56708, or the page operator for the fellow on-call
5. Noah Federman p21525 or x56708 for solid tumor service and William May (leukemia/lymphoma) office x56708 pager 10205.
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/Demoplastic 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. Alternatively, the Cytogenetics Laboratory (300 Med Plaza, Room 3158) can provide RPMI media. You may call the Cytogenetics Lab at x56678 and they will provide you with the RPMI media. This lab is open Monday through Friday. Please contact Dr. Nagesh Rao (Pgr #92239) for after hours or weekend requests if the Surgical Pathology supply is out or old. Fresh tissue of 2-3 mm size is OK for the study.
Specific Specimen Processing

Each of the following specimens has a unique protocol for processing as outlined below. 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.

**WILMS**

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.)

**Nephrectomies**

1. Photograph all surfaces of the intact specimen before inking or bivalving,
2. Weigh the specimen before further manipulation,
3. Apply ink to the surface, and let this dry before making the initial bivalving cut,
4. Bivalve the specimen carefully, choosing the plane of incision to provide optimal demonstration of the relationship between the tumor and the kidney,
5. Do not strip the capsule from the cortical surfaces
6. Following the initial bivalving cut, submit fresh tissue for special studies
   - jE_ Snap freeze normal kidney and tumor for submission to the Biopathology Center and/or submitted to our TPCL
   - jE_ Submit tissue for cytogenetic evaluation, when indicated
   - jE_ Place tissue in gluteraldehyde for electron microscopy, when indicated
7. Submit initial pilot sections for microscopic diagnosis, when necessary
8. Submit ureteral and vascular margins of resection,
9. Search carefully in the hilar region for any lymph nodes that might be present.
10. 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.

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