

American Pediatric Surgical Association

Standardized Toolbox of Education for Pediatric Surgery

Abdominal Masses of Childhood

APSA Committee of Education
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Abdominal Masses of Childhood

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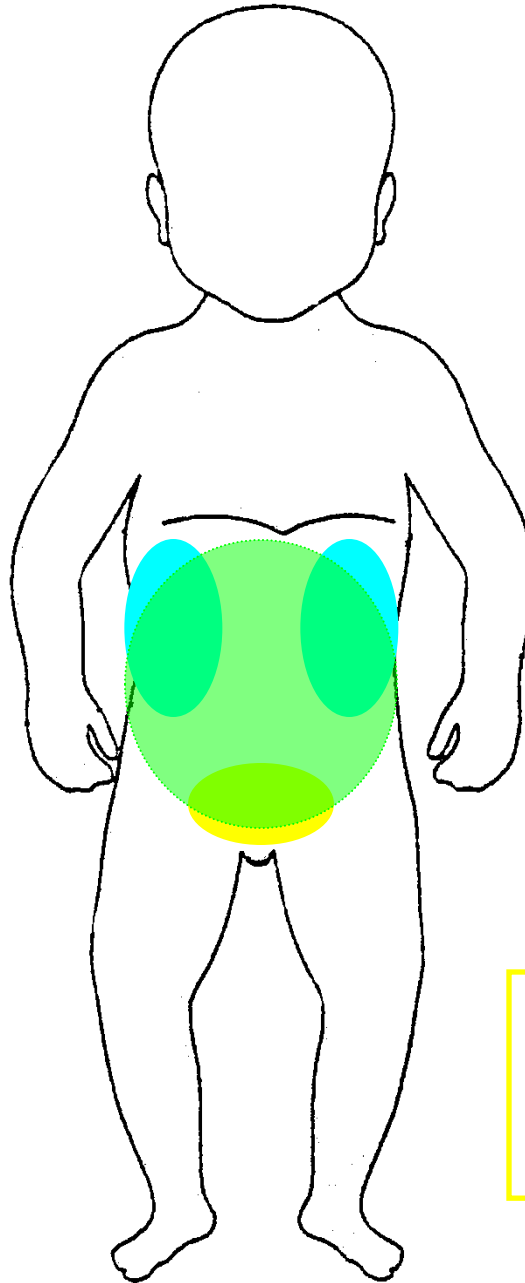
History

- **A child is seen by the PMD**
- **The mother has noticed the child's abdomen was different upon bathing**

INFANTS

Flank - 65%

- **Renal - 55%**
- Hydronephrosis
- Polycystic kidney
- Mesoblastic nephroma
- Renal ectopic
- Renal vein thrombosis
- Nephroblastomatosis
- Wilms tumor
- **Nonrenal - 10%**
- Adrenal hemorrhage
- Neuroblastoma
- Teratoma



Intraperitoneal - 20%

- **GI Masses - 15%**
- Duplication
- Meconium ileus
- Mesenteric-omental cyst
- **Hepatobiliary - 5%**
- Hemangioendotheloma
- Hepatoblastoma
- Hepatic cyst
- Choledochal cyst
- Hydrops of gallbladder

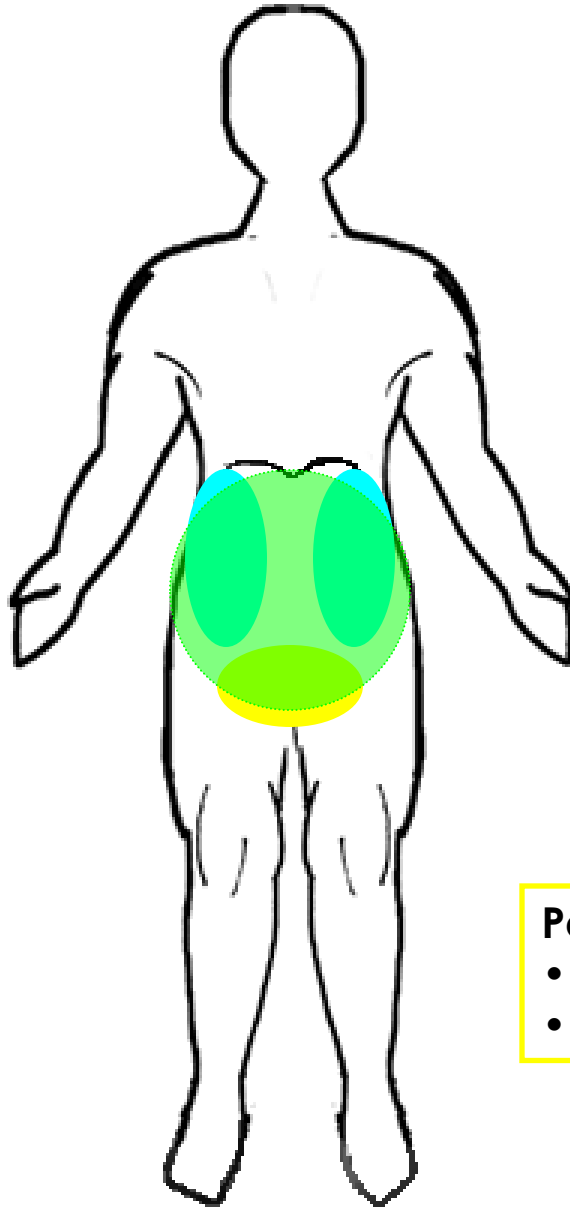
Pelvic - 15%

- Hydrometrocolpos
- Ovarian cyst
- Sacrococcygeal teratoma

CHILDREN AND ADOLESCENTS

Flank - 78%

- **Renal - 55%**
- Wilms tumor
- Hydronephrosis
- Cystic disease
- **Nonrenal - 23%**
- Neuroblastoma
- Teratoma
- Other neoplasms



Intraperitoneal - 18%

- **GI Masses - 12%**
- Appendiceal abscess
- Congenital abnorm.
- Other neoplasms
- **Hepatobiliary - 6%**
- Hepatoblastoma
- Hepatocellular ca
- Choledochal cyst

Pelvic - 4%

- Ovarian cyst
- Hydrometrocolpos

History Discussion Slide

- **What other points of the history do you want to know?**
 - Age of child is an important factor that adjust the differential diagnosis
 - Mass: duration, associated pain, changes in eating and elimination patterns, history of trauma
 - Birth hx: prematurity, difficult birth
 - Medical hx: associated medical illnesses
 - Family hx: syndromes (Beckwith-Wiedemann, WAGR, Gardner, MEN2B, Bloom)
 - ROS: night sweats, malaise, bleeding or bruising, skin changes, sexual history

Physical Exam

- **What specifically would you look for?**
 - Vital Signs: some tumors can cause elevated HR, BP; some masses may push up on diaphragm and limit breathing
 - Appearance: look for overgrowth
 - H/N: aniridia, raccoon eyes, proptosis, Horner's syndrome
 - Chest: respiratory embarrassment

Physical Exam

- **What specifically would you look for?**
 - Cardiac: congestive heart failure
 - Lymphadenopathy
 - Abdomen:
 - Omphalecele, hepatosplenomegaly
 - Mass – location, configuration, size, consistency, mobility, tenderness
 - GU: ambiguous genitalia, hypospadias, cryptorchidism

Studies (Labs)

- **What labs needed?**
 - CBC and differential
 - Lytes, BUN, Cr
 - Liver function tests
 - Amylase, lipase
 - Stool – Guaic
 - Urine – U/A, Vanillmandelic acid (VMA), Homovanillic acid (HVA)
 - Markers – alpha-fetoprotein, B-HCG

Studies (Imaging)

- **Investigations:**

- X-rays – not usually helpful
- US – good first test
- CT Scan – good test to help plan surgery and for staging
- MRI – limited application
- Nuclear scans – selective use

CT Scans

Wilms Tumor



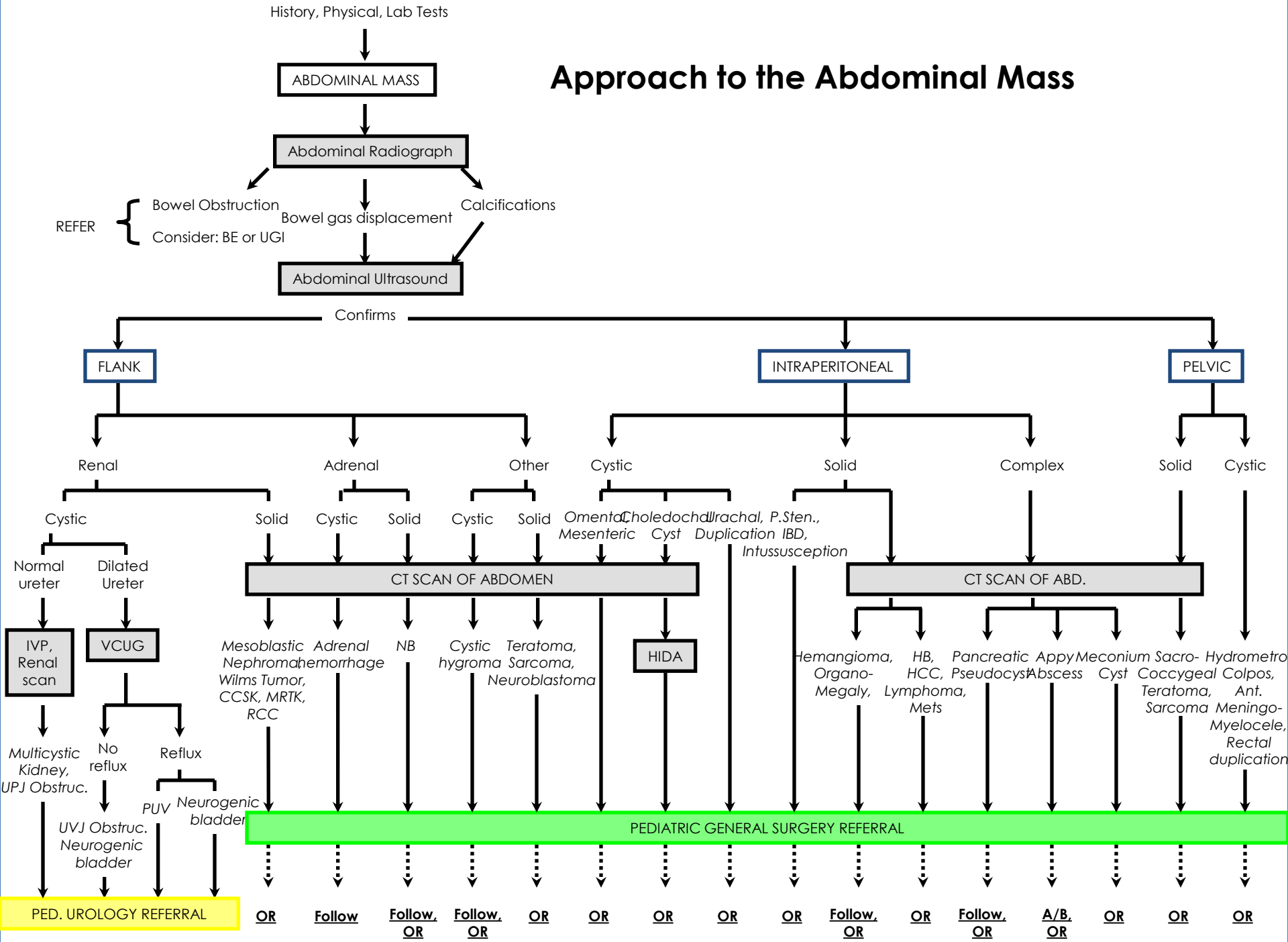
Neuroblastoma



Case Discussion

- **Diagnosis**
 - See flowchart
- **Plans**
 - See flowchart

Approach to the Abdominal Mass



Interval steps before / instead of surgery

- Key is to make sure all staging done first to allow surgical planning and in some instances obviate need for surgery
- Discussion with oncology is important to make sure that all tests are done and patient in fact needs surgery
- Some masses are not cancer however parents will always fear this – you need to be careful in your choice of words – e.g. mass and not tumor

Operation

- Each type of mass has its own approach
- In general terms, knowing the goals of surgery is important:
 - Staging, obtain tissue for diagnosis, resection, assistance with radiotherapy, or assistance with chemotherapy

Staging

- Staging may merely involve assessment of the mass and closing if spread to entire peritoneum
- However, usually need to consider whether the mass has grown into surrounding structures
- And sampling lymph nodes to assess for locoregional spread

Diagnostic

- If the mass is large and/or involving other structures such that a complete resection is not possible, then a portion of the tumor should be sampled to provide tissue for diagnosis
- At least 1 cubic cm of tissue is needed
- Send fresh (i.e. no formalin)

Resection

- In most situations, an attempt at resection will be the case
- Preoperative imaging needs to be studied carefully with interest in the vascular supply
- Care to avoid disruption of the margins to avoid tumor rupture

Radiotherapy

- Some tumors may benefit from post-operative radiotherapy
- To assist this, placing surgical clips at the margins of resection will be helpful
- And documentation of the location of the tumor in the operative notes will also help the radiation oncologist

Chemotherapy

- In those chemoresponsive tumors, placement of a central venous catheter under the same anesthetic as the mass resection will avoid a second anesthetic
- The type of central line should be discussed with the oncology staff

Complications

- **Peri-operative**

- Ileus is common after any abdominal surgery
- Post-op intussusception is well reported

- **Long Term**

- Is dependent on the tumor type and whether rupture has occurred
- Potential for adhesive bowel obstruction

Post-operative Management

- In most situations, the pathology results will be ready prior to the discharge of the patient
- Discussion with the oncology team to determine whether chemotherapy and/or radiotherapy is needed and if prior to discharge

Questions

1. Where do most abdominal masses arise?
 - A. Flank
 - B. Intraperitoneal
 - C. Pelvic
 - D. None of the above

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 - B. Intraperitoneal
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Questions

2. Which is the most useful first test to order to help determine the type of abdominal mass?
- A. X-ray
 - B. Ultrasound
 - C. CT scan
 - D. MRI

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Questions

3. With regards to abdominal masses, the goal of surgery may include?
- A. Staging
 - B. Obtain tissue for diagnosis
 - C. Resection of mass
 - D. Help adjuvant therapy
 - E. All the above

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- A. Staging
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 - D. Help adjuvant therapy
 - E. **All the above**

Final Discussion/Review

- The history and physical is key to help determine the type of abdominal mass
- Most masses arise from the flank
- US is the first test to do to determine the source
- CT is the next test to help surgical planning

Acknowledgement Slide

**The preceding educational materials were
made available through the
American Pediatric Surgical Association**

**In order to improve our educational materials
we welcome your comments/ suggestions:**

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