

PEDIATRIC UROLOGY

What we do...

When to refer...

Naida Kalloo, MD

June 20, 2017

Common anatomic problems managed by Pediatric Urology

- Inguinal Hernias and Hydroceles
- Undescended testes and Retractable testes
- Uncircumcised penis
- Appearance of circumcised penis
- Abnormalities of penis development
 - Hypospadias, chordee (bend), penile torsion
- Hydronephrosis/Hydroureter
- Vesicoureteral reflux
- Varicoceles

Other common conditions managed in our WISH clinic

- Urinary tract infections
- Daytime wetting
- Bedwetting
- Testicular or scrotal pain *
- Penile pain
- Vaginal pain
- Pain during urination (Dysuria)
- Terminal Hematuria/urethrorrhagia
- Urinary frequency
- Urinary urgency

Urologic Emergencies

- Testicular or Spermatic cord torsion
- Paraphimosis
- Priapism
- Urinary retention
- Testicular and Extratesticular masses*
- Febrile UTIs *
- Trauma

Fetal development



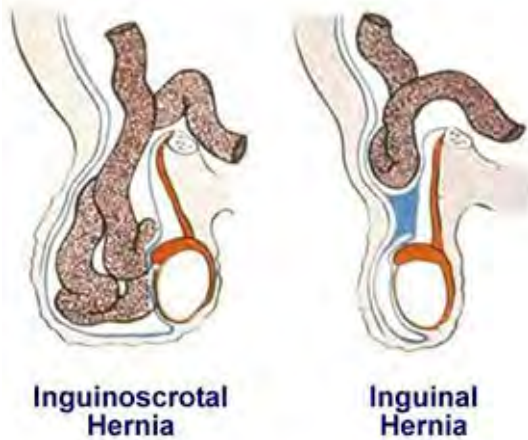
The testicle develops near the kidney about 7 weeks after conception

Testicle descends to top of groin at about 12 weeks after conception

Testicle descends into scrotum at about 4-6 weeks before birth

Premature infants have higher rates of undescended testes and inguinal hernias

Inguinal Hernias and Hydroceles



Inguinal Hernias and Hydroceles

- 10% of full term males
- 1% of males after infancy
- 99% resolve by 1-2 years of age
- Bilateral in 20%

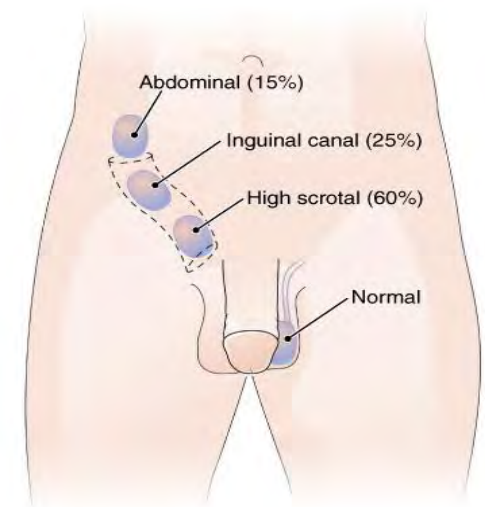
- Physical Exam
 - Visible enlargement: Examine Supine - attempt to reduce gently
 - No significant enlargement: Examine Standing or crying/straining
 - Transilluminate – hydrocele vs hernia. Determines urgency

- When to Refer
 - Any age - large, nonreducible, does not transilluminate
 - 6 months - Nonpalpable testis
 - 1 year of age – persistent hydrocele or hernia

- Associated risks
 - Incarceration of the bowel
 - Compromised blood flow to testes
 - Incarceration of the ovary and fallopian tube

Undescended Testes

- Most common birth defect of male genitalia
 - 2-4% of full term male infants
 - 30% of premature infants
- Associated Factors and Risks:
 - Impairment of fertility
 - Abnormal epididymis and vas deferens – 50-80%
 - Prolonged exposure to body temperature affects testis growth and sperm cell precursors
 - Testicular torsion
 - Associated inguinal hernia
 - Over 90% of infants have an associated inguinal hernia
 - ~10% of boys 10+ years old have associated hernias
 - Testis cancer – 5-10X higher than descended testes (RARE overall!)
 - Bilateral nonpalpable testes with male phenotype
 - Rule out genetic disorder or congenital adrenal hyperplasia



Undescended Testes

Retractile Testes

- Physical Exam:
 - Examine the testes while standing AT THE BEGINNING of the PE
 - Only remove the lower clothing, diaper or underwear to prevent getting chilled
 - Sweep from the ASIS to the base of the penis
 - If unsuccessful, try seated 'frog leg' position or supine
- When to Refer:
 - 6 months of age if the testis is not in the scrotum PERIOD!
 - 6-12 months if a retractile testes does not remain in the scrotum when released
- Retractile testes typically do not need to be seen if brought into the scrotum and remain when released

****ULTRASOUNDS ARE NOT RECOMMENDED****

Uncircumcised penis

- Foreskin is not retractable at birth - 'physiologic phimosis'
 - 20% are retractable by 2 years of age
 - 80% are retractable by 5 years old
- Do not force the foreskin back, only stretch it gently
- Rinse any residual urine with water during all diaper changes
- 'Smegma', 'preputial cyst', 'keratin pearl'
 - normal in the uncircumcised pediatric male
 - Helps separate the inner foreskin from glans and corona



Natural penis



Circumcised penis

© Healthwise, Incorporated

FIGURE 2



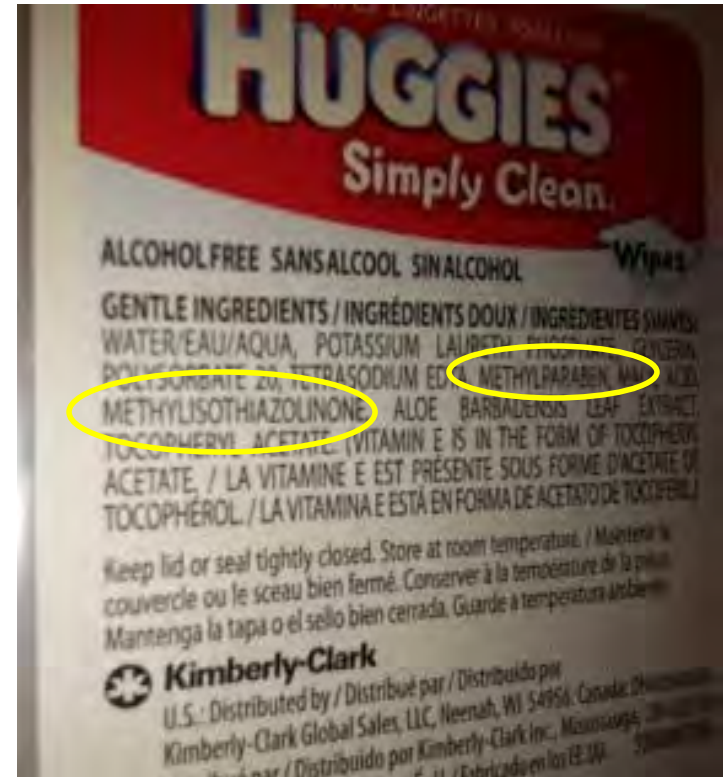
Preputial cyst (keratin pearl) from desquamated skin cells. (The foreskin is completely retracted and therefore not visible in this picture.)

Concealed penis and penile adhesions

- Penile skin covering the glans may not be ‘excess’ skin
 - The appearance of redundant skin may be due to fat pad pushing the skin distally over the glans
 - During PE
 - expose the entire penile shaft by pushing the skin from the base of the penis down to the pubic symphysis
- Penile adhesions
 - Physiologic adhesions occur between the inner preputial skin and the glans or corona
 - Secondary adhesions occur after inflammation
 - Reattachment during healing after circumcision
 - Diaper rash
 - Prolonged contact with urine
 - **Irritants in diaper wipes*****
 - May result in scarring or secondary phimosis



There are two preservatives used in Huggies baby wipes, which are ***methylisothiazolinone*** and ***methylparaben***. baby wipes is that they all have to contain preservatives because their moist environment is a breeding ground for bacteria. There are no absolutely non-toxic synthetic preservatives; however, some preservatives are more toxic than others. Methylisothiazolinone and methylparaben are potent toxins. [Methylisothiazolinone](#) may cause an allergic skin reaction and lab studies in mice suggest that it may be toxic to brain cells.



The major concern about [methylparaben](#) is that it mimics estrogen and disrupts the function of the hormone system.

<http://ireadlabelsforyou.com/huggies-baby-wipes-safe-or-toxic/>

Reformulated in 2015. Here is a list of new ingredients:

Water, Aloe Barbadensis Leaf Juice, Tocopheryl Acetate, Disodium Cocoamphodiacetate, Polysorbate 20, Fragrance, Citric Acid, Disodium Phosphate, Disodium EDTA, Phenoxyethanol, Sodium Benzoate (Source)



2-Bromo-2-Nitropropane-1,3-Diol, a formaldehyde-releasing preservatives was replaced with ***Phenoxyethanol and Sodium Benzoate***

Is phenoxyethanol safe?

Before we talk about the safety of preservatives, keep in mind that preservatives are necessary in disposable baby wipes because they keep our babies safe from dangerous bacteria. In my [Baby Wipes Rating List](#), I noted which disposable baby wipes that either do not have sufficient preservatives or which do not disclose the preservatives used.

The FDA has issued warnings revealing that the ingestion of **phenoxyethanol** can be toxic and harmful for infants. Accidental ingestion can produce depression of the central nervous system and lead to the occurrence of diarrhea and vomiting ([source](#)). So make sure that your baby does not put the baby wipes in her mouth, and that you don't use them to wipe her hands if she is a finger-sucker.

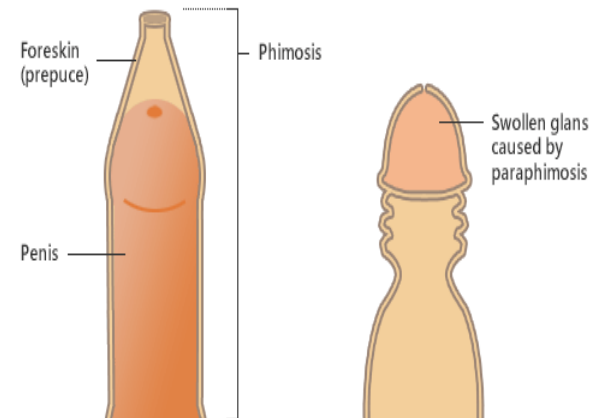
Phenoxyethanol is rated 4 out of 10 in the [Skin Deep database](#); it appears to [cause contact allergy](#) only in rare occasions; the data is limited on it, meaning there may be other issues associated with it that we simply don't know about (or, it might otherwise be fine – that's the problem with ingredients with limited data; we just don't know)

<http://ireadlabelsforyou.com/huggies-baby-wipes-safe-or-toxic/>

Indications for referral for circumcision or revision



- 2 or more episodes of infections of the foreskin or glans
- Urinary tract infection in a male
- Tight or scarred phimosis
- Ballooning during urination
- History of paraphimosis
- Developmental delay or physical disability
- Scarred skin bridges



Before referring to urology:

- Recurrent inflammation – Parents should
 - Push the fat pad back at the base of the penis to the pubic symphysis
 - GENTLY retract foreskin until opening at the tip is visualized without redundancy
 - Change diaper wipes or use water only
 - Do with every diaper change and bath.
- Phimosis with ballooning or penile adhesions with smegma
 - Same as above
 - After 6-9+ months of age
 - Betamethasone dipropionate 0.05% BID
 - Triamcinolone acetate 0.1% cream BID
 - Slow retraction over weeks
- There are very few medical indications for circumcision or revision
- Many insurance companies do NOT cover circumcisions or circumcision revisions
- Have parents contact their insurance company to make sure it is a covered procedure



HYPOSPADIAS



- Urethral opening appears anywhere on underside of penile shaft from the glans to the perineum.
- Occurs in 1/300 live male births.
- Locations of meatus:
 - glans
 - corona
 - distal shaft
 - midpenis (16%)
 - proximal (13%)
- Associated abnormalities:
 - Chordee or penile bend
 - Hooded foreskin
 - Scrotal abnormalities
 - Cryptorchidism
 - Inguinal hernia

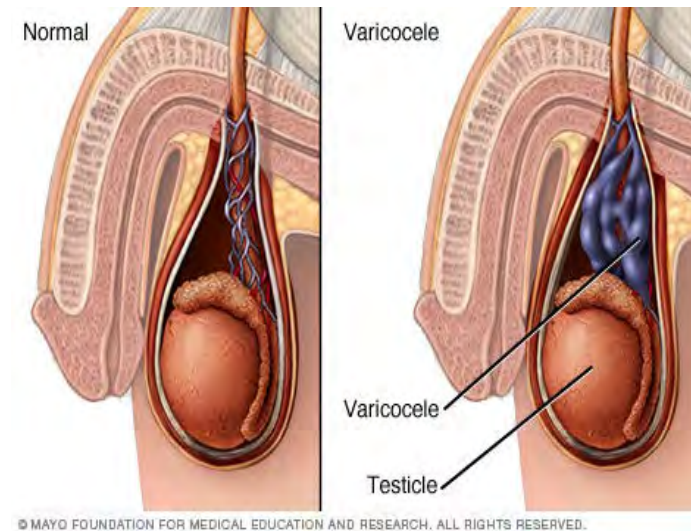


Hypospadias, chordee, penile torsion

- Surgical correction is typically done starting at 6 months of age
- If there is severe or complex hypospadias and an associated undescended testis, additional testing may be necessary
- When to refer:
 - If parents are anxious, refer at any time
 - If there is an associated undescended testis/testes refer early, next available appointment
 - Otherwise, refer at 3 to 4 months of age

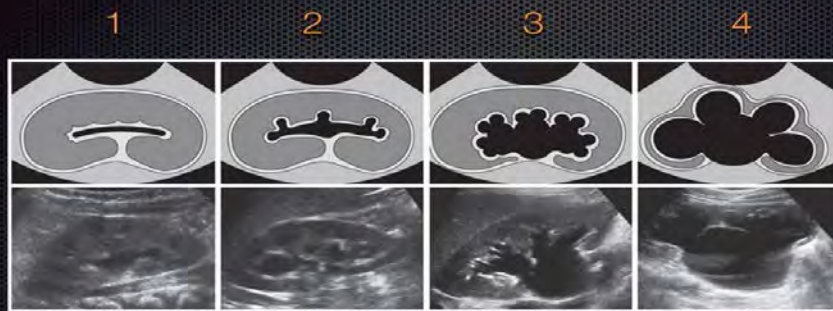
Varicocele

- Dilated veins in the scrotum
 - ‘Sack of spaghetti’
 - Associated with the onset of adrenarche
 - Left >> Right
 - 15-20% of males
 - Common in other family members
- When to refer:
 - Once detected, especially if there is testicular asymmetry
 - Followed annually to monitor testicular growth
 - Visually, with orchidometers, or ultrasound measurements
- Associated factors
 - Rarely due to an intraabdominal process
 - High index of suspicion if there is a prominent right varicocele
 - Get abdominal ultrasound and refer to Urology
 - Infertility and impaired testicular growth in 15-20% of males



Hydronephrosis / Hydroureter

Society for Fetal Urology grading system



Timberlake, M. D. & Herndon, C. D. A. (2013) *Nat. Rev. Urol.*



- Prenatally detected
- Incidentally detected
- Evaluation of UTIs
 - Obtain renal and bladder images
 - Pre and post void images helpful

Differential diagnoses

- Vesicoureteral reflux
- Obstruction
 - Ureteropelvic junction (UPJ)
 - Ureterovesical junction (UVJ)
 - Retrocaval ureter
 - Stricture
- Posterior urethral valve in males
- Neuropathic bladder
- Nonobstructed hydronephrosis
- Duplicated collecting systems with ectopic insertion

Hydronephrosis / Hydroureter

- When to refer:
 - Bilateral or solitary kidney
 - Call the pediatric urology office immediately
 - Unilateral with normal contralateral kidney
 - Renal bladder ultrasound after the 1st week of life
 - Next available appointment
 - If associated with a febrile UTI
 - Call the pediatric urology office immediately
- Bring in all imaging on CD
 - Reports are okay, pictures are ESSENTIAL!
- Lab work (creatinine) if bilateral or solitary kidney
 - After one week of age

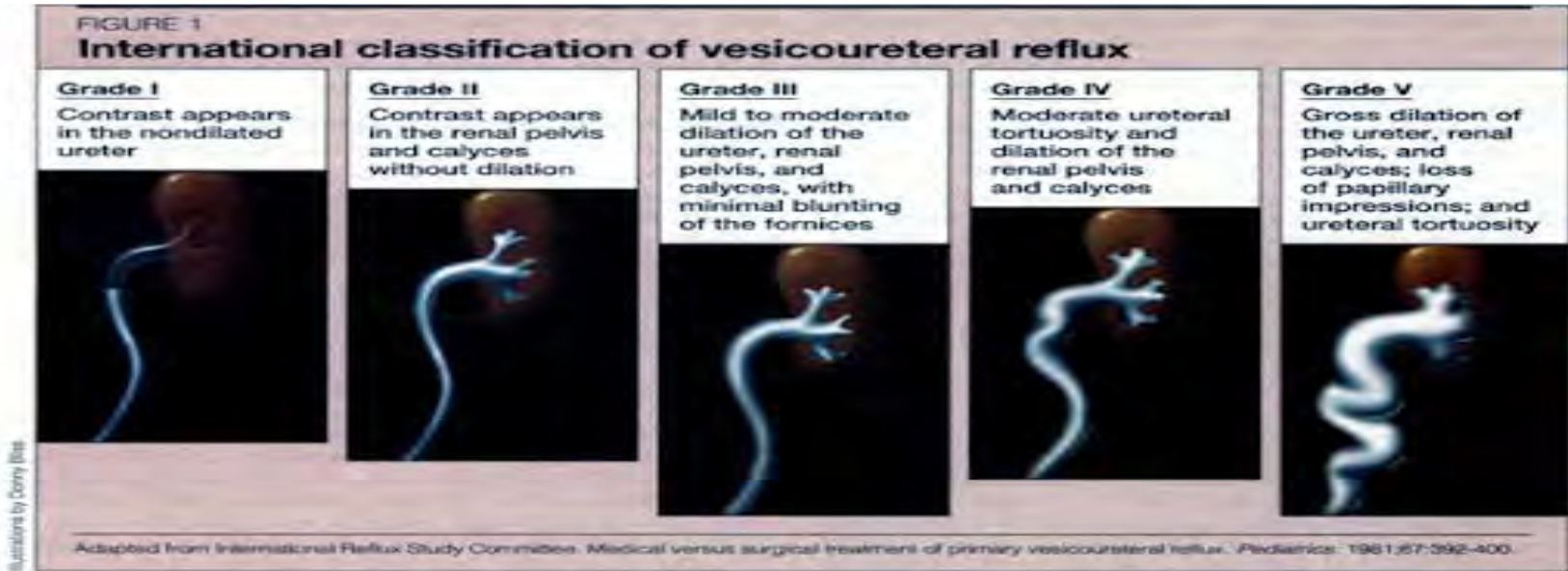
Urinary tract infections

- When to refer:
 - Any documented febrile UTI ($>100.5^{\circ}$)
 - Males with any documented UTI
 - Females with 2 or more documented afebrile symptomatic UTIs
- Before referral:
 - Document adequate treatment of the acute UTI with a follow up urine culture
 - Antibiotic prophylaxis if febrile or recurrent UTIs
 - Assess drinking, voiding and bowel movement habits

When referring a patient with a UTI

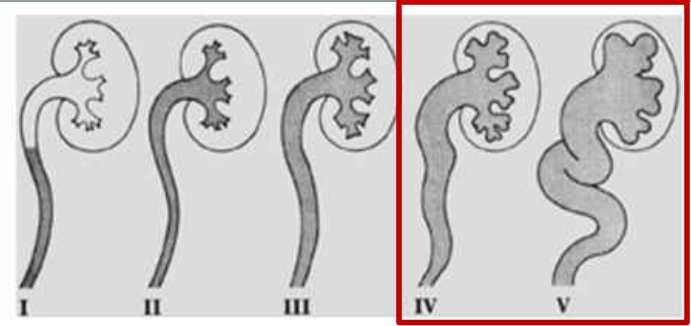
- Call the Urology office - (202) 476-5042
- Fax the urine culture results and any relevant clinic notes
- Fax (202) 476-4739
- Give parents copies of urine culture results!
- A renal bladder ultrasound with pre and post void images is helpful in most cases
 - Can be scheduled to coincide with the Urology visit
- Parents should bring in all imaging studies on CD to the visit
 - Reports are okay, PICTURES ARE ESSENTIAL!!!

Vesicoureteral Reflux



- Typically grades I, II and III do not require surgery and are not associated with significant renal damage
- Antibiotic prophylaxis is recommended in some cases, especially if prone to UTIs
- When to Refer:
 - If they have not been seen by a Urologist
 - Recurrent UTIs

Vesicoureteral Reflux



- Grades IV and V more commonly associated with congenital dysplasia and/or renal damage due to UTIs
- When to refer:
 - At diagnosis if they have not seen a Urologist
 - After any febrile UTI
- Assessment and monitoring:
 - DMSA renal scans to assess baseline and post UTI function and scarring
 - Follow up VCUG and/or renal bladder ultrasound every 18-24 months to assess for resolution and post void residual urine volume
 - Blood pressure every 6 months if there is significant renal damage or reduction of renal function
- Antibiotic prophylaxis
- May require surgery for urinary stasis to prevent recurrent UTIs or voiding dysfunction

Wetting Infections & Stooling Help WISH Clinic referrals

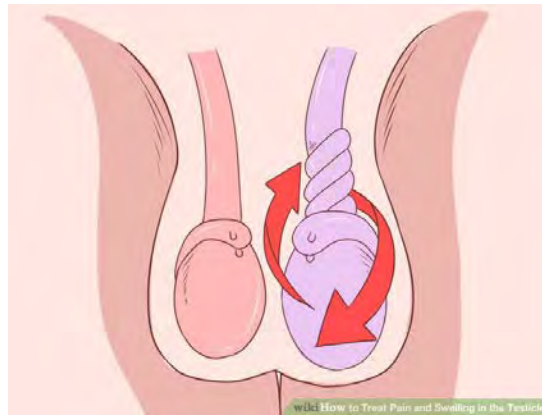
- Refer children with:
 - Recurrent UTIs - >2 nonfebrile UTIs
 - Daytime wetting – older than 3 years of age*
 - We do not ‘teach’ toilet training
 - Bedwetting – older than 6 years of age
 - Urinary frequency and urgency
 - Dysuria (painful urination) with or without a UTI
 - Vaginal or penile pain with or without a UTI
 - Scrotal or inguinal pain*
 - Not associated with scrotal swelling, nausea, vomiting or abdominal pain (Must rule out torsion immediately if these symptoms are present)
 - History of epididymitis*
 - If prepubertal, refer for a general Urology appointment with a renal bladder ultrasound with pre and post void images.
 - Terminal hematuria or bloody drops of urine in males (urethrorrhagia)

Urologic Emergencies

Testicular or Spermatic cord torsion

- SYMPTOMS – 1 or more

- Scrotal pain
- Scrotal swelling
- Abdominal pain
- Nausea
- Vomiting



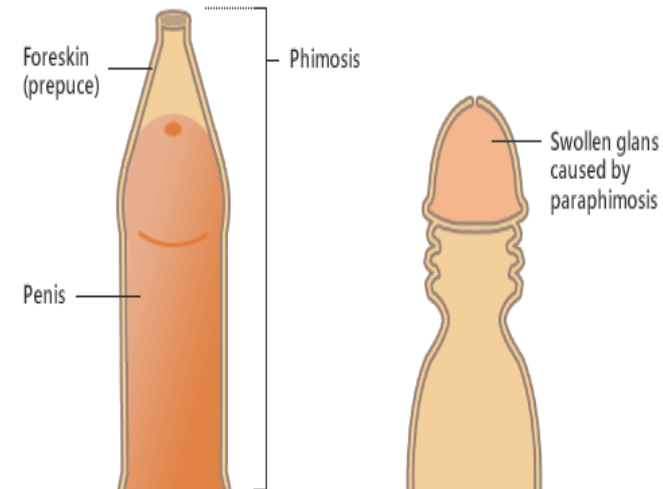
- Evaluate immediately at a medical facility
 - Typically scrotal ultrasounds are done to assess blood flow
 - Urologists on staff do not always need ultrasounds to diagnose and treat
- Every hour of delay increases the chance of testicular loss
- Children under 13 years old should go directly to a pediatric hospital, if possible, to avoid delayed treatment

Torsion in neonates

- Physical Exam:
 - Enlarged scrotum
 - Often tense or hard
 - Discolored
 - Not reducible
 - Difficult to distinguish from a hernia
- Obtain scrotal ultrasound to assess testicular blood flow
 - Blood flow in prepubertal testes is often difficult to assess
 - Hernias may be present
- Refer only when safe for the baby
- Surgery is controversial
 - (Almost) always too late to save the torsed testis.
 - Small percentage of bilateral asynchronous torsion
 - Must weigh the risk of general anesthesia vs prevention of RARE asynchronous torsion

Paraphimosis

- Caused by
 - Forcing the foreskin back
 - Leaving it retracted
 - **“ALWAYS PUT IT BACK WHERE YOU FOUND IT!”**
- Attempt to reduce the foreskin
 - Local anesthesia, injection or cream, for anticipated pain
 - Ice or compression for edema
 - Use gentle pressure on the glans downward and foreskin upward
 - Osmotic method – D50 soaked gauze or granulated sugar to osmotically draw out fluid
- If manual reduction is unsuccessful, contact a urologist or refer to nearest ER



Priapism

- Prolonged or painful erections
- Determine the etiology and duration
 - Sickle cell disease
 - Hydrate and contact hematology/oncology
 - Medications
 - Urinary retention
- Refer to ER for evaluation
- Urology typically consulted by ER or Heme/Onc service

Urinary retention

- History
 - Determine the duration and fluid intake
 - Bowel movement frequency, characteristics
 - Trauma
 - Abdominal or genital pain
- Physical exam
 - Palpable or visible bladder
 - Dribbling of urine
 - Check meatus, foreskin, vaginal introitus
- Bladder ultrasound
 - Check for masses and volume of urine in the bladder
- Catheterize
- Refer to ER if >6-8 hours without voiding if well hydrated
 - Earlier if uncomfortable or a known solitary kidney

Enlarged nonpainful or painful testicular or extratesticular mass

- Get an ultrasound within 24-48 hours
- Call Urology for:
 - Solid, cystic or heterogenous mass
 - Intratesticular or extratesticular
- Other masses (hydroceles, hernias and varicoceles) can be handled as previously noted

Conclusion

- If you have an urgent urologic concern, please call the urology office (202) 476-5042
- Most elective surgical procedures are done starting at 6 months of age.
- UTIs can be seen in either the WISH clinic or a general urology appointment.
 - Any UTI before 1-2 years of age should be seen in a general Urology appointment
 - Recurrent UTIs after toilet training should be referred to the WISH clinic initially
- We are happy to see any patient referrals
- THANKS FOR YOUR TIME AND ATTENTION!