

Urology: A Practical Primer and Recent Updates

Joel F. Koenig
Children's Mercy Hospital



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About Me

Grew up in Wichita (Go Aces)
Training: KU Med School → SIU → Wash U
With CMH since 2016
Wichita clinic



CMH Urology



Paul Bowlin



John Gatti



Joel Koenig



Disclosures

None



Objectives

- Discuss practical, day-to-day care regarding common issues
- Review recent published AUA guidelines
- Know when to refer to specialized care and what to tell parents ahead of referral
- Q & A



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Undescended Testicles: Diagnosis and Management

AUA Guidelines

[https://www.auanet.org/guidelines/cryptorchidism-\(2018\)](https://www.auanet.org/guidelines/cryptorchidism-(2018))



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AUA Guidelines

- Providers should obtain gestational history at the initial evaluation of boys with suspected cryptorchidism
- Primary care providers should palpate testes for quality and position at each recommended well child visit
- Providers should refer infants with cryptorchidism detected at birth by six months corrected gestational age
- Providers should refer infants boys with newly diagnosed (?acquired) cryptorchidism after six months corrected gestational age to a surgical specialist

AUA Guidelines

- Providers must immediately consult a specialist for all phenotypic male newborns with bilateral, non-palpable testes
- Providers should **NOT** perform ultrasound or other imaging modalities in the evaluation of boys with cryptorchidism
- Providers should assess for a possible disorder of sexual differentiation (DSD) when hypospadias and cryptorchidism co-exist
- In boys with bilateral, nonpalpable testes who do not have congenital adrenal hyperplasia (CAH), providers should measure Müllerian Inhibiting Substance (MIS or Anti- Müllerian Hormone [AMH]) and consider additional hormone testing to evaluate for anorchia
- In boys with retractile testes, providers should assess the position of the testes at least annually

AUA Guidelines

- Providers should not use hormonal therapy to induce testicular descent
- In the absence of spontaneous testicular descent by six months (corrected for gestational age), specialists should perform surgery within the next year.
- A scrotal or inguinal orchiopexy should be performed in prepubertal boys with palpable cryptorchid testes
- In boys with a non-palpable testicle, the surgical specialist should perform an exam under anesthesia to reassess palpability/location
- At the time of exploration for non-palpable testes the surgeon should identify the testicular vessels
- In boys with a normal contralateral testis, the surgical specialist may remove the undescended testicle
- Providers should counsel boys with a history of cryptorchidism regarding potential long-term risks

AUA Guidelines

- Providers should obtain gestational history at the initial evaluation of boys with suspected cryptorchidism

Embryology

- When do the testis normally descend?
 - 3rd trimester
 - 60% by 30 weeks
 - 93% by 32 weeks
 - More common:
 - premature births
 - small for gestational age babies



Incidence

- Term male infants?
 - 3%
- Preterm and/or birth weight < 2.5kg?
 - 33% - 45%
- 1 year of age?
 - 1% for full term
 - 10% for premature births
- 90% of spontaneous decent by 6 months

Incidence

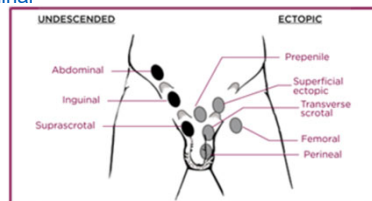
- Proximal hypospadias
 - 30%
- Other syndromes/conditions associated with UDT
 - Prune belly
 - Exstrophy
 - Prader-Willi

AUA Guidelines

- Primary care providers should palpate testes for quality and position at each recommended well child visit

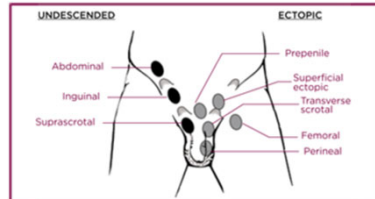
Classification

- Palpable vs. non-palpable
- Scrotal, inguinal, abdominal
- Retractable
- Ascending
- Ectopic



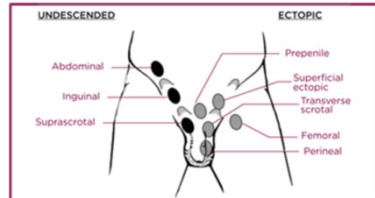
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Classification

- Palpable vs. non-palpable
- Scrotal, inguinal, abdominal
- Retractable
- Ascending
- **Ectopic**



Diagnosis

- Physical exam
 - Warm room
 - Supine and frog leg
 - Soap or lube may help
 - Retractable testes should remain in the scrotum when manipulated down

Diagnosis

- Non-palpable
 - Feel for cord structures across the pubic bone
 - Look for compensatory hypertrophy
 - 18% of non-palpable are palpable under anesthesia

Diagnosis

- Bilateral non-palpable
 - New born: consider DSD (CAH until proven otherwise)
 - Older child: chromosome and hormonal work up
 - Baseline LH, FSH
 - hCG stim test
 - AMH
 - Bilateral intra-abdominal testes 20x more likely than bilateral anorchia
 - Surgical exploration typically still recommended

Diagnosis



AUA Guidelines

- Providers should **NOT** perform ultrasound or other imaging modalities in the evaluation of boys with cryptorchidism

Imaging—Why not?



AUA Guidelines

- In boys with retractile testes, providers should assess the position of the testes at least annually

Retractile Testicles

- Initially extrascrotal on examination or easily moves out of the scrotum
- Manually replaced in scrotum
- Remains temporarily
- No tension

Ascent

- Typically identified ages 6-10
- More likely with retractile testicles (20%)
- Inguinal hernia in 50%

When to refer?

- Providers should refer infants with cryptorchidism detected at birth by six months corrected gestational age
- Providers should refer infants boys with newly diagnosed (acquired?) cryptorchidism after six months corrected gestational age to a surgical specialist

Fertility

- Histologic changes demonstrated in UDT and to a lesser extent in the contralateral testis
- Delaying orchiopexy increases abnormal histologic changes
 - Push for orchiopexy by 1 year
- Unilateral UDT still have normal fertility rates (90%)
- Bilateral UDT fertility rates 50-65%

Malignancy

- Increased risk of malignancy
- UDT ?
 - 2-8 x
 - Increased with orchiopexy after age 10 compared to prior
- Contralateral ?
 - 1.7 x
- Facilitate self exams

Ascending testicles

- May be more like primary undescended testicles
- Hildorf S, Clasen-Linde E, Fossum M, Cortes D, Thorup J. Fertility Potential is Impaired in Boys with Bilateral Ascending Testes. J Urol. 2021 Feb;205(2):586-594. PMID: 32903117.

Management

- 1 month old referred for unilateral UDT
- PE: normal phallus, normally descended R testis, L testis palpable in the inguinal region
- What do you do?
- Re-examine after 6 months of age, refer to urology if still undescended

Management

- 6 month old referred for unilateral UDT
- PE: normal phallus, normally descended R testis, L testis non-palpable
- What do you do?
- Refer to urology
- NO IMAGING

Management

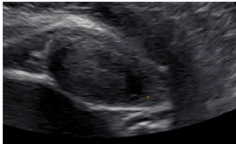
- 1 day old with bilateral non-palpable testicles and hypospadias
- What do you do?
- Full DSD work up
 - Chromosome
 - T, MIF, 17 OH-P, LH, FSH, Cortisol
 - Abdominal and pelvic US: looking for uterus

AUA Guidelines

- Providers must immediately consult a specialist for all phenotypic male newborns with bilateral, non-palpable testes

Management

- 12 year old referred for UDT
- Bilateral non-palpable testes on PE, otherwise healthy
- US (outside) shows bilateral inguinal testes 3.5cm each



Management

- Chromosome and hormones
 - LH, FSH, T, AMH, hCG stim
- In this case LH and FSH elevated and T undetectable
- Surgical exploration
 - Blind ending vessels on the left and vessels crossing ring on the right
 - Atrophied testicle removed from right scrotum

AUA Guidelines

- In the absence of congenital adrenal hyperplasia (CAH), providers should consider hormone evaluation to assess for anorchia

Testicular Microlithiasis (TML)

- Prevalence: 2.4-5.6%, increases with age
- Association with testicular tumors rare in pediatrics (3.1%)
- No association with CIS in children
- Utility of US has not been proven in children
- Most recommend self exams and/or annual physicals only in children

Testicular Microlithiasis (TML)

- European Society of Urogenital Radiology Guidelines (2015)/EUA guidelines
 - Isolated TML: serial self exams only
 - TML+risk factors (UDT, personal/1st degree relative GCT, atrophy): annual US and monthly self exams
 - Peutz-Jeghers Syndrome→ 10% risk of calcified Sertoli cell tumors

Summary UDT

- Refer at **6 months adjusted gestational age**
- NO IMAGING
- Testicles may ascend later in life
- Bilateral non-palpable UDT in new born → think CAH
- TML associated with testis tumors but typically routine self exams and annual physicals are only recommendation



VUR

- The prostate cancer of pediatric urology
 - High incidence/detection
 - Much is relatively benign
 - We overtreat to avoid undertreating
 - Still high morbidity in select patients



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Vesicoureteral Reflux (VUR)

- **Standard:** A guideline statement is a standard if (1) the health outcomes of the alternative interventions are sufficiently well-known to permit meaningful decisions and (2) there is virtual unanimity among panel members about which intervention is preferred.
- **Recommendation:** A guideline statement is a recommendation if (1) the health outcomes of the alternative interventions are sufficiently well-known to permit meaningful decisions and (2) an appreciable, but not unanimous majority of the panel members agrees on which intervention is preferred.
- **Option:** A guideline statement is an option if (1) the health outcomes of the interventions are not sufficiently well-known to permit meaningful decisions or (2) preferences are unknown or equivocal.

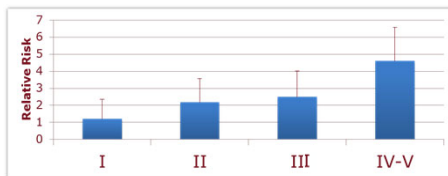


Treatment: < 1 year old

- Recommendation: Prophylaxis if < 1 year old with VUR and previous febrile UTI
- Recommendation: Prophylaxis even without febrile UTI (detected through screening) if < 1 year old with grades III-V VUR

Treatment: < 1 year old

- Most (not all) scarring occurs in 1st year of life
- Higher grade VUR = greater risk of renal scarring



Treatment: > 1 year old

- Recommendation: If bowel bladder dysfunction (BBD) present, treat it, ideally before any surgery
- 1st recommendation in this section

Treatment: > 1 year old

	CAP	Observation
No BBD, recurrent febrile UTI, renal cortical abnormalities	option	option
BBD, recurrent febrile UTI, OR renal cortical abnormalities	recommended	not recommended

Treatment: > 1 year old

- Option: surgical intervention
 - Open
 - Lap/robot
 - Endoscopic

Follow up

- Annual US, BP, height, weight, urinalysis
 - Also for WCC
- VCUG



Breakthrough UTI

- Symptomatic or febrile
- Strongly consider change in management
 - Surgery
 - Start or change CAP
 - Revisit BBD



Sibling/Family Screening

- Prevalence in siblings ~27%
- VCUG if abnormal US or history of UTI
- Option to get screening US
- Certainly higher suspicion/lower threshold



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VUR screening with prenatal hydronephrosis

- Recommendation: VCUG if
 - High grade hydronephrosis
 - Abnormal ureter/bladder
- Option: observation or VCUG for lower hydronephrosis



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VUR screening with prenatal hydronephrosis

- Not in the guidelines
 - VCUG for any male with bilateral hydronephrosis to rule out PUV

Our Standard Practice

- Febrile UTI = renal US
- Febrile UTI + abnormal renal US = VCUG

Our Standard Practice

- Consider VCUG after 1st febrile UTI
 - Sibling/family history of VUR
 - Abnormal pathogen
 - Rare for us

Our Standard Practice

- VUR prior to age 1
 - CAP till 1 year old
 - Risk of scarring much lower after 1 year
 - Consider observation, especially in males
 - Shared decision making

Our Standard Practice

- Breakthrough UTI on CAP
 - Consider surgery
 - Rotate CAP

Our Standard Practice

- UTI while off CAP after 1 year old
 - Focus on BBD
 - Consider CAP till toilet trained and BBD improved

Our Standard Practice

- Surgery typically last resort
 - Older patients when resolution less likely
 - Existing renal damage (labs or imaging)
 - Breakthrough UTIs

VUR Summary

- The prostate cancer of pediatric urology
 - High incidence/detection
 - recent decrease
 - Much is relatively benign
 - MUCH less treated now

VUR

- We overtreat to avoid undertreating
 - Still many on CAP who probably don't it to protect those that do
- Still high morbidity in select patients
 - Hopefully very low risk of permanent sequela from VUR today

VUR

Additional tools

— VURx (VUR index)

■ Validated resolution prediction tool

- Kirsch AJ, Arlen AM, Leong T, Meriman LS, Herrel LA, Scherz HC, Smith EA, Srinivasan AK. Vesicoureteral reflux index (VURx): a novel tool to predict primary reflux improvement and resolution in children less than 2 years of age. J Pediatr Urol. 2014 Dec;10(6):1249-54. doi: 10.1016/j.jpurol.2014.06.019. Epub 2014 Jul 24. PMID: 25511573.

Resolution rates

- 1: 89%
- 2: 69%
- 3: 53%
- 4: 16%
- 5-6: 11%

VCUG DATA	SCORE
Timing of Reflux	<input type="text"/>
3 Filling (Early-Mid)	+
2 Filling (Late)	
1 Voiding (Only)	
Ureteral Anomalies (Duplex/PUJ)	<input type="text"/>
1 Present	+
0 Absent	
VUR Grade	<input type="text"/>
1 High (4-5)	+
0 Low-Mod (1-3)	
Gender	<input type="text"/>
1 Female	↓
0 Male	
TOTAL	<input type="text"/> out of 6


Additional Resources

- <https://www.auanet.org/guidelines-and-quality/guidelines/vesicoureteral-reflux-guideline> VURx (VUR index)
- Managing vesicoureteral reflux in children: making sense of all the data

- Edwards A, Peters CA. Managing vesicoureteral reflux in children: making sense of all the data. F1000Res. 2019 Jan 8;8:F1000 Faculty Rev-29. doi: 10.12688/f1000research.16534.1. PMID: 30647916; PMCID: PMC6329208.

Thank You

■ Questions?

Children's Mercy
KANSAS CITY

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