Vesicoureteral Reflux (VUR) in Children – Where are we in 2014?

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Objectives

• To understand the significance & rationale of detecting VUR in the pediatric population
• To understand the management options
• To review some common pediatric VUR clinical scenarios
“As one looks over the last 30 years of reflux history, it is ironic that urologists have become so expert at its surgical correction before understanding so much of its natural history and true clinical significance”

John Woodard MD 1983
"He does have a point."
What is VUR?

- Retrograde flow of urine from bladder to kidneys
Etiology

- **Primary (congenital)**
  - Anomaly of the ureterovesical junction

- **Secondary (acquired)**
  - Increased intravesical pressure, neurogenic bladder, bladder outlet obstruction
Grades of VUR

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Into a nondilated ureter</td>
</tr>
<tr>
<td>II</td>
<td>Into the pelvis and calyces without dilatation</td>
</tr>
<tr>
<td>III</td>
<td>Mild to moderate dilatation of the ureter, renal pelvis, and calyces with minimal blunting of the fornices</td>
</tr>
<tr>
<td>IV</td>
<td>Moderate ureter dilatation and dilatation of the pelvis and calyces</td>
</tr>
<tr>
<td>V</td>
<td>Gross dilatation of the ureter, pelvis, and calyces; loss of papillary impressions; and ureteral tortuosity</td>
</tr>
</tbody>
</table>
Epidemiology

- Affects approximately 1% of all children
- Found in 30-50% of children with febrile UTIs
- Siblings with VUR ~27%
- Children of parents with VUR ~35%
- Prenatal hydronephrosis ~16%
- Boys – prenatal hydro - higher grade and bilateral
- Girls - UTIs
- Lower incidence in Asian or African Descent
- Genetics
  - 80-100% monozygotic twins
  - 35-40% dizygotic twins
Historical Events
VESICOURETERAL REFLUX IN CHILDREN

B. W. JONES AND JAMES W. HEADSTREAM

From the Department of Surgery, Division of Urology, University of Arkansas Medical Center, Little Rock, Ark.

VESICOURETERAL REFLUX IN CHILDREN

Victor A. Politano, M.D., Durham, N. C.
History of VUR

• 1952 – Hutch – VUR & Pyelonephritis in paraplegic patients
• 1959 – Hodson – UTI & Renal scarring high likelihood VUR in children
• 1967 – Kollerman & Ludwig – VUR in infants 60% decreased to 5% in children at 4 years of age
• Studies before abx prophylaxis became popular (1970s) demonstrated rates of recurrent UTI did not differ between those with and without VUR*
• 1973 – Bailey “reflux nephropathy”
• 1975 – Ransley & Risdon - study performed in pigs – induced VUR- physiological bladder pressures – renal scarring only in presence of UTI
• Late 1970s – Smellie – low dose abx prophylaxis while waiting for resolution
• 2 RCT – International Reflux Study (1992) & Birmingham Study (1987)
  • compared outcome of surgical vs medical treatment of grade III-IV
  • decrease in incidence of pyelo in surgical arm but no difference incidence of cystitis or renal scars
• 1997 AUA guidelines
• 2010 AUA guidelines

The Inciting Event

UTI
8% girls 2% boys by age 7*

PRENATAL HYDRONEPHROSIS
1-5% pregnancies#

VCUG

VUR


Imaging Studies after UTI – Two Approaches - Controversy

US & VCUG

TOP DOWN

BOTTOM UP

US & DMSA

VCUG ONLY IF ABNORMALITY
After first febrile UTI in this age group VCUG not routinely recommended unless the US reveals abnormalities

“The recommendations in this guideline do not indicate an exclusive course of treatment or serve as a standard of care; variations may be appropriate”
The Imaging Modalities
First described in 1905
Ionizing Radiation
Requires a catheter to install contrast

**ALARA CONCEPT**
Pulsed Fluoroscopy
  - Effective dose 3 mrem
  - Compared to flight from Boston to San Francisco 5 mrem
RNC-10x decrease; different grading scheme
but still requires a catheter

Can be done after UTI has been treated
ULTRASOUND

- Non-invasive
- No radiation
- Not reliable in detecting VUR
- Used to assess for:
  - Renal Abnormalities, e.g., hydronephrosis, renal scarring
  - Monitor Renal Growth

“Among young children who have a history of UTI, RBUS is a poor screening test for GU abnormalities with low sensitivity/specificity. A negative RBUS does not rule out significant GU pathology (particularly VUR grade III or higher), whereas a positive RBUS is a poor predictor. In such children RBUS and VCU should be considered complementary as they provide important but different information”
DMSA Renal Scan

- Detects acute pyelonephritis & renal scarring
- Healthy renal tissue (proximal tubules) takes up the tracer
- Very high sensitivity & specificity (92-95%)
- Performed initially to detect pyelonephritis and F/U to detect renal scars
- Scars – congenital (dysplasia) vs acquired
- More patients with pyelonephritis do not have VUR than do
- 1\textsuperscript{st} UTI – DMSA abnormality persists 36-56%*


Not current available due to the shortage of the agent
GOALS OF TREATMENT
- PREVENT UTIs
- PREVENT RENAL INJURY
- MINIMIZE TREATMENT MORBIDITY

UTI
- Antibiotics to keep urine sterile

NO VUR

VUR
- Surgery to correct VUR

PYELONEPHRITIS
- Inflammatory response -> focal ischemia, interstitial damage, fibrosis, irreversible scarring
- Renal scarring & damage

Consequences of Renal Scarring
Potential Complications of VUR

• Renal scarring
• Hypertension
• Proteinuria
• ESRD
• Pregnancy complication?
  – Pre-eclampsia
  – Pyelonephritis
Outcome of pregnancy in women with a history of vesico-ureteric reflux

Jean G. Hollowell
Eastern Virginia Medical School and Children’s Hospital of the King’s Daughters, Norfolk, VA, USA
Accepted for publication 23 January 2008

OBJECTIVES

To review the evidence relating to the outcome of pregnancy in women with vesico-ureteric reflux (VUR) or a previous history of VUR and to identify the factors contributing to morbidity in pregnancy, with particular emphasis on the role of renal scarring.

METHODS

Searches were carried out in Medline, Pubmed and MD Consult using various combinations of the keywords including: vesicoureteral reflux and pregnancy, maternal vesicoureteral reflux, vesicoureteral reflux in adulthood, reflux nephropathy and pregnancy. All data quoted in this review are from original articles.

RESULTS

The published studies showed that women with VUR that was not associated with renal scarring had no increase in the incidence of gestational hypertension, pre-eclampsia or fetal morbidity, regardless of whether their VUR was diagnosed in childhood or adulthood. However, women with VUR and normal kidneys did have higher incidence of urinary tract infection during pregnancy, which was not modified by ureteric re-implantation. Renal scarring was the primary risk factor for morbidity during pregnancy and this risk was independent of the presence or absence of VUR at the time of pregnancy.

CONCLUSION

The evidence does not support the practice of correcting low-grade VUR in girls with unscarred kidneys because this will reduce their risk of complications in pregnancy. The presence of renal scarring rather than the presence or absence of reflux is the principal determinant of morbidity during pregnancy.

KEYWORDS

vesico-ureteric reflux, pregnancy, reflux nephropathy, urinary tract infections, pyelonephritis
Renal Scarring & Treatment

- Surgical intervention for VUR reported to have no significant effect on renal outcome versus antibiotic prophylaxis
- No decreased in the incidence of VUR-associated ESRD
- Likely Explanation:
  - Presence of reflux prenatally or UTI during infancy may be the primary risk of renal impairment

*(The Big Bang Theory)*


Thoughts in Management

• Spontaneous resolution of VUR declines with age
• More severe grades are less likely to resolve
• Sterile reflux does not appear to cause significant nephropathy
• Extended courses of prophylactic antibiotics are well tolerated by children
• Anti-reflux surgery is highly successful
• Trying to prevent renal scarring & ESRD
Spontaneous Resolution

- Age at diagnosis
  - Younger children are more likely to have VUR
  - VUR is more likely to resolve in younger children
  - Resolution usually occurs within the first few years after diagnosis
  - Rarely resolves in the older child
Spontaneous Resolution

• Age and VUR grade dependent

• Elongation of submucosal tunnel
  – Bladder and ureteral growth
  – Intravesical ureter estimated to lengthen from 0.5 cm to 1.3 cm in adults – mature length achieved by 10-12 years

• Change of bladder dynamics
  – Larger capacity
  – Lower intravesical pressure
Resolution Rates

Table 2. Medical therapy—Percent chance of reflux resolution after specified number of years

<table>
<thead>
<tr>
<th>Risk category (age in months) (number of patients on which estimates are based)</th>
<th>1 year (95% confidence interval)</th>
<th>2 years (95% confidence interval)</th>
<th>3 years (95% confidence interval)</th>
<th>4 years (95% confidence interval)</th>
<th>5 years (95% confidence interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade I&lt;sup&gt;a&lt;/sup&gt; (N=15)</td>
<td>39.3 (24.6–51.1)</td>
<td>63.1 (43.2–78.1)</td>
<td>77.6 (57.2–88.3)</td>
<td>86.4 (67.7–94.3)</td>
<td>91.8 (75.7–97.2)</td>
</tr>
<tr>
<td>Grade II&lt;sup&gt;a&lt;/sup&gt; (N=250)</td>
<td>28.4 (24.1–31.7)</td>
<td>48.1 (42.3–53.4)</td>
<td>62.7 (56.2–68.1)</td>
<td>73.1 (66.8–78.2)</td>
<td>80.6 (74.8–85.1)</td>
</tr>
<tr>
<td>Grade III, unilateral, age 0–24 (N=27)</td>
<td>21.4 (10.8–30.8)</td>
<td>38.2 (20.9–55.0)</td>
<td>61.9 (36.5–77.1)</td>
<td>70.0 (43.5–84.1)</td>
<td>91.8 (75.7–97.2)</td>
</tr>
<tr>
<td>Grade III, unilateral, age 25–60 (N=27)</td>
<td>13.4 (4.6–21.4)</td>
<td>20.1 (9.5–30.7)</td>
<td>30.8 (16.5–45.1)</td>
<td>43.6 (20.9–70.1)</td>
<td>51.3</td>
</tr>
<tr>
<td>Grade III, unilateral, age 61–120 (N=15)</td>
<td>10.8 (3.5–17.5)</td>
<td>19.2 (7.9–30.5)</td>
<td>29.6 (14.1–45.2)</td>
<td>43.6 (16.5–61.9)</td>
<td>51.3</td>
</tr>
<tr>
<td>Grade III, bilateral, age 0–24 (N=62)</td>
<td>12.7 (7–18.1)</td>
<td>30.5 (18–43.4)</td>
<td>49.3 (30.3–68.1)</td>
<td>69.3 (43–91.1)</td>
<td>80.6 (64.8–90.4)</td>
</tr>
<tr>
<td>Grade III, bilateral, age 25–60 (N=53)</td>
<td>7 (3.1–10.8)</td>
<td>16.4 (8–26.6)</td>
<td>36.6 (21.5–51.7)</td>
<td>51.3 (30.3–72.3)</td>
<td>60.5</td>
</tr>
<tr>
<td>Grade III, bilateral, age 61–120 (N=14)</td>
<td>2.6 (1–7.9)</td>
<td>5.4 (2–15.1)</td>
<td>10.1 (4.5–15.7)</td>
<td>12.5 (5.5–20.5)</td>
<td>14.6</td>
</tr>
<tr>
<td>Grade IV, unilateral&lt;sup&gt;a&lt;/sup&gt; (N=28)</td>
<td>16.1 (5–25.1)</td>
<td>29.7 (14–40.8)</td>
<td>41 (23.5–54.5)</td>
<td>50.5 (30–69)</td>
<td>58.5</td>
</tr>
<tr>
<td>Grade IV, bilateral&lt;sup&gt;a&lt;/sup&gt; (N=65)</td>
<td>4.5 (1–7.9)</td>
<td>6.4 (2–15.1)</td>
<td>7.8 (3–21.8)</td>
<td>8.9 (4–23)</td>
<td>9.9 (4.8–15.3)</td>
</tr>
</tbody>
</table>

<sup>a</sup>The yearly rate of reflux resolution remains constant for each group.

<sup>b</sup>No difference shown by age or laterality (unilateral/bilateral); therefore, these categories were combined.

<sup>c</sup>Estimates only apply to the time of diagnosis and are not age specific.
Treatment Options

- Observation with prophylactic antibiotics
- Observation without antibiotics
- Surgical treatment
- Unilateral – Open Extravesical Ureteral Reimplant
- Bilateral – Open Intravesical Ureteral Reimplant
- Endoscopic – Deflux® (dextranomer/hyaluronidase)
  - Can be done both bilateral/unilateral
Antibiotic Prophylaxis

• Amoxicillin or cephalexin < 2 months of age
  – Daily dose 10 mg/kg
  – Develops R quickly

• Trimethoprim-Sulfamethaxozole > 2 months
  – Introduced 1973
  – Daily dose 2mg/kg based on TMP component
  – Competes for bilirubin on albumin -> elevated bilirubin levels -> kernicterus
  – TMP alone can be used

• Nitrofurantoin > 2 months
  – Introduced 1953 – low R
  – Daily dose 1-2 mg/kg
  – Hemolytic Anemia – immature liver can’t handle oxidative stress
ADVERSE REACTIONS OF NITROFURANTOIN, TRIMETHOPRIM AND SULFAMETHOXAZOLE IN CHILDREN

EDWARD KARPMAN AND ERIC A. KURZROCK*

From the Department of Urology, University of California-Davis-Children’s Hospital and School of Medicine, Sacramento, California

Conclusions: The use of nitrofurantoin, trimethoprim and sulfamethoxazole is safe in children for long-term prophylactic therapy. The antibiotic safety issue should not be misconstrued as an argument for surgical therapy, whether minimally invasive or not. Adverse reactions exist to these medicines but they are less common than seen in adults, presumably because of the lower dose used for therapy, and the lack of significant comorbidities and drug interactions in children. Serious side effects are extremely rare and most are reversible by discontinuing therapy. The extremely low potential for significant adverse reactions should be discussed with parents.
The role of antibiotics prophylaxis in VUR
Conclusion

=> Mild/Mod VUR (grade I-III) does not increase the incidence of UTI, pyelonephritis, renal scars
=> Role of antibiotics in preventing UTI or renal scars not supported
Conclusion

=> Continuous antibiotic prophylaxis was ineffective in reducing the rate of recurrent pyelonephritis & renal damage in children < 30 months with grade II-IV VUR
Conclusion

=> Prophylaxis does not reduce the rate of febrile UTI recurrence during 12 months after 1\textsuperscript{st} UTI +/- VUR

=> Grade III VUR & Younger Age - risk factor for recurrent febrile UTI

=> NNT to prevent a febrile UTI 41.7 children for 1 year
Conclusion

=> Antibiotic prophylaxis does not reduce the overall incidence of UTI in children with low grade VUR – however may prevent UTI in boys with grade III VUR
Conclusion

=> Long-term low dose TMP-SMX decreased UTIs
RIVUR (Randomized Intervention for the management of VesicoUreteral Reflux) Study

- Sponsored by NIH, started in 2007
- Placebo controlled, double blinded, multicentered
- Prophylactic TMP-SMZ vs. Placebo
- N= 607, age 2-72 months
- VUR grades I-IV
- UTI diagnosed by catheterized or clean catch (no bagged specimens), pyuria, single bacteria
- Outcomes – Recurrent UTI, Renal Scarring, Antimicrobial resistance
- 2 year follow-up period
- US & VCUG at baseline & VCUG at 2 years
- DMSA scans baseline, 1yr, 2yr
Results:
Prophylaxis reduced risk of recurrence by 50%
Effective - if index infection was febrile and in those with BBD
Renal scarring did not differ
First recurrent UTI by E.coli resistance higher in prophylaxis group

Conclusion – VUR after UTI abx prophylaxis reduced risk of recurrence of UTI but not renal scarring

RIVUR investigators calculated that 8 children would need to be treated for 2 years to prevent one case of febrile or symptomatic UTI
Indications for Surgery

- Breakthrough UTIs
- Noncompliance
- Persistent severe VUR
- Development of new renal scars
- Deterioration of renal function
- Persistent VUR in girls
- Reflux associated with congenital abnormalities at the UVJ (e.g. bladder diverticulum)
Deflux®

• Easily injectable, viscous gel made from two polysaccharides
  – Non-animal stabilized hyaluronic acid (NASHA)
  – Dextranomer microspheres (80–250 µm)
• Biodegradable
• FDA approved 2001 for grades II-IV VUR > 1 yr
Double HIT Technique
Open Surgical Techniques
11 studies (1148 Children)

Risk of UTI by 2,5, 10 years was not significantly different between surgical and medical
Combined Treatment resulted in 50% reduction in febrile UTI by 10 years
No reduction in risk of new or progressive renal damage
No significant difference in risk for UTI or renal damage between antibiotic prophylaxis
and no treatment

**Uncertain whether treatment of children with VUR confers clinically important benefits**
The additional benefit of surgery over antibiotics alone is small at best

**Assuming a UTI rate of 20% for children with VUR on abx for 5 years 9 reimplantations
would be required to prevent one febrile UTI with no reduction in the number of children
developing any UTI or renal damage**
INITIAL EVALUATION OF CHILD WITH VUR

**Standard**
- general medical evaluation - HT, WT, BP
- creatinine if bilateral renal abnormality
- assess for Bladder/Bowel Dysfunction (BBD)
- counsel the family re: rationale for treating, potential consequences of untreated VUR, treatment options

**Recommend**
- UA
- US

**Option**
- Creatinine
- DMSA
AUA Guidelines 2010

CHILD < 1 YEAR WITH VUR & UTI

**Recommend**
- History of febrile UTI => CAP
- In absence of history of febrile UTI => CAP with VUR III-IV

**Option**
- No history of febrile UTI => VUR I-II may be offered CAP

**Option**
- Circumcision in males with VUR
AUA Guidelines 2010

CHILD > 1 YEAR OLD WITH VUR & UTI

**Recommend**

- BBD should be treated before any surgical intervention
- Treatment options for this include
  - behavioral therapy
  - biofeedback
  - anticholinergic
  - alpha blockers
  - treatment of constipation
- CAP for BBD and VUR

**Option**

- CAP may be considered with UTI and VUR in absence of BBD
- Observational management without CAP with prompt initiation of antibiotic Rx for UTI may be considered in child with VUR in absence of BBD, recurrent febrile UTIs, or renal cortical abnormalities

**Option**

- Surgery for VUR = > both open & endoscopic may be used
FOLLOW UP MANAGEMENT

Recommend
- Annually BP, HT, WT
- Annual UA for proteinuria
- US q 12 month renal growth and any renal parenchymal scarring
- VCUG q 12-24 months
- If observational approach is being used f/u VCUG becomes an option

Option
- F/U VCUG - after 1 year of age - VUR I-II
- single N VCUG may serve to establish resolution
  - clinical significance of grade I and need for ongoing evaluation is undefined

Recommend
- DMSA
  - US is abnormal
  - Concern for scars with BT-UTI
  - Grade III-IV VUR
  - Increase serum creatinine

Option
- DMSA done to detect new scarring after febrile UTI
FOLLOW-UP MANAGEMENT FOLLOWING RESOLUTION OF VUR

Option
Following resolution of VUR either spontaneously or by surgical intervention & if both kidneys are normal by US or DMSA
General evaluation (BP, Ht, Wt) UA for protein and UTI through adolescence

Recommend
If kidney abnormal by US or DMSA then annual f/u

Recommend
With occurrence of febrile UTI following resolution or surgical treatment => evaluation of BBD or recurrent VUR

Recommend
Discussion with family re: HTN particularly during pregnancy, renal functional loss, recurrent UTI, familial VUR in child’s siblings and offspring be discussed
AUA Guidelines 2010

CHILD WITH SYMPTOMATIC BREAKTHROUGH UTI (BT-UTI)

**Recommend**

- Change in therapy, clinical scenario will guide choice – VUR grade, degree of renal scarring, BBD, parental preference
- Considered for open or endoscopic surgery

**Option**

- No evidence of existing or new renal cortical abn => change to different antibiotic prophylaxis

**Recommend**

- In pts not receiving CAP develop a febrile UTI => CAP

**Option**

- Not on CAP non-febrile UTI => begin CAP is an option
AUA Guidelines 2010

MANAGEMENT OF SIBLING/OFFSPRING VUR

VUR in siblings of children with VUR ~27%

VUR in offspring of a parent with VUR ~35%

Recommend
VCUG if abnormal US or if there is a history of UTI in sibling

Option
Given that the value of identifying and treating VUR is unproven, an observational approach without screening for VUR may be taken for siblings of children with VUR with prompt treatment of any acute UTI and subsequent evaluation for VUR

Sibling screening of older child who are toilet trained may be offered although the value of identification of VUR is undefined

US of sibling of a child with VUR may be done

Screening offspring of parents with VUR can be considered as similar to screening of siblings
Case Presentations
The end is near. You wish.
Case 1

- 2 ½ year old female referred after 1 febrile UTI
- Not toilet trained
- Started on bactrim prophylaxis
- US & VCUG performed
US Normal
VCUG – Right Grade II Left Grade III VUR
Case 1

- UA from VCUG – negative for infection & protein
- Options discussed – Abx prophylaxis
- Developed a breakthrough febrile UTI after 2 months
- DMSA performed
No Scars
Equal Function

148.0 MBq (4.00 mCi) DMSA
99m Technetium
Case 1

• Options discussed
  – Change antibiotic prophylaxis to nitrofurantoin and continue observation
  – Bilateral open ureteric reimplants
  – Bilateral Deflux®

• Elected to proceed with bilateral deflux® injections
Case 2

- 2 week old male referred for bilateral prenatal hydronephrosis
- No UTI
- US & VCUG performed
Case 2

- Bilateral grade 5 VUR
- Started on Amoxicillin prophylaxis
- Switched to Bactrim prophylaxis at 2 months of age
- Offered circumcision
- Recommended DMSA – parents declined (almost certainly would have shown renal cortical abnormalities consistent with renal dysplasia)
Case 3

- 1 year old girl with 1 febrile UTI
- Started on Bactrim Prophylaxis
- US & VCUG performed
Patient ID: 0467073
DOB: 3/3/2008
Sex: F

118.4 MBq (3.20 mCi) DMSA
99m Technetium

Perfusion
<table>
<thead>
<tr>
<th>(Counts)</th>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>250&lt;</td>
<td>176&lt;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(% Ratio)</th>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>56.73</td>
<td>41.27</td>
</tr>
</tbody>
</table>

Study Date: 6/8/2009
Radiopharmaceutical 1: 118.4 MBq (3.20 mCi) DMSA

Posterior 995K Duration: 215sec 256x256
Pix: 2.4mm 99m Technetium

LPO Mag 995K Duration: 252sec 256x256
Pix: 1.6mm 99m Technetium

RPO Mag 948K Duration: 252sec 256x256
Pix: 1.6mm 99m Technetium
Case 3

- Discussed findings & options with family
- Elected to proceed with a right extravesical ureteric reimplant
Case 4

• 9 year old female – hx of VUR – followed annual by local urologist with annual VCUG – not resolving therefore referred

• No recent UTIs

• US & VCUG performed
MAG 3 Renal Scan was performed when DMSA was not available.
Case 4

• Discussed options
• Elected to proceed with bilateral Deflux
• F/U US at 1 month & VCUG at 3 months
Case 4

- No evidence of VUR
- Antibiotics discontinued
So where are we in 2014 with respect to management of VUR?
Some Unanswered Questions

- Are antibiotics beneficial in prevention of UTIs in those with VUR?
- At what age to discontinue the antibiotic prophylaxis?
- Does treatment of VUR prevent renal scarring and ESRD? Or has the injury already occurred?
- Does persistent VUR in girls need surgical treatment?

Pregnancy => Bacteriuria/UTI => VUR => Pyelonephritis => Premature Labor
Some Concluding Thoughts

- VUR and its consequences are still considered a disease entity – management driven by infection of the urinary tract
- Antibiotic prophylaxis beneficial
- Surgical options are available beneficial
- Febrile UTI - top down vs bottom up
- Ultimate Goal is to prevent ESRD
- No “cookie cutter” recipe for treatment – care is individualized

“We over treat vesicoureteral reflux to avoid under treatment”
Warren Snodgrass MD
Pediatric Urologist
Dallas, TX
Thank You