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1/ Hi #NephTwitter #Renal #MedTwitter @aspneph radiology webinar this month was Vesicoureteral reflux #VUR and its management.

Let's get going with a poll!

What percentage of children with febrile UTI may end up having VUR?

2/ Answer: up to 30%

This may be an underestimate since many children don't get tested.

[PMID: 9743033]

<https://pubmed.ncbi.nlm.nih.gov/9743033/>

### 3/ Risk factors for VUR:

- ⚡ Bowel and bladder dysfunction
- ⚡ Abnormal urinary tract anatomy
- ⚡ Younger children and infants
- ⚡ Girls affected >> boys
- ⚡ Family history: sibling with VUR  25% recurrence

risk

Read more 

PMID:

<https://pubmed.ncbi.nlm.nih.gov/33869117>

### 4/ What tests aid Dx of VUR?

#### A. Renal ultrasound:

- ▲ Assess anatomy but not diagnostic for VUR
- ▲ Absence of hydronephrosis does NOT exclude

VUR!!

BLADDER TRANS



5/Testing in VUR:

B. Voiding cystourethrogram [VCUG]:

🎯 for VUR.

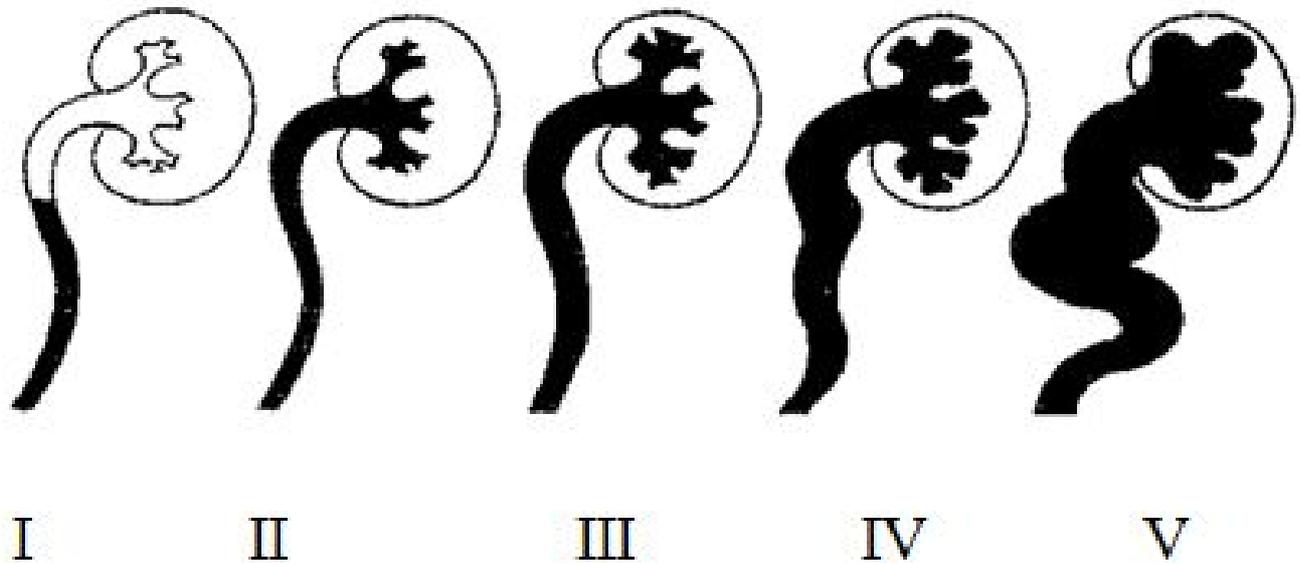
💎 Timing: 👍 unless has active UTI

💎 Prophylactic Abx: consider in 🧐 and with abnormal renal imaging

<https://pubmed.ncbi.nlm.nih.gov/9135273/>

<https://pubmed.ncbi.nlm.nih.gov/28855226/>

## Grades of reflux



### 6/ Webinar Pearls for VCUG:

- ◆ 8 images for adequate study
  - early filling, full bladder, R+ L obliques
- ◆ Cyclical voiding images are important
- ◆ Urethral  with voiding after Foley removal to diagnose any obstruction

7/ 2 tests in place of VCUG:

1) Contrast enhanced voiding ultrasound [CeVUS]:



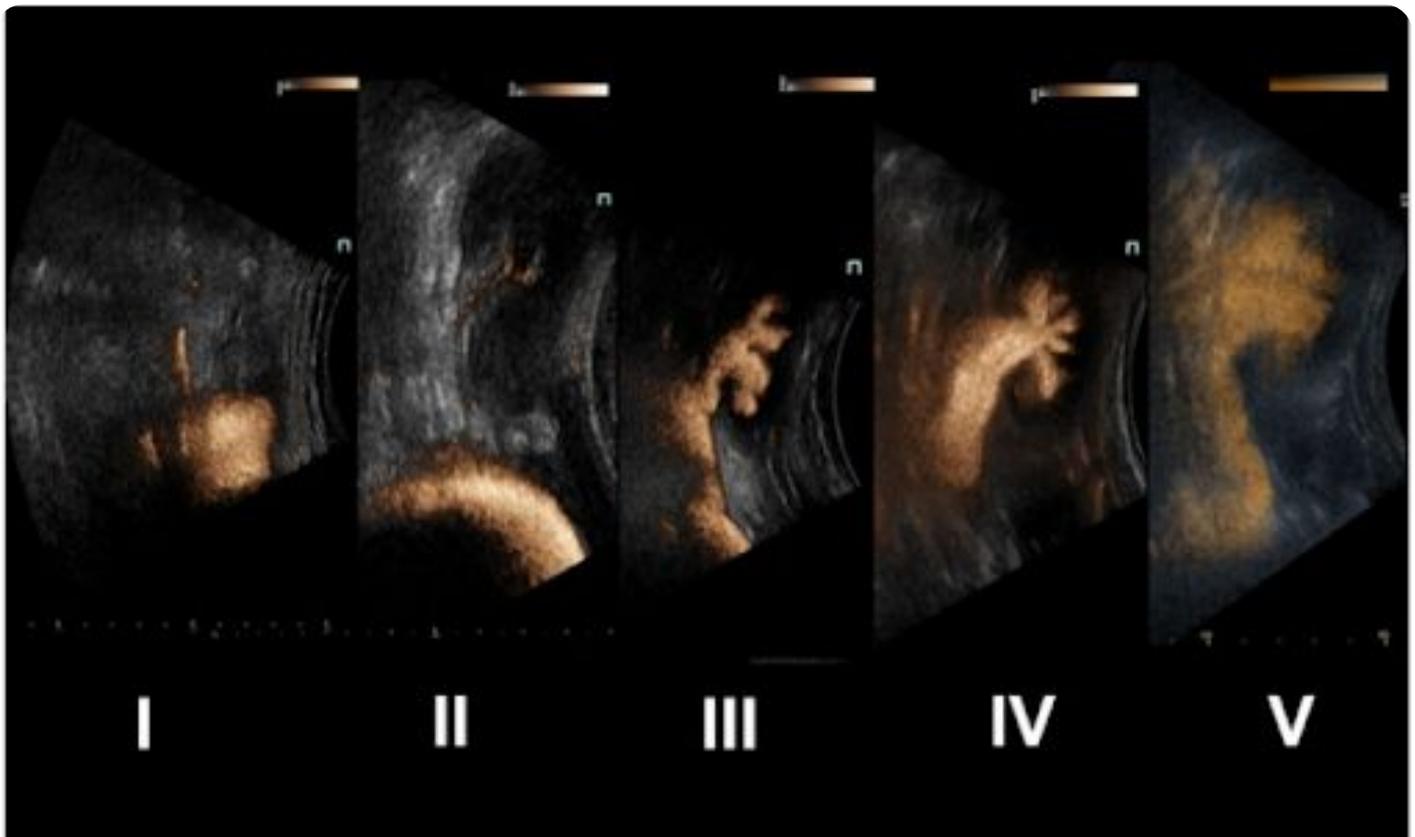
- ◆ No radiation
- ◆ Void in upright position



- ▲ Urethral catheterization
- ▲ May miss grade 1 VUR



<https://pubmed.ncbi.nlm.nih.gov/29181582/>



PMID: 33954899

8/ Another test in place of VCUG is:

2) Radionuclide cystogram (RNC):

Pros: Reduced radiation exposure

Cons: Less anatomic detail, not get precise grading

⚡ Used for follow-up evaluation of reflux rather than new diagnosis

9/ Functional nuclear imaging can be used in VUR; 2 tests are available

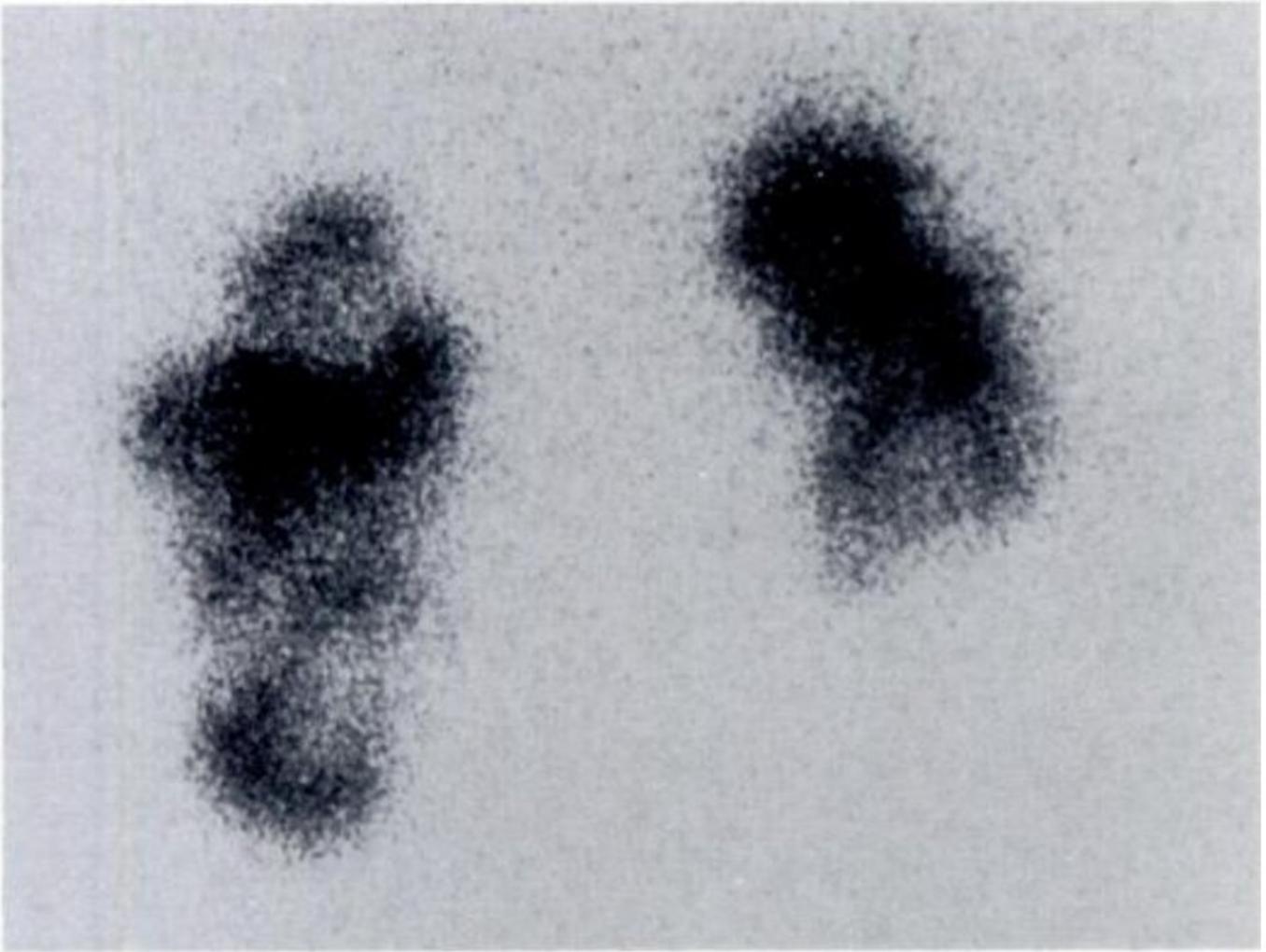
A. DMSA Scan

■ Technetium-99m DMSA is a radioisotope injected

IV

⚡ Size, shape and differential function

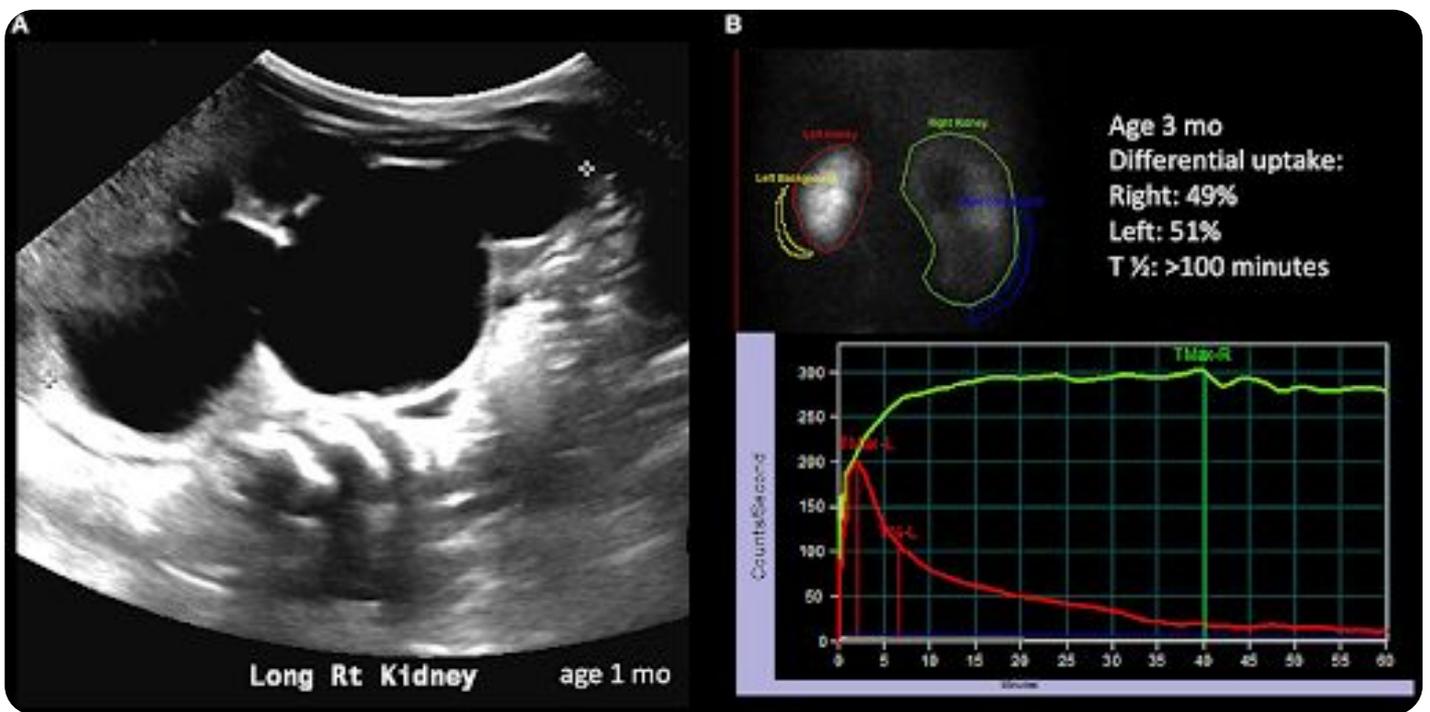
⚡ Detects renal scarring



10/ Another functional study :

B.  $MAG_3$ :

- ▲ 👁👁 for UPJ or UVJ obstruction
- ▲ Cannot detect VUR
- ▲ gives differential function



11/ Lets get into how to treat reflux! What is the role of antibiotic prophylaxis in VUR?

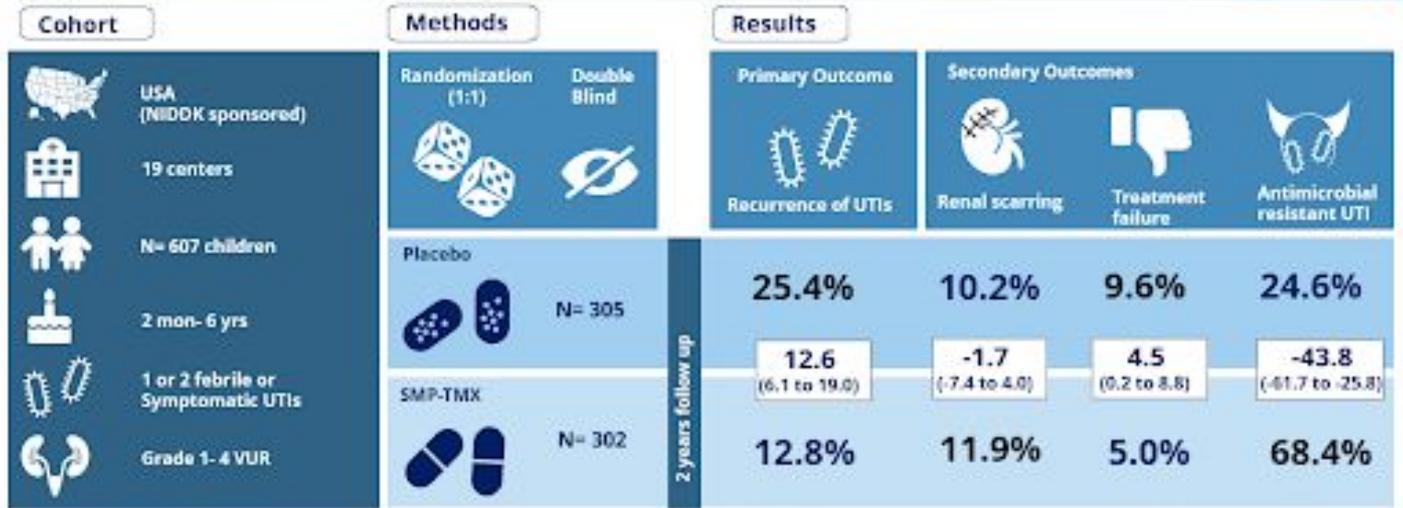
12/ Answer: A. Reduces UTI incidence ...at the cost of antibiotic resistance.

Abx prophylaxis does not prevent scarring.

#RIVUR trial

<https://www.nejm.org/doi/full/10.1056/nejmoa1401811>

# Will antimicrobial prophylaxis decrease renal scarring in children with VUR (vesicoureteric reflux)? The RIVUR trial



**Conclusion:** Among children with vesicoureteral reflux after urinary tract infection, antimicrobial prophylaxis was associated with a substantially reduced risk of recurrence but not of renal scarring.

**Reference:** Green DM, Wang M, Krasin M et al. Antimicrobial Prophylaxis for Children with Vesicoureteral Reflux. The RIVUR Trial Investigators. N Engl J Med 2014; 370:2367-2376. Visual Abstract by Sri Sudha Menonreddy, MD, FAAP @drM\_Sudha

13/ Non-surgical treatment of VUR includes

- Waitful watching for spontaneous resolution
- Address bowel and bladder dysfunction



14/ Surgical Rx of VUR includes

- ◆ Deflux: sub-ureteric transurethral injection of a copolymer
- ◆ Ureteral re-implantation [open or robotic]

Read more about surgical techniques in detail here!

PMID: 16716788

15/ To wrap this tweetorial- what determines the prognosis for VUR?

16/ Answer: Degree of renal scarring

⚡ Scars 📈📈 risk of hypertension and CKD

⚡ Long term follow up is key!!

⚡ Monitor for HTN, renal function and proteinuria



17/ For a case-based clinical discussion on vesicoureteric reflux with a radiologist and an expert, login to

@ASPNePh website, June 2022 webinar

#Membereducation



18/ Special thanks to #ASPENFOAM group for helping me write my first tweetorial! @drM\_sudha @nefron1310 @Swasthithinks

@drM\_sudha @nefron1310 @SwastiThinks

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