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UTI and Watchful Waiting: The Courage to Do Nothing

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ABBREVIATIONS
AAP—American Academy of Pediatrics
RBUS—renal and bladder ultrasound
UTI—urinary tract infection
VCUG—voiding cystourethrogram
VUR—vesicoureteral reflux

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In this issue of *Pediatrics*, Nelson and colleagues present a retrospective cross-sectional study of children <60 months of age who underwent renal and bladder ultrasound (RBUS) and voiding cystourethrogram (VCUG).[1] Like other studies of this topic,[2–6] this is a retrospective analysis of data captured through routine care, but it is probably the largest and most well-conducted study of its kind. Their findings are consistent with most earlier work, and their conclusions valid: RBUS is a lousy screen for vesicoureteral reflux (VUR). Because the new American Academy of Pediatrics (AAP) guidelines[7] recommend routine RBUS after the first febrile urinary tract infection (UTI), the authors make the point that a negative RBUS should not be interpreted as ruling out VUR or other conditions detectible on VCUG. This raises an important point. The AAP guideline, in fact, recommends watchful waiting (for a second UTI), not RBUS, as the screening test for high-grade VUR.

The AAP guideline suggests that, after the first UTI, the clinician should carefully observe the patient for a recurrence. A VCUG is recommended only after the second UTI. The rationale for this strategy is twofold. First, multiple studies show that children who have VUR are at increased risk for UTI.[8–13] Based on these data, the technical report that accompanies the AAP guideline[14] shows that watchful waiting can serve as a diagnostic test. Using the calculations in the technical report, it can be shown that a recurrent UTI has a positive predictive value of 55% for VUR of grade III or higher.

By the same calculus, children who do not have recurrent UTI are less likely to have VUR. In fact, the negative predictive value of having no recurrent UTI is 81%. If these calculations are repeated with the lower prevalence of high-grade VUR described in Nelson et al, the negative predictive value is over 98%, meaning the risk for high-grade VUR would be <2%. Moreover, because renal scarring among children who have VUR occurs with UTI, those children who do not have subsequent UTIs would not be expected to suffer renal damage. So even if therapy for VUR were known to improve long-term outcomes (and this has not been proven[15–18]), the benefit of finding VUR in children who do not have a recurrent UTI is doubtful.

The second reason for using watchful waiting as a screen for VUR is that 90% of children will never have a second UTI.[7] This means that 90% of children will not be exposed to the discomfort, expense, and radiation associated with a VCUG. Although VCUG is considered the gold standard for the detection of VUR, the tincture (or test) of time is a better screening test than RBUS but has none of the side effects of VCUG.

So Nelson and colleagues' conclusion that RBUS is a poor screen for VUR is valid. In fact, the AAP guideline and technical report acknowledge the poor sensitivity and low diagnostic yield of RBUS with respect to VUR. However, the guideline emphasizes that *early* ultrasound can identify infectious parenchymal complications and

obstructive uropathy. This is why it is recommended. The fact that RBUS is relatively *specific* with regard to high-grade VUR is the reason a VCUG would be indicated if ureteral or renal pelvic dilation is observed.

Readers should know that the RBUS recommended by the AAP guideline does serve a critical role in the evaluation of young children who have a first febrile UTI, but it is watchful waiting that screens for VUR.

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