Figure 1. Applying the eight Ds of antibiotic stewardship to UTI diagnosis and management

STEP A
Confirm symptoms of UTI

A. Are clinical features compatible with UTI?

Pyelonephritis (febrile UTI)
- Systemic features AND kidney ± bladder-specific symptoms

Cystitis (afebrile UTI)
- No systemic illness AND bladder-specific symptoms

Pyelonephritis still needs to be considered in afebrile infants and in systemically unwell children with inflammatory markers

No → **1. Do NOT initiate UTI work-up if symptoms are not compatible**

Yes ↓

STEP B
Screen for UTI

B. Do urinalysis results support diagnosis of UTI?

When ≥1 of the following signs are present, a UTI may be present:
- ❑ Pyuria (≥ trace LE or >5 WBC/hpf)
- ❑ Nitrituria (indicates gram-negative UTI)

Infants <2 months old can test negative for UTI with an LE of 1+ or greater

No → **2. Do NOT request urine culture if UA is negative**
*Consider a repeat UA if initial testing was performed early in illness**

Caveat: For sick infants in centres where bedside UA is not available, order both culture and UA simultaneously on appropriately collected urine samples

Yes ↓

STEP C
Confirm UTI

C. Is culture being requested on an appropriate sample?

- ❑ In/out catheter
- ❑ Suprapubic aspirate (SPA)
- ❑ Clean catch urine (CCU)
- ❑ Mid-stream urine (MSU)

No → **3. Do NOT request cultures on a bag collection**

Yes ↓

STEP D
Interpret culture report

D. Is diagnosis of UTI confirmed?

Pyuria PLUS significant growth of a single uropathogen
- ❑ Catheter: ≥5 × 10^4 CFU/mL or ≥5 × 10^7 CFU/L
- ❑ MSU or CCU: ≥10^5 CFU/mL or ≥10^8 CFU/L
- ❑ SPA: Any growth

Common uropathogens: *E.coli, Klebsiella, Proteus, Enterobacter, Enterococcus*

No →
4. Discontinue treatment if culture is negative
5. Do NOT treat non-uropathogens
6. Do NOT treat mixed or insignificant growth

Yes →
7. De-escalate to narrowest spectrum appropriate therapy
8. Do NOT request an end-of-treatment culture

Source: Optimizing management of urinary tract infections in children: A need for improved stewardship. © Canadian Paediatric Society, 2026. Also available at www.cps.ca