1.27 URINARY TRACT INFECTIONS

Introduction

Urinary tract infections (UTI) can involve any structure from the kidney to the urethra and occur in up to 2.8% of all children and 5% of febrile infants. According to the latest estimates from the Agency for Healthcare Research and Quality's Kid Inpatient Database, more than 40,000 children aged 0-18 years were hospitalized in 2016 because of a UTI. The rate is highest in very young infants who present with unexplained fever and is particularly high in girls and uncircumcised boys. Infants younger than 1 year of age account for more than 30% of UTI hospitalizations. Most UTI can be treated as an outpatient; indications for inpatient treatment include age less than 1-2 months, dehydration, inability to tolerate oral antibiotics, and concern for serious complication (such as renal abscess, obstructive uropathy, urosepsis, and others). Pediatric hospitalists frequently encounter children with UTI and must remain current on strategies for diagnosis, treatment, and follow-up care.

Knowledge

Pediatric hospitalists should be able to:

- Describe the abnormal anatomic and physiologic aspects of the urogenital system that may predispose children to UTI at varying ages, such as vesicoureteral reflux, posterior urethral valves, constipation, voiding dysfunction (including neurologic causes), and others.
- Describe the range of clinical presentations attending to differences in age.
- Compare and contrast lower (cystitis) versus upper (pyelonephritis) UTI.
- Explain indications for admission of a child with UTI, such as young age, dehydration, sepsis, suspected serious complication, and others.
- List uropathogens that cause UTI in both previously healthy hosts and those with underlying disease.
- Discuss the utility and limitations of commonly obtained laboratory tests, such as urinalysis, urine culture, blood culture, serum chemistries, and others.
- Specify appropriate antimicrobial coverage for common uropathogens, with awareness of antimicrobial resistance patterns within the local community.
- Describe the indications for screening for underlying anatomic abnormalities, especially for children with a first UTI.
- Discuss the utility and limitations of various imaging modalities, including ultrasonography, voiding cystourethrography, and nuclear scintigraphy.
- Describe the typical response to therapy, including common complications to consider if response is atypical.
- Summarize current literature regarding treatment and evaluation for underlying abnormalities.
- List indications for subspecialty consultation or referral.
- Summarize the discharge plan regarding continued antimicrobial therapy, need for antimicrobial prophylaxis, and follow-up.

Skills

Pediatric hospitalists should be able to:

- Identify patients at risk for UTI.
- Use the appropriate urine collection method attending to patient's age, voiding function, and clinical condition.
- Prescribe appropriate initial antimicrobial and supportive therapy.
- Interpret results of diagnostic testing and use results to guide diagnosis and management.
- Identify when consultation is appropriate and efficiently access appropriate support services needed to provide comprehensive care.
- Establish discharge criteria, including medical and social considerations, and identify when they are met.
- Create a discharge plan that includes contingency instructions, medications, and follow-up as appropriate.
- Communicate effectively with patients, the family/caregivers, and the primary care provider regarding the expected course of illness, treatment options, possible sequelae, and the importance of both short-term and longer-term follow-up.

Attitudes

Pediatric hospitalists should be able to:

- Recognize the importance of communicating with the patients, the family/caregivers, and the primary care provider to assure a safe, efficient, and effective discharge and post-discharge care.
- Exemplify collaborative practice with the healthcare team to ensure coordinated hospital care for children with UTI.

Systems Organization and Improvement

In order to improve efficiency and quality within their organizations, pediatric hospitalists should:

- Collaborate with referring physicians (primary care, emergency medicine, specialists, and other hospital physicians) to develop and sustain appropriate referral networks for evaluation, admission, or transfer of children with UTI.
- Collaborate with subspecialists when appropriate, to ensure consistent, timely, and up-to-date evaluation and care in the inpatient setting and after discharge.
- Lead, coordinate, or participate in the development and implementation of cost-effective, safe, evidence-based care pathways to standardize the evaluation and management of hospitalized children with UTI.
- Collaborate with laboratory and radiology directors and staff to ensure the availability of systems for timely evaluation of specimens and performance and interpretation of appropriate evaluation studies.

References

1. Subcommittee on Urinary Tract Infection, Steering Committee on Quality Improvement and Management, Roberts KB. Urinary tract infection: clinical practice guideline for the diagnosis and management of the initial UTI in febrile infants and children 2 to 24 months. *Pediatrics*. 2011; 128:595-610. https://doi.org/10.1542/peds.2011-1330.