

## SECTION TWO. CORE SKILLS

## 2.01 BLADDER CATHETERIZATION AND INTERPRETATION OF URINALYSIS

## Introduction

Bladder catheterization is a commonly performed procedure, typically used to collect a sterile urine sample for analysis and culture when urinary tract infection (UTI) is suspected. Bladder catheterization is also used to relieve urinary retention or obstruction, particularly in cases of anatomic abnormalities or neurogenic bladder, or to monitor urine output and overall fluid status. Pediatric hospitalists frequently encounter patients requiring bladder catheterization, and in many practice settings, may need to be adept at performing this procedure in infants, children, and adolescents. While not all pediatric hospitalists will regularly perform bladder catheterization, all will be required to interpret urinalysis (UA) in routine practice. A UA is most commonly used to diagnose UTI but can also be used to detect a wide range of pediatric conditions, including primary renal disease, trauma, diabetes, and metabolic disease. The ability to effectively interpret a urinalysis in the inpatient setting remains a core skill for the pediatric hospitalist.

## Knowledge

Pediatric hospitalists should be able to:

- Review the basic anatomy of the male and female genitourinary tract.
- Discuss the indications and contraindications for bladder catheterization.
- Describe how the method used to collect a urine specimen can affect interpretation of urine culture results.
- Explain why bladder catheterization is the preferred method of collection in infants and children who cannot reliably produce a voided specimen or in whom a sterile sample is needed.
- Compare and contrast the implications of using different methods to collect a urine specimen, including the varied ability to correctly interpret the UA and culture.
- Describe the steps in performing bladder catheterization for both male and female patients, attending to aspects such as patient identification, sterile technique, patient positioning, equipment needs, and specimen handling.
- Describe the risks and complications associated with bladder catheterization, including localized trauma, creation of a false passage, and potential stricture formation.
- Discuss the indications for analgesia, sedation, or anxiolysis and the medications that may be used for each.

- Describe the indications and risks of indwelling bladder catheters and the criteria for removal.
- Describe best practices and care bundles that can minimize the risk of catheter associated urinary tract infections (CAUTIs).
- Review the indications for consultation with a urologist for bladder catheterization, including known genitourinary tract abnormality, recent genitourinary surgery, or urethral trauma.
- Define a UTI in terms of minimum bacterial colony counts needed with different methods of obtaining the sample, such as catheterization, clean catch, and clean bag.
- Discuss the importance of appropriate specimen handling and the potential effect on culture results.
- Discuss the different components of a urinalysis, including specific gravity, white and red blood cell counts, protein, casts, and glucose, including how each can be used to detect and manage different pediatric conditions.
- Compare and contrast the sensitivity, specificity, and positive or negative predictive value of the leukocyte esterase and nitrite components of a UA in the diagnosis of UTI.

## Skills

Pediatric hospitalists should be able to:

- Perform a pre-procedural evaluation to determine risks and benefits of bladder catheterization.
- Demonstrate proficiency in performance of bladder catheterization on infants, children, and adolescents, when required according to local practice.
- Identify the level of pain and anxiety provoked by the procedure and provide appropriate pharmacologic or nonpharmacologic interventions when indicated.
- Employ proper techniques for holding and calming patients before, during, and after bladder catheterization and educate healthcare providers in these practices when indicated.
- Consistently adhere to infection control practices.
- Identify complications and respond with appropriate actions.
- Distinguish the need for and efficiently access appropriate consultants and support services for assistance with analgesia, sedation, anxiolysis, and performance of a bladder catheterization.
- Diagnose pediatric conditions, such as UTI, nephrotic syndrome, glomerulonephritis, diabetes mellitus, and others, through effective interpretation of a UA.

## Attitudes

Pediatric hospitalists should be able to:

- Realize the importance of obtaining a sterile urine specimen to correctly diagnose urinary tract infection.
- Realize the importance of effective communication with patients and the family/caregivers regarding the indications

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for, risks, benefits, and steps of bladder catheterization.

- Appreciate the need for collaboration with nurses, learners and other healthcare providers, to promote the use of evidence-based practices in maintenance of urinary catheters to decrease risk of CAUTIs in the inpatient setting.
- Exemplify appropriate adherence to and advocate for strict infection control practices.

### Systems Organization and Improvement

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

- Lead, coordinate, or participate in the development and implementation of cost-effective, safe, evidence-based procedures and policies for performance of bladder catheterization in children.

- Lead, coordinate, or participate in the development and implementation of educational initiatives designed to teach the proper technique for bladder catheterization as well as safe catheter maintenance when prolonged catheterization is required.

### References

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