

# Percutaneous Nephrostomy (PCN) Tube Related Infections

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## CLINICAL PRESENTATION

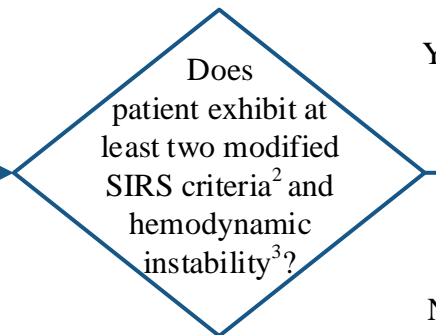
## EVALUATION

Patient presentation suspicious for PCN infection:

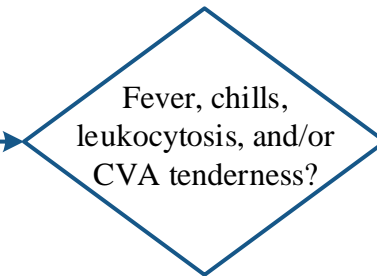
- **Lower UTI:** dysuria, frequency, urgency and/or suprapubic pain
- **Upper UTI:** fever/chills, leukocytosis and/or CVA tenderness (with or without lower UTI symptoms)
- **PCN exit site infection:** local signs for erythema, warmth, tenderness and/or purulence

Labs:

- CBC with differential, BUN, creatinine
- Blood cultures
- Urine analysis and urine culture<sup>1</sup> from urethral and PCN sites



• Renal ultrasound or CT abdomen and pelvis with contrast  
 • Consider Infectious Diseases (ID) consult  
 • See [Sepsis Management - Adult algorithm](#)



• Start empiric IV antibiotics (refer to [Page 2](#))  
 • Consider CT abdomen and pelvis with contrast to rule out hydronephrosis, pyelonephritis and renal abscess

• Start empiric IV antibiotics (refer to [Page 2](#))  
 • Consider renal ultrasound to rule out hydronephrosis and renal abscess

See [Page 2](#)

CVA = costovertebral angle  
 SIRS = systemic inflammatory response syndrome  
 UTI = urinary tract infection

<sup>1</sup> For proper collection and labeling of urine specimen, refer to ELSEVIER (Mosby's) Nursing Skills and Procedures (see [Appendix A](#))

<sup>2</sup> Modified SIRS criteria:

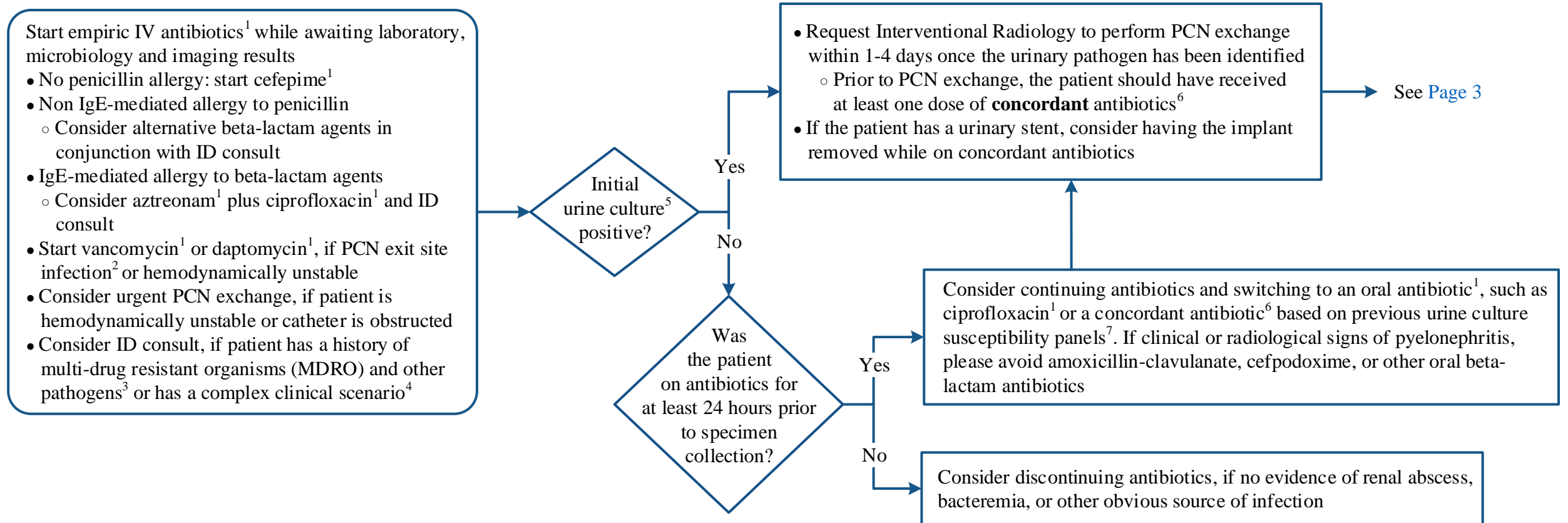
- Temperature < 36 or ≥ 38.5°C
- Heart rate ≥ 110 bpm
- Respiratory rate > 24 bpm
- WBC count < 3 or ≥ 15 K/microliter

<sup>3</sup> The patient is considered hemodynamically unstable if systolic blood pressure < 90 mmHg

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## INITIAL MANAGEMENT



<sup>1</sup> For antibiotic therapy consider: medication allergies, history of past infections including multi-drug resistant pathogens, recent antibiotic exposure, creatinine clearance, and significant drug-drug interactions

<sup>2</sup> Observe for local signs for erythema, warmth, tenderness, and/or purulence

<sup>3</sup> MDROs and other pathogens include:

- Enterococcus resistant to vancomycin
- Any extended spectrum beta-lactamase (ESBL)-producing gram negative bacilli
- *Staphylococcus aureus*
- Any carbapenem resistant gram negative bacilli
- *Stenotrophomonas maltophilia*
- All other gram negative bacilli that are resistant to usual recommended first-line agents

<sup>4</sup> Significant renal impairment, antimicrobial allergies, and/or drug-drug interactions

<sup>5</sup> Urine culture collected at initial evaluation, see Page 1

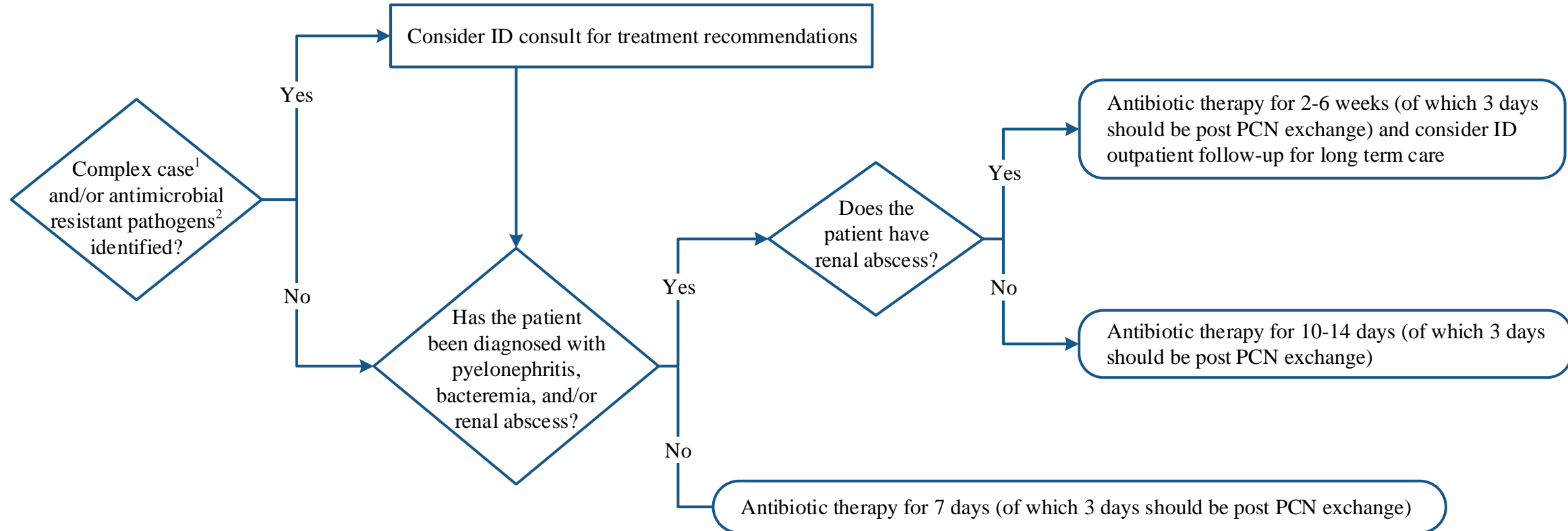
<sup>6</sup> Concordant antibiotics are defined as microbiologically active based on current or previous susceptibilities

<sup>7</sup> Nitrofurantoin, due to low concentrations at the infection site, should not be utilized as an oral option for the treatment of PCN related infections

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## FURTHER MANAGEMENT



<sup>1</sup>Persistent signs of infection, multiple allergies to antibiotics and/or significant drug-drug interactions

<sup>2</sup>MDROs and other pathogens include:

- Enterococcus resistant to vancomycin
- *Staphylococcus aureus*
- *Stenotrophomonas maltophilia*
- Any extended spectrum beta-lactamase (ESBL)-producing gram negative bacilli
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## APPENDIX A: Specimen Collection from a Nephrostomy Tube

**Note:** Collection of a urine specimen from contamination/colonized sites such as the old or used collection bag(s) may lead to inaccurate diagnosis and for this reason the following collection methods should be used

**Supplies:**

- Specimen labels
- Non-sterile gloves
- CTU-30 Tubing(s) (optional)
- Drainage Collection (bedside) bag(s)
- Biohazard Bags for Specimens
- Sterile specimen container/cup
- 70% isopropyl alcohol wipes
- Leg bag(s)
- Plastic-back protective pad (e.g., "chux")

**Methods for collection (perform one of the following methods to collect a urine specimen):**

### A. Free flow of urine into a sterile specimen container:

- Confirm patient identity and explain procedure to the patient
- Position patient sitting with the patient's back exposed
- Perform hand hygiene
- Position the plastic-backed protective pad (e.g., "chux") to protect the patient's skin and/or linens
- Don gloves
- Disconnect the connector from proximal (nearest to patient) tube
- Scrub the proximal connector with 70% isopropyl alcohol wipes and let dry (preferably for 15-30 seconds)
- Allow urine to flow freely out of the tube into the sterile cup while ensuring sterility. Note: It may take several minutes for the kidney to produce urine.
- Collect at least 10 mL of urine in the sterile cup; secure top of sterile cup
- Label the specimen cup identifying the source (urine), location (right nephrostomy tube or left nephrostomy tube) and any other labeling requirements per institutional policy
- Repeat urine specimen collection on the contralateral side if indicated
- Discard supplies. Doff gloves and perform hand hygiene.
- Ensure timely transport of specimens to lab using Pneumatic Tube System or specimen pick up by lab as appropriate

### B. Free flow of urine into a new drainage collection bag (leg bag or bedside):

- Confirm patient identity and explain procedure to the patient
- Position patient sitting in the upright position or a position of comfort
- Perform hand hygiene
- Position the plastic-backed protective pad to cover the patient's skin and/or linens
- Don gloves
- Disconnect the distal (away from patient) tube from the proximal connector
- Scrub the hub with 70% isopropyl alcohol wipes and let dry (preferably for 15-30 seconds)
- Carefully insert a new collection bag: position collection bag below the kidney level
- Allow urine to flow freely into the collection bag for 15-30 minutes. Urine allowed to collect or sit in a collection bag for more than 1 hour is considered contaminated and is not to be used as a sterile specimen. Collect at least 10 mL of urine in the sterile cup; secure top to sterile cup.
- When at least 10 mL of urine has been collected in the collection bag, open the bag valve over the sterile cup. Ensure the specimen remains sterile. Do not allow the valve or tip of the nephrostomy tube to touch the rim or inside wall of the cup.
- Label the specimen cup identifying the source (urine), location (right nephrostomy tube or left nephrostomy tube) and any other labeling requirements per institutional policy
- Repeat urine specimen collection on the contralateral side if indicated
- Discard supplies. Doff gloves and perform hand hygiene.
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## SUGGESTED READINGS

- Bahu, R., Chaftari, A., Hachem, R., Ahrar, K., Shomali, W., El Zakhem, A., . . . Raad, I. (2013). Nephrostomy tube related pyelonephritis in patients with cancer: Epidemiology, infection rate and risk factors. *The Journal of Urology*, 189(1), 130–135. <https://doi.org/10.1016/j.juro.2012.08.094>
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## DEVELOPMENT CREDITS

This practice consensus statement is based on majority opinion of the PCN management workgroup at the University of Texas MD Anderson Cancer Center for the patient population. These experts included:

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