CLINICAL PATHWAY:
Suspected Nephrolithiasis

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.

Inclusion Criteria: patients >1 year of age with high suspicion of urolithiasis *AND* symptoms/chief complaint of urinary tract infection (UTI), flank pain, nausea or vomiting
Exclusion Criteria: <1 year of age, concern for septic shock, chief complaint of symptoms consistent with UTI and/or, low suspicion for UTI (see **UTI pathway**)

UA concerning for UTI[1]:
- Nitrites OR
- Leukocyte esterase OR
- Microscopy shows bacteria OR
- ≥5 WBC/hpf

Initial ED Evaluation:
- History including pain, gross hematuria, nausea/vomiting, personal history of nephrolithiasis
- Physical exam findings including flank pain
- Labs:
  - Urinalysis (UA) with microscopy; urine culture if UA concerning for UTI[1]
  - For high risk patients[2], additional labs should iclude Chem 8, and CBC with auto differential

High risk patients[2]:
- Solitary kidney
- Congenital anomaly of the kidney and urinary tract (CAKUT)
- Immunocompromised host
- Complex medical history

Initial ED Management:
- FEN/GI:
  - NPO
  - 20 mL/kg NS bolus (max 1 liter)
  - **Ondansetron** 0.15 mg/kg IV PRN q8hr (max 8 mg/dose)
- Pain control:
  - **Ketorolac** 0.5 mg/kg/dose (max 30 mg/dose) IV q6hr
    - If high risk[2] or evidence of abnormal renal function, consider alternative
  - **Morphine** 0.1 mg/kg/dose (max 5 mg/dose) IV q3hr PRN severe pain

Retroperitoneal Complete US
- Indeterminate (evidence of hydronephrosis and/or hydroureter without identified calculus) → Consider low-dose CT scan of abdomen/pelvis w/o contrast
- Negative for calculus → Consider other diagnosis & treat off pathway
- Positive for calculus

Calculus?
- Yes
- No → Consider other diagnosis & treat off pathway

- Patient to receive initial management as above, if not already received
- Obtain Chem 8, if not already obtained
- Notify Urology via IntelliDesk
- Notify Nephrology via IntelliDesk if patient is high risk[2] and/or abnormal renal function based on the following definitions:
  - 2 months-2 years: Cr > 0.4 mg/dL
  - 3 years-15 years: Cr > 0.7 mg/dL
  - >16 years: >1.0 mg/dL
  - Creatinine that increases by 50% from baseline or increases by 0.3 mg/dL

Urinalysis concerning for infection[1]?

No (UA negative)

Reassessment
- For pain oral management, consider the following:
  - **Ibuprofen** 10 mg/kg/dose (max 600 mg) q6hr PRN moderate pain
    - If high risk[2] or evidence of abnormal renal function, consider **Acetaminophen** 15 mg/kg/dose PRN q6hr (max 1000 mg/dose OR 75 mg/kg/day; not to exceed 4,000 mg/day)
  - **Oxycodone** 0.1 mg/kg/dose (max 5-10 mg/dose) q4hr PRN severe pain
- **Tamsulosin** PO 0.4 mg daily if age >2 years AND ureteral calculus
- Trial PO clear liquids

Yes (UA positive)

Suspected Infection
- Treat per **UTI Pathway**
- Blood work (if not previously obtained):
  - CBC with differential
  - Renal function panel
  - Blood culture, if concern for obstructed stone and/or signs of sepsis

Update Urology to determine need for admission and plan of care, if not already consulted.

Meets criteria for admission?
- Not tolerating PO
- Pain not controlled with oral analgesics
- Need for IV antibiotics
- Per Urology recommendation
- Fever ≥101.5°F

- Yes → Admit to Urology service. Nephrology consult if:
  - Abnormal renal function (see above)
  - High risk patient[2]
- No → **Discharge Criteria:**
  - Pain well-controlled on oral analgesics
  - Tolerating PO

Discharge instructions:
- Strain urine
- Drink enough fluids for urine to be clear
- Return to ED if pain not controlled, not tolerating PO, or fever
- Medications:
  - Antiemetics, antibiotics & pain medications if needed. If narcotics are prescribed, a maximum of 3 days should be specified.
  - Tamsulosin as directed by Urology
- ED to place Urology referral in Epic
  - 2 weeks for stone in ureter
  - 4-6 weeks if stone in kidney

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