PYELONEPHRITIS

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PGY 1 Emergency Medicine

PATHOPHYSIOLOGY

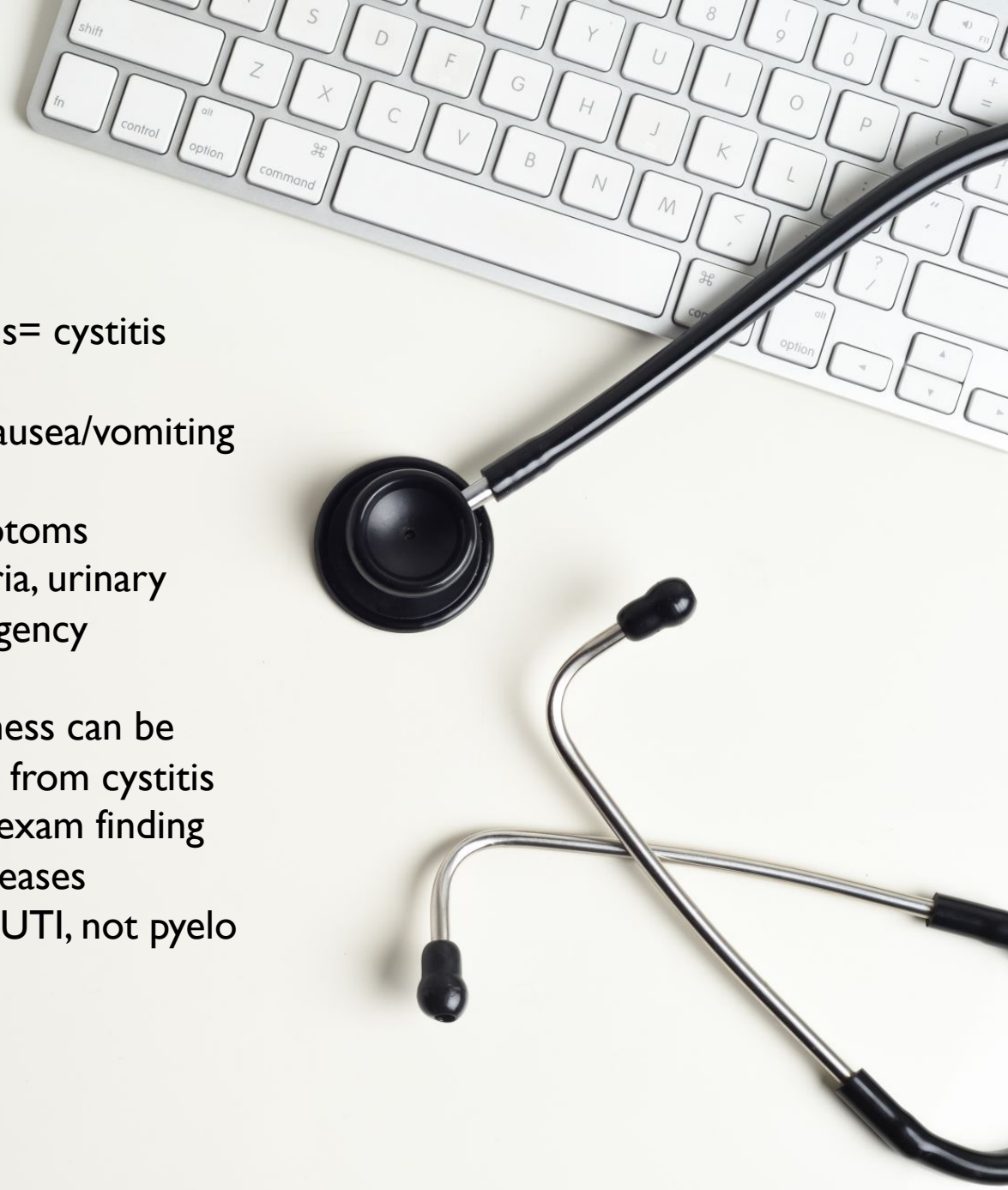
- Acute pyelonephritis results from bacterial invasion of the renal parenchyma
  1. Direct invasion: ascending infection from lower urinary tract
  2. Hematogenous spread: infection via the blood stream mostly commonly of gram positive organisms 2/2 to IVDA and endocarditis
- E coli accounts for 70-90% of uncomplicated UTIs and 21-54% of complicated UTIs (ie secondary to anatomic or functional abnormalities that impair urinary tract drainage)
- Ddx: pyelo v acute cystitis v infected stone v AAA v GYN (ie ecoptic, torsion, cyst)

CLINICAL SYMPTOMS

Pyelonephritis= cystitis symptoms + fever/chills/nausea/vomiting

Cystitis symptoms include dysuria, urinary frequency/urgency

CVA tenderness can be referred pain from cystitis as a physical exam finding and only increases likelihood of UTI, not pyelo



DIGANOSIS AND WORKUP

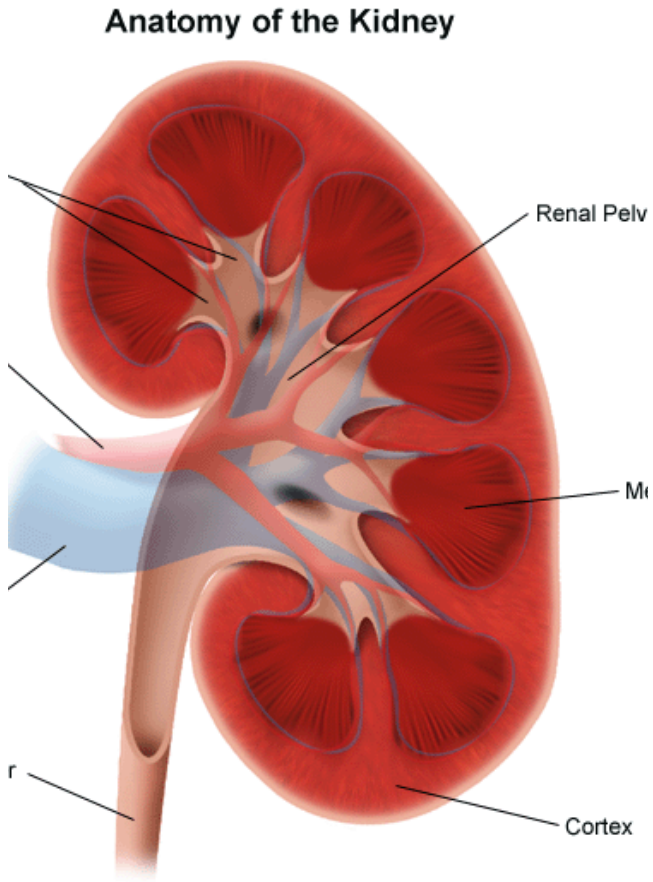
Workup

U/A + urine culture

Consider imaging (CT or US) if any o ht following are present:

- **Hx of renal stone**
- **Poor response to abx**
- **Male**
- **Elderly**
- **Diabetic**
- **Severly ill**

Blood cultures are NOT indicated (orgnaisms in blood cultures usually match those in urine culture 97% of the time)



POSSIBLE COMPLICATIONS

- Renal/perinpehric abcsess
  - Signs/symptoms similar to pyelo (fever, CVAT, dysuria)
  - Associated with DM and renal stones or hematogenous seeding
  - Unlikely to respond to antibiotics alone, requires source control
- Emphysematous pyelonephritis
  - Rare gas-forming infection nearly always occuring in patients with DM and obstruction
  - Appear toxic + septic
  - May require nephrectomy

DISPO

- Should be discharged from the ED if young, otherwise healthy, and tolerating PO
- Consider observation if:
  - DM
  - Immunocompromised
  - Unable to tolerate PO
- Consider inpatient if
  - Elderly >65
  - Pregnant > 24 weeks
  - Renal calculi/obstruction and AKI
  - Recent hospitalization/instrumentation
  - Solitary kidney or other anatomic abnormality

TYPICAL CDU MANAGEMENT

Inclusion Criteria

- Probability of dc within 24 hrs >80%

Exclusion Criteria:

- Meets criteria for inpatient
- Suspected sepsis or severe medical comorbidity (renal transplant)
- With concomitant renal stone and obstruction

Typical observation management:

- Review ED diagnostic tests, lab work, imaging
- Analgesics, antipyretics, antiemetics
- IV hydration
- Antibiotics per hospital antibiogram recommendations

Dispo home if:
Observation course stable
Clinical improvement
Tolerating meds
Follow up arranged
Home care coordinated

Hospital if:
Deterioration in clinical status
No improvement in clinical conditions
Unstable vital signs/SIRs/sepsis
LOS exceeds 24 hrs

JEFFERSON ANTIBIOGRAM

	Pyelonephritis, Community-acquired	**Pyelonephritis Risk of Nosocomial Pathogens**
Organisms Implicated	E. Coli, P. mirabilis, K. pneumoniae	Resistant E coli, P mirabilis, K pneumonia, Enterobacter spp, Serratia spp, pseudomonas, enteroccucs spp
Preferred Regimen	Ceftriaxone	Cefepime or piperacillin/tazobactam If concern for ESBL, consider meropenem. If concern for Enterococcus sp, may add ampicillin to cefepime or use piperacillin/tazobactam
Beta-Lactam Allergy	Aztreonam or gentamicin	Aztreonam or gentamicin If concern for Enteroccocus spp, consider vanc until cultures result