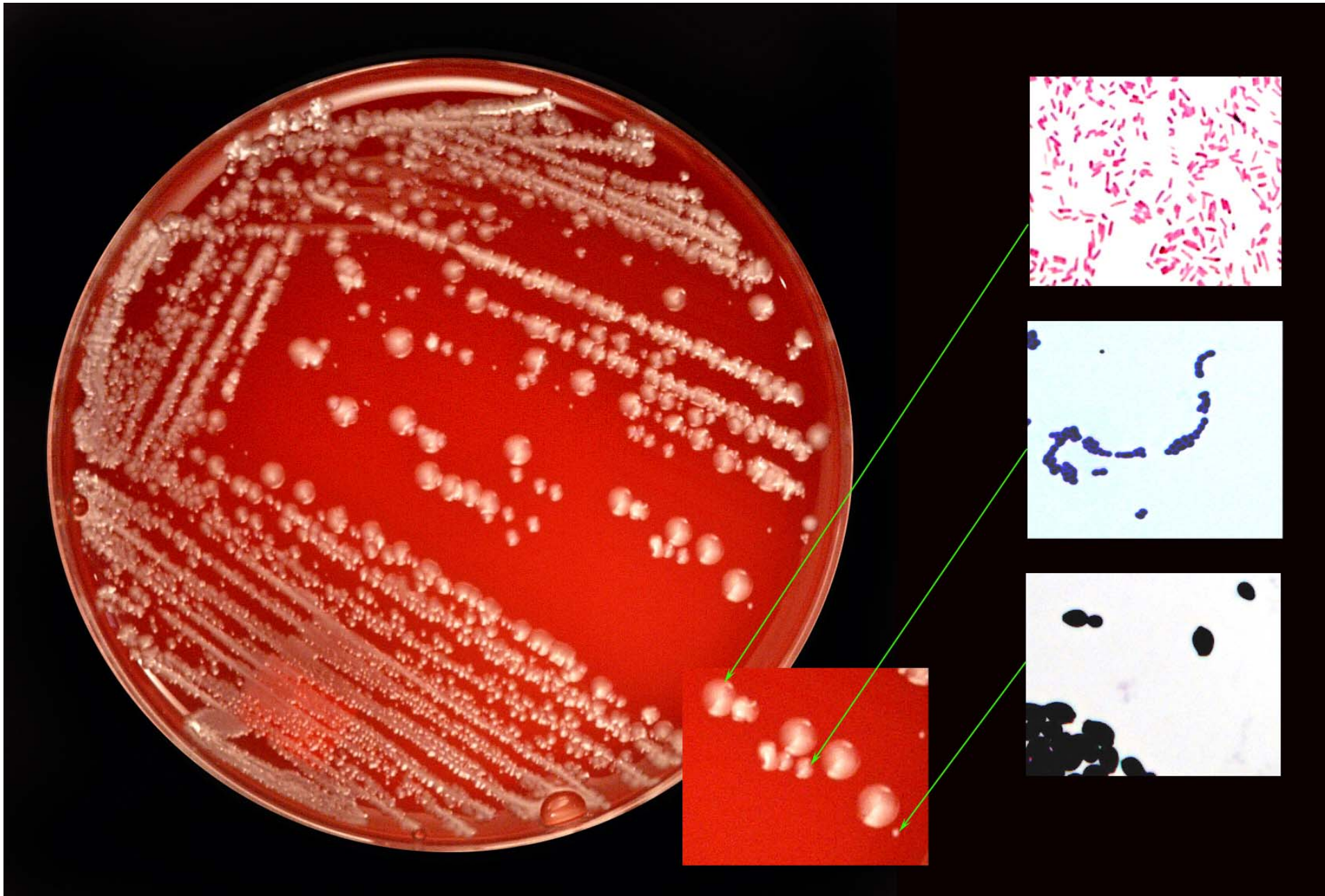




Lower Urinary Tract Infections

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Definitions

- **Bacteriuria:** bacteria in the urine
- **Pyuria:** white blood cells in the urine
- Bacteriuria can be symptomatic or asymptomatic
- **Colonization:** Asymptomatic bacteriuria in the absence of symptoms or pyuria
- **Cystitis:** dysuria, urgency, frequency, suprapubic pain (many causes)
- **Bacterial cystitis:** culture positive results

More Definitions

- **Prophylactic antimicrobial therapy:** prevention of infection in sterile urinary tract
- **Suppressive antimicrobial therapy:** prevention of symptomatic infection in colonized urinary tract
- **Nosocomial infection:** in hospitalized or institutionalized patients

Classification Schema

- Site of Origin
 - **Cystitis**: dysuria, frequency, urgency, pressure
 - **Pyelonephritis**: fever, chills, flank pain
 - It is very difficult to distinguish the two on the basis of symptoms and generally not necessary as the treatment is similar in clinically uncomplicated infections

Classification Schema

- Anatomic or functional status of urinary tract
 - **Uncomplicated:** occurring in a normal urinary tract in a healthy individual
 - **Complicated:** occurring in a functionally or structurally abnormal urinary tract, a host with a compromised immune system, a host with diabetes, or infection with a virulent or resistant strain of bacteria

Classification Schema

- Stamey: most clinically useful classification... based on relationships
 - **First infections** (25-30% females 30-40 yrs)
 - 50% will have second infection within a year
 - **Unresolved bacteriuria**: urine not sterilized despite treatment (bacterial resistance, second organism, rapid reinfection, azotemia, noncompliance with treatment)
 - **Recurrent** (95% of recurrent UTI in women)
 - **Bacterial persistence** (staghorn calculus, enterovesical fistula, anatomic anomaly)

Epidemiology

- Most common bacterial infection
- Minimal morbidity in healthy individuals
- 11% of women in any given year
- More than 50% of women in lifetime
- 1 in 3 women before age 24
- Uncommon in men before age 50
- 3.5 – 7 million office visits per year
- Nosocomial: most common cath assoc uti

Epidemiology

- 30 days of catheter = 100% colonization
- 25% of infections in noninstitutionalized elderly
- Benign illness in nonpregnant, nonobstructed female
- Risk factors in sexually active women
 - Diaphragm, spermicides, intercourse frequency, estrogen deficiency

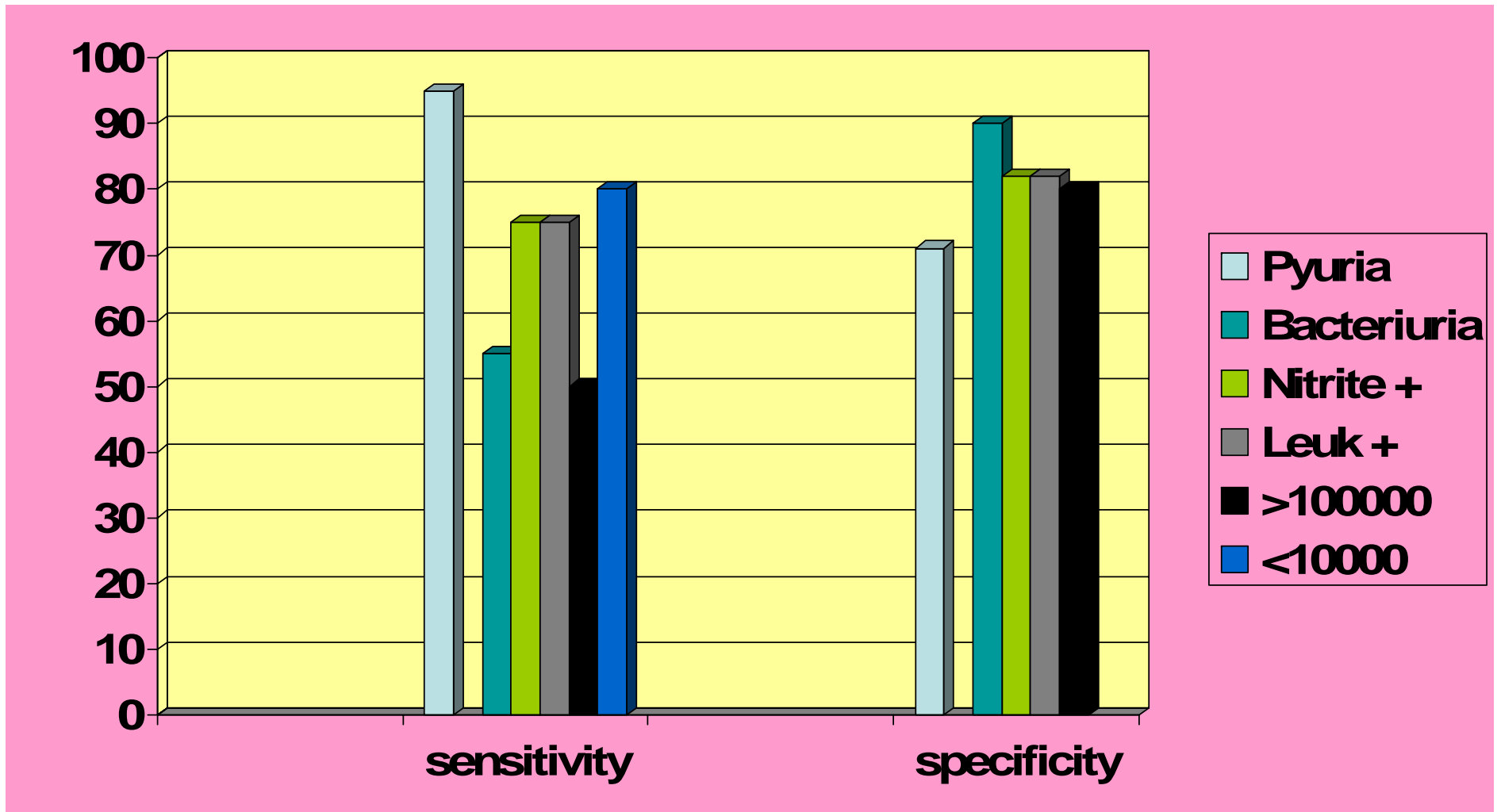
Epidemiology in Healthy Persons

- Basically a nuisance
- Clear spontaneously if untreated
- Does not lead to renal scarring, hypertension, or renal failure
- ASB in 3% of teenage women, increasing 1% per decade
- ASB danger in pregnancy (30-40% incidence of pyelonephritis)

Pathophysiology

- Bacteria that cause UTI are normally present in bowel (E. coli 85% of community acquired UTI)
- Vaginal mucosal colonization precedes infection; failure of host defenses
- While colonized, repeated infections occur
- Colonization resolves eventually, but can recur years later
- 6-12 month episodes of recurrent UTI

Diagnosis



Diagnosis

- Positive nitrites or leukocyte esterase indicates likelihood of infection is 25% higher than based on symptoms alone
- Negative dipstick indicates 25% lower
- Positive dipstick + symptoms: institute Rx
- Negative dipstick + symptoms: culture
- Symptoms unresponsive in 48 hours: culture



Consider Imaging (ultrasound)

- Women with febrile infections
- Men
- If urinary tract obstruction is suspected
 - Calculi, Diabetes, Previous instrumentation
 - Ureteral stricture
 - UPJ obstruction
- Persistent symptoms despite treatment
- Rapid recurrence after successful Rx



- Hematuria is cancer until proven otherwise
- Anyone with microhematuria or gross hematuria and a negative culture needs urologic evaluation
- Anyone with hematuria and culture documented UTI needs urologic evaluation if hematuria persists after successful Rx



Therapeutic Strategies

- Bacterial resistance to antibiotics is a major problem and related to local usage patterns
- Resistance involves B-lactams, trimethoprim-sulfa, fluoroquinolones
- Urine levels more important than serum levels
- Use inexpensive, narrow spectrum antibiotic

Therapy

- 3 day course of therapy more than adequate for uncomplicated UTI
- Symptoms may persist after successful single-dose therapy
- Trimethoprim-sulfa and nitrofurantoin good initial choices: effective and inexpensive

What do I do with recurrent UTI?

- A. Rule out site of bacterial persistence with retroperitoneal ultrasound
- B. Review culture reports
- C. Explain pathophysiology to patient
- D. Initiate one of 3 therapies depending upon patient preference and history

Strategies

- 1. Self treatment for 2 days at first sign of infection and culture if symptoms persist
- 2. Pre or Post intercourse single dose therapy
- 3. Long-term, low dose, every other day therapy for 6 months

Suppressing UTI in patients with colonization

Methanamine Hippurate: urinary antiseptic,
releases formaldehyde

Given 1 gram twice daily with vitamin C to
acidify the urine, no bacterial resistance

Keeps colony counts low and seems to
decrease incidence of symptomatic
infection



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