

Using clinical decision support coupled with  
audit and feedback to optimize the diagnosis  
and treatment of urinary tract infections in  
residential care

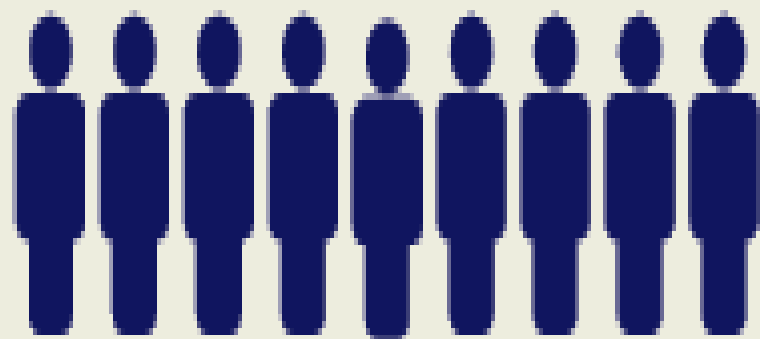
Victor Leung, MD FRCPC  
Providence Health Care

# Background

- Urinary tract infections (UTI) and asymptomatic bacteriuria (ASB) are common in the elderly
- Overuse of antibiotics for UTI and ASB has contributed to emergence of drug resistant bacteria
- Inappropriate use of antibiotics also leads to adverse effects

# Problem

- Urine cultures are often collected from residents with non-specific signs and symptoms
- There is a communication gap between LPNs, RNs and physicians in residential care
- It is a common misconception that cloudy urine or foul smelling urine are signs of UTI
- Treatment of ASB results in patient harm



in long-term care

50%



in the community

19%

0%

100%

Prevalence of Asymptomatic bacteriuria in seniors over 70  
(upper estimates)

# Solution

- Use evidence informed tools to help nursing staff and physicians decide when it is necessary to collect urine cultures (Loeb criteria)
- Support nursing staff in using screening tools
- Support physicians in choosing antimicrobials

# Goals

- Optimize diagnosis of urinary tract infections
- Increase appropriate utilization of urine cultures
- Avoid antibiotic prescriptions for asymptomatic bacteriuria

# Plan

- Education and awareness (Nov – Dec 2012)
  - Residential Care UTI treatment guidelines
  - Screening tool for UTIs
- Biweekly audit and feedback (Jan – Dec 2013)
  - 1 year pilot at Langara

# Urinary tract infections – diagnostic toolkit

## Criteria for Urine Testing

### Resident *without* Indwelling Catheter

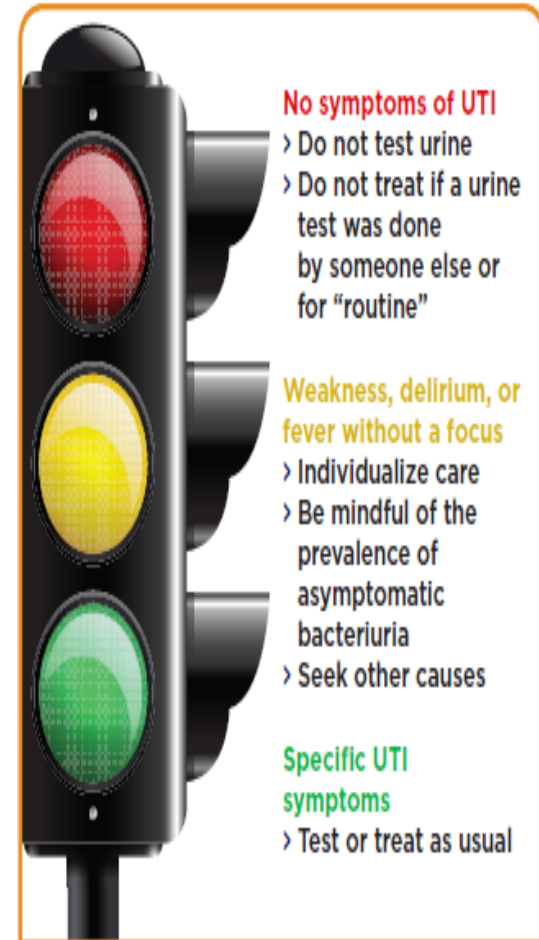
- Fever (37.9 °C)+ at least one of the symptoms below (new or increased) OR
- If no fever, at least two of the following symptoms:

- Acute Dysuria
- Gross hematuria
- Urinary Incontinence
- Urinary Urgency/hesitancy
- Suprapubic pain
- Flank pain
- Urinary Frequency

### Resident *with* Indwelling Catheter

- At least one of the following symptoms below (new or increased)

- Fever
- Pelvic Discomfort
- Flank pain (back, side pain)
- Malaise or lethargy with no other cause
- Costovertebral angle (CVA) tenderness
- Rigors (shaking chills)
- Delirium
- Gross hematuria





# Symptoms and signs of UTI

- Frequency of urination
- Dysuria (burning or discomfort during urination)
- Urgency
- Hesitancy
- New onset incontinence (the elderly)

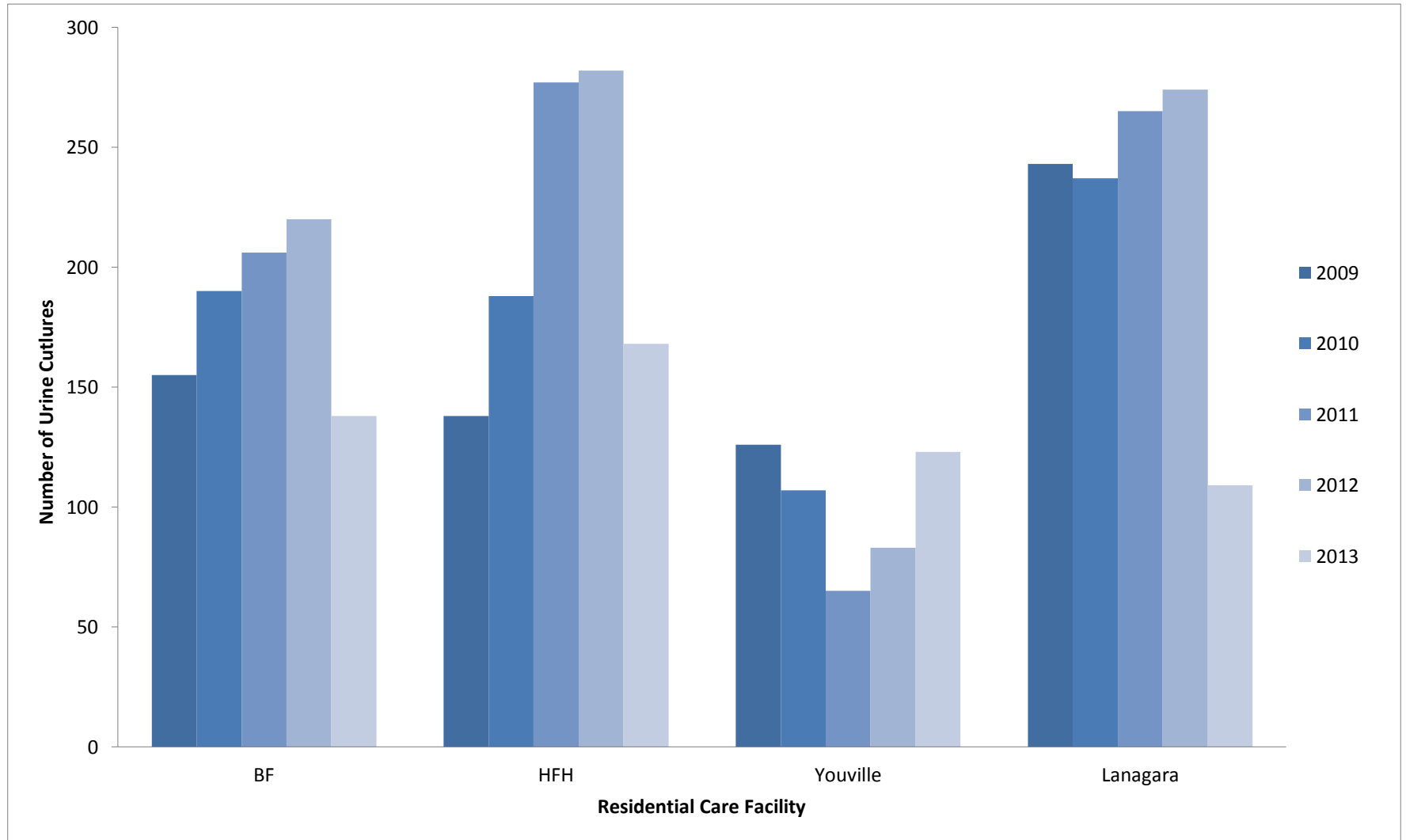
**NOTE:** malodorous or cloudy urine is not a symptom of UTI.

- Fever
- Costovertebral angle tenderness (pyelonephritis)

# Metrics

- Number of urine cultures
- Appropriateness of urine cultures based on clinical chart review and UTI screening tool
- Antimicrobial use in residential care
- Number of transfers from residential care to acute care

# Urine Cultures from PHC Residential Care Facilities are Decreasing



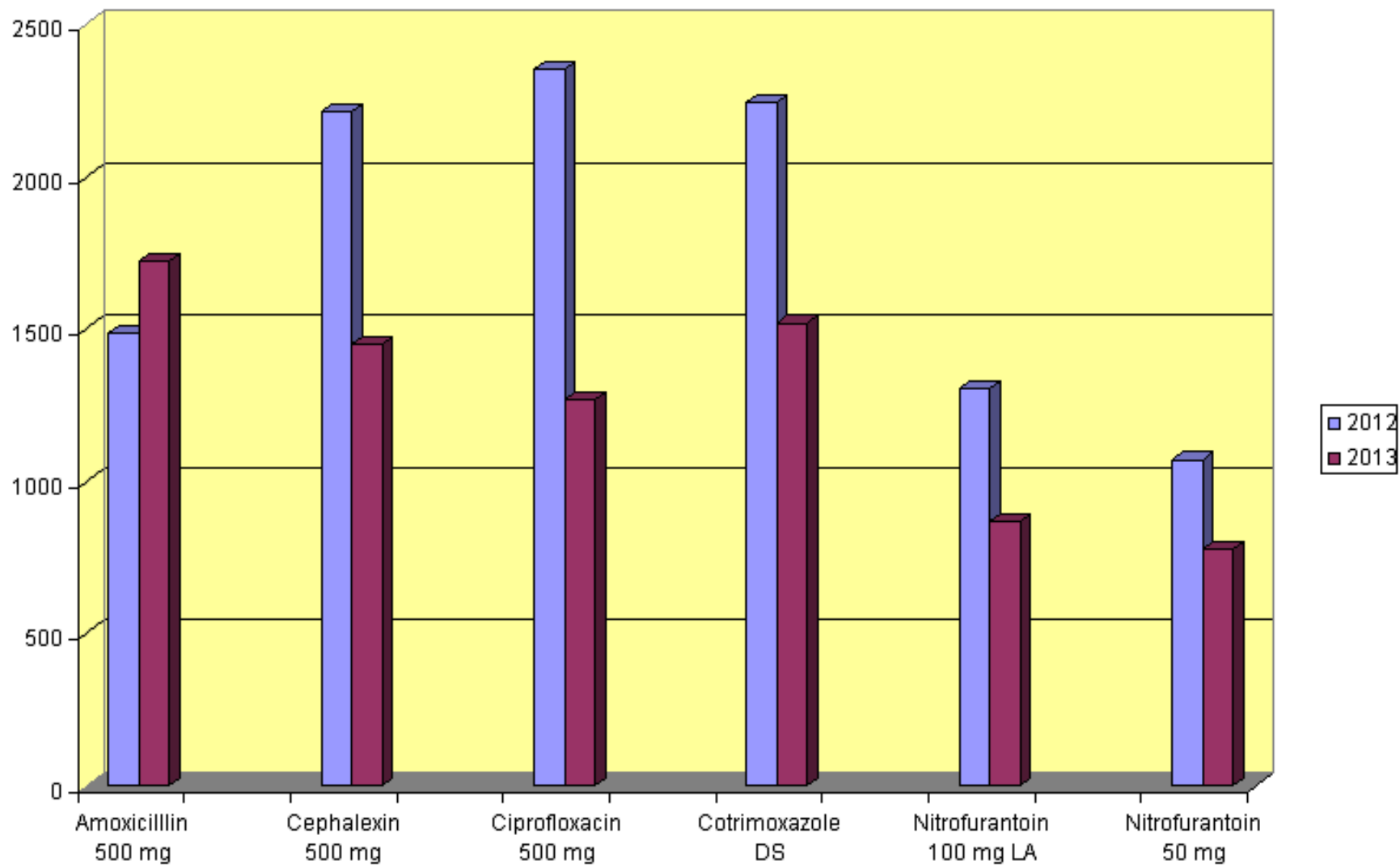
# Laboratory Cost Savings

- Total cost of urine C&S: \$48.71
  - Cost of urine culture and susceptibility: \$29.14
  - MSP Fee for urine cultures: \$19.57
- Cost savings at Langara alone:
  - \$8037
- Cost savings at all Residential care:
  - \$15,635
- Unmeasured/avoidable costs

# PHC RESIDENTIAL ANTIBIOTIC USAGE

- Comparison of 2012 and 2013 usage of antibiotics most commonly prescribed for UTI's

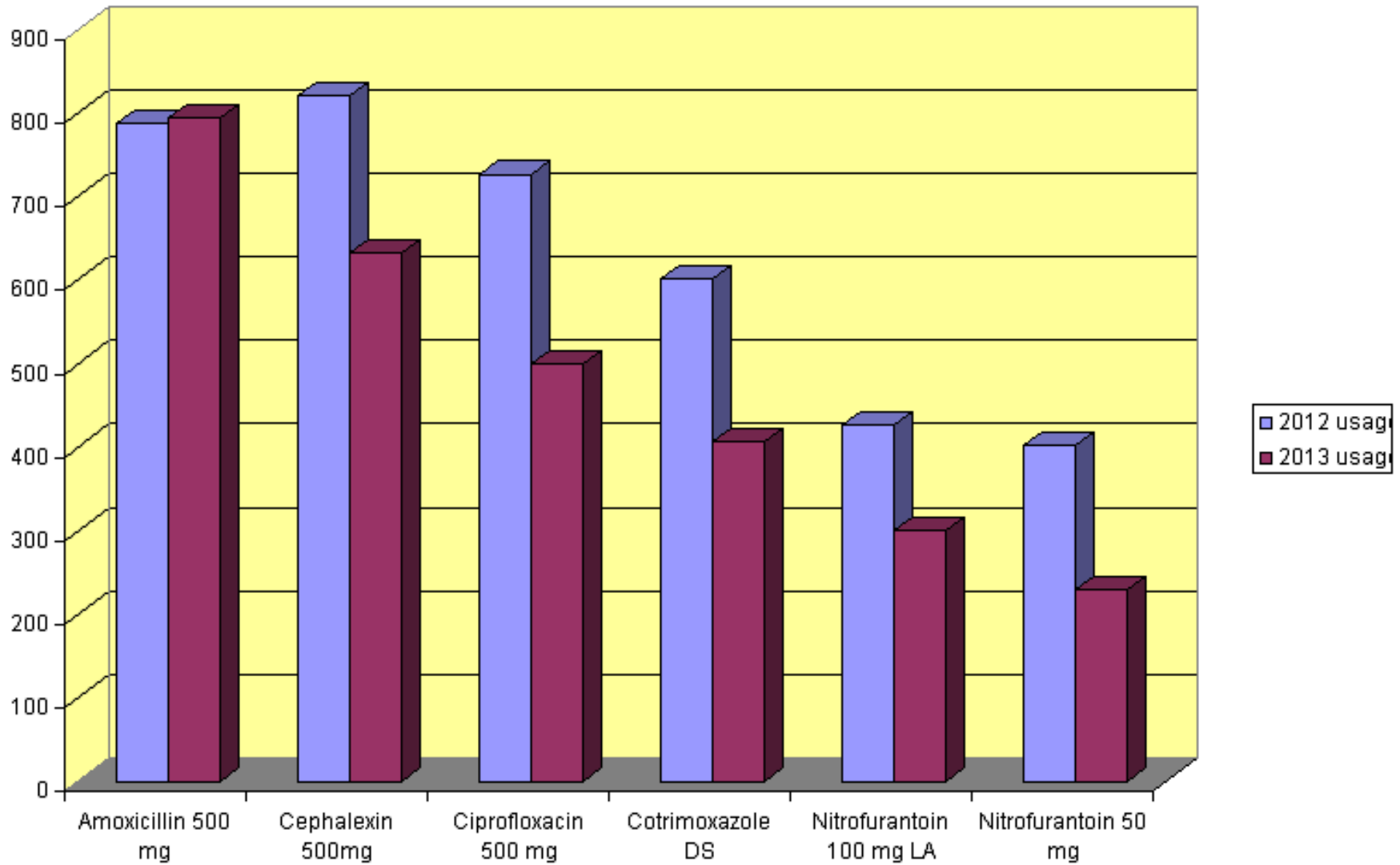
### PHC RESIDENTIAL ANTIBIOTIC USAGE



# PHC RESIDENTIAL ANTIBIOTIC USAGE

<b>Antibiotic</b>	<b>2012 usage</b>	<b>2013 usage</b>	<b>%reduction</b>
<b>Amoxicillin 500 mg</b>	<b>1487</b>	<b>1723</b>	<b>-16%</b>
<b>Cephalexin 500 mg</b>	<b>2216</b>	<b>1448</b>	<b>35%</b>
<b>Ciprofloxacin 500 mg</b>	<b>2355</b>	<b>1270</b>	<b>46%</b>
<b>Cotrimoxazole DS</b>	<b>2244</b>	<b>1520</b>	<b>32%</b>
<b>Nitrofurantoin 100 mg LA</b>	<b>1303</b>	<b>870</b>	<b>33%</b>
<b>Nitrofurantoin 50 mg</b>	<b>1071</b>	<b>778</b>	<b>27%</b>

## LANGARA ANTIBIOTIC USAGE





# Conclusions

- Clinical decision support tools for nurses and physicians + audit/feedback can improve diagnostic test utilization
- Improved use of diagnostic tests saves money and reduces patient harm