Antibiotic Stewardship:
Start By Counting

2016 Fall Regional Workshops
Urinary Tract Infection 101

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“You can’t improve what you can’t measure”

1. Peter Drucker-Managing auto assemble at GM 1943
2. Edward Deming-PDSA early 1950s
3. William Thompson-mid 1800s
4. Lord Kelvin.”Wireless is all very well but I'd rather send a message by a boy on a pony!”

Antibiotics…

• …pose a risk to nursing home residents similar to that of antipsychotic medications
• …account for 20% of adverse drug reactions in nursing home residents
• …amplify a resident's risk of developing C. Diff eightfold
• …increase a resident’s risk of becoming colonized with resistant bacterial strains which may be more costly to treat, have worse outcomes and may be spread to other residents (and staff) in the facility
• …contribute to drug-drug interactions.
Call Light to Pill Pass

Objectives

1. Understand the complex flow of information from resident change of condition through treatment orders to resolution of symptoms.

2. Visualize a system in your busy facility to track process steps in the management of UTI.

3. Understand the importance of providing feedback to physicians and staff.

ANTIBIOTIC RESISTANCE THREATS in the United States, 2013

CDC Sept. 13, 2013
Thus, we propose to require that the IPCP incorporate preventing and controlling infections and communicable diseases, and an antibiotic stewardship program, which includes both antibiotic use protocols and a system to monitor antibiotic use.

This should reduce unnecessary antibiotic use and the risk to residents from being prescribed an unnecessary antibiotic or an inappropriate antibiotic for an inappropriate time.
Why Antibiotic (Abx) Stewardship is Important

"Variability in Antibiotic Use Across Nursing Homes and the Risk of Antibiotic Related Adverse Outcomes for Individual Residents." JAMA Internal Medicine, June 29, 2015.

- January 1, 2010 - December 31, 2012
- 607 nursing homes in Ontario Province
- 110,656 residents
- 50.6 million resident days
- 2.8 million Days of Therapy (DOT)
- DOT/1000 resident days ranged from 22.4-192.7
- Nursing homes ranked in “Low, Medium, High” tertiles by DOT/1000 resident days

Nursing Homes in Abx Use Study

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Low (n=202)</th>
<th>Medium (n=202)</th>
<th>High (n=202)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOT/1000 res days</td>
<td>37 (20-46)</td>
<td>53 (46-62)</td>
<td>77 (62-193)</td>
</tr>
<tr>
<td>Number of beds</td>
<td>127 (82-166)</td>
<td>120 (85-160)</td>
<td>100 (62-144)</td>
</tr>
<tr>
<td>Dependent ADLs</td>
<td>44%</td>
<td>43%</td>
<td>42%</td>
</tr>
<tr>
<td>B&amp;B continence</td>
<td>76%</td>
<td>77%</td>
<td>77%</td>
</tr>
</tbody>
</table>
Primary Adverse Outcomes
ER/Hospital Discharge Diagnoses

- C. Difficile enteritis
- Diarrhea
- Gastroenteritis
- Antibiotic resistant organism
- Allergic reaction to antibiotic
- General adverse medication event

Study Findings

1. Odds ratio of adverse antibiotic related events in antibiotic users in High use NHs was 1.24x higher than in the Low use NHs antibiotic users.

2. Odds ratio of adverse antibiotic related event in non-antibiotic users in High antibiotic use NHs was similarly 1.23x higher than in the Low use NHs non-antibiotic users.

Inappropriate Antibiotic Use in NHs

- 25 – 80% of use deemed inappropriate

1. Identify core team members: IDMD, PharmD, epidemiologist, IT, micro, infection control. And they should be compensated.
2. Collaboration among hospital P&T, IC committees.
3. Support of Administration, medical leadership, and local providers is essential. Operate under the auspices of quality assurance and patient safety.
4. The IDMD and PharmD should negotiate with administration for authority, compensation, and expected outcomes.
5. Administrative support for necessary infrastructure to measure and track antimicrobial use.
6. Two core strategies are prospective audit with intervention and feedback and formulary restriction and pre-authorization.

Guidelines for Antibiotic Stewardship - IDSA  
Clinics of ID 2007

1. Prospective audit of antibiotic use with direct interaction and feedback to the prescribing physician
2. Formulary restriction and prior authorization requirements.

“(2). Using the right drug for the right diagnosis in the right dose for the right length of time.” Crnich

Getting Organized for Antibiotic Stewardship

- Assemble the core team
- Anchored in QA/QI and performed by IP/IC
- “Audit” means counting things - everything antibiotic
- Counting needs a system and a place to write things down
- Administrative support
- Tell everybody
- Go…
- Expected time line - now and forever (2-3 years)
As simply as possibly stated, antibiotic stewardship in LTC is:

- Deciding on best practice criteria for antibiotic use in bacterial infection within your institution - the ruler
- Creating a system for gathering data
- Determining whether antibiotic use for that infection is within the institutional criteria - the measure
- Providing feedback to the prescribing providers and staff so they can improve their practice behavior
- Keep measuring outcomes.

What Crnich, et. al. Say About ABS

- Unique NH structure to evaluation and treatment = barrier to improvement
- Staff IC training and consistency
- Develop tools/protocols to restrict urine testing
- Empower staff – discourage unnecessary testing
- Track urine testing and treatment and assess
- Target inappropriate testing and treatment
- Communication tools, antibiotic timeouts

"Facility best practice definition of UTI"

Defined in Facility QA/QI:

- No Gold Standard
- UTI is a clinical diagnosis based on symptoms
- High incidence asymptomatic bacteriuria/pyuria among our residents who have no symptoms
- Mythic biases: smell, darkness, behaviors, “last time this happened”, institutional triggers
- 50% of nursing home residents have asymptomatic bacteriuria and they do not need treatment*

*Nicolle, Clinical Infectious Diseases 2000;31:757-61
Wisconsin Healthcare‐Associated Infections in LTC Coalition

**McGeer Clinical Criteria SUTI**  
(No Catheter)

At least one of the following
1. Acute dysuria or Acute pain, swelling, tenderness of testes, epididymitis, or prostate
2. Fever or leukocytosis with at least one of the following clinical findings:
   - CVA pain or tenderness, suprapubic tenderness, gross hematuria, new or increased incontinence, urgency, or frequency
3. If fever or leukocytosis is not present, at least two of the clinical findings above.

*Sourse et al. Infect Control Hosp Epidemiol 2012; 33:965–977 22*

**McGeer Clinical Criteria CAUTI**

1. At least one of the following with no other explanation
   a. Fever
   b. Rigors
   c. New onset hypotension
   d. Acute change in mental status or functional decline without other explanation and leukocytosis
   e. New CVA pain or tenderness
   f. New suprapubic tenderness
   g. Acute pain, swelling, tenderness of epididymis, testes, or prostate
   h. Purulent drainage from around catheter at meatus.

*Sourse et al. Infect Control Hosp Epidemiol 2012; 33:965–977 22*

**Loeb Minimum Criteria for Initiating Antibiotics**

**No Indwelling Catheter**
- Acute dysuria **OR**
- Fever* plus at least one of following (new or worsening):
  - Urgency
  - Frequency
  - Suprapubic pain
  - Gross hematuria
  - Costovertebral angle tenderness
  - Urinary incontinence

**Chronic Indwelling Catheter**
- Must have at least one of the following
  - Fever*
  - New costovertebral angle tenderness
  - Rigors (shaking chills)
  - New onset delirium


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Or Make up your own...*

One of the following:
- Dysuria
- New onset Frequency, Urgency, or Incontinence
- Flank pain or tenderness
- Suprapubic pain
- Gross hematuria
- Focal tenderness or swelling of testis, epididymis, prostate
- Recent catheter trauma obstruction
- Purulent drainage around catheter

...as long it is evidenced based.

*Nace et al. JAMDA 15 (2014) 133-139

Define a system in your busy facility to track process steps in the management of UTI.

Care Pathway: Call Light to Pill Pass

I. Nurse evaluation in change of condition
II. Communication with physician by phone, fax, or in person
III. UA/UC laboratory report arrival
IV. Communication with physician by phone, fax, or in person
V. Review and improve

Alice Peterson RN
How antibiotics are used in your facility (Call light to pill pass)
Wisconsin Healthcare-Associated Infections in LTC Coalition

Metric vs Data

Data

1. Chart based primary source
2. Staff communication incorporated into daily nursing routine: morning report, huddle, problem notebook
3. Assign shared responsibility for counting/audit: IP, DON, nurse managers, administrator
4. Archive: spreadsheet, event sheet, electronic event page

Data For Management of When To Test

- Signs and symptoms with resident change of condition
- Resident, nurse, provider
- Communication (scripting)
- Provider response
- Documentation quality
- Was physician response compatible with facility best practice evidence based definition
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Metric – a measurement by which quality of a process can be assessed
1. Expressed in terms of a comparable denominator
2. Meaningful in your facility
3. Pertinent to the process

<table>
<thead>
<tr>
<th>Facility</th>
<th>Antibiotic starts</th>
<th>Time Frame (Days)</th>
<th>Residents (Days)</th>
<th>Total Resident Days</th>
<th>Antibiotic starts/day</th>
<th>Antibiotic starts/1000 resident days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Sheep</td>
<td>10</td>
<td>30</td>
<td>10</td>
<td>300</td>
<td>10/300</td>
<td>33.3/Krd</td>
</tr>
<tr>
<td>Better Sheep</td>
<td>10</td>
<td>30</td>
<td>100</td>
<td>3000</td>
<td>10/3000</td>
<td>3.3/Krd</td>
</tr>
<tr>
<td>Puffin House</td>
<td>10</td>
<td>30</td>
<td>5</td>
<td>150</td>
<td>10/150</td>
<td>66.6/Krd</td>
</tr>
</tbody>
</table>

Feedback to physicians and staff.

• Medical Director involvement is essential
• Letters of introduction
• Antibiotic resistance data (the Antibiogram)
• Dear Doctor letters
• Antibiotic report cards
• Daily nurse scripted prompting
PMNH Antibiotic Report Card for Treatment of UTI 2014

<table>
<thead>
<tr>
<th>Provider</th>
<th>Antibiotic Starts</th>
<th>Appropriate</th>
<th>Not Appropriate*</th>
<th>Percent not Appropriate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. One</td>
<td>40</td>
<td>32</td>
<td>8</td>
<td>20.0</td>
</tr>
<tr>
<td>Dr. Two</td>
<td>29</td>
<td>27</td>
<td>2</td>
<td>5.3</td>
</tr>
<tr>
<td>Dr. Three</td>
<td>8</td>
<td>6</td>
<td>2</td>
<td>25.0</td>
</tr>
<tr>
<td>Dr. Four</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Dr. Five</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.0</td>
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<tr>
<td>PMNH Cumulative</td>
<td>79</td>
<td>67</td>
<td>12</td>
<td>15.2</td>
</tr>
</tbody>
</table>

*Resident's clinical symptoms did not meet McGeer's Surveillance Criteria for diagnosis of UTI

Staff Feedback $$$!!!

- In-services
- Documentation expectation
- Skills improvement
- Daily re-enforcement

Staff educational development

- Facility evidence based best practice criteria
- Clinical skills
- Scripting
- Stewardship principles
- Empowerment of the nurse role as physician collaborator
- Validation in nursing knowledge and skill
- Diplomacy in communication
### References