


Wisconsin Healthcare-Associated Infections in LTC Coalition



## 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!"

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## 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.

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**Starting Point**  
Spot the ball  
Where we are  
today



**Goal**  
Shows Eddie Lacey  
Where to run  
Where we want to  
go

**Call Light to Pill Pass**

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**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.

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**ANTIBIOTIC RESISTANCE THREATS**  
in the United States, 2013

CDC Sept. 13, 2013

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\$480 B CMS \$ 2011  
\$478 B buys WI 2015  
\$24.4 B SNF; \$110B AC  
\$14.3 B top 15 list OIG

Nov 2013 Executive order 13676 to PCAST

July 11, 2014 "Report to the President on Combating Antibiotic Resistance".

September 18, 2014 "National Strategy for Combating Antibiotic Resistant Bacteria"

March 2015 "National Action Plan for Combating Antibiotic Resistant Bacteria".

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This document is scheduled to be published in the Federal Register on 07/16/2015 and available online at <http://federalregister.gov/a/2015-17207>, and on [FDsys.gov](http://FDsys.gov).

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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.

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... we propose to revise the regulatory description of the infection control program to: include infection prevention, identification, surveillance, and antibiotic stewardship; require each facility to periodically review and update its program; require performance of an analysis of their resident population and facility; designate an infection prevention and control officer(s) (IPCO)

The responsibility and necessary knowledge for an IPCO likely goes well beyond basic infection control training. Therefore, we propose to require that the IPCO be a healthcare professional with specialized training in infection prevention and control beyond their initial professional degree.

<https://s3.amazonaws.com/public-inspection.federalregister.gov/2015-17207.pdf>

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## Why Antibiotic (Abx) Stewardship is Important



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### "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

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### Nursing Homes in Abx Use Study

Characteristics	Low (n=202)	Medium (n=203)	High (n=202)
DOT/1000 res days	37 (20-46)	53 (46-62)	77 (62-193)
Number of beds	127 (82-166)	120 (85-160)	100(62-144)
Dependent ADLs	44%	43%	42%
B&B continent	76%	77%	77%

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### Primary Adverse Outcomes ER/Hospital Discharge Diagnoses

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

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### 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.

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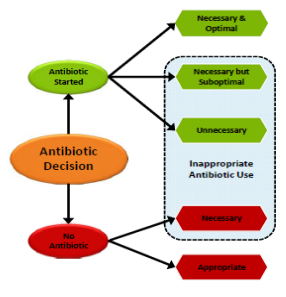
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### Inappropriate Antibiotic Use in NHs



- 25 – 80% of use deemed inappropriate
- Zimmer et al. *J Am Geriatr Soc* 1986; 34(10): 703-10
- Katz et al. *Arch Intern Med* 1990; 150(7): 1465-8
- Warren et al. *J Am Geriatr Soc* 1991; 39(10): 963-72
- Pickering et al. *J Am Geriatr Soc* 1994; 42(1): 28-32
- Loeb et al. *J Gen Intern Med* 2001; 16(6): 376-83
- Vergidis et al. 2011; *J Am Geriatr Soc* 59(6): 1093-8

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### Guidelines for Antibiotic Stewardship - IDSA Clinics of ID 2007

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 tract antimicrobial use.
6. Two core strategies are prospective audit with intervention and feedback and formulary restriction and pre-authorization.

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### Two main core Abx Stewardship strategies

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

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### 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)

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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 feed-back to the prescribing providers and staff so they can improve their practice behavior
- Keep measuring outcomes.

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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

Crnich CJ, et.al. *Drugs Aging* (2015) 32:699–716

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“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

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### 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:
  - o 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.

Fever = >100F or 2F over baseline  
Leukocytosis = WBC >14K or >6% bands

Stone et al. *Infect Control Hosp Epidemiol* 2012; 33:965-977 22

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### 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.

Fever = >100F or 2F over baseline  
Leukocytosis = WBC >14K or >6% bands

Stone et al. *Infect Control Hosp Epidemiol* 2012; 33:965-977 23

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### Loeb Minimum Criteria for Initiating Antibiotics

No Indwelling Catheter	Chronic Indwelling Catheter
<ul style="list-style-type: none"> <li>• Acute dysuria</li> <li style="text-align: center; padding: 2px 0 2px 20px;"><b>OR</b></li> <li>• Fever* <b>plus</b> at least one of following (new or worsening):                             <ul style="list-style-type: none"> <li><input type="checkbox"/> Urgency</li> <li><input type="checkbox"/> Frequency</li> <li><input type="checkbox"/> Suprapubic pain</li> <li><input type="checkbox"/> Gross hematuria</li> <li><input type="checkbox"/> Costovertebral angle tenderness</li> <li><input type="checkbox"/> Urinary incontinence</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Must have at least one of the following                             <ul style="list-style-type: none"> <li><input type="checkbox"/> Fever*</li> <li><input type="checkbox"/> New costovertebral angle tenderness</li> <li><input type="checkbox"/> Rigors (shaking chills)</li> <li><input type="checkbox"/> New onset delirium</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 10px;">* Fever &gt; 100° or 2.4° F above baseline</p>

Loeb, et al. *Infect Control Hosp Epidemiol* 2001;22:120-124 24

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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

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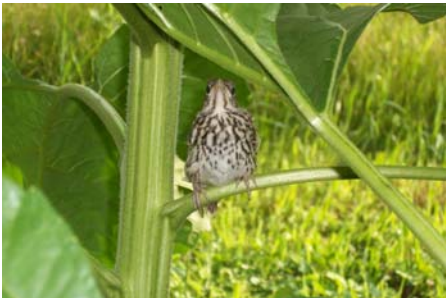
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### Define a system in your busy facility to track process steps in the management of UTI .



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### 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

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**Starting Point**  
Spot the ball  
Where we are  
today

➔

**Goal**  
Shows Eddie Lacey  
Where to run  
Where we want  
to go

How antibiotics are used in your facility  
(Call light to pill pass)

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**Starting Point**  
Spot the ball  
Where we are  
today

**QAPI (PDSA)**

➔

**Goal**  
Shows Eddie Lacey  
Where to run  
Where we want  
to go

**Metrics**

**Audit**  
Keep the Score  
How we measure  
progress

Plan-Do-Study-Act Deming 1993

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**Metric vs Data**



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### Metric vs Data



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### 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

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### 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

Facility	Antibiotic starts	Time Frame (days)	Residents	Total Res Days	Antibiotic start/Res day	Antibiotic starts/1000 res-days
Good Shep	10	30	10	300	10/300	33.3/Krd
Better Shep	10	30	100	3000	10/3000	3.3/Krd
Puffin House	10	30	5	150	10/150	66.6/Krd

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**Feedback to physicians and staff.**



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**Physician Feedback**

- Medical Director involvement is essential
- Letters of introduction
- Antibiotic resistance data (the Antibigram)
- Dear Doctor letters
- Antibiotic report cards
- Daily nurse scripted prompting

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### PMNH Antibiotic Report Card for Treatment of UTI 2014

Provider	Antibiotic Starts	Appropriate	Not Appropriate*	Percent not Appropriate
Dr. One	40	32	8	20.0
Dr. Two	29	27	2	5.3
Dr. Three	8	6	2	25.0
Dr. Four	2	2	0	0.0
Dr. Five	0	0	0	0.0
PMNH Cumulative	79	67	12	15.2

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

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- ### Staff Feedback \$\$\$!!!
- In-services
  - Documentation expectation
  - Skills improvement
  - Daily re-enforcement
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- ### 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
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## References

1. Crnich CJ, et.al. "Optimizing Antibiotic Stewardship in Nursing Homes: A Narrative Review and Recommendations for Improvement" *Drugs Aging* (2015) 32:699–716.
2. Nace et.al. "Clinical Uncertainties in the Approach to Long Term Care Residents With Possible Urinary Tract Infection" *JAMDA* 15 (2014) 133-139
3. Stone et. al. "Surveillance Definitions of Infections in Long-Term Care Facilities: Revisiting the McGeer Criteria" *Infect Control Hosp Epidemiol* 2012;33(10):965-977
4. Loeb, et.al. "Development of minimum criteria for the initiation of antibiotics in residents of longterm-care facilities: results of a consensus conference. *Infect Control Hosp Epidemiol* 2001;22:120–124.
5. Nicolle, "Urinary Tract Infection in Long-Term-Care Facility Residents" *Clinical Infectious Diseases* 2000;31:757–61

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## Urine Test Tracking S...

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