Antibiotic Stewardship in Nursing Homes

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Outline of Presentation

1. What is Antibiotic Stewardship and Why Is It Important for Nursing Homes?
2. CMS Mandate for Nursing Homes to Implement Antibiotic Stewardship
3. Key Quality Improvement Targets in Nursing Home Infection Management
4. Developing an Antibiotic Stewardship Program in Your Nursing Home

What is Antibiotic Stewardship? and Why Is It Important for Nursing Homes?

Antibiotic Stewardship Is...
A set of commitments and activities designed to:
- optimize the treatment of infections
  and
- reduce the adverse events associated with antibiotic overuse

In Operational Terms, Antibiotic Stewardship Is....

A system of informatics, data collection, personnel, policies and procedures designed to assure that patients get:
- the right drug
- at the right time
- for the right duration

Why Antibiotic Stewardship Is Important for Society Overall and Specifically for Nursing Homes
Worldwide Crisis of Antibiotic Resistance

- Multi-drug resistance increasingly common
- Over 20,000 deaths annually in U.S.A. from multi-drug resistant infections
- Projected 317,000 deaths per year by 2050

What’s Causing the Crisis?

1. Fewer New Antibiotics Being Developed
2. Resistant Strains Spread Rapidly
3. Antibiotics Are Overused

Superbugs’ Kill India’s Babies and Pose an Overseas Threat

Why the Focus on Nursing Homes

- Antibiotic usage tends to be quite high
- NHs with the highest prescribing rates tend to also have the highest *Clostridium difficile* infection rates
- Residents LIVE there (as opposed to hospital)
Antibiotic Prescribing Rates across 31 North Carolina Nursing Homes

The Average: Nursing Home Resident
- 4.6 antibiotic prescriptions per year
- 1 prescription every 80 days
- On antibiotics 10% of the time

Resistant Bacteria Now Commonly Colonize Nursing Home Residents
- results of skin, airway, skin and wound cultures in 82 residents

Clostridium Difficile: an Indicator of Antibiotic Overuse

Reasons Antibiotics Are Prescribed

The most common “other” infection is C. difficile

CMS Mandate for Nursing Homes to Implement Antibiotic Stewardship

We are requiring facilities to develop an Infection Prevention and Control Program (IPCP) that includes an Antibiotic Stewardship Program and designate at least one infection Preventionist (IP). That program should include antibiotic use protocols and a system to monitor antibiotic use.

Implementation Timetable:
- Antibiotic Stewardship – 11/28/2017
- Infection Preventionist (IP) – 11/28/2019
- IP on Quality Assessment and Assurance Committee – 11/28/2019
Prescribing antibiotics “just in case” was accepted in the past, but now antibiotics should be given after careful, evidence-based consideration of risks and necessity.

This session will provide guidance on key elements of antibiotic stewardship for your nursing home.

F Tags that Surveyors Can Cite to Enforce Antibiotic Stewardship

Federal Tag 441: Infection Control
Federal Tag 329: Unnecessary Drugs
Federal Tag 332/333: Medication Errors
Federal Tag 428: Drug Regimen Review

Can Antibiotic Use be Safely Reduced?

Education and QI Works: Results from Randomized Trial
- Antibiotic Prescriptions Per 100 Resident-Days

Antibiotic Prescribing Rates in 28 Minnesota Nursing Homes

Key Areas for Improvement in Nursing Home Antibiotic Use

Average for 31 North Carolina Nursing Homes
Average = 2.19 prescriptions per year
Decision-Making Can Be Complicated

Nurse

Provider

Supervisor

Family

I learned in nursing school back in 1968...

Every time mother [Does X] she needs antibiotics

Case #1

- Mrs. Jenkins, a 79 year old with stroke, incontinence
- Wet incontinence pad has odor
- No complaints
- Normal vital signs

What would you do and why?

Is This Evidence-Based Practice?

What Causes Changes in Urine Color or Odor?

- Diet
- Medications
- Dehydration
- Bacteria in urine
- If person is not sick, it’s asymptomatic bacteriuria

Colonization versus Infection: Why the Difference is Important in Nursing Home Care

Is Cloudy or Smelly Urine a Reason To Give Antibiotics?

<table>
<thead>
<tr>
<th>Percent</th>
<th>Nurses</th>
<th>Geriatricians</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>No</td>
<td>90</td>
<td>70</td>
</tr>
</tbody>
</table>

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Cerebral Palsy Center for Health Services Research
University of North Carolina at Chapel Hill
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What should you do for Mrs. Jenkins?

Should you get a urine culture ‘just in case’?

What Happened?

- Positive cultures were overtreated
- Negative cultures were ignored
- Most common reason cultures were ordered was “mental status change,” which is rarely due to urine infection

Interestingly…The two sepsis cases that arose during 7 days post-culture in these 254 patients were from non-urinary sources and had negative urine cultures

Case #2: Two Different People

Mrs. White

- 84 year old with arthritis and moderate dementia
- Uncooperative with dressing
- Irritable
- Eats half of breakfast
- Says she’s tired

Ms. Blue

- 34 year old nurse
- Divorced, alone this weekend
- You were going to have lunch with her, but she cancels
- Low energy; not hungry
- Doesn’t want to get dressed
- Doesn’t want to deal with people

Both Have Similar Nonspecific Symptoms *

Ms. White

- 84 year old with arthritis and moderate dementia
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- Irritable
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- Says she’s tired

Ms. Blue

- 34 year old
- Divorced, alone this weekend
- Low energy; not hungry
- Doesn’t want to deal with people
- Doesn’t want to get dressed

* Nonspecific Symptoms – don’t relate to any particular body part or body system
What You Might Say to Your Friend Ms. Blue

- Coming down with a virus?
- Too much to drink last night?
- Didn’t sleep well?
- Pain?
- Stress?
- Depression?

What the Nursing Supervisor Says About Ms. White

**Probably the urine. Needs an antibiotic.**

Turning to antibiotics as a knee jerk reaction.

Jumping to conclusions

- In nursing homes --- One of the biggest causes of unnecessary antibiotic use
- In medical decision-making – the most common reason for medical errors

What else could be causing Ms. White’s fatigue, irritability, and poor appetite?

The Big Seven: Common Reasons for Nonspecific Symptoms

- Dehydration
- Medication side effect
- Coming down with a virus
- Didn’t sleep well
- Pain
- Constipation
- Stress / anxiety / depression

Active Interventions for Non-Specific Symptoms

- Assess hydration status (and encourage fluids)
- Review current medications
- Look for signs of a respiratory or GI virus
- Think about sleep problems
- Ask about pain / discomfort
- Ask about constipation
- Look for sources of stress, anxiety or depression
- Monitor symptoms and vital signs (especially temperature)
- Use nursing interventions where appropriate

Case #3

- Mr. Leonard, 76 year old non-smoker
- 5 days of nasal congestion, sore throat and sneezing
- Hacking cough worse at night
- Decreased appetite, more tired
- Temp 99.4, other vitals normal, pulse ox 97%
- Placed on antibiotics
Research Result: Cough Alone Increases 3x the likelihood of a NH Patient Getting Antibiotics

**Question:** Is cough alone a reason to give antibiotics? Why or why not?

### Common Respiratory Infections

<table>
<thead>
<tr>
<th>Infection Type</th>
<th>Common Cause</th>
<th>Common Symptoms</th>
<th>Distinguishing Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Cold</td>
<td>Virus</td>
<td>Nasal congestion/sneezing</td>
<td>Nasal symptoms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sore throat</td>
<td>Normal vitals (+/− fever)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dry cough</td>
<td>Unchanged lung exam</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute bronchitis</td>
<td>Virus</td>
<td>Cough (+/− sputum)</td>
<td>Normal chest X-ray</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(+/− sputum)</td>
<td>Normal vitals (+/− fever)</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>Bacterium or Virus</td>
<td>Pleuritic chest pain</td>
<td>Abnormal vital signs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fever</td>
<td>Abnormal lung exam</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Infiltrate on chest X-ray</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mental status changes</td>
</tr>
<tr>
<td>Influenza-like illness</td>
<td>Virus</td>
<td>Sore throat</td>
<td>Chills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dry cough</td>
<td>Body aches</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fever</td>
<td>Malaise</td>
</tr>
<tr>
<td>COPD exacerbation</td>
<td>Virus or bacterial</td>
<td>Cough (+/− sputum)</td>
<td>Normal chest X-ray</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(+/− sputum)</td>
<td>Normal vitals (+/− fever)</td>
</tr>
</tbody>
</table>

**Case 4**

Does this need antibiotics? One week later

**Case 5**

Does this need antibiotics? Two weeks later

### Emergency Departments and Hospitals: Big Risk, Hard to Control

Over Half of C Diff Infections in NHs Occur within a Month Post-Hospital Discharge

Source: Pawar et al, ICDHE 2012; 33:1107-12

### Which Antibiotics Pose the Highest Risk of Clostridium difficile?

Source: Wenisch et al., Antimicrob Ag Chemother 2014; 58(9):5079-83
Reducing Antibiotic Overuse Works: Impact of fluoroquinolone restriction on rates of *C. difficile* infection in a Community Hospital

### Empirically Chosen Antibiotics for UTI are Often Ineffective (except at promoting resistance)

<table>
<thead>
<tr>
<th>Antibiotic Prescribed Empirically (% of the time)</th>
<th>Percent Resistant (% of isolates)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Escherichia Coli (44%)</td>
<td>Proteus (13%)</td>
</tr>
<tr>
<td>Ciprofloxacin (26%)</td>
<td>57%</td>
</tr>
<tr>
<td>Nitrofurantoin (12%)</td>
<td>42%</td>
</tr>
<tr>
<td>Ceftriaxone (11%)</td>
<td>17%</td>
</tr>
<tr>
<td>Levofloxacin (7%)</td>
<td>58%</td>
</tr>
<tr>
<td>TMP-SMX (16%)</td>
<td>42%</td>
</tr>
<tr>
<td>Proteus (13%)</td>
<td>4%</td>
</tr>
<tr>
<td>Klebsiella pneumoniae (13%)</td>
<td>4%</td>
</tr>
<tr>
<td>Klebsiella pneumoniae (13%)</td>
<td>4%</td>
</tr>
</tbody>
</table>

- Data from 75 prescriptions and 1,580 positive cultures in 31 NHs -

### Options Available to Reduce C Diff Post Hospitalization

1. Try to Reduce Antibiotic Burden
   - Re-evaluate need for antibiotics in the first place
   - Re-evaluate duration of antibiotic treatment
   - Re-evaluate choice of antibiotic
2. Probiotics
   - Cochrane review (2013): “moderate quality evidence suggests that probiotics are both safe and effective for preventing Clostridium difficile-associated diarrhea”


### Recommended Duration of Antibiotic Therapy

<table>
<thead>
<tr>
<th>Type of infection</th>
<th>Sanford Guide, 2015</th>
<th>ID Society</th>
<th>David Weber</th>
<th>Actual NH Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple UTI (cystitis)</td>
<td>3 days$^1$</td>
<td>3 days$^2$</td>
<td>3 days</td>
<td>7.5 days</td>
</tr>
<tr>
<td>COPD exacerbation</td>
<td>3-10 days$^2$</td>
<td>--</td>
<td>3-5 days</td>
<td>3-5 days</td>
</tr>
<tr>
<td>Pneumonia without sepsis</td>
<td>Until afebrile for 3d</td>
<td>&gt;5 days$^4$</td>
<td>&gt;5 days</td>
<td>&gt;5 days</td>
</tr>
<tr>
<td>Cellulitis (lower extremity)</td>
<td>10 days$^3$</td>
<td>5 days</td>
<td>5-7 days</td>
<td>9-6 days</td>
</tr>
</tbody>
</table>

$^1$TMP-SMX – 3 days; Nitrofurantoin – 5 days; Varies with drug; No therapy required in most cases; $^2$ Not diabetic; $^3$ Minimum 5 days (should be afebrile 48-72 hours); $^4$ non-ambulatory treat as HCAP; assess using score for severity

### Summary: Situations Leading to Antibiotic Overuse

1. Urine appearance and odor
2. Urine test results
3. Nonspecific symptoms
4. Cough
5. Wounds
6. Red and swollen legs
7. Emergency departments and hospitals
8. Empirical antibiotic choice
9. Antibiotic treatment too long
Antibiotic Stewardship Works ....sometimes

USING DATA TO MOTIVATE OR REINFORCE CHANGE

Antibiotic Use Jan-Apr 2015, by NH

Change in Antibiotic Use ‘15-'16, by NH

How to Develop an Antibiotic Stewardship Program in Your Nursing Home

#1: Commit Leadership / Create Team

- Agree to incorporate antibiotic stewardship into facility Quality Assurance and Performance Improvement goals, monitoring, and reporting
- Identify an infection preventionist (a.k.a. infection control nurse or infection specialist) and provide time
- Set up an antibiotic stewardship leadership team
- Communicate expectations to medical and nursing staff

Create an Antibiotic Stewardship Team and Make them Accountable

- Medical Director
- Director of Nursing
- Infection Preventionist
- Consultant Pharmacist
- Laboratory
- ID Consultant
#2: Gather and Report Data

- Antibiotic prescriptions / 1,000 resident-days
- Percent of time on antibiotics
- C difficile infection rate
- Urine cultures: multidrug resistance rate
- Rate of hospitalization for sepsis
- Rate of fever among persons who had antibiotics initiated in the nursing home, by infection site
- Proportion of prescriptions that are “high C diff risk” antibiotics, by infection site
- Urine cultures per 1,000 resident-days
#3: Educate Everyone Involved in Decision-Making

Nurses  Providers

Supervisors  Residents and Family

Training for Nursing Staff

- One-hour in-service DVD
- Pocket cards with key guidelines

Implementation Manual

- A step-by-step guide explaining how to incorporate our materials into a program that will improve outcomes

Posters to Provide Periodic Reminders to Staff

UNC Antibiotic Stewardship Start-Up Package

- Training for Nursing Staff
  - One-hour in-service DVD
  - Pocket cards with key guidelines

- Posters to Provide Periodic Reminders to Staff
Training for Medical Staff

- CD-ROM of case discussions by university experts
- Pocket cards with key guidelines

Educational Materials for Residents / Families

- Brochure entitled Why Not Antibiotics
- Website has 5-minute video

Training DVD for Emergency Department Staff

- Multidisciplinary case discussions from UNC faculty on emergency department management of nursing home residents

Free and Modestly-Priced Resources on the Web

nursinghomeinfections.unc.edu

#4: Set Goals and Establish Policies

- Timetable for implementing program
  - Data reporting
  - Education
  - Quality improvement reports
  - Involvement in collaborative
- Initial targets

Establishing Policies and Procedures

- Some say to do this first
- However, reviewing data and setting facility priorities may be better to do first
- Best policies and procedures are endorsed by facility staff and updated regularly
- AMDA will soon publish a report with sample policies and procedures for antibiotic stewardship
Evidence-Based Strategies That Work

- Communication guidelines for nursing staff around suspected infections – SBAR; protocols (e.g., asking for photos of skin problems)
- Publicizing antibiotic use statistics (QAPI)
- Antibiotic initiation protocols
- Antibiotic duration guidelines
- Antibiotic time-out
- Protocol for ordering of urine cultures
- Protocol for management of urine culture results

-CRITICAL ROLE OF LEADERSHIP CANNOT BE OVEREMPHASIZED-

Resources

https://nursinghomeinfections.unc.edu/