ANTIBIOTIC STEWARDSHIP
IN NURSING HOMES

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(with thanks to Phil Sloane, MD, MPH for his slides)

DISCLAIMER

The views and opinions expressed in this lecture are those of this speaker and do not reflect the official policy or position of any agency of the U.S. government.
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

CRISIS OF ANTIBIOTIC RESISTANCE

- Multi-drug resistance increasingly common
- Over 23,000 deaths annually in U.S.A. from multi-drug resistant infections
- Projected 317,000 deaths per year by 2050

Deaths Attributable to Antimicrobial Resistance Every Year by 2050

WHAT’S CAUSING THE CRISIS?

1. Fewer New Antibiotics Being Developed

2. Resistant Strains Spread Rapidly

3. Antibiotics Are Overused

“If you thought COVID was bad, you don’t want antimicrobial resistance,” Dr Paul De Barro, biosecurity research director at Australia’s national science agency, the CSIRO, told The Guardian.

“I don’t think I’m exaggerating to say it’s the biggest human health threat, bar none. COVID is not anywhere near the potential impact of AMR.”

“We would go back into the dark ages of health.”
ANTIBIOTIC STEWARDSHIP UNDER COVID-19

• Current evidence from hospitalized COVID-19 patients identified that while 72% (1450/2010) of patients received antibiotics, only 8% (62/806) demonstrated superimposed bacterial or fungal co-infections.

• WHO also reports that azithromycin is being widely used with hydroxychloroquine although it is not yet recommended outside of COVID-19 clinical trials.

• WHO guidelines: For suspected or confirmed mild COVID-19, WHO recommends against the use of antibiotic therapy or prophylaxis. For suspected or confirmed moderate COVID-19, that antibiotics should not be prescribed unless there is clinical suspicion of a bacterial infection.

Widespread use of antibiotics should be discouraged, as their use may lead to higher bacterial resistance rates, which will impact the burden of disease and deaths in the population during the COVID-19 pandemic and beyond.

https://www.who.int/publications/i/item/clinical-management-of-covid-19

COVID-19 IN NURSING HOMES

• Consider in older people, particularly those in LTCs to provide empiric antibiotic treatment for possible pneumonia.

• Treat with narrow-spectrum (Access) antibiotics (such as amoxicillin), instead of broad-spectrum antibiotics (Watch and Reserve antibiotics).

https://www.who.int/publications/i/item/clinical-management-of-covid-19
SEPTEMBER, 2015: CDC identified core elements of antibiotic stewardship.

CMS 2016-17 ACTION PLAN: developing and pilot test a worksheet for surveyors to "assess the new antibiotic stewardship requirement."

November 2019: All NHs much have a trained infection preventionist

Implementation will include a key role for infection control nurses

42 CFR Parts 405, 431, 447, 482, 483, 485, 488, and 489
Reform of Requirements for Long-Term Care Facilities

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 Next Steps:
CMS has funded QIN-QIOs (Quality Innovation Network- Quality Improvement Organizations as part of the CDI Reporting and Reduction Project to help enroll NHs in the NHSN (National Healthcare Safety Network Long-term Care Facility Component

Agarwal M. JAMDA. 2019
EXISTING REGULATIONS PROMOTING ANTIBIOTIC STEWARDSHIP

Federal Tag 441: Infection Control
Mentions performing antibiotic review

Federal Tag 329: Unnecessary Drugs
To optimize medication use and monitoring to appropriately minimize exposure and prevent consequences

Federal Tag 332/333: Medication Errors
To reduce preventable errors and adverse events

Federal Tag 428: Drug Regimen Review
Outlines role of pharmacist in scheduled reviews of medication use in high risk residents

YES, THIS IS A POLICY CHANGE

Prescribing antibiotics “just in case” was accepted in the past, but now antibiotics should be given after careful, evidence-based consideration of risks and benefits.

This session will provide guidance on key elements of antibiotic stewardship for your nursing home
OBJECTIVES AND QUESTIONS

1. Context: Is antibiotic resistance a problem in your nursing home? If so, how do you know?
2. Know the problem: Are Antibiotics overused in your nursing home? If so, why and how does this happen?
3. Do something: If you were designing a program to reduce inappropriate antibiotic use, what behaviors would you most want to change?

STEP ONE: 
KNOW THE CONTEXT

QUESTION: Is antibiotic resistance a problem in your nursing home? If so, how do you know?
LOOK FOR DATA ON RESISTANT BACTERIA

Results of skin, airway, skin and wound cultures in 82 residents of a Michigan nursing home

- MRSA: 63%
- CR-GNR: 72%
- VRE: 18%

% of Nursing Home Residents with Positive Culture

J Clin Micro 50(5), 1698-1703, 2012

Clostridium Difficile: an Indicator of Antibiotic Overuse

**IMPACT**
- Caused close to half a million illnesses in one year.
- Comes back at least once in about 1 in 3 patients who get C. difficile.
- 1 in 11 people 65 and older died within a month of C. difficile infection diagnosis.

**RISK**
- People on antibiotics are 7-10 times more likely to get C. difficile while on the drugs and during the month after.
- Being in healthcare settings, especially hospitals or nursing homes.
- More than 80% of C. difficile deaths occurred in people 65 and older.
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STEP TWO:
UNDERSTANDING THE PROBLEM

Question: Are Antibiotics overused in your nursing home? If so, why and how does this happen?
LOOK FOR COMPARISON DATA ON PRESCRIBING

- Up to 70% of nursing home residents receive at least 1 antibiotic a year

How is your home doing compared to others?

- Up to 75% of antibiotics are prescribed inappropriately

How is your home doing compared to others?


SITUATIONS LEADING TO ANTIBIOTIC OVERUSE

1. Urinary: Urine appearance and odor and urine test results
2. Respiratory: Cough
3. Skin: Wounds, Red and swollen legs
4. Emergency departments and hospitals
5. Prophylaxis
6. Nonspecific symptoms
7. Empirical antibiotic choice and duration

LOOK AT THE REASONS ANTIBIOTICS ARE PRESCRIBED

The most common “other” infection is C. difficile

Presumed Urinary Infection: 42%
Respiratory Infection: 30%
Presumed Skin and Soft Tissue Infection: 14%
Other Infection: 14%

HOW ARE ANTIBIOTIC PRESCRIBING DECISIONS MADE?

Factors Influencing Antibiotic Prescribing Decisions

Clinical Situation → Patients and Families

Nursing Homes and Staff
Health Care Providers

Prescribing Decision
Probably the urine. Needs an antibiotic.

Every time mother [Does X] she needs antibiotics.

People are predictably irrational. The basic wiring of our brains makes us return to the same mistakes again and again. This work has been enunciated by Kahneman and Tversky, Dan Ariely, and others. People are susceptible to natural decision-making bias and the use of heuristics, through a dual process of decision-making.

Non-specific Symptoms Case: Tale of Two People

**MS. WHITE**

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

Non-specific Symptoms Case: Tale of Two People

**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
• Uncooperative with dressing
• Irritable
• Eats half of breakfast
• 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

WHAT YOU MIGHT THINK ABOUT 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 THINKS 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 IN MS. WHITE

- Dehydration
- Medication side effect
- Viral illness
- Insomnia and fatigue
- 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

Should we get a urine culture “just in case”
### LOOK AT TYPES OF ANTIBIOTICS

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

<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>TMP-SMX (16%)</td>
<td>42%</td>
</tr>
<tr>
<td>Nitrofurantoin (12%)</td>
<td>4%</td>
</tr>
<tr>
<td>Ceftriaxone (11%)</td>
<td>17%</td>
</tr>
<tr>
<td>Levofloxacin (7%)</td>
<td>58%</td>
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### RECOMMENDED DURATION OF ANTIBIOTIC THERAPY (NON-HOSPITALIZED PATIENTS)

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<tr>
<th>Type of infection</th>
<th>Sanford Guide, 2015</th>
<th>ID Society</th>
<th>David Weber</th>
<th>Actual NH Practice</th>
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</thead>
<tbody>
<tr>
<td>Simple UTI (cystitis)</td>
<td>3 days&lt;sup&gt;1&lt;/sup&gt;</td>
<td>3 days&lt;sup&gt;1&lt;/sup&gt;</td>
<td>3 days</td>
<td>3 days</td>
</tr>
<tr>
<td>COPD exacerbation</td>
<td>3-10 days&lt;sup&gt;2&lt;/sup&gt;</td>
<td>--</td>
<td>3-5 days</td>
<td></td>
</tr>
<tr>
<td>Pneumonia without sepsis</td>
<td>Until afebrile for 3d</td>
<td>&gt;=5 days&lt;sup&gt;4&lt;/sup&gt;</td>
<td>&gt;=5 days</td>
<td></td>
</tr>
<tr>
<td>Cellulitis (lower extremity)</td>
<td>10 days&lt;sup&gt;3&lt;/sup&gt;</td>
<td>5 days</td>
<td>5-7 days</td>
<td></td>
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<sup>1</sup> TMP-SMX – 3 days; Nitrofurantoin – 5-days; 2 Varies with drug. No therapy required in most cases; 3 Not diabetic; 4 Minimum 5 days (should be afebrile 48-72 hours);’ non-ambulatory treat as HCAP; assess using score for severity
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## OBJECTIVES AND QUESTIONS

1. **Context:** Is antibiotic resistance a problem in your nursing home? If so, how do you know?
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3. **Do something:** If you were designing a program to reduce inappropriate antibiotic use, what behaviors would you most want to change?
**STEP THREE:**
DEVELOPING AN ANTIBIOTIC STEWARDSHIP PROGRAM IN YOUR NURSING HOME

QUESTION: If you were designing a program to reduce inappropriate antibiotic use, what behaviors would you most want to change?

ANTIBIOTIC STEWARDSHIP WORKS ....SOMETIMES

THE CDC’S SEVEN KEY ELEMENTS OF ANTIBIOTIC STEWARDSHIP

CDC’s Core Elements of Antibiotic Stewardship in Nursing Homes
#1. LEADERSHIP COMMITMENT

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

THE CHALLENGE OF LEADERSHIP TURNOVER

One-year turnover rate in NC Nursing Homes:
- Administrator
- Director of Nursing
- Infection Control Nurse
#2. ACCOUNTABILITY
CREATE AN ANTIBIOTIC STEWARDSHIP TEAM AND MAKE THEM ACCOUNTABLE

- Medical Director
- Director of Nursing
- Infection Preventionist
- Consultant Pharmacist
- Laboratory
- ID Consultant

# 3. DRUG EXPERTISE
THE CONSULTANT PHARMACIST CAN BE YOUR FRIEND

- Pharmacists are increasingly aware of antibiotic stewardship issues
- Work with consultant pharmacist with infectious disease or antibiotic stewardship training
- Also ally yourself with programs and experts in hospitals or medical centers
#4 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 has published 2-page template

#4. THEN **TAKE ACTION!!**

- Create policies to improve antibiotic prescribing and use
  - Require prescribers to document a dose, duration, and indication for all antibiotic prescriptions
  - Develop algorithms for assessing, testing and treating infected residents
- Implement practices to improve antibiotic use
  - Standardize assessment and communication tool for potentially infected residents
  - Standardize process for communication of antibiotic use information during transfers
  - Develop antibiograms
  - Take an antibiotic “time out”
SUGGESTED POLICIES AND PROCEDURES

- Improved communication with providers – SBAR; protocols; photos of skin problems
- Improved decision-making – algorithms; standing orders
- Improved antibiotic selection – protocols; standing orders
- Improved use of test results: chest x-rays, urine culture data, including negative cultures -- protocols
IMPROVING CARE PROCESSES: APPROACHES THAT WORK

- Guidelines for urine testing, including what to do when cultures come back
- Pharmacist involvement in evaluating antibiotic starts and/or antibiotic duration
- Excel spreadsheet to chart antibiotic use – and regularly publicizing statistics

- CRITICAL ROLE OF LEADERSHIP CANNOT BE OVEREMPHASIZED -

APPROACHES THAT ARE MORE DIFFICULT TO IMPLEMENT

- Communication guidelines for nursing staff around suspected infections – SBAR; protocols (e.g., asking for photos of skin problems)
- Antibiotic initiation protocols
- Infection Control Nurse leadership role (“infection preventionist”)
- Antibiograms

- CRITICAL ROLE OF LEADERSHIP CANNOT BE OVEREMPHASIZED -
RECOMMENDATIONS FOR PRACTICE: SEPSIS DETECTION PROGRAM

1. If status change → document vital signs at least 2x / day
2. Apply two screens to vital signs:
   ▶ 100-100-100
   ▶ Temperature ≥99.0°F
3. If either screen is positive:
   ▶ urgent in-person or virtual visit with medical provider
   ▶ rapid diagnostic testing – e.g., WBC, blood culture, serum lactate and possibly serum calcitonin; others per symptoms
   ▶ begin scheduled vital sign recordings every four hours

OPTIONS AVAILABLE TO REDUCE C DIFF POST HOSPITALIZATION

1. 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”
   ▶ Current evidence is mixed for infection control

3. Infection Control

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

Which Antibiotics Pose the Highest Risk of Clostridium Difficile?

Pawar et al. ICDHE 2012; 33:1107-12

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

INFECTION CONTROL IS IMPORTANT!!!
-Preventing C Diff Infection and Spread-

**SPREAD**
- Touching unclean surfaces, especially those in healthcare settings, contaminated with feces from an infected person.
- Dirty hands.
- Failing to notify other healthcare facilities when patients with *C. difficile* transfer from one facility to another.

**PREVENT**
- Improve prescribing of antibiotics.
- Use best tests for accurate results to prevent spread.
- Rapidly identify and isolate patients with *C. difficile*.
- Wear gloves and gowns when treating patient with *C. difficile*. Remember that hand sanitizer doesn’t kill *C. difficile*.
- Clean room surfaces with EPA-approved, spore-killing disinfectant (such as bleach), where *C. difficile* patients are treated.

# 5. TRACK PROCESSES

- Clinical assessment documentation with change of condition
- Prescribing documentation
  - Antibiotic type
  - Frequency
  - Duration
- Adherence to facility-specific treatment recommendations
  - Staff process
  - Prescriber process

# 5. TRACK OUTCOMES

**Antibiotic Prescribing**
- Point prevalence surveys of antibiotic use
- New antibiotic starts/1,000 resident-days
- Antibiotic days of therapy/1,000 resident-days

**Adverse Events**
- Rates of *C. difficile* infections
- Rates of antibiotic-resistant organisms
- Rates of adverse drug events due to antibiotics
- Hospitalizations and Emergency Department visits for infections
AN ABUNDANCE OF FREE HELP!

- https://www.health.state.mn.us/diseases/antibioticresistance/hcp/asp/ltc/index.html
- https://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/SNF_ASP_Toolkit.aspx
- https://www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html

INFECTION TRACKING EXCEL SPREADSHEETS

UNC Antibiotic Stewardship Start-Up Package
**ANTIBIOTIC PRESCRIBING PORTION OF INFECTION TRACKING SPREADSHEETS**

![Antibiotic Stewardship Start-Up Package](image)

**INFECTION TRACKING EXCEL SPREADSHEETS**

![Infection Tracking Excel Spreadsheets](image)
#6. REPORT OUTCOMES!

- Time should be set aside to report on the data you’ve tracked
- Let providers know how they’re doing

#7. EDUCATION

- Clinical providers (MD, DO, NP, PA, PharmD)
- Nursing staff (RNs, LPNs, CNAs)
- Residents and families
• A step-by-step guide explaining how to incorporate our materials into a program that will improve outcomes

Developed by
The Cecil G. Sheps Center for Health Services Research
At the University of North Carolina at Chapel Hill

• One-hour in-service DVD
• Pocket cards with key guidelines
POSTERS TO PROVIDE PERIODIC REMINDERS TO STAFF

UNC Antibiotic Stewardship Start-Up Package

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

Why Not Antibiotics?

Taking antibiotics when they are not needed is like leaving the lights on all the time...
The lights may burn out, leaving us in the dark when we need them most.
If we use antibiotics when we don’t need them, they may not work when we get sick.

Read more inside...

TRAINING DVD FOR EMERGENCY DEPARTMENT STAFF

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

CONTROVERSIES IN EMERGENCY DEPARTMENT MANAGEMENT OF NURSING HOME PATIENTS WITH SUSPECTED INFECTION

ROUND TABLE DISCUSSION OF 10 TOUGH CASES

• Infiltrate vs atelectasis on x-ray
• Nonspecific symptoms: to culture or not?
• Urinary retention and polymicrobial urine culture
• Started on antibiotics in emergency department: can the nursing home stop it?
• Nonhealing gastronomy site: is it infection?
• Multiple antibiotic courses: patient becomes pan-resistant
• A case of urosepsis – could it have been prevented?
• Antibiotic associated diarrhea: what to do?
• Cycle of repetitive ED visits and hospitalizations

2015

1 hour free CME credit available for MDs, DOs, NPs, and PAs
Free and Modestly-Priced Resources on the Web

nursinghomeinfections.unc.edu
CAN YOU TAKE THE LEAD IN YOUR FACILITY?