Healthcare Epidemiology in the LTC Setting
Bringing it all Together

David A. Nace, MD, MPH, CMD
Division of Geriatric Medicine
University of Pittsburgh

Chief of Medical Affairs
UPMC Senior Communities

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Speaker Disclosures

Dr. Nace has no conflicts of interest related to this presentation.
Learning Objectives

By the end of the session, participants will be able to:

• Discuss challenges faced by LTC facilities when implementing an infection control program

• Describe what a reasonable Infection Prevention & Control Program (IPCP) for nursing facilities might look like

• Discuss the role of interdisciplinary team members in supporting LTC infection control programs

Evolution of Nursing Homes & the Regulatory Environment

Marion Branch National Home for Disabled Volunteer Soldiers, Indiana

1965 Medicare & Medicaid

Nursing Home Reform Act of 1987 OBRA 87

2016 – CMS Updates "Requirements of Participation"

2009 – Infection Control Guidance Updated
Nursing Homes – Key Component of the Modern U.S. Healthcare System

- Nursing Homes are the predominant institutional site for PA/LTC
- PA/LTC represents fastest growing spending category in US healthcare system*

Nursing homes are active participants in the transmission of MDROs across care sites**

* Chandra A, Dalton MA, Homes J. Health Affairs, May 2013

Nursing Facilities Roles

- Residential
- Medical Care
- Rehabilitation
- Spiritual Care
- Socialization
What is the Purpose of the IPCP in NFs?

- Prevent Healthcare Associated Infections
- Prevent Antimicrobial Resistance
- Prevent Adverse Drug Events

Harm from infections among SNF residents

- Infections were among the most common causes of harm; accounting for 26% of adverse events

<table>
<thead>
<tr>
<th>Type of Harm</th>
<th>Events related to infection</th>
<th>Infection events deemed preventable</th>
<th>Transfers to hospital from infection event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverse events</td>
<td>39 (25.8%)</td>
<td>22 (59%)</td>
<td>34 (87.2%)</td>
</tr>
<tr>
<td>(n=148)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of Harm</th>
<th>Events related to infection</th>
<th>Infection events deemed preventable</th>
<th>Transfers to hospital from infection event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporary</td>
<td>20 (16.8%)</td>
<td>9 (45%)</td>
<td>NA</td>
</tr>
<tr>
<td>(n=113)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Hospitalizations from infections were estimated to cost ~83 million dollars (the most expensive cause of harm)

OIG report: Adverse Events in Skilled Nursing Facilities: National Incidence Among Medicare Beneficiaries (OEI-06-11-00370), February 2014
Increased ADE Risk in Hi Abx Use Homes

- 24% increased risk of ADE in high use NFs
- Abx related ADE included -
  - C diff, diarrhea, gastroenteritis, MDROs, allergic reactions, general medical ADE
  - Focused on hospital or ED related ADE
- ADE risk occurred among residents with and without abx exposure

<table>
<thead>
<tr>
<th></th>
<th>All Residents</th>
<th>Residents Who Received Abx</th>
<th>Residents Who Didn’t Receive Abx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number Needed to Harm</td>
<td>53</td>
<td>71</td>
<td>83</td>
</tr>
</tbody>
</table>

Infection Control Regulations

• **1990-2009**
  - 5 survey tags — 6 pages
  - F441 — “Infection Control”
  - F442 — “Preventing Spread of Infection”
  - F443 — “Employees with Communicable Disease”
  - F444 — “Handwashing”
  - F445 — “Linens”
  - Antimicrobial stewardship unknown
  - No clear guidance on how to interpret the regs

Infection Control Regulations

• **2005**
  - F334 — “Immunizations” tag added
  - New regulation addressing influenza and pneumococcal vaccination of residents
  - Doesn’t address staff
Infection Control Regulations

• **2009**
  - Surveyor Guidance updated
  - Collapsed tags to F441 – “Infection Control” – 34 pages
  - Required infection control program
    - Included tracking of antimicrobial stewardship
    - Person who oversees, but short of requiring “IP”
    - Oversight not a full FTE
    - Hand hygiene
    - Transmission based precautions

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### STATE OF WISCONSIN / DEPARTMENT OF HEALTH SERVICES
Division of Quality Assurance / Bureau of Nursing Home Resident Care

<table>
<thead>
<tr>
<th>TOP TEN FEDERAL CITATIONS – NATION, STATE, REGIONAL OFFICE – 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nation</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>F323 - supervision to prevent accidents (6160)</td>
</tr>
<tr>
<td>F441 - infection control (6018)</td>
</tr>
</tbody>
</table>

*Courtesy V Griffin, Wisconsin Department of Health Services, Division of Quality Assurance / Bureau of Nursing Home Resident Care, 5/10/2017*
Deficiencies for FY15 and FY14

<table>
<thead>
<tr>
<th>Tag #</th>
<th>Tag Title</th>
<th>RANK (##) FY15</th>
<th>RANK (##) FY14</th>
</tr>
</thead>
<tbody>
<tr>
<td>F225</td>
<td>Investigate/Report Allegations/Individuals</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>F309</td>
<td>Provide Care/Services for Highest Well-being</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>F498</td>
<td>Nurse Aide Competency/Care Needs</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>F465</td>
<td>Safe, functional, sanitary, comfortable environment</td>
<td>7</td>
<td>NR</td>
</tr>
<tr>
<td>F323</td>
<td>Free of Accident/Hazards/Supervision</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>F279</td>
<td>Develop Comprehensive Care Plans</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>F226</td>
<td>Develop/Implement ANE Policies</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>F425</td>
<td>Pharmaceutical Service</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>F371</td>
<td>Food Procure, Store/Prepare/Serve</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>F441</td>
<td>Infection Control</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>


Infection Control Regulations

- **2016**
  - Regulations changed – Guidance Pending - ??How Many Pages??
  - Facilities must have an Infection Control & Prevention Program (IPCP)
  - Facilities must have an Antimicrobial Stewardship Program (ASP)
    - Antibiotic use protocols
    - System to monitor antibiotic use

Infection Control Regulations

**2016**
- Facilities must delegate at least one infection preventionist (IP)
  - May designate more than one person
  - Primary professional training in nursing, medical technology, microbiology, epidemiology, or other related field and can be qualified by education, training, experience or certification

**3 Phase Implementation**
- Phase 1 – Nov 28, 2016 - IPCP
- Phase 2 – Nov 28, 2017 - ASP
- Phase 3 – Nov 28, 2019 - IP

Challenges for Facilities

**Training**
- Infection control
- What is included in an IPCP?
- What types of surveillance are there?
- What is an ASP?

**Annual Facility Risk Assessments**
- What should be considered when performing an annual risk assessment?

**Access to Expertise**
Impact of the New Regulations?

• Facility Activities
  • Past implementation experience suggests that *facilities will change structure and processes*
    • Prior IC regulations
    • PA Act 95 of 2002 – Reporting LTC Staff Immunizations

• Deficiency Citations
  • Will there be a shift in citations?

• Outcomes
  • Uncertain if quality and outcomes will change
    • No alignment of facilities and practitioners
    • Lack of relevant QMs related to infections

Silos and Missed Marks

⇒ Outside of resident immunizations & UTI
  • No facility-based QMs addressing infection control or ASP

⇒ No Impact for Impact Act

⇒ MIPS measures (physician quality payment system requirement) currently irrelevant to nursing facility settings
  AND

⇒ MIPS QMs do not align with facility QM / incentives
Opportunities

• NHSN
  • May prove to be an important data source

• AMDA
  • Promoting ASP as a CMS recognized “Improvement Activity” under MIPS
  • Working with stakeholders to develop relevant QMs

• NQF
  • Calls for measure development - Require substantial funding

The Infection Prevention and Control Program (IPCP)
Creating a Reasonable IPCP for NF

• The visible tip represents the outcomes of the IPCP
  • Limited activity should be spent here
• The non-visible portion represents the activities (processes) undertaken by the IPCP to improve outcomes
  • This is meat of the activity
IPCP Key Activities

• Risk Assessment
  • Identifying key processes that are high volume, high risk, problem prone

• Surveillance *(Measurement)*
  • System to track, trend, monitor, & **assess** outcomes
    • Outcome measures – rates of disease, AMR, ADE
    • Process measures – rates of key components of processes

Surveillance Patterns

• **Common Cause**
  • Endemic disease
  • Seasonality / Cyclic

• **Special Cause**
  • Clusters
  • Outbreaks
  • Epidemics
  • Seasonality / Cyclic
**Surveillance Patterns - Common Cause**

**Endemic disease**

Endemic cases are expected regularly throughout time

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**Surveillance Patterns - Special Cause**

Clusters & Outbreaks

Cluster is an aggregation of cases in a given area, over a period of time.

Outbreak is occurrence of more cases than expected of a particular disease.
Surveillance Patterns – Common or Special Cause
Seasonality / Cyclic

Cases noted to vary predictably at a given time period each year

Typical Surveillance Patterns

<table>
<thead>
<tr>
<th>Facility Acquired Infection</th>
<th>Type of Variation</th>
<th>Pattern</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTI</td>
<td>Common Cause</td>
<td>Endemic</td>
<td>Cluster or seasonality suggests over-diagnosis</td>
</tr>
<tr>
<td>Respiratory</td>
<td>Common Cause</td>
<td>Endemic</td>
<td>Cluster or seasonality suggests respiratory viral cases</td>
</tr>
<tr>
<td>C diff</td>
<td>Common Cause</td>
<td>Endemic</td>
<td>Spike suggests inappropriate abx use; unlikely to be outbreak</td>
</tr>
<tr>
<td>Influenza</td>
<td>Special Cause</td>
<td>Cluster; Outbreak; Seasonal</td>
<td>Never endemic; prompts immediate interventions</td>
</tr>
<tr>
<td>Norovirus</td>
<td>Special Cause</td>
<td>Cluster; Outbreak; Seasonal</td>
<td>Never endemic; prompts immediate interventions</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>Special Cause</td>
<td>Cluster; Outbreak; Seasonal</td>
<td>Never endemic; prompt immediate search for cause</td>
</tr>
<tr>
<td>Legionella</td>
<td>Either</td>
<td>Any</td>
<td>Often endemic; Clusters prompt search for cause</td>
</tr>
<tr>
<td>MDROs</td>
<td>Either</td>
<td>Anh</td>
<td>May be endemic; Clusters prompt search for cause</td>
</tr>
</tbody>
</table>
Defining Infections – “Criteria”

- Definitions used will vary with your goals for surveillance

- Optimal definitions will have no false negatives and no false positives

To conduct surveillance – you must use infection definitions

Reality Check – *Criteria Aren’t Winds That Blow In From the East*
Various “Infection Criteria”

- There are several criteria used to define infections
  - McGeer, Stone, Loeb, PA-PSA, IDSA, etc

- These criteria serve different purposes

- May differ from what you are calling an infection in your facility

- **Stone (2012 Revised McGeer)**
  - Not very sensitive (miss some true infections)
  - Benchmark comparisons against other facilities (*upper portion of iceberg*)

- **Loeb**
  - More sensitive
  - Reasonable set of minimum criteria for when to start antibiotics (*appropriateness - lower portion of iceberg*)

- **PA Patient Safety Authority**
  Similar to Stone

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**Infection Definition Tradeoffs**

- **STONE (REVISED MCGEER)**
  - Low Sensitivity
  - High Specificity

- **LOEB**
  - High Sensitivity
  - Low Specificity
A Word on “Infection Criteria”

• May need to use more then one set of criteria
  • In PA – infections treated as well as PA-PSA reported infections
  • Infections you treat vs those meeting Loeb criteria (appropriateness measure)

• No set of criteria should always supplant clinical judgment

• Clinical judgment should not always supplant criteria

What is important is the process

AHRQ Tools

https://www.ahrq.gov/nhguide/index.html
SBAR Forms

Loeb Criteria Checkboxes

Tool 4. Quarterly or Monthly Prescribing Profile

https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/3_TK2_T4-Quarterly_or_Monthly_Prescribing_Profile_Final.pdf
Example of McGeer Criteria
Class Worksheet Checklist

- Complete worksheet for each resident with suspected infection
- Documents signs and symptoms
- Facilitates analysis of appropriateness


Nursing Home Antimicrobial Stewardship Guide
Toolkit 2. Monitor and Sustain Stewardship

https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/3_TK2_T2-Antibiotic_Use_Tracking_Sheet_Final.pdf
Reporting at QAPI / Infection Control Meeting


The QAPI process and IPCP will both be more data driven.

• Regular QAPI reporting
  • Outcome measures - disease rates, MDRO rates

• Periodic / As needed reporting
  • Process measures – audits of PPE compliance;

Examples of Risk Assessment and Process Surveillance Activities for the 7 Components of an IPCP
Occupational Health

• Risk Assessment
  • Completing a Community TB Risk Assessment
  • Hepatitis B Program and Policies
  • HCP Influenza Immunization Program

• Process Measures
  • Number or rate of PPD conversions among staff
  • Number of staff who accept hepatitis B vaccination
  • Rate of influenza vaccination among staff

Parenteral and Device Care

• Risk Assessment
  • POC Device Policies
  • Line care policies
    • Standards for care
    • Training expectations
  • Injection safety training
  • Urinary catheter care
  • Phlebotomy services

• Process Measures
  • Line care observations
  • Injection safety observations
  • POC device use audits
  • Rates of CAUTI
  • Line infection rates
  • Percent of false positive blood cultures
Toolkit for Implementing Single Patient Use Glucose Meters in Long-Term Care Facilities

Wisconsin


Example of a Checklist for Assessing Competency for Urinary Catheter Insertion

http://m.bardmedical.com/media/143117/edu_bestpracticesfoleyadvance_skillschecklistinsertionremoval.pdf
Example of a Checklist for Assessing Competency for Urinary Catheter Insertion

CDC Website

https://www.cdc.gov/hai/prevent/tap/resources.html
http://www.mnreducinghais.org/prevention/injection.html
Central Line Checklist


Aseptic Technique for Dressing Changes

https://www.jointcommission.org/topics/clabsi_toolkit__chapter_3.aspx
Antimicrobial Stewardship

• Risk Assessment
  • Guideline adherence (*caution - this won’t be black or white*)
  • Broad spectrum antibiotic use
  • Antimicrobial resistance
  • C diff burden

• Process Measures
  • Antibiotic use measures – antibiotic starts, antibiotic days
  • Rate of compliance with Loeb (or other treatment) criteria
  • Rate of treatments over 7 days
  • MDRO rates
  • Rate of usage of specific antibiotics such as floxacins

UTI Test Tracking Sheet

<table>
<thead>
<tr>
<th>General Information</th>
<th>Nursing Assessment</th>
<th>Provider Ordering Results</th>
<th>Audit of Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room Number</td>
<td>Resident’s Name</td>
<td>Date Symptom Onset (Day)</td>
<td>Localizing Urinary Signs and Symptoms (Classify as Renal, Urinary Tract)</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------------</td>
<td>--------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Room 1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• Tracks testing for suspected UTI
• Symptoms checked on drop down list
• Interdisciplinary approach – engages Medical Director
• Can be used to determine rate of compliance with Loeb or other criteria

Wisconsin HAI in LTC Coalition – UTI Test Tracking Sheet. Courtesy V Griffin, 5/10/2017
https://www.dhs.wisconsin.gov/regulations/nh/hai-events-index.htm
MDRO Tracking
Mandated CRE Reporting WI

- CRE tracking in WI
  - Voluntary as of Sep 1, 2016
  - Mandatory as of Jun 1, 2017

- NHSN reporting module

- All facilities must enter information monthly, even if no cases occurred in the facility
  - Must report the denominator monthly
  - [https://www.cdc.gov/nhsn/pdfs/ltc/ltcf-labid-event-protocol_current.pdf](https://www.cdc.gov/nhsn/pdfs/ltc/ltcf-labid-event-protocol_current.pdf)

Immunizations

- Risk Assessment
  - Vaccine education
  - Resident immunization – influenza and pneumococcal disease

- Process Measures
  - Immunization rates
  - Documentation audits
    - Was education provided?
    - Were vaccine information statements (VIS) given?
Transmission Based Precautions

• Risk Assessment
  • MDRO transfer
  • Outbreak spread

• Process Measures
  • PPE compliance audits
  • Rate of education compliance

Hand Hygiene

• Risk Assessment
  • 5 Moments
  • Accessibility of Alcohol Based Sanitizers
  • Resident hand hygiene

• Process Measures
  • Compliance observations and audits
  • ABHG dispenser audits
    • Percentage empty (or broken) by unit
  • Rate of use of resident hand wipes
Environment

• Risk Assessment
  • Legionella (in areas prone to legionella)
  • MDDRO / C diff risk
  • Water pitcher contamination

• Process Measures
  • Water cultures or faucet cultures
  • Terminal cleaning audits
  • Linen handling audits
  • Water pitcher audits
How Does this Impact Me?

- Administration and Governing Board
  - Know the final guidance
  - Ensure IPCP and QAPI programs are active
    - Ensuring right leaders are in place
  - Set expectations for the program
  - Monitoring and responding to results
  - Ensuring resources
    - Appropriate FTE for IP
    - Assess need for consultant expertise
    - Do we have the data sources needed
      - Reach out to lab to obtain antibiograms
    - Do we have the diagnostic testing necessary
      - Frequency of lab draws in facility
      - Timeliness of results
      - Do we have the most appropriate types of testing
How Does This Impact Me?

**• All Nursing Staff**

- Active participants in surveillance
  - Know signs and symptoms of infections – *avoid early closure of differential diagnosis*
  - Thoroughly documenting signs/symptoms of infections
  - Accurately and timely communicating potential and confirmed infections
  - Recognizing increases in infection rates on the unit
- Must be responsible partner in antimicrobial stewardship activities
- Adequate evaluation in response to CNA, resident, or family concerns
- Monitoring response
  - Not just vitals Q shift
  - How is the resident doing?
- Understand role doesn’t end when culture ordered or sensitivities checked
- Make recommendations

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**How Does This Impact Me?**

**• Medical Director**

- Need to read the final guidance
- Active participant in IPCP and QAPI programs
- Communication and outreach to practitioners
- Actively intervening with practitioners
- Assisting in community and facility assessments

**• Attending Physicians and NP / PA / CNS**

- Must respond to pharmacy and facility recommendations
- Align MIPS or APM (ACO) requirements
- Meeting quality metrics to remain on staff and/or in network
- Meeting resident & family expectations
- Practice specialization likely (training or certification in PA/LTC Medicine by ABPLM)
How Does This Impact Me?

• ID Physician and Hospital Based IP?
  
  • Drivers
    • Greater role expected with ACO’s and narrowed networks
    • Uncertainty in the ID physician’s traditional acute care based role
  
  • Potential roles
    • Unlikely to take on the MD or primary care role
    • Invaluable partner in addressing the need for more formalized IPCPs in nursing facilities
    • Collaborating with acute to LTC antibiotic therapy programs
  
  • Caveats
    • Need to make sure there is an understanding of the NF environment and culture
    • Focus on stewardship

References

• Final Requirements of Participation (NF Regs)

• CDC Principles of Epidemiology in Public Health

• Practical Healthcare Epidemiology
  • Lautenbach E, Woeltje KF, Malani PN. University of Chicago Press, Chicago, IL; 3rd Ed: 2010

• WI Healthcare-Associated Infections in LTC Coalition Events
  • https://www.dhs.wisconsin.gov/regulations/nh/hai-events-index.htm
References

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  • https://www.ahrq.gov/nhguide/index.html

• Collaborative Healthcare-Associated Infection Network
  • http://www.mnreducinghais.org/

• Injection Practices – HAI Prevention Strategies
  • http://www.mnreducinghais.org/prevention/injection.html

• PA Patient Safety Authority
  • http://patientsafetyauthority.org

Questions?

Thank You!

Contact Information

David A. Nace, MD, MPH, CMD naceda@upmc.edu