Long Term Care Infection Prevention Starts at the Top

Webinar for Long Term Care Leaders, Quality Directors, and Administrators
Hosted by the Illinois Department of Public Health, Division of Patient Safety and Quality

May 15, 2014
The opinions, viewpoints, and content presented in this webinar may not represent the position of the Illinois Department of Public Health.
Long Term Care in the ERA of Antibiotic Resistance

Vishnu Chundi M.D.
Metro Infectious Disease Consultants
Intentions

Plans are only good intentions unless they immediately degenerate into hard work. Peter Drucker

Hell isn't merely paved with good intentions; it's walled and roofed with them. Yes, and furnished too. Aldous Huxley
Metro Infectious Diseases Consultants

70 plus Infectious Disease doctors- Private practice
Provide care in about 100 hospitals in Illinois, Michigan, and Indiana
Have been involved in LTAC care for more than 15 years
Provide infection control and attempting to provide antibiotic stewardship to over 30 nursing homes
What is my Role

Consultative practice in Infectious Disease
Not on the payroll of any Hospitals, Pharmaceutical company or other agency.
Over 15 years of experience in Acute care, Long term acute care and 3 years in long term care facilities
Provide infection control guidance to large nursing home groups
Outline

- Issues in LTCF
- Why should we care?
- Drivers for antimicrobial use
- Inter-relations between Acute Care/LTAC/LTCF
- Possible Interventions
BACKGROUND

- US population age>85 is expected to double by 2030
- 1 of every 4 persons who reach age 65 will likely spend part of life in LTCF
- 1.5 million persons in US reside in LTCFs
  - More than acute care hospitals in the US
INTENSITY OF ILLNESS

2.6-14 Infx/1000 Resident-days

63% Deaths – Infection Related

25-50 % ACH Transfers Secondary to Infx
WHY INFECTION IN LTCF?

SUSCEPTIBLE HOST:

- Underlying illnesses
- Impaired immune response
- Medications affecting resistance to infection
- Impaired mental status
- Incontinence
- Indwelling urinary catheters
- Central or PICC catheters
Screening

- Illinois: Mandatory MRSA screening for all ICU patients
- REALM (Regional Evaluation of a Legislative Mandate) Study, CDC sponsored to evaluate MRSA rates following the legislative mandate
- CRE 2001 1% of K. pneumonia strains reported to CDC were CRE
- 2007 CRE comes to Chicago
- 2008 8% of K. pneumonia strains reported to CDC were CRE
LTAC Cycling- The Golden Triangle

- Transfer of patients between Acute care hospital to LTAC and Nursing home and back to acute care
- Resulting in inter-facility and intra-facility spread of MDRO
- These patients per guidelines receive the broadest spectrum antimicrobial therapy as they are likely to harbor MDRO’s
THE CHALLENGE

Invasion – of MDRO’S, sicker patients

Intrusion – Regulatory Concerns
  - Infections in the Media

Paradigm Shift – ACH → LTACH → LTCF
THE EXPECTATIONS

- Provide more care with less Money
- Prevent transfer of MDROs to other patients
- Identify ALL patients colonized by MDROs on admission to LTCF....without transfer data
- Alert the receiving institution of any potential isolation concern – even if you don’t know the patient has an MDRO
CRE Detect & Protect Campaign

Carbapenem Resistant Enterobacteriaceae

Extensively Drug Resistant Organism Registry

Mandatory reporting began November 1, 2013

https://www.xdro.org/img/MEMO_XDRO%20Registry_090413_Final.pdf

www.xdro.org
Novel public health infection control tool created as partnership between

- Chicago CDC Prevention Epicenter
- Illinois Department of Public Health
- Medical Research Analytics and Informatics Alliance (MRAIA)
The XDRO registry addresses 2 critical gaps

<table>
<thead>
<tr>
<th>Gap</th>
<th>XDRO registry</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Need improved inter-facility communication</td>
<td>Allows for CRE information exchange</td>
</tr>
<tr>
<td>2. Need improved detection</td>
<td>Stores CRE surveillance data</td>
</tr>
</tbody>
</table>
XDRO registry:
intended participants

All Illinois hospitals (including LTACHs)
All Illinois intermediate and long-term care facilities
All Illinois laboratories
Long Term Care Facilities

Long-term care facilities (LTCFs) may be defined as institutions, such as nursing homes and skilled nursing facilities that provide healthcare to people who are unable to manage independently in the community.
Renewed Respect for Role of the Environment: Who’s Been in the Room Before or With You?

- Huang SS (2006); Drees M (2008); Zhou Q (2008); Moore C (2008); Hamel M (2010)
  - All documented increased risk of acquisition of VRE, MRSA, &/or CDI when admitted to room where prior occupant had one of these or if in multi-occupancy room
  - So what’s the answer?

"The patient in the next bed is highly infectious. Thank God for these curtains."
Pathways to Resistance

Pathways to antimicrobial resistance. Antimicrobial resistance may spread through multiple direct and indirect pathways to humans and food animals (arrows). The relative strength of these pathways will differ greatly not only for different bacteria and different kinds of resistance but also in different locations and environments. Mather et al.’s study contributes to the development of a quantitative understanding of this complex process.
Figure 1: Dates of discovery of distinct classes of antibacterial drugs

Illustration of the "discovery void." Dates indicated are those of reported initial discovery or patent.

- 1910: Salvarsan
- 1920: Penicillin
- 1930: Sulfonamide
- 1940: Streptomycin
- 1940: Bacitracin
- 1940: Nitrofurans
- 1940: Chloramphenicol
- 1940: Polymyxin
- 1940: Chlortetracycline
- 1940: Cephalosporin
- 1940: Pleuromutilin
- 1940: Erythromycin
- 1940: Isoniazid
- 1940: Vancomycin
- 1940: Streptogramin
- 1950: Nalidixic acid
- 1950: Trimethoprim
- 1950: Lincomycin
- 1950: Fusidic acid
- 1950: Fosfomycin
- 1950: Mupirocin
- 1950: Metronidazole
- 1950: Carbapenem
- 1950: Oxazolidinone
- 1950: Monobactam
- 1950: Daptomycin

Adapted from Silver 2011 (1) with permission of the American Society of Microbiology Journals Department.
On the drip. In China, antibiotics are commonly taken intravenously for colds and other maladies that are often treated less aggressively in the west.
Country-to-Country Transfer of Patients and the Risk of Multi-Resistant Bacterial Infection

Benjamin A. Rogers,1 Zohreh Aminzadeh,1,2 Yoshiro Hayashi,1,3 and David L. Paterson1

1University of Queensland Centre for Clinical Research, The University of Queensland, Herston, Brisbane, Australia; 2Infectious Diseases Research Centre, Shaheed Beheshti University M. C., Tehran, Iran; 3Department of Intensive Care Medicine, the Royal Brisbane & Women's Hospital, Herston, Brisbane, Australia

Management of patients with a history of healthcare contact in multiple countries is now a reality for many clinicians. Leisure tourism, the burgeoning industry of medical tourism, military conflict, natural disasters, and changing patterns of human migration may all contribute to this emerging epidemiological trend. Such individuals may be both vectors and victims of healthcare-associated infection with multiresistant bacteria. Current literature describes intercountry transfer of multiresistant Acinetobacter spp and Klebsiella pneumoniae (including Klebsiella pneumoniae carbapenemase– and New Delhi metallo-β-lactamase–producing strains), methicillin-resistant Staphylococcus aureus, vancomycin-resistant enterococci, and hypervirulent Clostridium difficile. Introduction of such organisms to new locations has led to their dissemination within hospitals. Healthcare institutions should have sound infection prevention strategies to mitigate the risk of dissemination of multiresistant organisms from patients who have been admitted to hospitals in other countries. Clinicians may also need to individualize empiric prescribing patterns to reflect the risk of multiresistant organisms in these patients.
CRE Spread
NDM-1 Feb 2011
NDM-1 Spread
THE PERFECT INFECTIOUS STORM

MDROs

CROWDING

I’m in isolation

CATHETERS

COST

CONSTRAINTS
Who Owns Nursing Homes?

![Pie chart showing the distribution of nursing homes by type of ownership.]

- **Proprietary**: 61.5%
- **Voluntary nonprofit**: 30.8%
- **Government and other**: 7.7%


*Figure 1. Percent distribution of nursing homes, according to type of ownership: United States, 2004.*
Who Pays?

![Bar chart showing percentage of nursing home residents by sources of payment at admission and at time of interview: United States, 2004.](chart)

**Figure 3.** Percentage of nursing home residents, by sources of payment at admission and at time of interview: United States, 2004.

**Source:** CDC/NCHS, National Nursing Home Survey, 2004.
How Independent are the residents?

[Chart: Pie chart showing percentages of nursing home residents by number of activities of daily living dependencies.]

NOTE: Activities of daily living (ADLs) are bathing, dressing, toileting, transferring, and eating.

Figure 4. Percentage of nursing home residents, by number of activities of daily living dependencies: United States, 2004.
Length of stay - Only the lonely

- Married or living with partner: 345 days
- Widowed: 480 days
- Divorced or separated: 543 days
- Single or never married: 556 days

You have to be brave to get old

Figure 6. Percent distribution of nursing home residents, according to continence levels in bowel and bladder: United States, 2004

Co morbid Illness in Nursing Homes

Figure 7. Percentage of nursing home residents, by selected primary diagnoses at admission and at time of interview: United States, 2004.

Figure 8. Percent distribution of nursing home residents, according to number of hospital admissions with an overnight stay in the 90 days before the facility interview: United States, 2004.
ED Visits

NOTE: ED is emergency department.

Figure 9. Percent distribution of nursing home residents, according to number of hospital emergency department visits in the 90 days before the facility interview: United States, 2004
### Survival of Pathogens On Environmental Surfaces

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. difficile</td>
<td>&gt;5 months</td>
</tr>
<tr>
<td>Staphylococci</td>
<td>7 months</td>
</tr>
<tr>
<td>VRE</td>
<td>4 months</td>
</tr>
<tr>
<td>Acinetobacter</td>
<td>5 months</td>
</tr>
<tr>
<td>Norovirus</td>
<td>3 weeks</td>
</tr>
<tr>
<td>Adenovirus</td>
<td>3 months</td>
</tr>
<tr>
<td>Rotavirus</td>
<td>3 months</td>
</tr>
<tr>
<td>SARS, HIV etc.</td>
<td>Days to weeks</td>
</tr>
</tbody>
</table>
The Inanimate Environment Can Facilitate Transmission

X represents VRE culture positive sites

~ Contaminated surfaces increase cross-transmission ~

The Infection Problem

- INFECTED PATIENTS
- SUSCEPTIBLE PATIENTS
- ENVIRONMENTAL SURFACES
- HCW HANDS

ISOLATION

HAND HYGIENE
Patients and Docs

- Some in need of antibiotic interventions
- Some ignore isolation signs
- Some can’t distinguish colonization from infection
- Some are biologic terrorists whose weapons are patients colonized with resistant organisms
DRIVERS OF ANTIMICROBIAL USE IN LTCF
THE CHALLENGE

1.5-3.8 million (2000 est.) nosocomial infections occur in LTCF’s yearly

Average of 1 infection per resident per year

Acuity of illness of LTCF residents has increased – similar to acute care hospitals
Transitions in Care

Transfer from one facility to another
Not necessary to leave the physical hospital (Sub acute care; Rehabilitation; Outpatient)
Long Term Acute Care (Kindred, RML, etc)
Significant administrative rules that dictate admission criteria
Staffing ratio differences
Rehabilitation issues
Transfer within Facility

Rehabilitation and Sub acute care

Sub Acute care has approximately daily reimbursement of $400.00 a day. Nursing home care is $205.00 for semi private room

Rehabilitation also has significant restrictions on testing and antimicrobial use

Encourages empiricism

Infection control issue – common areas
Long Term Care Facilities
Nursing Homes

In U.S. 2011- 15,702 nursing homes with 1.7 million residents. Occupancy rate of 86%

In Illinois- 781 nursing homes with 100,346 residents
http://www.cdc.gov/nchs/data/hus/hus12.pdf#109

In Illinois MIDS provides ID consultative services for 36 nursing homes focusing on infection control.
Most consultations are for patients with multiple co-morbidities who would have stayed at an LTAC or acute care hospital in past.
Long Term Care

Issues

Cohorting of patients - Beds and space
Infection control associated costs
Nursing homes are the residents homes - Rights, dignity
Antibiotic costs - Byzantine rules based on insurance carriage
Reimburse physician for 1 visit month - even with sicker patients
Hand Off/ Fumble

Poor Hand Offs

Complex patients

Overly complex charts with frequent contradiction

Electronic Medical Record

Inconsistent use of Dose/ Duration/ Start with stop dates

Fumbling/ Bumbling
Issues at Transfer

MIDC
Metro Infectious Disease Consultants, L.L.C.
Cultures

Frequent misuse of culture data or lack of data
Colonization and Infection-
IDSA diabetic foot guidelines- We recommend sending a specimen for culture that is from deep tissue, obtained by biopsy or curettage after the wound has been cleansed and debrided. We suggest avoiding swab specimens, especially of inadequately debrided wounds, as they provide less accurate results (strong, moderate).
Studies

PubMed – Antimicrobial stewardship in term care – 17 citations of which 10 are relevant

Jump RL et al. V.A LTCF 160 beds Cleveland report a decrease in antimicrobial usage by 30% and a statistically significant decrease in C. difficile rates in post intervention period. On site ID consultation
Sisyphean Task

- Convincing MD’s that Antimicrobials are Misused
- Educating MD’s about Antimicrobial Resistance
- Questioning MD’s about Indications for Antimicrobial Use
- Getting MD’s to conform to Documentation Standards
- Instruct MD’s on distinguishing Colonization from Infection
- Not place emphasis on cost savings
ANTIBIOTIC STEWARDSHIP

Some studies report that 25-75% of antibiotics were prescribed inappropriately.

Education on judicious antibiotic use, avoiding culture of colonized body fluids & surfaces, and development of antibiotic guidelines have improved LTCF antibiotic usage in several studies.
ANTIBIOTIC STEWARDSHIP

Antibiotic resistant pathogens i.e. MDRO are strongly associated with antibiotic use.

Antibiotics are used in approximately 7 – 10% of residents in LTCF. During a 1-year period, the chance of receiving at least 1 course of antibiotics is >50%.

A common problem is the failure to distinguish INFECTION from COLONIZATION. Antibiotics may be overprescribed for colonization. Frequently, antibiotics are prescribed over the phone in this setting. Example: treating a positive urine or sputum culture over the phone, without clinical correlation.
Our Experience

To date we have been actively engaged with over 30 long term care facilities in combination of antibiotic stewardship, infection control and consultative practice.

Review of all medications prescribed
Results

Medication reconciliation -
Stop all non essential meds - For example Proton pump inhibitors, Drug interactions. Frequently resulted in decrease of diarrhea

Antibiotic use - Defined length and need for antibiotics
Transfer out of facilities - Decreased significantly
Decrease in antibiotic use

Appropriate infection control measures
Hurdles to Overcome

- Misconceptions RE: AB safety/Liability
- Antibiotics used to justify transfer
- Unnecessarily Prolonged Duration of Antibiotics
- Budgetary Constraints for Infection Control Measures
- Restraints on the care of futile cases
XDRO Registry

Participate to better define extent of issues
This will allow for rational development of rules to better utilize limited resources
Hopefully allow for improved care of patients with reduction in infections and cost
Thank You
Thank you for attending!

Please fill out webinar evaluation:
https://www.surveymonkey.com/s/cre-ltcf-admin

Webinar recordings and slides will be available at:
https://www.xdro.org/cre-campaign/index.html

CRE Project Directors:
Robynn Leidig
Robynn.Leidig@illinois.gov
312-814-1631

Angela Tang
Angela.Tang@illinois.gov
312-814-3143