Decreasing CRE Incidence through Prevention in Long Term Acute Care Hospitals

Wasif Hafeez, MD, Chief of Infectious Disease, DMC Sinai-Grace Hospital
Debbie White MSN, CPHQ, CIC, Divisional Director of Quality Mgmt., Select Medical
Beth Oakley RN, BSN, Infection Control, Select Specialty Hospital - Grosse Pointe
SELECT MEDICAL’S LTACH FOOTPRINT

100+ Long-Term Acute Care Hospitals (LTACH)
(26 States)
Growing Critically Ill Population

- Advancing technology contributes to improved survival from acute catastrophic illness
- There is a more frequent transition to chronic critical illness in this patient population
- This larger population will now have requirements for expertise in chronic critical illness

> 5M
# of Patients admitted to ICUs every year

17% - 39%
Of total hospital costs ($121 billion annually)

1/3
Proportion of patients who require mechanical ventilation

25%
Percentage of patients on a ventilator >7 days

1Crit Care Med suppl, 2008
2Crit Care Med 2013
Acute Critical Illness or Trauma

- Recover Quickly
- Die Quickly
- Survive or Become Chronically Critically Ill

- Prolonged mechanical ventilation
- Multi-organ system failure may require hemodialysis or TPN, etc.
- Profound weakness and debilitation
- Requirement for high levels of nursing care

• LTACHs provide care to a unique patient population
  – Have had long and complicated ICU stays
  – Are typically elderly with chronic conditions superimposed on acute conditions
  – Are experiencing severe protein-calorie deficits
  – Have invasive devices
  – Have a history of sepsis and infections with a significant percentage of these caused by MDRO’s
  – Are actively colonized with MDRO’s at the time of admission
  – Have significant wound and skin issues present at the time of admission
• All of these create the perfect storm for patients at risk for infection complications
Conditions Managed in the LTACH Setting

- Prolonged Mechanical Ventilation
- Complex pulmonary disorders
- Refractory COPD exacerbation
- Refractory CHF exacerbation
- Sepsis with sequelae
- Complex infectious disease
- Renal failure
- Postoperative management CVS, GI surgery
- CNS disease-TBI, postop, CVA/bleed
Our Patients

- Are at increased risk for infections due to multiple risk factors
- Resulting in a greater potential for being on antibiotics
- With each course of antibiotics, selective pressure increases until a MDRO gets selected out
- MDROs are exceedingly difficult to treat
- Horizontal spread of MDROs remains a threat
- Other issues include:
  - CDI
  - HAPU
  - Nutrition
Initiatives in place at Select Specialty Hospital Northwest Detroit

1. Besides the basics of Infection Prevention
   a) CHG BATHING
   b) Daily for vented patients and known MDRO
   c) Weekly for all patients

2. Oral care, elevate head of bed, monitor residuals

3. Device Utilization Reduction
   a) Foley Fridays
   b) No Femoral lines
   c) Avoid PICC lines
   d) Promote Midlines
4. Active surveillance for MDROs
   a) “Did not really work for us”
   b) Literature claims 10%+ cultures

5. Probiotics
   a) Under consideration
   b) Mixed results in prior trials

6. Early isolation or Cohorting
   a) Theradoc
   b) Verigene
7. Antimicrobial Stewardship
   – Avoid Quinolone use
   – Use narrowest spectrum Abx
   – Encourage obtaining cultures before Abx Dx
   – Cultures should not be drawn from lines
   – De-escalate Abxs as Cxs become available
   – Differentiate infection from colonization
   – Treat the patient not the culture
   – Shorter courses of Abx
   – Pay attention to innoculum effect
     • Proper dosing – especially betalactams
     • Use of synergy
   – Aggressive source management
Has it Worked?
Select Specialty LTACHs Infection Control Plan

• Five (5) major components
  1. Planning
  2. Prevention
  3. Surveillance
  4. Control
  5. Reporting

• Comprehensive approach
• Intended to provide guidance to prevent, recognize and report infections
• Is consistent with all evidence-based guidelines, consensus statements and community standards (where applicable)
• Is a continuation of our overall pt/staff/visitor safety plan
IC Plan Components

• Planning
  – Risk Assessment & program eval
  – Readiness: Bio-terrorism, Pandemic Flu
  – Current antibiogram

• Controls
  – Environmental controls
  – Education of staff, patients & visitors
  – MDRO controls

• Prevention
  – HH/PPE
  – Cleaning/disinfection
  – Invasive device protection from contamination (bundles)
  – Vaccine compliance
  – Special transmission precautions for existing infections
• The policy of the Hospital is to prevent transmission of highly transmissible or epidemiologically important infections by direct or indirect contact

• Because of the fragility of the patient population and the high degree of MDRO colonization and infections at the time of admission, these have been expanded beyond the 2007 CDC Guidelines
• Mandatory Reporting
  – State specific required reporting
  – CMS requires:
    • CLABSI
    • CAUTI
    • VAE
    • Laboratory identified C-diff
    • Laboratory identified MRSA in the blood
    • Flu vaccine participation (employees/LIP/LDP; patients)

• Internal Reporting
  – HA Cdiff
  – HA MDRO infections of any kind (urine/blood/stool/sputum/wound/etc.)
Specific High Risk Conditions

• Implementation of evidence-based guidelines
  – Pneumonia
  – Ventilator Associated Events (Ventilator Associated Conditions-VAC and Ventilator Associated Conditions-possibly infection related-IVAC)
  – Device related infections
  – Influenza prevention
CARBAPENEM-RESISTANT ENTEROBACTERIACEAE

9,000 DRUG-RESISTANT INFECTIONS PER YEAR
600 DEATHS

CARBAPENEM-RESISTANT KLEBSIELLA SPP. 7,900
CARBAPENEM-RESISTANT E. COLI 1,400

CRE HAVE BECOME RESISTANT TO ALL OR NEARLY ALL AVAILABLE ANTIBIOTICS

THREAT LEVEL
URGENT
This bacteria is an immediate public health threat that requires urgent and aggressive action.
CRE Initiative Results in MI LTACHs

Resulted in decreased infection rates in long-term acute care hospitals
Goal:

• Build a regional, public health model to reduce the spread of CRE
### Participation Timeline

<table>
<thead>
<tr>
<th>Phase</th>
<th>Baseline Period</th>
<th>Intervention Period</th>
<th># Acute Care Facilities</th>
<th># LTAC Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>Sept 2012-Feb 2013</td>
<td>March 2013- Aug 2014</td>
<td>17</td>
<td>4</td>
</tr>
<tr>
<td>Phase 2</td>
<td>March 2014-Aug 2014</td>
<td>Sept 2014-Feb 2016</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Phase 3</td>
<td>Sept 2015-Feb 2016</td>
<td>March 2016-Aug 2017</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>
Overall CRE Incidence Density in STACHs and LTACHs

Overall CRE Incidence Density (cases per 10,000 patient days)

- Cohort 1: Acute Care Facilities
- Cohort 1: LTACHs
- Cohort 2: Acute Care Facilities
- Cohort 2: LTACHs

- Baseline
- Intervention
# Impact of CRE Prevention Efforts

<table>
<thead>
<tr>
<th></th>
<th>LTACHs</th>
<th>Acute Care Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparative patient days ratio</td>
<td>1</td>
<td>33</td>
</tr>
<tr>
<td># of infections prevented in Cohort 1</td>
<td>37</td>
<td>197</td>
</tr>
<tr>
<td>Approximate comparative ratio of CREs prevented</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td># of infections prevented in Cohort 2</td>
<td>14</td>
<td>29</td>
</tr>
<tr>
<td>Approximate comparative ratio of CREs prevented</td>
<td>14</td>
<td>1</td>
</tr>
</tbody>
</table>
• Interventions are critically important in the LTACH environment: differential improvement was found in the LTACH environment after a CRE Prevention intervention as compared to other acute care hospitals.

• Prevention strategies that encourage compliance and sustainability have a greater impact in the LTACH given the acuity of the patients.
• LTAC patients immunocompromised
• On ventilators
• Most on Long Term ABX
What are We Doing to Stop the Spread?

- Education
- Proper PPE and Hand Hygiene
- Re-education
It all Starts in Orientation

- Teaching about importance of PPE and HH
- Patient safety
- Employee safety
• Proper donning of PPE and HH
• Proper doffing of PPE and HH
• Make sure to gown and glove before entering the patients room
• Use carefully-don’t spread the contamination
• Always remember to remove carefully
• WASH YOUR HANDS
“Contaminated” and “Clean” Areas of PPE

• Contaminated
  – Outside front
  – Areas of PPE that have or are likely to have been in contact with body sites, materials, or environmental surfaces where the organism may be living

• Clean
  – Inside, outside back, ties on head and back
  – Areas of PPE that are not likely to have been in contact with the organism-dirty to clean
What Type of PPE Would *You* Wear?

- Just a thinking game for new hires
- While giving a shower?
- Transporting a patient off the floor to a test?
- Responding in an emergency situation?
- Taking vital signs?
- Cleaning an incontinence of stool?
Patient Safety

• Educate the importance of HH and how it stops the spread of CRE and other microbes
• Foaming in and out of every room with no exceptions
• Importance of Educating the families
• Health care workers are hard working individuals
• Wearing plastic impermeable gown and gloves is not appealing but it’s a must!
• Educating how to stop the spread of CRE and the fact that there are very limited ABX to treat it
Follow up with Staff and Families

• After orientation follow up with staff
• Make yourself available to answer any questions
• Education pamphlets are always available
• If we are not careful, we may all end up in hazmat suits
• Carbapenem Resistant Enterobacteriaceae (CRE) is more common than we think, so we need to act!
HH and PPE Audits on All Staff

- SSH audits HH and PPE monthly
- We track and trend our data
- We report not only in board meetings but monthly to staff
Hold Each Other Accountable

• Get the staff involved
• Have them hold each other accountable
• Win/Win situation
Rule Breakers

• At Select Specialty Hospital, it’s not just about following the rules
• It’s ALL about
  – Patient Safety
  – Education and Protecting yourself
Physicians

- Some of our worst offenders are the physicians
- PPE and HH are extremely important for YOU!
If we all hold each other accountable for our own actions, we can stop the spread of CRE/KPC
Thank You