



TEXAS
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Services
Texas Department of State
Health Services

Preventing Healthcare Acquired Infections

2017

Outbreaks

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Respiratory Cluster at a LTCF

- 120 bed facility in East Texas
- 16 deaths over past 2 weeks;
 - 5 from pneumonia / respiratory
 - Two were roommates
- 1/3 of all deaths in past six months
- 2 staff members off work with respiratory illnesses; 14(of 85) total staff were off work / ill in 1 month
- 13 residents with URIs
- 7 residents currently with "pneumonia"
 - Congestion
 - Fever
 - Vomiting


3



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Investigation...



- Line list (1 month)
32 with URI or Pneumonia
5 deaths from respiratory
- 11 deaths in 3 weeks (8 were on hospice)
All were in same hallway
- Dates of illness onset not available
- Antibiotics without lab
...Isolation based on lab
- 7 residents in 1 month with conjunctivitis
- Flu vaccines:
Residents 60%
Staff 20%
- Pneumococcal offered to residents but ?how many received?
- Only hand sanitizer at reception desk, in pockets



4

What IS an outbreak?


"Dramatic clustering of cases of an infectious disease in a geographic area over a relatively short period of time"
-AJIC, 2008

5

Long-Term Care Facilities (LTCFs)

- 4 million Americans admitted to or reside in long-term care facilities each year
- 1 million in assisted living
- 1-3 million serious infections each year
- Est: 1.4 - 5.2 HAI/1,000 resident-care days
- Est. prevalence 5% point prevalence




6

Perfect Storm

Colonization with resistant organisms
Hospitalized frequently
Transfer pathogens between LTCFs and hospitals

Infections Agent

Susceptible Host

Means of Transmission

Population vulnerable to infection (physiologic reserve)
Poor hygiene (cognitive/functional limitations)

Mobile / Interact directly / social activities
Staff / visitors

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Respiratory Illnesses

- Predisposed:
 - decreased clearance, altered throat flora, feeding tube, swallowing difficulties, aspiration, inadequate oral care
- Limited physiologic reserve
underlying disease: COPD, heart disease
- Reduced immune response / impaired immunity
- Diagnostic challenges/delays:
 - Atypical presentations: AMS, respiratory rate
 - Communication with off-site provider
 - More difficult to get CXR, pulse ox, cbc

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Respiratory Illnesses

Pneumonia second most common cause of infection among LTCF residents

- Streptococcus pneumoniae, hemophilus influenzae, staph aureus (including MRSA)
- Legionella pneumoniae

Viral Respiratory infections:
RSV, parainfluenza, coronavirus, rhinovirus, adenovirus

Influenza

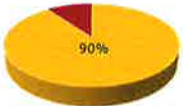
- very contagious, incubation 1-2 days
- clinical attack rate 25-70, case fatality over 10%

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Pneumonia Prevention

- Hand hygiene
- Wearing gloves for respiratory care
- Elevate head of bed during after tube feeding (prevent aspiration)
- Vaccination of patients/residents with pneumococcal vaccine
CMS Rule

Healthy People 2020 Goal



90%

SHEA/APIC Guideline: Infection prevention and control in the long-term care facility 10

Influenza Outbreak Prevention

- Vaccinating staff and residents
CMS rule
- Rapid identification
- Promptly initiate treatment
- Isolate to prevent transmission
- Restricting admissions
- Restricting visitors
- Cohorting residents with influenza
- Infected staff should not work

SHEA/APIC Guideline: Infection prevention and control in the long-term care facility 11

Conjunctivitis

7 residents in 1 month with conjunctivitis

- nonspecific/viral
- S. aureus most common bacterial

Where did they get it from?

- Contaminated eye drops
- Hand cross contamination
- Infected visitor
- Infected healthcare worker

Epidemic conjunctivitis may spread rapidly through LTCF

Wear gloves for contact with eyes or ocular secretions

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Employee Health

- LTCF staff less formal training than in other acute care settings
- Symptoms / signs may go unrecognized
- Staff may work in multiple facilities
- Increased risk of exposure of employees to residents
 - Zoster, conjunctivitis, scabies, influenza, gastroenteritis, TB
 - Pediatric LTCF: childhood diseases, varicella, measles, mumps, rubella

13

Employee Health

Employees can cause significant outbreaks in LTCF

- Policy that prohibits employees (including contractors / agencies) with communicable diseases, infected skin lesions, rashes, diarrhea from
 - Contact with residents
 - Contact with residents food
 - Exclude from work altogether
- Employee/contractor/agency vaccine policies (flu, Tdap, varicella, MMR, Hep B, consider Hep A)


Implementation of Health-Safe Personnel, ACIP, Nov, 2011
<https://www.cdc.gov/mmwr/pdf/rr/rr0007.pdf>

14

Visitors

Policy/procedure to limit introduction of community infections

- Respiratory etiquette
 - Signs – cover/cough
 - Masks at entry points
- Hand gel / hand washing
- Isolation precautions / education
- Notices of outbreaks



15

Gastroenteritis Outbreak...

...120 bed facility in East Texas...

- 10 residents ill with vomiting / diarrhea
- unconfirmed number of employees with same symptoms

Your thoughts/recommendations?

→no cases after 1 week

16

Age-related decrease in gastric acid
High prevalence of incontinence → cross infection / fecal-oral transmission
Person-to-person spread - shared bathrooms, dining, rehab facilities

- Viral gastroenteritis
Rotavirus, enteroviruses, noroviruses
- Bacterial gastroenteritis
Clostridium Difficile, b. cereus, E. coli, shigella, S aureus
- Parasites
Giardia lamblia

17

Norovirus (GE) evaluation

- Submit stool specimens as early as possible, ideally during acute phase (within 2-3 days of onset)
- Consider submitting vomitus for norovirus when fecal unavailable (less sensitive)

DON'T routinely collect environmental swabs

Kaplan's Criteria:

1. Vomiting in more than half of symptomatic cases
2. Mean/median incubation period of 24-48 hours
3. Mean/median duration of illness of 12-60 hours
4. No bacterial pathogen isolated from stool culture

<https://www.cdc.gov/nid/ugb/95/norovirus.html>

18

Norovirus/GE


1. Cleaning modifications
2. Frequently touched surfaces
3. **Commodes, toilets, faucets, bedrails, telephones, door handles, computer equipment, kitchen preparation surfaces**
4. **Increase frequency cleaning to twice/day, with disinfection three times a day/frequently touched surfaces**
5. **Cleaning order: lower likelihood first (counter top first, toilets/bathrooms last)**

<https://www.cdc.gov/HAI/organisms/norovirus.html>

19

Norovirus Outbreak Prevention/Response

- **Contact** precautions min. 48 hours after resolution of symptoms
- Single occupancy room / single bathroom
- Separate from asymptomatic patients, cohort in multi-occupancy room
- Designated patient care area / contiguous section within a facility for patient cohorts
- Minimize patient movements within ward / unit
- Restrict symptomatic/recovering patients from leaving area
- Close ward to new admissions/transfers
- Suspend group activities for duration of outbreak
- **Recovered** recently infected staff = best choice for giving care -- staff care for one patient cohort -- exclude students, volunteers, etc.
- Hand hygiene - for visitors as well - use soap/water



<https://www.cdc.gov/HAI/organisms/norovirus.html>

20

Communication

Internal planning

- Environmental services
- Central supply
- Linen services
- Employee health

Line list cases

- Case (staff/patient) identifier
- Case location
- Symptoms
- Outcome / Date of resolution
- Diagnostics submitted



<https://www.cdc.gov/hai/pdfs/norovirus/215882-A-C1CommPlanWS599.pdf>
<https://www.cdc.gov/hai/pdfs/norovirus/22911B-A-ForoLineList598.pdf>

21

C. difficile

- Becoming number 1 cause of diarrhea
- Patient = source of spread through contamination of caregiver hands / shared equipment
- Greatest risk: contamination of resident's skin/environment – symptomatic but hasn't started treatment yet
- Common cause of acute diarrhea in LTC (Gastric acid suppression)
 - Malnutrition, increases frailty, hospitalization, even death
 - Increases hospital length of stay, cost, probability to discharge to LTCF instead of home

C. Diff prevention can prevent spread of OTHER infections

National Nursing Home Quality Improvement Campaign - nqualitycampaign.org
Strategies to Prevent C. difficile Infections : 2014 Update SHEA/IDSA

22

C. difficile outbreak

- Early ID → limits spread by reducing time from symptom onset to starting therapy
- Care personnel identifying/communicating diarrhea (protocol?)
- Obtaining stool specimen when watery diarrhea (policy?)
- Rapid containment for symptomatic residents reduces contamination
- Early implementation of contact precautions – gowns/gloves (policy)
- Dedicated equipment (thermometer, stethoscope, blood pressure cuff, glucometer, computer)
- Education of residents, family members, housekeeping/environmental on contact precautions, hand washing (language)
- Separate toilets, private room, cohorting (consider MRSA status of roommates)

National Nursing Home Quality Improvement Campaign - nqualitycampaign.org
Strategies to Prevent C. difficile Infections : 2014 Update SHEA/IDSA

23

Spores...


- C. diff spores are NOT killed by alcohol hand rubs
- C. diff spores are NOT removed by hand washing
- Use of gloves is critical to prevent hand contamination



EPA-registered disinfectant that is C. Diff sporicidal or 1:10 bleach
Daily cleaning/disinfection of room, equipment

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24



Hospital employee:

- Was at work 4-5 days, travelled and stayed in hotel 4-5 days, then returned to work next day, with respiratory symptoms → pneumonia

Five months later....

Patient at same hospital:

- Inpatient for 3.5 weeks, then transferred specialty hospital in same facility for 3 weeks, then dc to LTCF
- 2 days after arriving at LTCF → respiratory symptoms → transferred back to hospital

25



Legionella / Legionnaire's disease

NOT person-to-person
 Inhaled aerosol from contaminated water source (travel, healthcare)

Incubation period 2-10 days, most common 5-6 days
 Fever, Myalgia, Cough, headache
 Clinical/radiological pneumonia
 Almost all require hospitalization; 5-30% fatal

One of the confirmatory lab criteria:

- Detection of *L. pneumophila* antigen in urine
- Isolation/culture of legionella from respiratory secretion, lung tissue, pleural fluid
- Fourfold or greater rise in serum antibody titer (paired test – acute/convalescent phase)

- Higher risk: immunosuppressed, COPD, diabetes, history of smoking

26



Possibly healthcare associated:

Case had exposure to a healthcare facility for any portion of the 10-day incubation period

1. Notify LHD / DSHS
2. Engineering:
 - ~~No environmental testing~~
 - Review water maintenance procedures
3. Active surveillance (6 months)
 - Daily review of CXRs, sputum cultures, new pneumonias
 - ALL pneumonias that develop 2 days after admission → urinary antigen test, culture

27

Definitely healthcare associated:

Case has history of spending entire 10-day incubation period in a hospital or long-term care

1. Notify LHD / DSHS
2. Engineering:
 - Environmental testing
 - Review water maintenance procedures
3. Retrospective review of prior 6 months for any clinically compatible cases
4. Active surveillance (6 months)
 - Daily review of CXRs, sputum cultures, new pneumonias
 - ALL pneumonias that develop 2 days after admission → urinary antigen test, culture
5. Facility staff/employees with clinically-compatible illnesses; notify medical staff to consider in differential
6. Consider water restrictions for high risk patients (shower filters, sterile/bottled water)

28

HOSPITAL OUTBREAK

- One definitely health-care associated case or
- Two possibly health-care associated case within 1 year within the same facility

- a. Notify LHD / DSHS
 - Sanitarian to assist environmental investigation
- b. ICP:
 - Make sure ALL HA pneumo get surveillance
 - Consider empiric early treatment

29

Infection Prevention during Blood Glucose Monitoring

Case 1

- 2nd grader with diabetic mother
- Child took mother's lancet from bathroom
- On school bus had 'blood brother' ceremony with 5 other children
 - bus driver discovered lancet on afternoon ride home and reported to school the next day


30

Infection Prevention during Blood Glucose Monitoring

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Case 2

- Health fair at Indian Cultural Center
- PA students used reusable fingerstick device/pen to perform glucose screening on approximately 50 residents



<https://www.cdc.gov/injectionsafety/blood-glucose-monitoring.html>

31

Infection Prevention during Blood Glucose Monitoring

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Case 3

- LTCF used single reusable lancet and single glucometer for assisted glucose monitoring of 15 residents
- Glucometer was not cleaned and disinfected between patients
- 8 of 15 were hospitalized with acute Hepatitis B
- 6 of them died

MMWR, February 18, 2011 / 60(06):182


32

Infection Prevention during Blood Glucose Monitoring

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Case 4

- LTCF used single-use lancets and single-patient assigned insulin vials
- Each wing had a single glucometer for all patients on that wing
- Glucometer was not cleaned and disinfected between patients
- Of 45 residents receiving glucose monitoring, 8 developed acute Hep B infection
- Source was 1 resident who was receiving glucose monitoring identified as Hep B carrier after acute Hep B 1 year ago



MMWR, March 11, 2005 / 54(09):220-223

33

Infection Prevention during Blood Glucose Monitoring

- Fingerstick devices should never be used for more than one person
- Single-use, disposable fingerstick devices should always be used in settings where assisted monitoring of blood glucose is performed (LTCF)
- Blood glucose meters should be assigned to an individual and should NOT be shared
*Device should be cleaned after every use per manufacturer instructions

<https://www.cdc.gov/infectioncontrol/blood-glucose-monitoring.html>

Patient transfers / handoffs

61yo, BKA, resident LTCF
→ Pneumonia symptoms → hospital

- CXR: Cavitory lesion
- 1 sputum collected – AFB neg,
- Culture pending

→ ICP reported possible case to us

Patient transfers / handoffs

HOSPITAL ← → LTCF

• Acute	• Low tech
• Intensive care	• Functional home
• High tech	• Visitors, social activities
• Values:	• Values:
• Infection control	• Comfort
• Patient safety	• Dignity
• Patient care	• Rights

→ opportunity for transmission & acquisition of HAIs

UTAH INFECTION CONTROL TRANSFER FORM
 Designed to help in transfer and admission of patients to Long-Term Care

Patient/Resident: LTR Name: _____ Age: _____ State of Birth: _____ SSN: _____ Discharge Date: _____

Receiving Facility Name: _____ Contact Name: _____ Contact Phone: _____
 Receiving Facility Room: _____

Currently in Isolation Precautions? Yes No
 If Yes check: Contact Droplet Airborne Other: _____

Did or does have (and document below): No Yes No Known, MRSA or Communicable Disease

Current Infection, History or Testing Out: Yes No

Multiple Drug Resistant Organism (MDRO): MRSA VRE Acinetobacter not susceptible to carbapenems Klebsiella not susceptible to carbapenems Significant communicable disease Yes No Other: _____ (e.g., list, alcohol, disinfectant, detergent, etc., TB, etc.) (inserted or ruling out)

*Additional info if known: _____

https://www.cdc.gov/hai/practices/implementation_tools.html 37

UTAH INFECTION CONTROL TRANSFER FORM

MRSA: Yes No Never MRSA or Communicable Disease

VRE: Yes No

Acinetobacter not susceptible to carbapenems: Yes No

Klebsiella not susceptible to carbapenems: Yes No

Significant communicable disease: Yes No

Other: Yes No (e.g., list, alcohol, disinfectant, detergent, etc., TB, etc.) (inserted or ruling out)

*Additional info if known: _____

Check yes to any that **generally** apply:

Cough/sneezed into elbow Arise directly in presence of stool No response to PPE not required or "airborne"

Placement of urine Changing linens Other uncontained body fluid/secret

Vomiting Containing (e.g., venable)

*NOTE: Appropriate PPE required OR Y if interventionally through such NOT contained

ISOLATION PRECAUTIONS

Resistant PPE: Hand Goggles Mask

Appropriateness to infection above: ANY YES Check Required PPE ALL NO Just sign form

Person completing form: _____ Date: _____

ERRATA: _____

https://www.cdc.gov/hai/practices/implementation_tools.html 38

Outbreak Response plan: Best Practices

1. Pre-existing policy/procedure, approved head of time by medical staff
2. Include clinical case definitions in advance in the policy

→ Facilitates **rapid implementation of control measures**

→ Empowers charge nurses to rapidly isolate and/or cohort infected individuals

→ Empowers staff to curtail contact between residents and staff on units

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SHEA/APIC Guideline: Infection Prevention and Control in the Long-Term Care Facility. AHC Special Communication. July 2008. 39

Outbreak Response Prevention Plan : Best Practices

Vaccine policies:
Mass vaccination of residents / antivirals as response → consent from treating physician → consent from medical decision maker
 Obtain consent for vaccination, antivirals, and cultures at time of admission from resident and/or medical decision maker

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SHEA/APIC Guideline: Infection Prevention and Control in the Long-Term Care Facility. AJIC Special Communication. July 2008. 40

Outbreak response Prevention plan : best practices

Occurrence of single verified highly transmissible diseases
 TB, influenza, scabies, salmonella, norovirus:
 → Prompt notification of medical director
 → Pre-existing protocol
 → Implement institutional outbreak control measures
 → Isolation precautions
 → Authority to relocate residents / confine to rooms
 → Authority to restrict visitors
 → Authority to obtain cultures
 → Assessment of exposed residents
 → Assessment of exposed personnel
 → Authority to administer relevant prophylaxis

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SHEA/APIC Guideline: Infection Prevention and Control in the Long-Term Care Facility. AJIC Special Communication. July 2008. 41

MDROs

- Increased morbidity, mortality, cost
- LTCF residency is risk factor for antibiotic-resistant infection in hospitalized patients
- Increased risk with length of stay, multiple beds in rooms
- Once endemic, elimination *highly unlikely*

Key control/prevention measures:

- Antibiotic Stewardship (another speaker?)
 - Fun fact: antimicrobials = 40% of all systemic drugs prescribed in LTCF
 - 25-75% time, inappropriate use
- Isolation and precautions

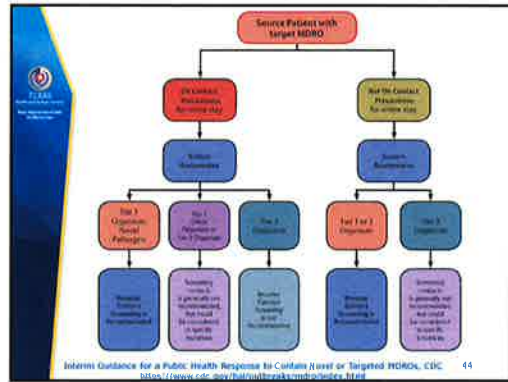
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42

MDRO Outbreak Response

- Threshold for declaring / initiating controls should be much lower
- Implement outbreak control measures if evidence of epidemiologically important pathogen
- Don't wait for a fully evolved outbreak
- Identify if transmission/dissemination is occurring
- Identify affected patients
- Ensure appropriate control measures are promptly initiated/implemented to contain potential spread
- Characterize the organism/mechanism in order to guide further response actions, patient management, and future responses
- Contact local/state health department

Interim Guidance for a Public Health Response to Contain Novel or Targeted MDROs, CDC
<https://www.cdc.gov/hai/outbreaks/mdro/index.html> 43




DSHS Public Health Region 4/5N Disease Reporting System

1-866-310-9698

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<http://www.dshs.texas.gov/dcu/investigation/conditions/> 45

Texas Syndromic Surveillance System (TxS2)



Texas Department of State Health Services

Detect as early as possible abnormal disease patterns that could result in high morbidity and mortality

Provides near real time data of emerging public health conditions, recognizes conditions indicating unusual events, and generates alerts

Patient presents to ER → HER data sent to TxS2 automatically

Access through ESSENCE

Electronic Surveillance System for the Early Notification of Community-based Epidemics

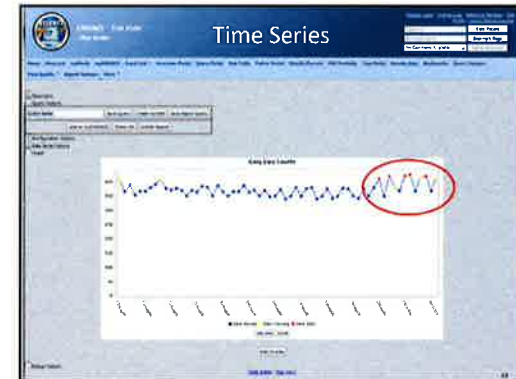
Participation qualifies for Meaningful Use / EHR Incentive Program

<http://www.dshs.texas.gov/txs2>

12 Syndromes* (ESSENCE)

- Injury
- Neurological
- Rash
- Reportable Diseases
- Respiratory
- Shock/Coma
- Botulism-like
- Exposure
- Fever
- Gastrointestinal Illness
- Hemorrhagic Illness
- Influenza-like Illness

ESSENCE is customizable with regards to syndromes and ad hoc queries. These 12 syndromes are the typical set used by other states.



Alert List

Region/Syndrome Based Temporal Alerts

State	Alert Name	Region	Alert Type	Alert Start	Alert End	Alert Status	Alert Description	Alert Count	Alert Rate	Alert Rate (95% CI)	Alert Rate (99% CI)
TX	IBV	PHR 4/5N	IBV	10/1/17	10/1/17	Active	Region 4/5N Influenza B Virus	1,25	2.3	1.25 - 3.3	1.25 - 3.3
TX	IBV	PHR 4/5N	IBV	10/1/17	10/1/17	Active	Region 4/5N Influenza B Virus	1,25	2.3	1.25 - 3.3	1.25 - 3.3
TX	IBV	PHR 4/5N	IBV	10/1/17	10/1/17	Active	Region 4/5N Influenza B Virus	1,25	2.3	1.25 - 3.3	1.25 - 3.3
TX	IBV	PHR 4/5N	IBV	10/1/17	10/1/17	Active	Region 4/5N Influenza B Virus	1,25	2.3	1.25 - 3.3	1.25 - 3.3
TX	IBV	PHR 4/5N	IBV	10/1/17	10/1/17	Active	Region 4/5N Influenza B Virus	1,25	2.3	1.25 - 3.3	1.25 - 3.3
TX	IBV	PHR 4/5N	IBV	10/1/17	10/1/17	Active	Region 4/5N Influenza B Virus	1,25	2.3	1.25 - 3.3	1.25 - 3.3
TX	IBV	PHR 4/5N	IBV	10/1/17	10/1/17	Active	Region 4/5N Influenza B Virus	1,25	2.3	1.25 - 3.3	1.25 - 3.3
TX	IBV	PHR 4/5N	IBV	10/1/17	10/1/17	Active	Region 4/5N Influenza B Virus	1,25	2.3	1.25 - 3.3	1.25 - 3.3
TX	IBV	PHR 4/5N	IBV	10/1/17	10/1/17	Active	Region 4/5N Influenza B Virus	1,25	2.3	1.25 - 3.3	1.25 - 3.3
TX	IBV	PHR 4/5N	IBV	10/1/17	10/1/17	Active	Region 4/5N Influenza B Virus	1,25	2.3	1.25 - 3.3	1.25 - 3.3

Txs2 Contact

**Region 4/5N
January Smith
Epidemiologist**

(903) 533-5210
January.Smith@dshs.texas.gov

Mpi/www.dshs.texas.gov/txs2 Page 50

Thank You

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Page 51
