Preventing Respiratory Infections in Skilled Nursing Facilities

Last Updated 2019

Basics of Infection Prevention
Healthcare-Associated Infections Program
Center for Health Care Quality
California Department of Public Health

Objectives

- Discuss the epidemiology of pneumonia and ventilator-associated pneumonia (VAP)
- Discuss evidence based pneumonia and VAP prevention care practices
- Review importance of a water management program in *Legionella* prevention
- Review influenza prevention strategies
- Describe adherence monitoring of prevention practices

Pneumonia in Skilled Nursing Facilities

- Second most common cause of infection in SNF
- Seasonal increase in pneumonia due to influenza
- 6-23% of SNF residents with pneumonia die

SHEA/APIC Guideline:
Infection Prevention and Control in the Long-Term Care Facility (2008)

Bacterial Pneumonia Pathogens in SNF

Most common pneumonia pathogens in SNF

- *Streptococcus pneumoniae* 13%
- Aerobic gram-negative bacteria 13%
- *Hemophilus influenzae* 7%
- *Staphylococcus aureus* 7%
- *Moraxella catarrhalis* 5%

SHEA/APIC Guideline:
Infection Prevention and Control in the Long-Term Care Facility (2008)

Pneumonia Etiology

- Bacteria enter the respiratory tract by
  - Aspiration or oral content
  - Inhalation of aerosols containing bacteria
  - From other parts of the body
    - Oral pharyngeal microorganisms
    - Stomach

Elderly SNF Residents at Risk for Pneumonia

Residents with:

- Decreased clearance of bacteria from the airways
- Altered throat flora
- Poor functional status, immobility
- Presence of feeding tubes
- Swallowing difficulties and aspiration
- Inadequate oral care

Preventing Pneumonia Through Vaccination

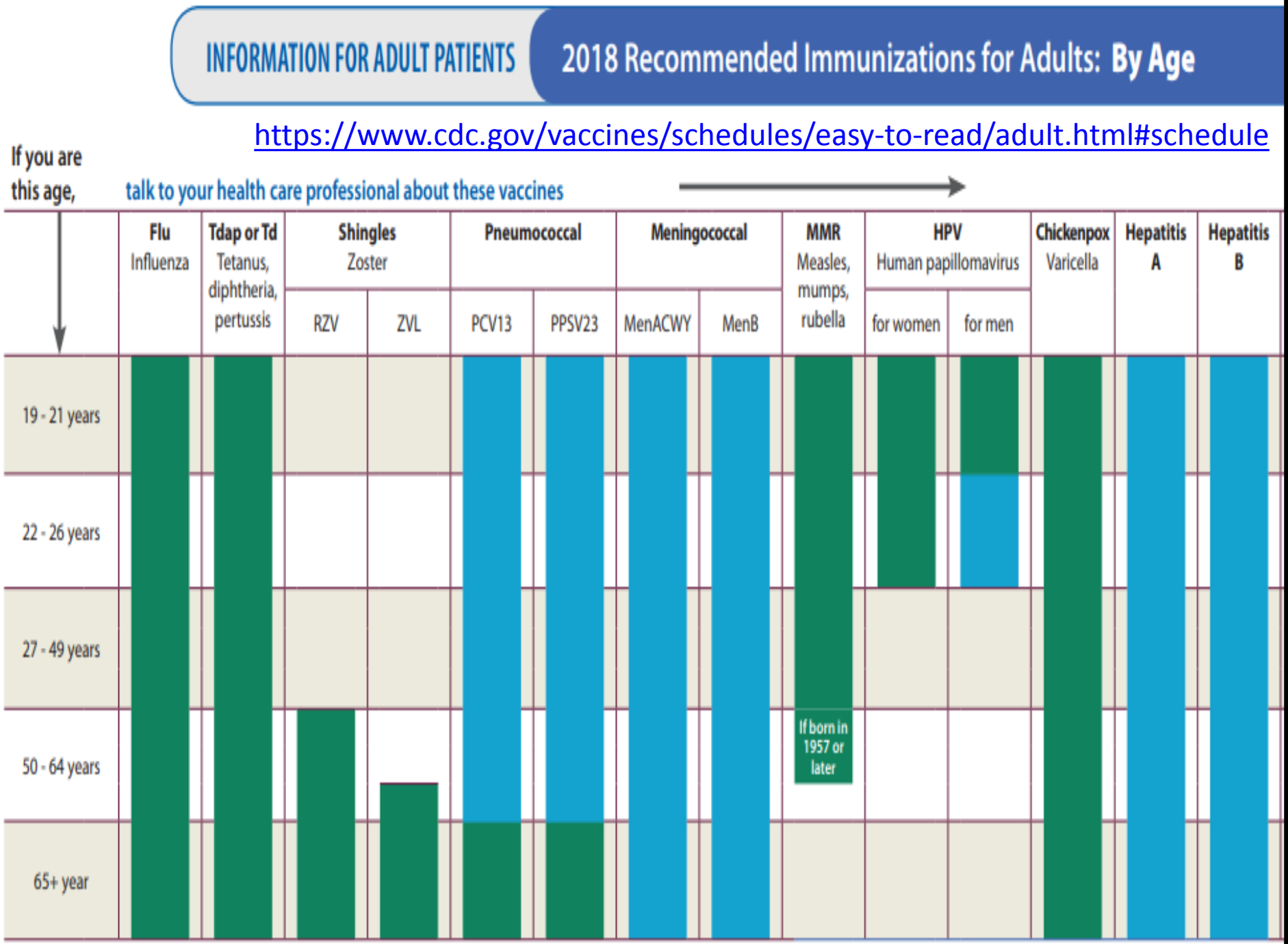
- Promote pneumococcal vaccine
  - Required by CMS to offer pneumococcal vaccine
  - 13-valent pneumococcal conjugate vaccine (PCV13), 1 dose*
  - 23–Valent pneumococcal polysaccharide vaccine (PPSV23), 1-3 doses depending on indication*
- Promote annual resident influenza vaccination
  - Required by CMS to offer Influenza vaccine
  - Have an annual event to kick off flu season
  - Get consents signed early or upon admission to facilitate
- Promote influenza HCP vaccination
  - Required by 35 (60%) California local health departments

*CDC Adult Immunization Schedule (https://www.cdc.gov/vaccines/schedules/easy-to-read/adult.html#schedule)

Immunization Resources

https://www.cdc.gov/vaccines/schedules/easy-to-read/adult.html#schedule

California Department of PublicHealth


INFORMATION FOR ADULT PATIENTS
2018 Recommended Immunizations for Adults: By Age
https://www.cdc.gov/vaccines/schedules/easy-to-read/adult.html#schedule
If you are this age,
talk to your health care professional about these vaccines
Flu
Influenza
Tdap or Td
Tetanus, diphtheria, pertussis
Shingles
Zoster
RZV
ZVL
Pneumococcal
PCV13
PPSV23
Meningococcal
MenACWY
MenB
MMR
Measles, mumps, rubella
HPV
Human papillomavirus
for women
for men
Chickenpox
Varicella
Hepatitis A
Hepatitis B
19 - 21 years
22 - 26 years
27 - 49 years
50 - 64 years
65+ year
If born in 1957 or later

Preventing Pneumonia in SNF

- Ensure adequate nutrition and hydration
  - Record food and fluid intake to ensure adequacy
  - Offer small snacks and fluid several times a day
- Provide daily oral care
  - Prevent bacteria from accumulating
  - Decreases risk of pneumonia if aspirated
- Elevate the head of the bed 30 to 45 degrees during **tube feeding** and for at least 1 hour after to decrease aspiration
- Perform hand hygiene after contact with respiratory secretions
- Use gloves for suctioning and cleaning respiratory equipment

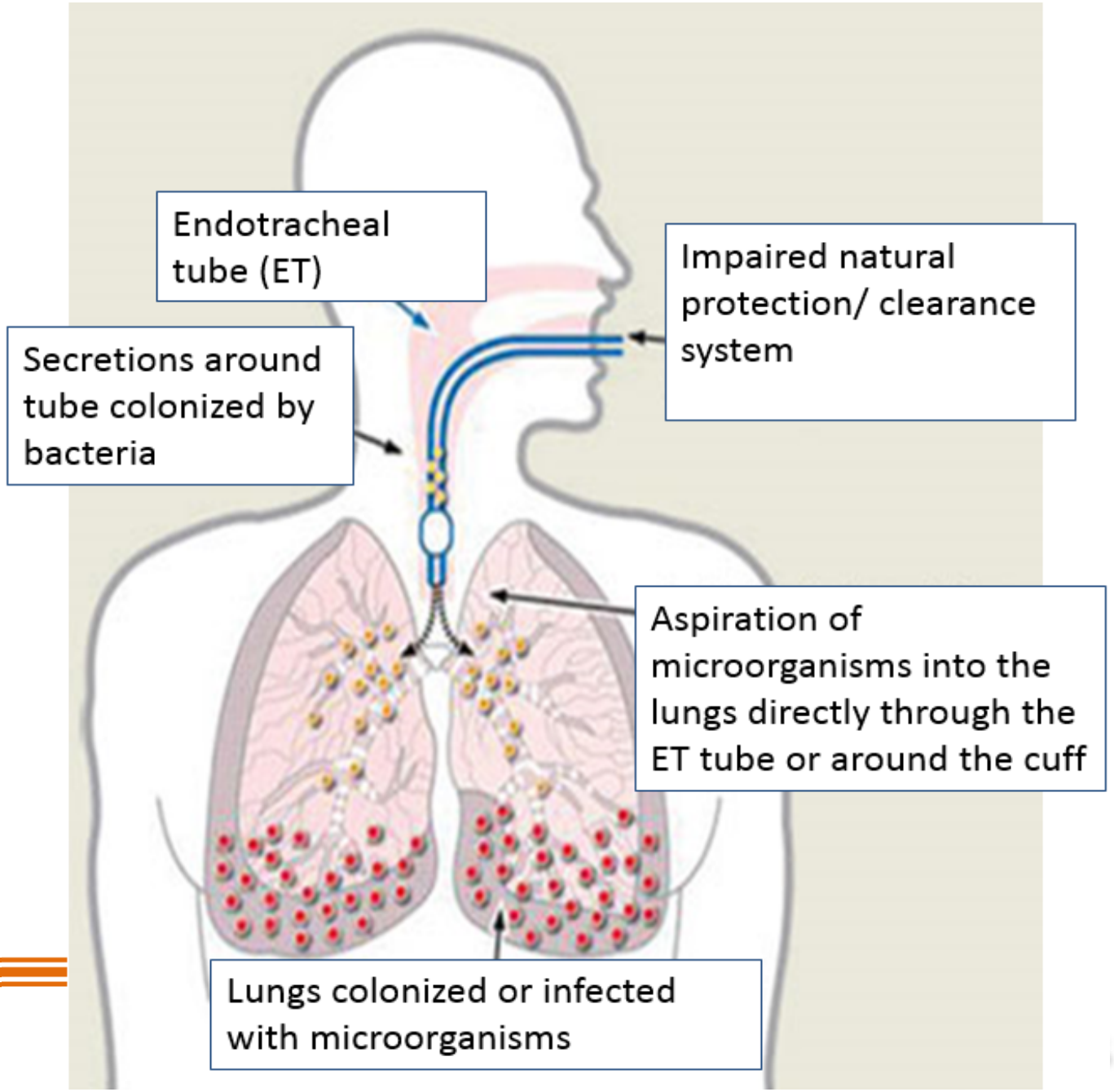
APIC Infection Preventionist's Guide to Long Term Care, 2013
(https://apic.org/APICStore/Products/Product?id=SLS6008)

Ventilator-Associated Pneumonia (VAP)

- Approximately 1200 SNF in California
  - 131 (10%) care for residents on mechanical ventilation
  - 3855 total SNF ventilator beds
- Residents may be on ventilator long term or for life
- Residents with an endotracheal tube directly into the respiratory tract at risk for VAP
- Up to 50% patients with VAP die
  - Highest mortality occurs in patients with severe illness and infection with non-fermentative gram-negative bacilli (examples, *Acinetobacter* and *Burkholderia* species)

Institute for Healthcare Improvement (IHI)
http://www.ihi.org/resources/Pages/Tools/HowtoGuidePreventVAP.aspx

VAP Pathogenesis



VAP Prevention Challenges

Pre-existing conditions (**non**-modifiable risk factors):

- Head trauma
- Coma
- Nutritional deficiencies
- Immunocompromised
- Multi organ system failure
- Acidosis
- Co-morbidities such as diabetes or lung disease
- History of smoking

VAP Prevention: Modifiable Risk Factors

1. Prevent aspiration of secretions
2. Reduce duration of ventilation
3. Reduce colonization of airway and digestive tract
4. Prevent exposure to contaminated equip

Prevent Aspiration of Secretions

- Maintain elevation of head of bed (HOB) 30-45 degrees
- Avoid gastric over-distention
- Avoid unplanned extubation and re-intubation
- Use cuffed endotracheal tube with in-line or subglottic suctioning
- Encourage early mobilization of patients with physical/occupational therapy

Reduce Duration of Ventilation

- Conduct “sedation vacations”
- Assess readiness to wean from vent daily
- Conduct spontaneous breathing trials

May not be feasible for SNF residents on long term ventilator support

Reduce Colonization of Airway and Digestive Tract

- Use cuffed endotracheal tube (ETT) with inline or subglottic suctioning
  - Minimizes secretions above cuff; prevents contamination of lower airway
- Avoid acid suppressive therapy for patients not at high risk for stress ulcer or stress gastritis
  - Increases colonization of the digestive tract

Reduce Colonization of Airway and Digestive Tract - 2

- Perform regular oral care with an antiseptic agent
- Reduce the opportunities to introduce pathogens into the airway
  - Perform good hand hygiene
  - Use gloves for contact with respiratory secretions or contaminated objects; follow with hand hygiene
  - Educate staff to avoid contaminating the ETT from patient's mouth, HCP hands, introducing pathogens from patient's other body sites or the environment

Prevent Exposure to Contaminated Equipment

- Use sterile water to rinse reusable respiratory equipment
- Remove condensate from ventilatory circuits
- Change ventilatory circuit only when malfunctioning or visibly soiled
- Store and disinfect respiratory equipment effectively

Legionnaire's Disease

- Severe form of pneumonia
- Caused by inhaling or aspirating the bacteria, Legionella pneumophila
  - Not transmitted person-to-person
- Often requires hospitalization
- Incubation period 2-10 days prior to onset of symptoms
- Fatal in 10% of cases overall and 25% of healthcare-associated cases

cdc.gov/legionella

https://www.cdc.gov/legionella/downloads/fs-legionella-clinicians.pdf

Legionella in California and the United States

California cases reported between 2015 – 2017

- Total Legionella cases – 1554
- Healthcare-associated – 125 (8%)
  - Hospital associated – 45(35%)
  - **SNF associated – 57(46%)**

U.S. Legionella outbreaks (2000–2014)

- ~5,000 cases
- **19% in LTC facilities**
- Rate increased 286% from 2000–2014

Legionella

- Found naturally in freshwater
- Grows best in man-made water environments with temperatures 77°-107.6° F, stagnation, scale and sediment, and presence of certain aquatic amoebae
- Identified in health care facilities
  - Water used for showering (potable water)
  - Cooling towers (parts of large air conditioning systems)
  - Decorative fountains
  - Hot tubs

Risk Factors for *Legionella*

- Immunosuppressed hosts
- Solid organ transplant recipients
- Advanced age
- Male gender
- Cigarette smoking
- Alcohol abuse
- Chronic pulmonary disease
- Corticosteroid usage
- Renal failure

APIC Text 2018:
Healthcare Associated Pathogens and Diseases: *Legionella pneumonophila*

Laboratory Test for Legionella

- Urinary antigen test
  - Detects most common cause- L. pneumophilia serogroup 1
- Lower respiratory secretion, tissue, or pleural fluid culture
  - Detects other *Legionella* species
  - Ordered if urinary antigen test is negative, and *Legionella* is suspected
- **Report all positive Legionella cases to CDPH L&C District Office and local public health department**

Legionella Prevention

- Since 2017, SNF are **required by CMS** to have a comprehensive water management program to reduce the risk of *Legionella* growth and spread

"Facilities must develop and adhere to policies and procedures that inhibit microbial growth in building water systems that reduce the risk of growth and spread of legionella and other opportunistic pathogens in water"

CMS Memo June 02, 2017
https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertificationGenInfo/Downloads/Survey-and-Cert-Letter-17-30.pdf

Influenza

- Caused by Influenza virus (Influenza A and B most common)
- "Flu season" is late fall to early spring (October – March)
  - Varies from season to season depending on flu strain
  - Recommendation for vaccination before end of October
- Elderly are at highest risk for serious influenza complications
- Severe illness may lead to life-threatening pneumonia
  - 400-5,000 influenza deaths annually in California

https://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/LTCF_PreventingHAI.aspx

Influenza Epidemiology

- Incubation period 1-4 days
- Highly contagious first 3 days of illness
- Symptoms
  - Fever ≥100°F
  - Muscle aches
  - Headache
  - Non productive cough
  - Sore throat
  - Runny nose
- SNF residents may have subtle changes in mental status and a temperature below normal

https://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/LTCF_PreventingHAI.aspx

Influenza Etiology

- Spread by viral particles coming in contact with the respiratory tract
  - Infected person coughs or sneezes (droplets)
  - Uninfected person inhales the viral particles
- Can survive on surfaces for 24-48 hours (contact)
- Transmission can occur
  - Person to person
  - Person to object to person

https://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/LTCF_PreventingHAI.aspx

Influenza Prevention

- Vaccinate **residents** and **healthcare workers**
- Post "*Cover Your Cough*" signage and visitation restrictions
- Screen visitors during flu season
- Implement work restrictions for ill employees
- Encourage residents and visitors to practice respiratory hygiene and cough etiquette
- Ensure adherence to hand hygiene

https://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/LTCF_PreventingHAI.aspx

Transmission-based Precautions for Influenza

- Droplet precautions and Enhanced Standard precautions
- Implement precautions for suspected or confirmed influenza for 7 days after illness onset or until 24 hours after resolution of fever and respiratory symptoms, whichever is longer
  - Place ill residents in private room or cohort with other influenza residents
  - Confine symptomatic residents to their rooms, restrict group activities, and serve meals in their rooms
  - If other residents become symptomatic, cancel all group activities – serve meals in resident rooms

Admissions or Returning Residents Treated for Influenza

- Avoid new admissions or transfers of asymptomatic residents to units with symptomatic residents
  - Ensure new or returning residents with acute respiratory illness be medically evaluated before admission or transfer to determine appropriate placement

https://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/LTCF_PreventingHAI.aspx

Admissions or Returning Residents Treated for Influenza - 2

Remember:

- Returning influenza residents from a hospital, who are clinically appropriate for discharge from the hospital and past the acute phase - may still need droplet precautions
- Hospital patients with influenza should be discharged when clinically ready, not based on the period of potential virus shedding or recommended duration of droplet precautions

https://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/LTCF_PreventingHAI.aspx

Influenza Outbreak

- Consult with **local health departmen**t to
  - Determine strategies for limiting admissions
  - Determine limitations on a case by case basis
  - Consider chemoprophylaxis of non-ill residents
  - Reduce any prolonged closures to all admissions if transmission appears to be controlled with unaffected units able to accept new admissions
- Report to CDPH L&C District Office

https://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/LTCF_PreventingHAI.aspx

Facility Role in Respiratory Infection Prevention

- Ensure policies reflect current evidence based practices
  - CDC guidelines
- Ensure staff competency upon hire and at least annually
  - New hire orientation
  - Annual skills fair
  - Return demonstration to ensure competency
- Establish an adherence monitoring program for measuring prevention care practices
  - Use tools to measure adherence
- Provide feedback to frontline staff and leaders
  - Present adherence results to each unit

Are Pneumonia Prevention Care Practices Used in YOUR Facility?

All Residents

- ❑ Promote resident and HCP influenza vaccination
- ❑ Promote pneumonia vaccination
- ❑ Ensure adequate nutrition and hydration
- ❑ Perform regular oral care
- ❑ Perform hand hygiene
- ❑ Ensure effective water management program
- ❑ Encourage early mobilization

Additional Practices for Residents on Mechanical Ventilation

- ❑ Maintain HOB 30-45 degrees
- ❑ Avoid gastric distention
- ❑ Assess readiness to wean
- ❑ Use cuffed ETT with inline suctioning
- ❑ Avoid acid suppressive therapy if possible
- ❑ Prevent exposure to contaminated equipment

You won't know if you don't monitor!

Sample Adherence Monitoring Tool - VAP Prevention

Ventilator Pneumonia Prevention Observations	Pt 1		Pt 2		Adherence by Task	
					#Yes	# Obs
Head of bed 30-45 degrees	Yes	No	Yes	No		
Sedation vacation documented	Yes	No	Yes	No		
Readiness to wean documented	Yes	No	Yes	No		
Oral care with an antiseptic agent is performed regularly (per policy)	Yes	No	Yes	No		
Hand hygiene performed before providing care	Yes	No	Yes	No		
Sterile water used to rinse reusable respiratory equipment	Yes	No	Yes	No		
Condensate in ventilatory circuit is removed	Yes	No	Yes	No		
Ventilatory circuit is changed only when malfunctioning or soiled	Yes	No	Yes	No		
# Yes _____ # Observed_____					#Yes/#Observed = % Adherence	_____%

CDPH Adherence Monitoring Tools (www.cdph.ca.gov/hai)

California Department of PublicHealth

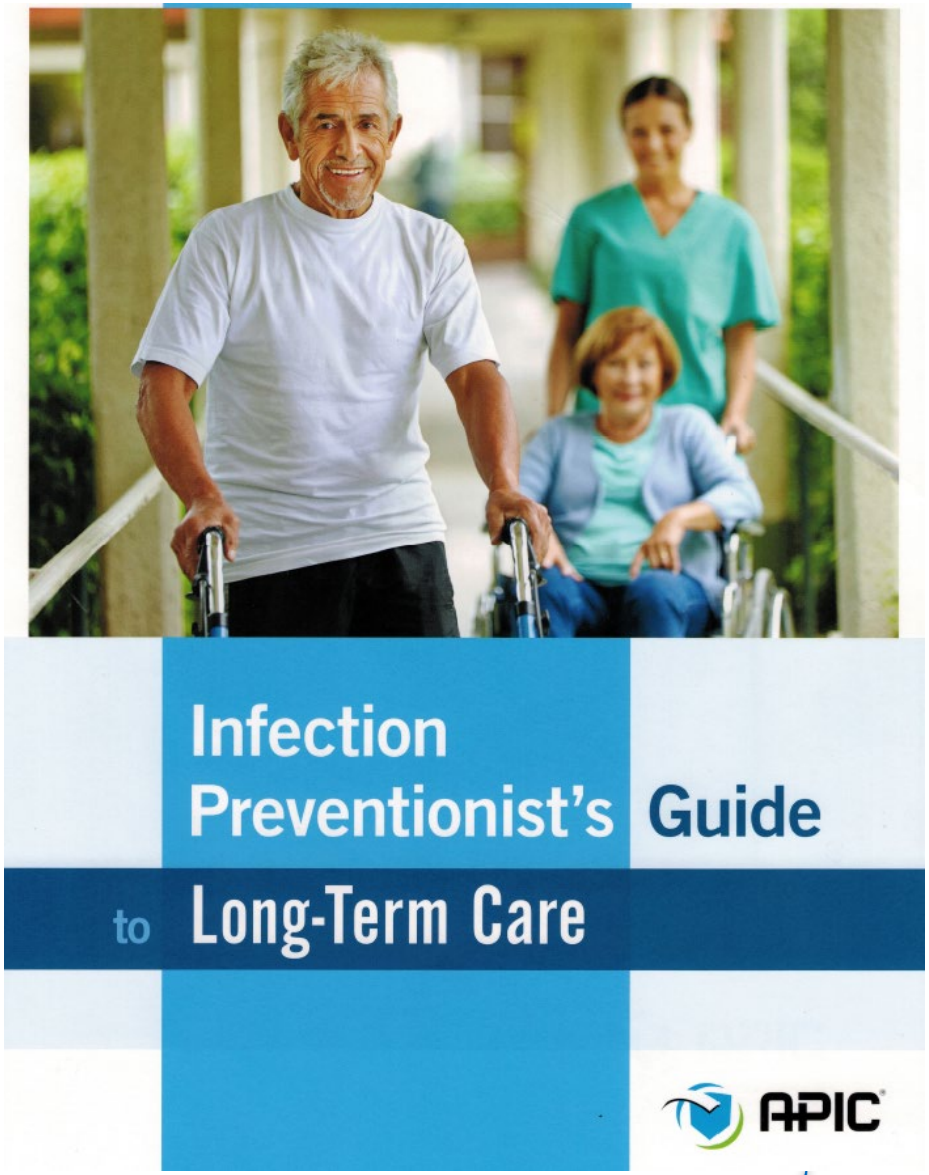
Summary

- Evidence-based prevention care practices prevent healthcare associated pneumonia
- SNF pneumonia prevention includes programs to vaccinate residents and health care providers
- Morbid complications of ventilated patients are common but many are preventable by following care practices
- A comprehensive water management program, required by CMS, reduces residents' risk for Legionnaire's disease
- SNF should have a robust annual influenza plan
- Adherence monitoring of prevention care practices and providing feedback to frontline staff improves outcomes

Infection Preventionist's Guide to Long-Term Care

Available at:
APIC Website Store

apic.org/APICStore/Products/Product?id=SLS6008



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- Institute for Healthcare Improvement (IHI) http://www.ihi.org/resources/Pages/Tools/HowtoGuidePreventVAP.aspx
- NHSN Patient Safety Module: Chapter 6 (PNEU/VAP), http://www.cdc.gov/nhsn/PDFs/pscManual/6pscVAPcurrent.pdf

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- https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertificationGenInfo/Downloads/Survey-and-Cert-Letter-17-30.pdf

Questions?

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