

“Lassoing the Beast”

Outbreak Containment: Transmission-Based Precautions

Louisiana Department of Health | Office of Public Health
Infectious Disease Epidemiology Section
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“ The speaker does not have a financial or non-financial relationship with a commercial interest that would create a conflict of interest with this presentation. ”

Disclosure Statement

Objective

Define Contact, Droplet, and Airborne Isolation Precautions.

Outline

1. Standard Precautions
2. Droplet Precautions
3. Airborne Precautions
4. Personnel vaccination compliance



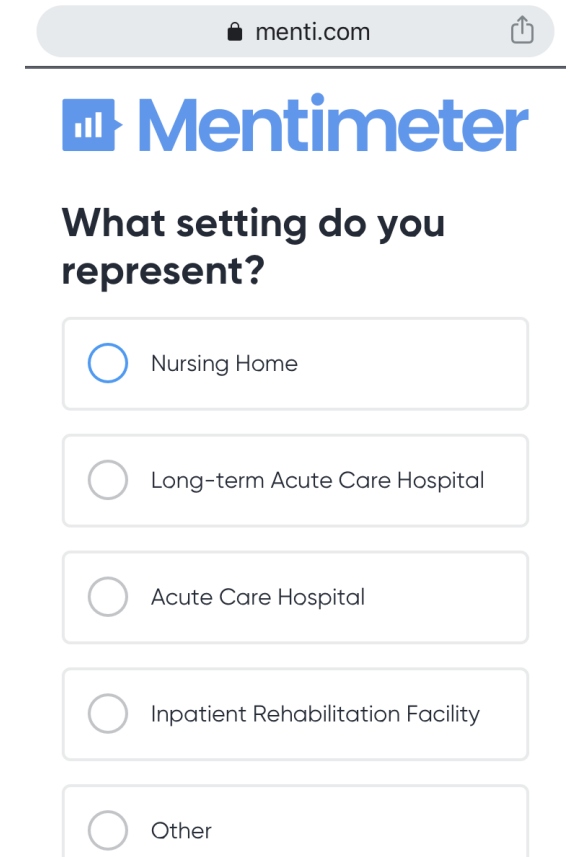
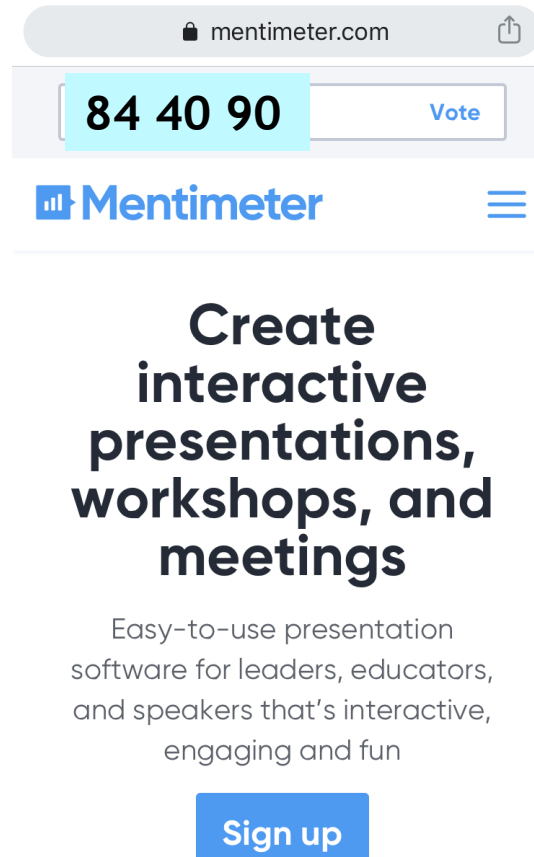


Implementation and Innovation

Mentimeter for Audience Participation

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Standard Precautions

Hand Hygiene (HH)

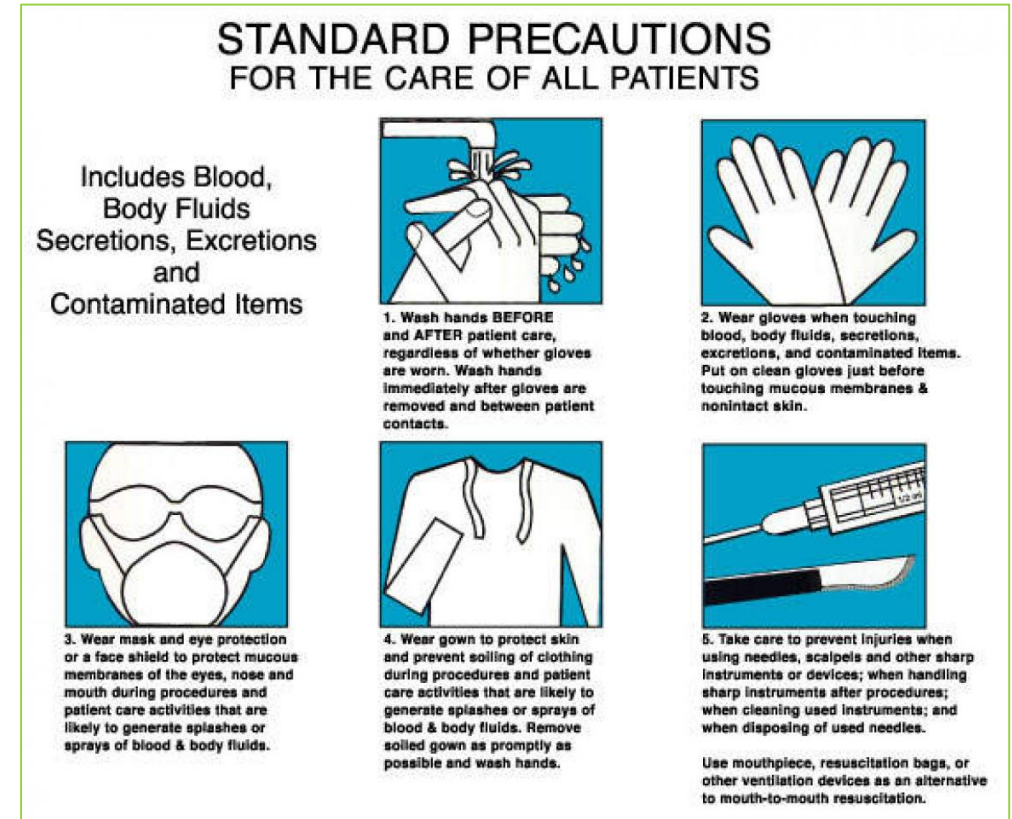
- Before and after all patient contact
- Potentially infectious material
- Before/after donning/doffing PPE including gloves
- Soap and water when visibly soiled

Gloves

- Any contact with potentially infectious material
- Remove after contact and perform HH
- Do not reuse

Gowns

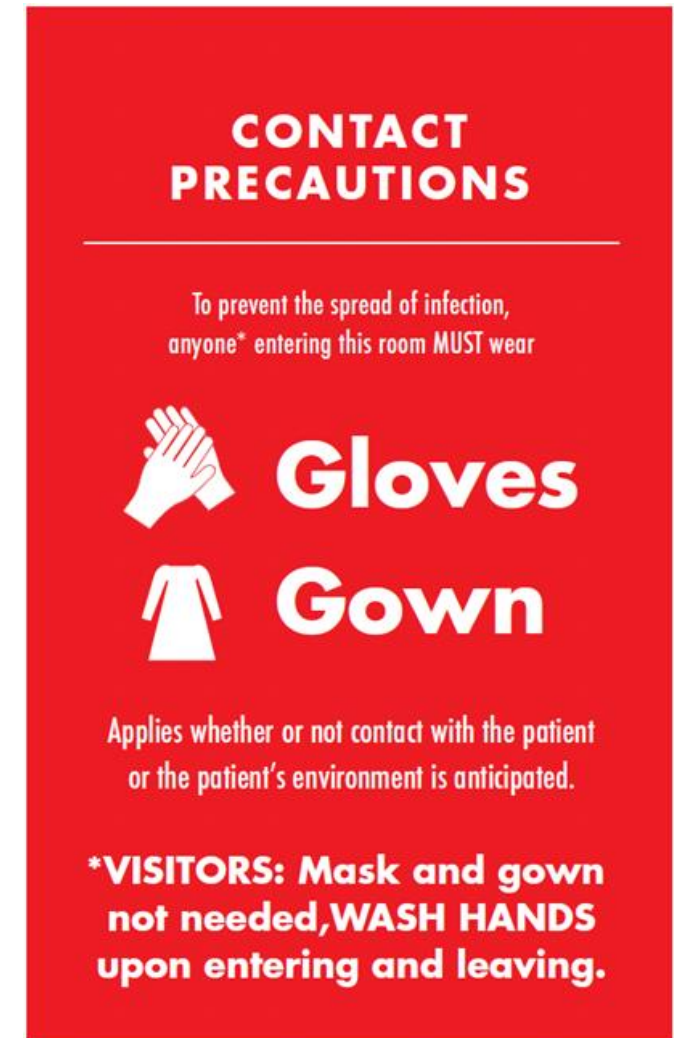
- Contact with blood, body fluids, secretions (including respiratory), or secretions are anticipated
- Remove before leaving patient's room
- Don't wear the same gown for care between patients



Contact Precautions

- ▶ Use hand sanitizer or wash hands with soap and water for at least 15 seconds
- ▶ Put on gown and gloves before entering the patient's room.
- ▶ Wear gown and gloves for the entire stay in the room.
- ▶ Remove the gown and gloves before leaving the room.
- ▶ Use hand sanitizer or was hands before leaving the patient's room.

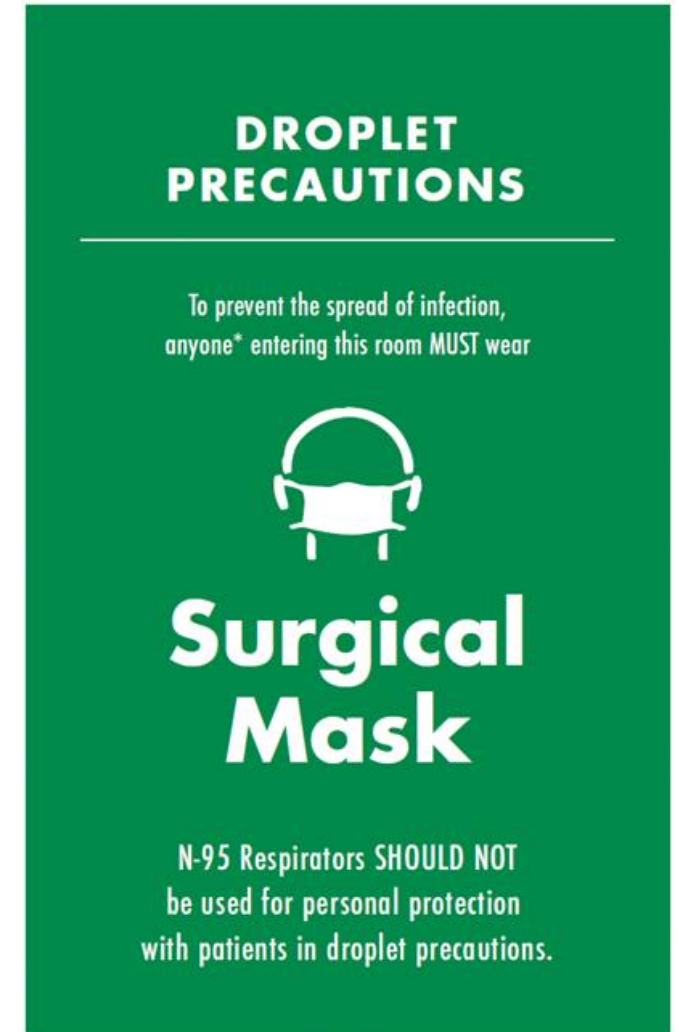
- Do NOT put personal items on the patient's bed, trash can, or linen hamper.
- Do NOT leave the room with gown and gloves on.
- Do NOT use the patient's bathroom.



Droplet Precautions

- ▶ Use hand sanitizer to wash hands with soap and water for at least 15 seconds.
- ▶ Place a surgical mask on before entering the patient's room.
- ▶ Remove the mask before leaving the patient's room.
- ▶ Use hand sanitizer or wash hands before leaving the patient's room.

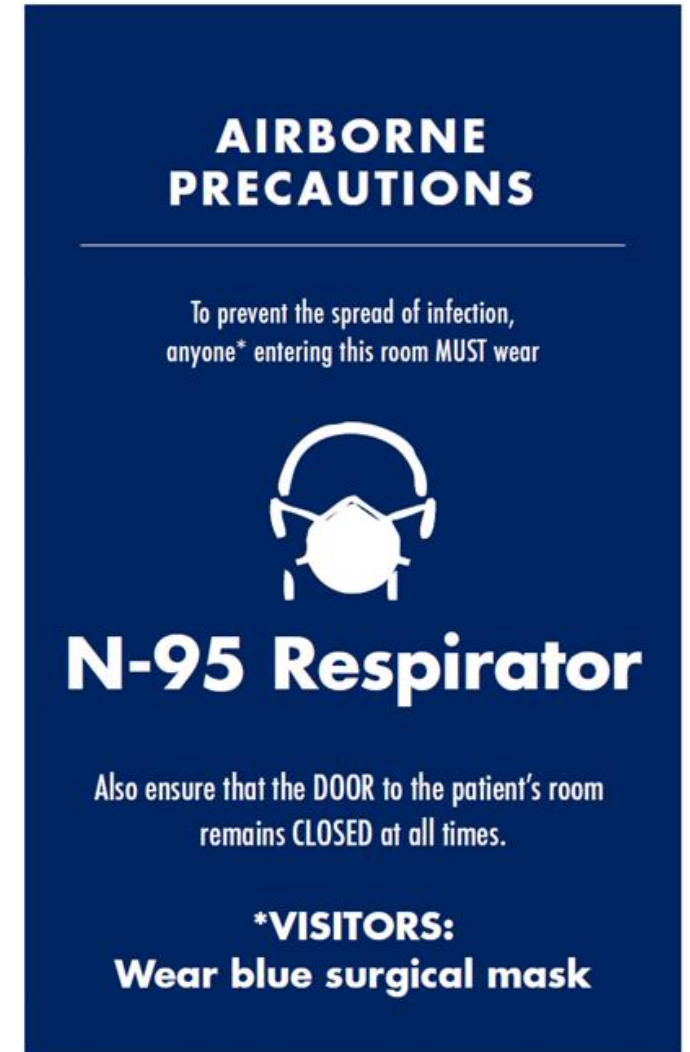
- Do NOT remove mask while in the room.
- Do NOT wear mask outside of the room.
- Do NOT leave the door open.



Airborne Precautions

- ▶ Use hand sanitizer before entering the room.
- ▶ Place a blue N95 mask on before entering the patient's room.
- ▶ Keep mask on the entire time you're in the room.
- ▶ Keep the patient's room door closed at all times.
- ▶ Use hand sanitizer to wash hands with soap and water for at least 15 seconds before leaving the room.

- Do NOT remove mask while in the room.
- Do NOT leave the door open.
- Do NOT bring children under 17 years of age.



Special Contact Precautions (Contact Plus)

- ▶ Use hand sanitizer before entering the room.
- ▶ Wear gloves and gown every time you enter the room and the entire time you are in the room.
- ▶ Remove gloves and gown before you leave the room.
- ▶ Wash hands with soap and water for at least 15 seconds before leaving the room.
- ▶ Ask all healthcare workers to wash their hands.

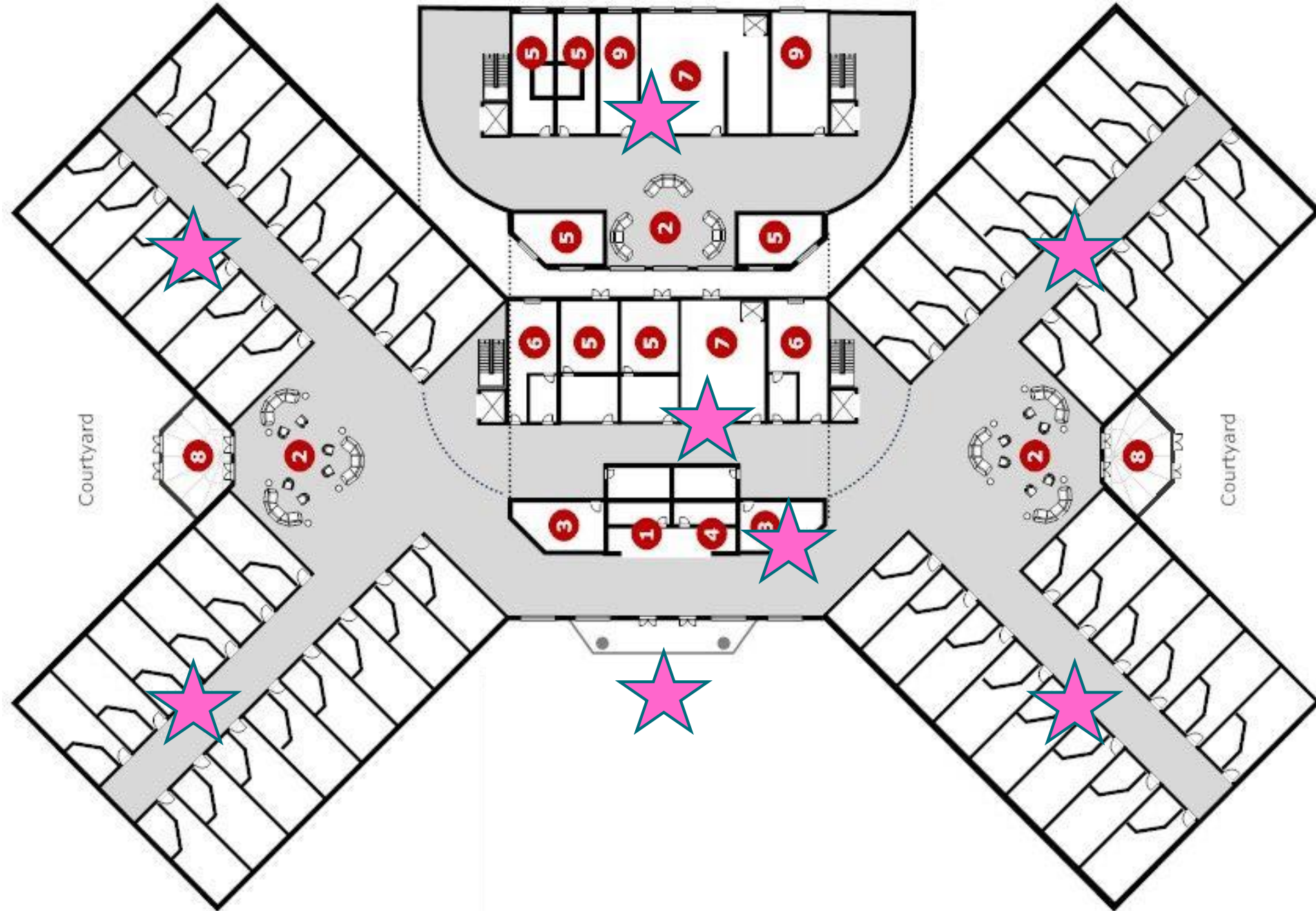
- Do NOT put personal items on the patient's bed, trash can, or linen hamper.
- Do NOT use the patient's bathroom.
- Do NOT allow children to visit if they are not able to follow these instructions.



Nursing Home Residential Unit Plan

1. Administration
2. Lounge
3. Nurse Station
4. Pharmacy
5. Medical/service
6. Laundry
7. Living/Dining Room
8. Sunroom
9. Employee Facilities

not to scale



Infection Prevention and Control Assessment and Response (ICAR) Tool for Long-term Care Facilities

- ▶ HAI/AR Program utilizes these to stop transmission
- ▶ Modified or full ICARs
 - Healthcare Personnel and Resident Safety
 - Hand Hygiene
 - Personal Protective Equipment (PPE)
 - Respiratory/Cough Etiquette
 - Environment Cleaning
- ▶ Available for settings across the healthcare spectrum
- ▶ Direct observations
- ▶ Purpose is to identify and subsequently mitigate gaps in IC Programs

Infection Prevention and Control Assessment Tool for Long-term Care Facilities

This tool is intended to assist in the assessment of infection control programs and practices in nursing homes and other long-term care facilities. If feasible, direct observations of infection control practices are encouraged. To facilitate the assessment, health departments are encouraged to share this tool with facilities in advance of their visit.

Overview

Section 1: Facility Demographics

Section 2: Infection Control Program and Infrastructure

Section 3: Direct Observation of Facility Practices (optional)

Section 4: Infection Control Guidelines and Other Resources

Infection Control Domains for Gap Assessment

- I. Infection Control Program and Infrastructure
- II. Healthcare Personnel and Resident Safety
- III. Surveillance and Disease Reporting
- IV. Hand Hygiene
- V. Personal Protective Equipment (PPE)
- VI. Respiratory/ Cough Etiquette
- VII. Antibiotic Stewardship
- VIII. Injection safety and Point of Care Testing
- IX. Environmental Cleaning

Transmission-Based Precautions Reinforced During ICARs Subsequent to LTCF Outbreaks

Takeaway Message: Infection Control Works!

- ▶ Precautions for all symptomatic patients regardless of positive laboratory tests
- ▶ Daily rounding to assess additional positive cases
- ▶ Informing public health of outbreaks within 24 hours, regardless of etiology
- ▶ Cohorting of staff
- ▶ Did not recommend moving patients: consider incubation periods
- ▶ Increase hand hygiene opportunities
- ▶ Fully stock PPE and audit use
- ▶ Communications with patients, families, and visitors
- ▶ Face shields during aspirating procedures
- ▶ “Do what you can with what you have.” – Dr. Raoult Ratard and other really smart people

In all cases where ICARs were administered, transmission stopped within one incubation period of the causative agent.

<https://www.cdc.gov/hai/pdfs/toolkits/Interfacility-IC-Transfer-Form-508.pdf>

Inter-facility Infection Control Transfer Form

This form must be filled out for transfer to accepting facility with information communicated prior to or with transfer.
Please attach copies of latest culture reports with susceptibilities if available.

Sending Healthcare Facility:

Patient/Resident Last Name	First Name	Date of Birth	Medical Record Number

Name/Address of Sending Facility	Sending Unit	Sending Facility Phone

Sending Facility Contacts	Contact Name	Phone	E-mail
Transferring RN/Unit			
Transferring physician			
Case Manager/Admin/SW			
Infection Preventionist			

Does the person* currently have an infection, colonization OR a history of positive culture of a multidrug-resistant organism (MDRO) or other potentially transmissible infectious organism?	Colonization or history (Check if YES)	Active infection on Treatment (Check if YES)
Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA)	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
Vancomycin-resistant <i>Enterococcus</i> (VRE)	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
<i>Clostridioides difficile</i>	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
<i>Acinetobacter</i> , multidrug-resistant	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
Enterobacteriaceae (e.g., <i>E. coli</i> , <i>Klebsiella</i> , <i>Proteus</i>) producing-Extended Spectrum Beta-Lactamase (ESBL)	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
Carbapenem-resistant Enterobacteriaceae (CRE)	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
<i>Pseudomonas aeruginosa</i> , multidrug-resistant	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
<i>Candida auris</i>	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
Other, specify (e.g., lice, scabies, norovirus, influenza):	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes

Does the person* currently have any of the following? (Check here ☐ if none apply)

<input type="checkbox"/> Cough or requires suctioning	<input type="checkbox"/> Central line/PICC (Approx. date inserted <input type="text"/>)
<input type="checkbox"/> Diarrhea	<input type="checkbox"/> Hemodialysis catheter
<input type="checkbox"/> Vomiting	<input type="checkbox"/> Urinary catheter (Approx. date inserted <input type="text"/>)
<input type="checkbox"/> Incontinent of urine or stool	<input type="checkbox"/> Suprapubic catheter
<input type="checkbox"/> Open wounds or wounds requiring dressing change	<input type="checkbox"/> Percutaneous gastrostomy tube
<input type="checkbox"/> Drainage (source): <input type="text"/>	<input type="checkbox"/> Tracheostomy

Implementation Science

Lessons from a Nursing Home Outbreak of Influenza A

Morens and Rash. ICHE;16(5):275-280

- ▶ A nursing home service in a multiword chronic care hospital, Honolulu, Oahu, 1989 to 1990.
- ▶ Complicated by *Mycoplasma pneumoniae* infections.
- ▶ The outbreak was detected on one 37-bed ward of a five-ward Honolulu nursing home.
- ▶ Seven of nine specimens for virus isolation were taken from ill patients in the first 3 days after illness onset.
 - Three of them, all from fatal cases (patients 5,6, and 7) yielded influenza A (H3N2), as did one of two specimens taken more than 3 days after illness onset (patient 3).
 - Isolates from patients 6 and 7 were found to be indistinguishable from influenza A/England/\$/ 27/88 (H3N2), a prevalent strain similar to that of the vaccine each had received.
- ▶ Outbreak management: screening visitors, intensified surveillance for ill staff, patients 3 and 7 were cohorted in the same room, and prophylaxis administered to all residents.
- ▶ Modes of transmission: spatial and temporal patterns of onsets and assessing acuity of patients.
- ▶ Determination: possible that ungloved staff and transmission during suctioning, tube feeding, oral care, and large viral inocula delivered directly into the respiratory tract could explain the high rates of pneumonia and death.

Detection and Control of Influenza Outbreaks in Well-Vaccinated Nursing Home Populations

Monto, et al. CID, 2004;39:459-64

► Methods

- Influenza surveillance was performed among elderly residents of nursing homes in Michigan during 2 influenza seasons.
- The antiviral drug oseltamivir was used for outbreak control at the discretion of nursing home staff once influenza transmission was confirmed by virus isolation or rapid antigen detection.

► Results

- Oseltamivir was used in all homes with influenza transmission; outbreak control varied according to the rapidity of outbreak recognition and the extent of antiviral use.
- Reported adverse events were primarily gastrointestinal reactions and rashes. Analysis of the usefulness of rapid antigen detection tests for outbreak recognition indicated a sensitivity of only 77% (specificity, 92%).

► Conclusions

- Oseltamivir was reasonably well tolerated, and its use, along with continued promotion of vaccination coverage among nursing home residents and staff, should be a valuable addition to institutional outbreak-control strategies.

Report of an Outbreak: Nursing Home Architecture and Influenza-A Attack Rates

Drinka, et al. JAGS, 1996;44(8):910-913.

► Methods

- Measured number of respiratory illnesses and influenza cultures in consenting symptomatic residents.
- Building characteristics.

► Results

- Building with unique ventilation system experienced fewer cases.

► Conclusion

- Retrospective observation suggests that architectural design may influence the attack rate of influenza A in nursing homes.

Effect of Influenza Vaccination of Nursing Home Staff on Mortality of Residents: A Cluster-Randomized Trial

Lemaitre, et al. JAGS, 2009;57(9):1580-1586.

- ▶ Objective: To evaluate the effect of staff influenza vaccination on all-cause mortality in nursing home residents.
- ▶ Setting: Forty nursing homes matched for size, staff vaccination coverage during the previous season, and resident disability index.
- ▶ Measurements:
 - The primary endpoint was total mortality rate in residents from 2 weeks before to 2 weeks after the influenza epidemic in the community.
 - Secondary endpoints were rates of hospitalization and influenza-like illness (ILI) in residents and sick leave from work in staff.
- ▶ Conclusion: These results support influenza vaccination of staff caring for institutionalized elderly people.

Transmission of Influenza: Implications for Control in Health Care Settings

Bridges, et al. CID, 2003;37:1094-1101.

- ▶ Annual influenza epidemics in the United States result in an average of 136,000 deaths and 114,000 hospitalizations.
- ▶ Influenza can spread rapidly to patients and health care personnel in health care settings after influenza is introduced by visitors, staff, or patients.
- ▶ Influenza outbreaks in health care facilities can have potentially devastating consequences, particularly for immunocompromised persons.
- ▶ Although vaccination of health care personnel and patients is the primary means to prevent and control outbreaks of influenza in health care settings, antiviral influenza medications and isolation precautions are important adjuncts.
- ▶ Although droplet transmission is thought to be the primary mode of influenza transmission, limited evidence is available to support the relative clinical importance of contact, droplet, and droplet nuclei (airborne) transmission of influenza.

Bridges, et al. CID, 2003;37:1094-1101.



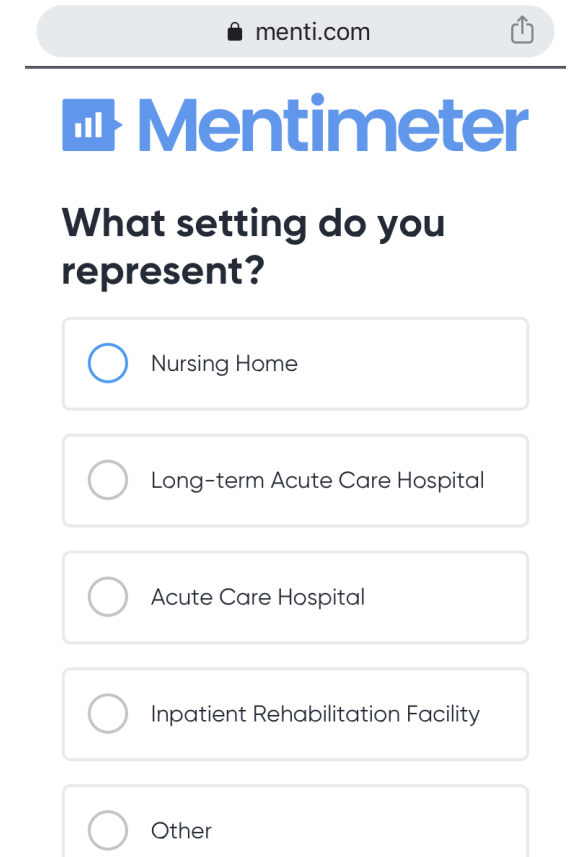
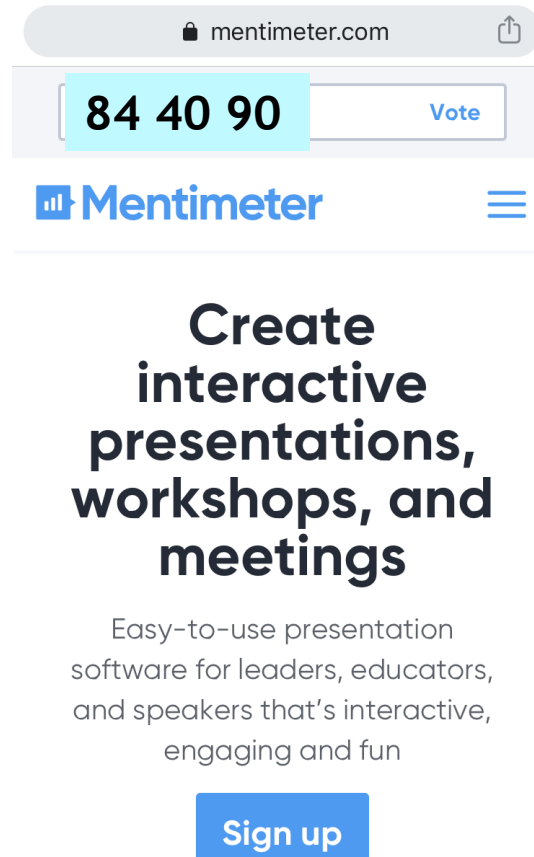
Summary

- ▶ All personal protective equipment should be used in conjunction with hand hygiene.
- ▶ Vaccination of healthcare workers in addition to patients are key with preventing influenza outbreaks in any healthcare setting, particularly long-term care.
- ▶ Consider the geography of LTCF when reviewing potential spread of infectious agents.
- ▶ Communication with patients, staff, visitors, and transferring facilities is key.
- ▶ Coordinate with public health to utilize ICAR to stop transmission.
- ▶ Review the literature to stay up-to-date with guidance and best practices.

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Questions?

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