

Hand Hygiene: A Patient Safety Imperative

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Hand Hygiene: A Resident Safety Imperative

- **Background**
 - High prevalence of colonization and infection by multidrug-resistant organisms (MDROs) in long-term care facilities (LTCFs)
 - Current and emerging pathogens that warrant improved infection prevention and control
- **Role of hands in transmission of pathogens**
 - What are the sources of healthcare personnel hand contamination
 - Hand contamination among healthcare personnel (HCP) & LTCF residents
- **Current status of hand hygiene compliance in LTCFs**
- **Evidence supporting alcohol-based hand rubs (ABHRs) as the preferred method of hand hygiene**
- **Evidence that hand hygiene reduces healthcare-associated infections**

LTCF Residents Are at High Risk of Developing Healthcare-Associated Infections

- **More than 4 million Americans reside in or are admitted to LTCFs annually**
- **About 1 million individuals reside in assisted living facilities**
- **1 to 3 million infections occur each year in such facilities**
 - Most common types of infection include:
 - Gastrointestinal tract
 - Skin, soft tissue, and mucosa
 - Respiratory tract
 - Urinary tract
- **Up to 380,000 people die of infections each year in LTCFs**

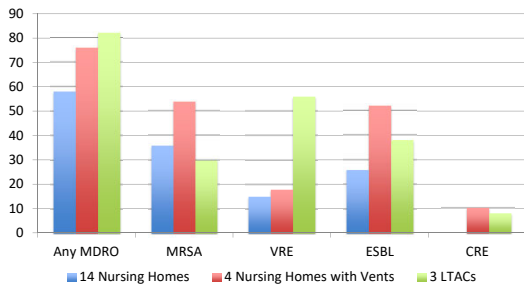
CDC <https://www.cdc.gov/longtermcare/index.html>
La Place L et al. CDC Emerging Infections Program, 2015

Colonization and Infections Due to Multidrug-Resistant Organisms (MDROs) Are Common Among LTCF Residents

- LTCF residents are disproportionately affected by multidrug-resistant organisms (MDROs)
- > 50% of LTCF residents are colonized with a MDRO, without having any signs of infection
 - Higher than patients in acute care hospitals, including ICU patients
- Recent study of 1050 LTCF residents in California revealed:
 - Prevalence of MDROs was 65% in NH residents, 80% in LTAC patients

Mody L. J Amer Geriatr Soc 2017;65:472
 McKinnell JA et al. Clin Infect Dis 2019 (Epub ahead of print)

Point Prevalence of MDROs in 21 LTCFs



McKinnell JA et al. Clin Infect Dis 2019 (Epub ahead of print)

Burden of Invasive MRSA Infections Among Nursing Home Residents

- 2013 CDC study of 777 nursing homes revealed
 - Total of 806 invasive MRSA infections in nursing home residents
 - 91% were bloodstream infections
 - 2.8 Infections/100,000 resident-days
 - Average of 1 invasive MRSA infection/nursing home/year
 - 92% of cases required hospitalization
 - In-hospital mortality rate was 19%

Grigg C et al. J Am Geriatric Soc 2018;66:1581

Emergence of *Candida auris* in vSNFs and LTACs



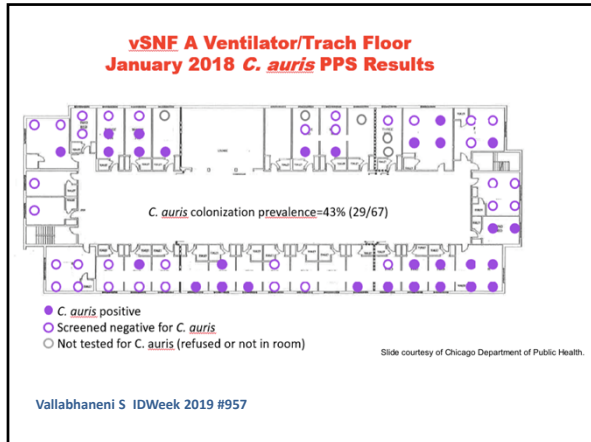
Emergence of *Candida auris*

- *Candida auris* has spread to more than 30 countries since it was first reported in Japan in 2009
- More than 800 clinical cases have been reported in USA
- Causes serious invasive infections with a mortality rate of 30% - 60%
- Organism is multidrug-resistant
- Affected patients/residents remain colonized for long time periods
- Organism can survive on surfaces for > month

Outbreak of *Candida auris* in New York City Healthcare Facilities

- From July 2016 – April 2017, an outbreak of 51 clinical cases of *Candida auris* infection occurred in New York City facilities
- 31 (61%) of cases had resided in LTCFs immediately before being hospitalized
- 45% of case-patients died within 90 days
- Suboptimal availability of ABHRs and poor environmental cleaning contributed to transmission
 - ABHRs were completely absent in 1 LTCF

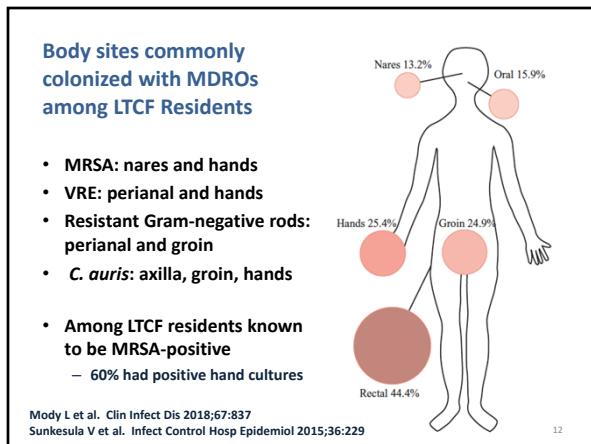
Adams E et al. Emerg Infect Dis 2018;24:1816

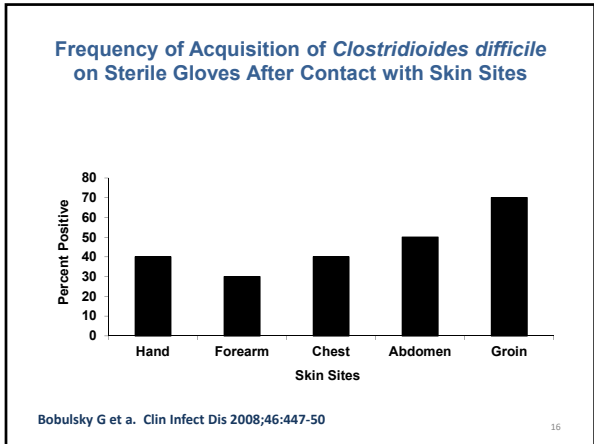


Importance of Hand Hygiene in Ensuring Patient Safety

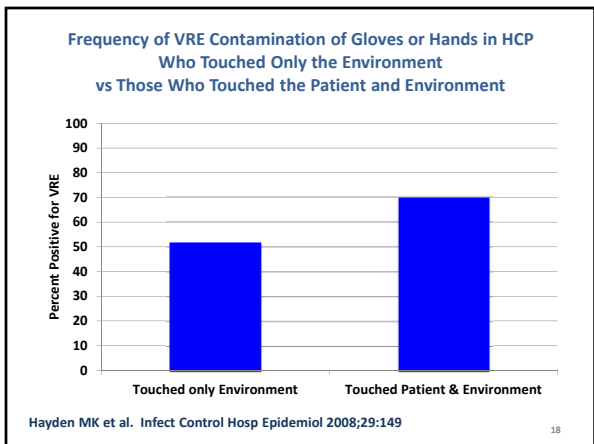
- MDROs and other pathogens are most frequently spread from one resident to another via the hands of HCP
- As a result, hand hygiene is considered one of the most important measures for reducing transmission of MDROs and improving patient safety
- Contamination of HCP hands can occur following:
 - Direct Contact with colonized/infected residents
 - Contact with contaminated objects in the vicinity of affected residents

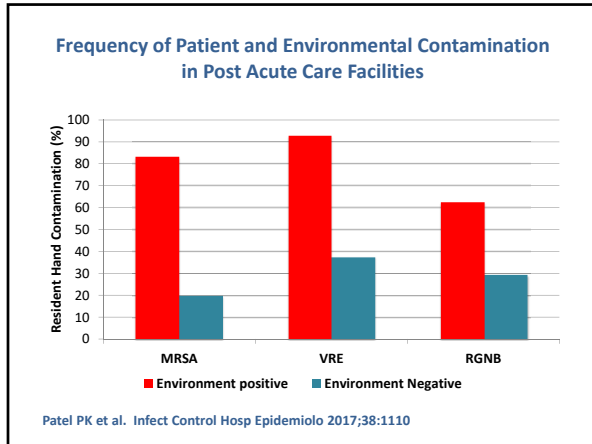
CDC Guideline for Hand Hygiene in Healthcare Settings 2002
World Health Organization Guideline for Hand Hygiene in Health Care, 2009

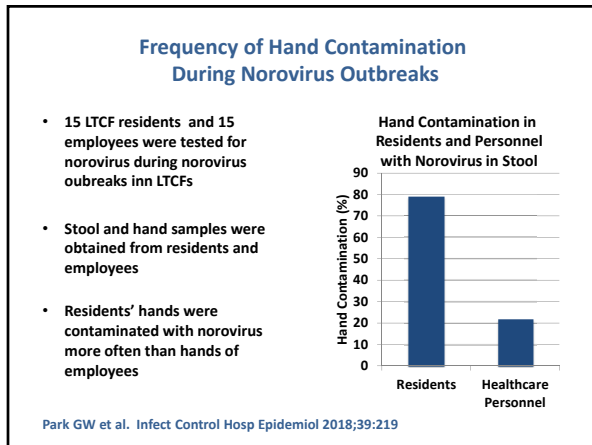


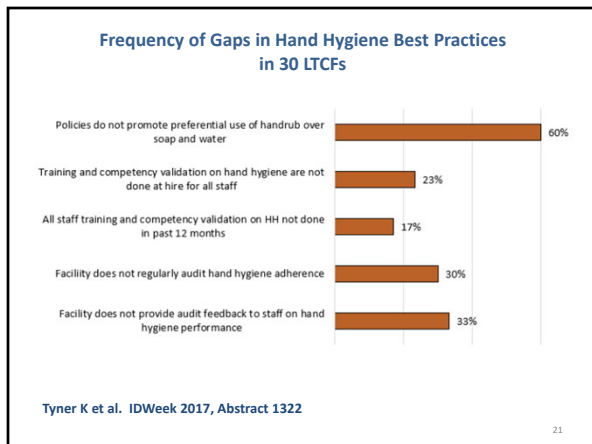


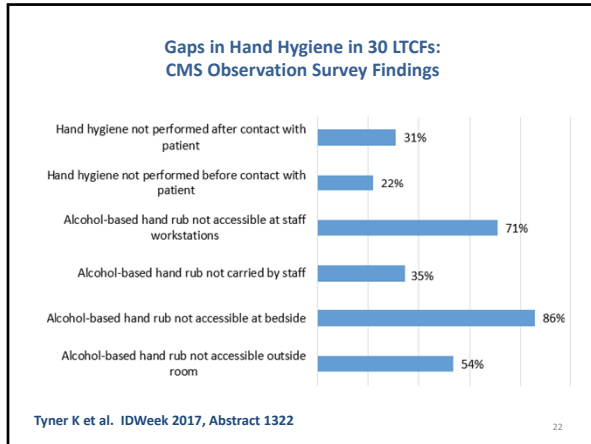


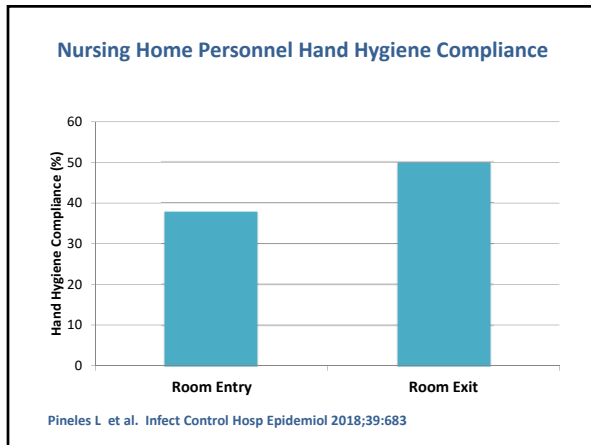












Poor Hand Hygiene Can Lead to Serious Outbreaks of Infection

- **Example of an outbreak due to poor hand hygiene**
 - 28-month outbreak of serious invasive group A *Streptococcus* infections occurred in a nursing home
 - 19 invasive and 60 noninvasive infections occurred
 - In 2015, 57 cases, and 4 deaths among residents occurred
 - Both residents and employees were affected
 - Genetic typing of isolates showed that all were the same strain
- **Factors contributing to the outbreak:**
 - Poor hand hygiene (compliance rates of 14% to 25%)
 - Deficient wound care
 - Employees likely did NOT perform hand hygiene before & after using gloves during wound care

Nanduri SA et al. Clin Microbiol Infect 2019;25:248

CMS Commitment to Reducing Healthcare-Associated Infections in Nursing Homes

- In September 2019, head of CMS reiterated the agency's commitment to ensuring the safety and quality of care in nursing homes
- CMS worked with CDC to develop a free online training course regarding infection prevention and control in LTCFs
 - Includes a separate module dedicated to the topic of hand hygiene (Module 7)
- Provides support for hand hygiene as an essential component of improving resident safety in LTCFs

<https://www.cms.gov/blog/ensuring-safety-and-quality-americas-nursing-homes>

Evidence Supporting Alcohol-Based Hand Rubs as the Preferred Method of Hand Hygiene

- Some healthcare personnel still believe that soap & water handwashing is the best form of hand hygiene
 - Includes some nurses, physicians, nursing assistants, others
 - Such individuals work in hospitals and in LTCFs
- In the last 20 years, multiple studies have shown that this opinion is no longer correct

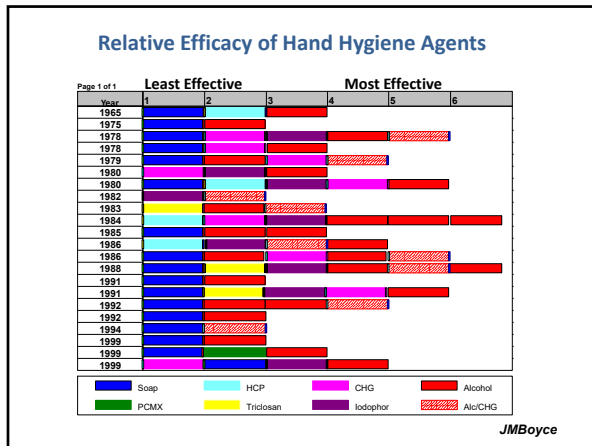
Are Recommended Handwashing Policies Practical?

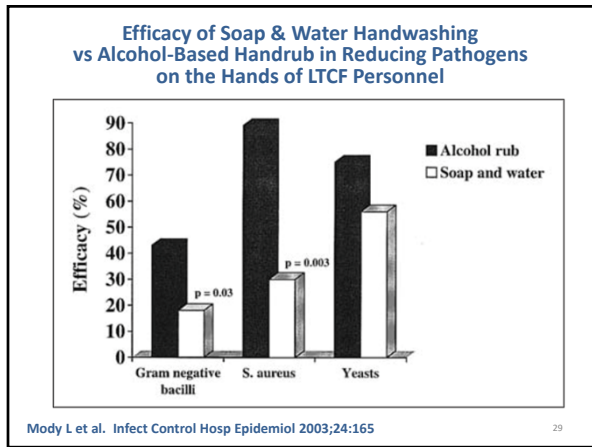
- Time required for soap & water handwashing:
 - 62 seconds to get to sink, wash, dry and return
- ICU with 12 nurses
- 40% compliance: 2 to 6.4 hrs/8-hr shift
- 100% compliance: [16 hrs/shift](#)

- Time required for alcoholic hand disinfection:
 - 15-second contact time · bedside dispenser
- 40% compliance: 1 to 1.6 hrs/8-hr shift
- 100% compliance: [4 hrs/shift](#)

Voss A & Widmer AF Infect Control Hosp Epidemiol 1997;18:205-8


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Irritant Contact Dermatitis Due to Frequent Handwashing

- Frequent use of soap & water can lead to skin irritation and damage due to irritant contact dermatitis
 - Painful skin irritation causes healthcare personnel to avoid handwashing
 - May lead to increased colonization of hands by pathogens



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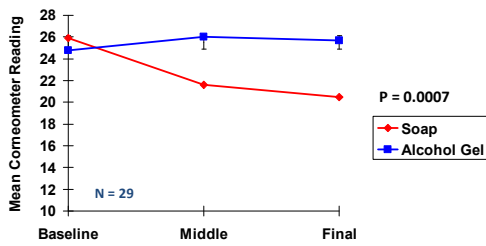
Alcohol-Based Hand Rubs Cause Less Skin Irritation and Dryness than Soap & Water Handwashing

- In 1998, a 6-week prospective randomized trial with crossover design
 - Funded by GOJO Industries
- 29 nurses on 3 wards participated
- The study compared:
 - a non-medicated, "mild" soap
 - an alcohol hand gel
- Skin irritation/dryness of nurses hands were assessed:
 - self-assessment by participants
 - visual assessment by study nurse
 - measuring electrical capacitance of skin on hands



Boyce JM et al. Infect Control Hosp Epidemiol 2000;21:442

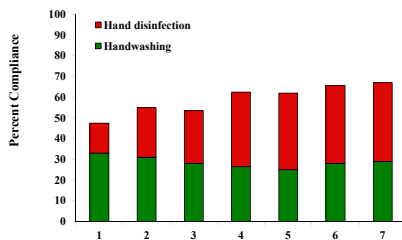
Average Electrical Capacitance Readings of the Skin of Nurses' Hands



Note: A low Corneometer reading indicates drier skin

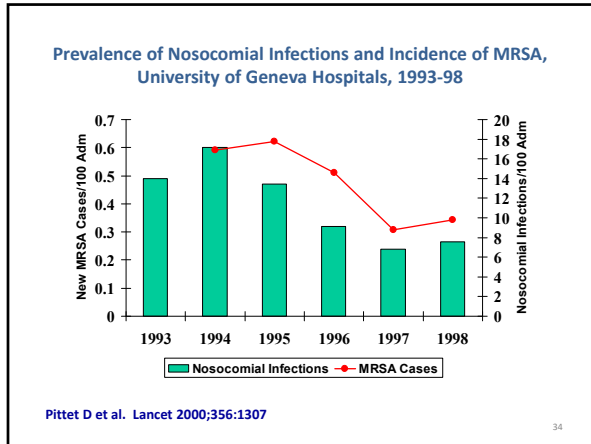
Boyce JM et al. Infect Control Hosp Epidemiol 2000;21:442

HAND-HYGIENE COMPLIANCE DURING 7 HOSPITAL-WIDE SURVEYS, UNIVERSITY OF GENEVA HOSPITALS, 1994-97



Pittet D et al. Lancet 2000;356:1307

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CDC and WHO Hand Hygiene Guidelines

- CDC and WHO guidelines and SHEA Compendium all recommend the use of alcohol-based hand rubs (ABHRs) for routine hand hygiene
- ABHRs:
 - ◆ Faster to use and more convenient
 - ◆ Are more effective than soap & water handwashing at reducing bacteria on hands
 - ◆ Cause less skin irritation and dryness than handwashing
 - ◆ Can promote increased hand hygiene compliance and reduction of healthcare-associated infections

CDC Guideline for Hand Hygiene in Healthcare Settings 2002
 WHO Guidelines for Hand Hygiene in Health Care 2009
 SHEA Compendium on Hand Hygiene 2014

Recommendations from CDC Guideline

- Wash hands with soap and water
 - When visibly dirty or visibly soiled with proteinaceous material, blood or other body fluids
 - Before eating and after using a restroom
 - If exposure to *Bacillus anthracis* (spore-forming pathogen) is suspected or proven
 - Wash with either non-antimicrobial soap or antimicrobial soap & water
- Use alcohol-based handrub as the preferred means for routine hand antisepsis in all other clinical situations, if hands are not visibly soiled. If alcohol-based handrub is not available, wash hands with soap & water

CDC Guideline for Hand Hygiene in Health Care, 2002
 CDC Training Course on Infection Prevention in Nursing Homes, 2019

The Five Components of the WHO multimodal hand hygiene improvement strategy

- 1a. System change – Alcohol-based handrub at point of care
- +
- 1b. System change – access to safe, Continuous water supply, soap and towels
- +
- 2. Training and education
- +
- 3. Evaluation and feedback
- +
- 4. Reminders in the workplace
- +
- 5. Institutional safety climate

www.who.int/gpsc/5may/tools/training_education/en/

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Impact of Improving Hand Hygiene on HAI Rates

- In the systematic review of hand hygiene compliance by Luangasanatip, 19 of 41 studies reported clinical outcomes
 - All reported that improvements in hand hygiene were associated with reductions in at least one measure of HAIs and/or resistance rates
 - Pathogen most frequently reduced was MRSA; less frequently *C. difficile*
 - Reductions were not seen with all pathogens analyzed

Intervention Strategy	Median Odds Ratio	Q1	Q3	Min	Max
Single intervention	~4	~2	~8	~1	~25
WHO-5	~6	~4	~10	~2	~20
WHO-5+	~8	~5	~15	~3	~30

Luangasanatip N et al. BMJ 2015;351:h3728

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Impact of Improving Hand Hygiene on HAI Rates

- Allegranzi et al. performed literature review of impact of hand hygiene on preventing transmission of healthcare pathogens and reduction of healthcare-associated infections
- 36/40 published studies reviewed by Allegranzi et al. found that hand hygiene reduced transmission of healthcare pathogens and healthcare-associated infections
 - Most studies were performed in hospital settings
- Due to limited resources, few prospective studies have evaluated the impact of hand hygiene infection rates in LTCFs

Allegranzi B et al. Hand Hygiene: A Handbook for Medical Professionals, chapter 41

Impact of Hand Hygiene on Reducing Infections in Nursing Home Residents

- Prospective hand hygiene improvement program in 174-bed LTCF
- Program elements included:
 - Switch from soap & water handwashing to use of ABHRs
 - Increased product availability
 - Education of HCP and residents
 - Posters placed throughout facility
 - Observation tool to monitor hand hygiene compliance
 - Included video on hand hygiene technique
- Results: Reduction in LRTIs and slight reduction in SSTIs

Reduction in Nursing Home Infections Following Hand Hygiene Improvement Program

Infection Type	Baseline	Intervention	P-value
LRTI	1.0	0.55	P = 0.01
SSTI	0.35	0.25	P = 0.65

LRTI = lower respiratory tract infection
SSTI = skin and soft tissue infection

Schweon SJ et al. Am J Infect Control 2013;41:39

Cluster-Randomized Hand Hygiene Intervention Trial

- Prospective cluster-randomized hand hygiene intervention trial in 26 nursing homes for 1 year
- Intervention in 13 nursing homes included:
 - Increased availability of ABHR
 - Hand hygiene promotion
 - Staff education
 - Local work groups
- Results:
 - Intervention group had
 - Significantly increased use of ABHR
 - Significantly lower mortality
 - Significantly less antibiotic use
 - Data on infection rates was of insufficient quality for analysis

Monthly mortality rate

Percent of days with antibiotic use

Temime L et al. Am J Infect Control 2018;46:173

CDC Recommendations for Enhanced Barrier Precautions When Caring for NH Residents with MDROs*

- Enhanced barrier precautions refers to use of gloves & gowns during high-contact resident care activities
 - Dressing
 - Bathing/showering
 - Transferring
 - Providing hygiene
 - Changing linens
 - Changing briefs or assisting with toileting
 - Device care or use
 - Central line, urinary catheter, feeding tube, tracheostomy/ventilator
 - Wound care
 - Any skin opening requiring a dressing

* Does not include *Clostridioides difficile* or norovirus

<https://www.cdc.gov/hai/pdfs/containment/PPE-Nursing-Homes-H.pdf>

**CDC Recommendations for Enhanced Barrier Precautions
When Caring for NH Residents with MDROs***

- Place sign on door or wall outside resident's room
 - Include list of high-contact activities
- Make gowns and gloves available outside resident's room
- Ensure access to alcohol-based hand rub in every resident room
 - Ideally, both inside and outside room
- Perform periodic monitoring and assessment of adherence to determine need for training and education
- Provide education to residents and visitors

* Does not include *Clostridioides difficile* or norovirus

<https://www.cdc.gov/hai/pdfs/containment/PPE-Nursing-Homes-H.pdf>

Summary

- LTCF residents are at increased risk of infections, which are often caused by MDROs
- MDROs and other healthcare pathogens are most commonly spread from one resident to another by the hands of HCP
- Hand hygiene is one of the most effective measures for preventing the spread of healthcare-associated pathogens and reducing healthcare-associated infections
- Improving hand hygiene is a patient safety imperative
- Alcohol-based hand rubs are the preferred method of hand hygiene in healthcare facilities, including LTCFs

Thank you for your attention!
