Infection control in non-hospital settings: the example of long-term and ambulatory care facilities

B. Allegranzi

Clean Care is Safer Care

WHO Patient Safety

ESCMID Workshop, Geneva 25-27 February 2013
Definition adopted for the WHO Guidance

- **Outpatient (ambulatory) care**: any medical service provided to patients who are not admitted as inpatients in a hospital. Examples of outpatient care settings: primary healthcare settings, outpatient departments of hospitals, 'poly' clinics, specialized clinics, emergency departments, outpatient surgical centres, physical therapy, rehabilitation centres, diagnosis laboratories, and dental care.

- **Primary care**: first and basic level of healthcare, which guarantees the global assistance and the continuity of care throughout the patient’s life, acting as case manager and coordinator and controlling health care demand.

- The scope of the document also includes **home care** and **long-term care facilities**.

- This care can be for **health promotion, prevention, diagnosis, palliation, cure or rehabilitation, and specialized assistance** (e.g., dialyses units, oncology centers).
Systematic reviews summary (1)

- Literature reviews and expert opinions ('90s)
  - **Transmission** in GP's offices, emergency departments; ophthalmologists' offices and clinics; dental offices; and alternative-care settings
  - **Risk linked to:** 1) invasive procedures; 2) inadequate disinfection and sterilization of instruments and equipment; 3) absent or inappropriate use of barrier precautions; 4) inadequate hand-washing practices; 5) waiting in common areas
  - **Most frequent agents:** *Mycobacterium* spp, HBV, measles, rubella, adenovirus
  - Experts' opinion about the risk of transmission varies considerably

  - Goodmann et al. JAMA 1991;
  - Herwaldt et al. ICHE 1998
APEAS study on Adverse Events (AE) in Primary Healthcare - Spain

- Cross sectional study in 48 primary care settings in Spain
- Prevalence of AE in Primary Healthcare: 1.1% (95% CI: 1.0%-1.2%)
- 55.5% (n=429) related to medications
- 7.4% (n=57) were HAI
  - surgical and/or trauma wound infection (5.1%)
- 64.3% of AE and 78.9% of HAI considered clearly preventable
Systematic reviews summary (2)

- Hand contamination in outpatient settings
  - Doctors' hand contamination with: *S. aureus*, MRSA, *Pseudomonas* spp, HCV in primary paediatric care, outpatient dermatology clinics, GPs' and ophthalmology offices, ambulatory haemodialysis
  - Haemodialysis and cystic fibrosis patients' hand contamination with *S. aureus*, MRSA, *Pseudomonas* spp, VRE

- Cohen et al. Dermatology 2002
- Girier et al. Med Mal Inf 2000
- Grabsch et al. ICHE 2006
- Zuckerman et al. J Cistic Fib 2009
Infection control practices in 68 Ambulatory Surgical Centers (ASC) in the USA

- Overall, **67.6%** (95% CI 55.9%-77.9%) ASCs had at least 1 lapse in infection control
- **17.6%** (95% CI, 9.9%-28.1%) ASCs had lapses in ≥3 of the 5 infection control categories
- **Common lapses:** lapses in handling of blood glucose monitoring equipment (46.3%); using single-dose medication vials for more than 1 patient (28.1%); failing to adhere to recommended practices for equipment reprocessing (28.4%); **lapses in hand hygiene performance** before and after the surgical procedure (17.7%)

*Schaefer et al. JAMA 2010*
Hand hygiene compliance in different outpatient settings

Compliance %

<table>
<thead>
<tr>
<th>Setting</th>
<th>Compliance %</th>
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<tbody>
<tr>
<td>Whyte-Family doctors</td>
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</tr>
<tr>
<td>Martin-Madrazo-PC</td>
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</table>

* Before patient contact
WHO Guide on Hand Hygiene in Outpatient and Home-based Care and Long-term Care Facilities

■ Main objective:
To provide conceptual and practical guidance for the application of the WHO Multimodal Hand Hygiene Improvement Strategy and the My Five Moments approach in healthcare settings where patients are not admitted as inpatients to a hospital.

■ Ultimate aim:
To facilitate the implementation of hand hygiene improvement programmes and obtain maximum compliance with hand hygiene recommendations in these settings.

http://www.who.int/gpsc/5may/en
Critical elements for evaluation of hand hygiene opportunities in outpatient care situations

- Transmission risk according to procedure
- Infection risk for the patient
- Patients' susceptibility status
- Patients' colonization status
- Infection risk for the healthcare worker
- Frequency of the procedure
The geographical conceptualization of the transmission risk

Critical site with infectious risk for the patient

Critical site with body fluid exposure risk


My 5 moments for HAND HYGIENE

1. BEFORE TOUCHING A PATIENT
2. BEFORE CLEAN ASEPTIC PROCEDURE
3. AFTER BODY FLUID EXPOSURE RISK
4. AFTER TOUCHING A PATIENT
5. AFTER TOUCHING PATIENT SURROUNDINGS
The concept of the Five Moments does not change.
The concept of the patient zone and health-care area requires adaptation
PATIENT ZONE

HEALTH-CARE AREA
Haemodialysis

Your 5 Moments for Hand Hygiene

1. Before touching a patient
2. Before clean/aseptic procedure
3. After body fluid exposure risk
4. After touching a patient
5. After touching patient surroundings

Dental Care

1. Before clean/aseptic procedure
2. Before touching a patient
3. After body fluid exposure risk
4. After touching a patient
5. After touching patient surroundings
The patient zone concept in primary care

- In primary care settings, in many cases no "zone" is temporarily dedicated to a patient exclusively.
- The patient’s access to health-care is limited to a short time and the space allocated to care delivery accommodates numerous successive patients.
- The time required for actual contamination of the surroundings by patient's flora is basically unknown.
- In these conditions the concept of patient zone coincides with the patient him/herself.
- However, in any outpatient settings, the health-care environment is contaminated by microorganisms brought by patients and health-care workers, which can carry harmful resistance patterns.
It requires adaptation!
Practical examples

- Public vaccination campaign
- Blood drawing in a laboratory
- Visit to a general practitioner's office
- Mother-and-child consultation in a health post
- Consultation in an emergency policlinic
- Home care
- Chest radiograph in a diagnostic centre
- Haemodialysis in a specialized ambulatory clinic
- Labour and delivery assistance
- Dental care in a clinic
- Long-term care facilities
Public vaccination campaign

Hand hygiene opportunities according to the My Five Moments for Hand Hygiene

1. The person exposes his arm. The HCW applies skin antiseptic to the injection site using a small gauze pad and discards it after use.
2. The HCW picks up the pre-prepared, single-use material for vaccination.
3. The person leaves the room.
4. The HCW writes a note on a sheet of paper on the table.
5. A person walks in (while the previous person walks out) and sits down on a chair.

The HCW applies an adhesive bandage to the injection site.

The HCW discards the needle into the sharps' disposal container on the table.

The HCW performs the injection.
Hand hygiene opportunities according to minimum requirements for hand hygiene

1. The person leaves the room.
2. The HCW applies an adhesive bandage to the injection site.
3. A person walks in (while the previous person walks out) and sits down on a chair.
4. The HCW writes a note on a sheet of paper on the table.
5. The person exposes his arm.
6. The HCW applies skin antiseptic to the injection site using a small gauze pad and discards it after use.
7. The HCW discards the needle into the sharps’ disposal container on the table.
8. The HCW performs the injection.
9. The HCW picks up the pre-prepared, single-use material for vaccination.

© by author
Monitoring hand hygiene compliance...

Observation Form_Outpatient care / Moments 1&4

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<tbody>
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Observation Form_Outpatient care / Moments 1&4

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Observation Form_Outpatient care / Moments 2&3

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HHA Education Tools
On line learning package for GPs

All healthcare workers
Basic hand hygiene information
• Why, how and when
• Multiple choice questions
• annual requirement?

HCW specific packages


Courtesy, Philip Russo
Key messages

Alcohol Based Hand Rub

Point of Care

Before and After Touching a Patient

Hand Hygiene Australia
Leaflet for patients on hand hygiene in home care

When should your health care provider/carer clean their hands?

There are 5 Moments when hand hygiene should be performed by your healthcare provider/carer:

Moment 1. When arriving to attend your care
- At home
  - After your health care worker has entered your house
- In a clinic
  - On entering the treatment room
- Anywhere
  - Before starting any care
  - Before giving oral medications

Moment 2. Before attending to your care
- Immediately before touching your wounds or giving intravenous medications
- Immediately before touching any device you may have like a catheter or IV line

Moment 3. After attending your care
- After touching your wounds or giving your medications
- Immediately after touching any device you may have like a catheter or IV line
- After they have disposed of used/dirty equipment or rubbish
- After collecting any specimens

Moment 4. When your care is finished
- When they leave your home, room or building you are in

Moment 5. After touching the surroundings but not the patient
- After touching any furniture or equipment but not touching you
- After touching any pets
German National Hand Hygiene Campaign „AKTION Saubere Hände“ 2008 -2013

Participating Institutions by March 2012

- **Inpatient Module**: 707 hospitals, 51 rehabilitation clinics
- **Long Term Care Module**: 115 facilities
- **Outpatient Care Module**: 171 facilities

Courtesy, Christiane Reichard
My 5 moments of hand hygiene in outpatient care: invasive procedures* and non-invasive

*Invasive procedures: e.g. dialysis, puncture of joints, invasive radiology procedures, endoscopy, small surgery etc.
Outpatient Care

AKTION Saubere Hände

Hand hygiene and aseptic tasks and method of hand rub

Händedesinfektion
vor aseptischen Tätigkeiten

Vor jeglicher Art von Konnektion bzw. Diskonnektion an einem invasiven Device, z. B.:

VOR dem Legen jeglicher Art von Kathetern durch die durchzuführende und assistierende Person
VOR jeder Konnektion/Diskonnektion jeglicher Art von Katheter und Drainagesystem
VOR der Zubereitung von parenteral verabreichten Medikamenten und infusionslösungen
VOR der Durchführung von Injektionen
VOR Konnektion/Diskonnektion am Infusionssystem
VOR Infusionssystem
VOR dem Abseugen
VOR dem Wechsel von Teilen des Beatmungs- systems inklusive Inhalationszubehör, etc.

Vor jedem Kontakt mit Wunden, nicht intakter Haut und Schleimhaut, z. B.:

VOR jedem Verbandswechsel und Kontakt mit der Wunde
ZWISCHEN septischen und aseptischen Arbeits- schritten beim Verbandswechsel

*unabhängig davon ob Handschuhe getragen werden

Alle Informationen zur AKTION Saubere Hände unter: www.aktion-sauberehaende.de

Einreibemethode
für Ihre Händedesinfektion

Desinfektionsmittel auf die trockenen Hände!

- Die Hände müssen nass sein
- Daumen, Fingerkuppen und Nagelfalze nicht vergessen
- 30 Sekunden Einwirkzeit

Bitte beachten:
- Nur Waschen mit Wasser und Seife bei sichtbarer Verschmutzung
- Kurze, un lackierte Fingernägel
- Keine Ringe
- Keine Uhren

Alle Informationen zur AKTION Saubere Hände unter: www.aktion-sauberehaende.de
Long Term Care

AKTION Saubere Hände

My 5 moments of hand hygiene: the immobile* and the mobile resident

*bedridden
Long Term Care

AKTION Saubere Hände

Hand hygiene and aseptic tasks and method of hand rub
CDC Guidance - Key components

- Dedicate Resources to Infection Prevention (Administrative Measures) (1 ICN)
- Educate and Train Healthcare Personnel
- Monitor and Report Healthcare-associated Infections
- Adhere to Standard Precautions - Hand Hygiene / PPE
- Injection Safety
- Environmental Cleaning
- Medical Equipment Cleaning and Reprocessing
- Respiratory Hygiene/Cough Etiquette
HAI burden in LTCFs

- HAI prevalence in LTCF: 6-10 per 100 residents
- In USA LTCFs, 1.6 million to 3.8 million infections occur each year
- On average, any LTCF resident develops 1 to 3 infections per year, mainly UTI and pneumonia
- The onset of infection is the most common cause of hospital admission (26-50% of transfers to hospitals from LTCF) and death among residents in LTCF, mainly from pneumonia
- 19% of infections occurs in clusters/outbreaks

References:
Surveillance Definitions of Infections in Long-Term Care Facilities: Revisiting the McGeer Criteria

Infect Control Hosp Epidemiol 2012;33(10):965-977

Nimalie D. Stone, MD; Muhammad S. Ashraf, MD; Jennifer Calder, PhD; Christopher J. Crnich, MD; Kent Crossley, MD; Paul J. Drinka, MD; Carolyn V. Gould, MD; Manisha Ithani-Mehta, MD; Ebbing Lautenbach, MD; Mark Loeb, MD; Taranisia MacCannell, PhD; Preeti K. Malani, MD; Lona Mody, MD; Joseph M. Mylotte, MD; Lindsay E. Nicolle, MD; Mary-Claire Roghmann, MD; Steven J. Schween, MSN; Andrew E. Simor, MD; Philip W. Smith, MD; Kurt B. Stevenson, MD; Suzanne F. Bradley, MD

for the Society for Healthcare Epidemiology Long-Term Care Special Interest Group

| TABLE 1. Considerations for Inclusion of Infections in Long-Term Care Facilities (LTCFs) into Facility Infection Surveillance Programs |
| --- | --- | --- |
| Points to consider | Infections | Comments |
| A. Infections that should be included in routine surveillance |
| 1. Evidence of transmissibility in a healthcare setting | Viral respiratory tract infections, viral gastroenteritis, and viral conjunctivitis | Associated with outbreaks among residents and healthcare personnel in LTCFs. |
| 2. Processes available to prevent acquisition of infection | Pneumonia, urinary tract infection, gastrointestinal tract infections including *Clostridium difficile*, and skin and soft tissue infections | Associated with hospitalization and functional decline in LTCF residents. |
| 3. Clinically significant cause of morbidity or mortality | Any invasive group A *Streptococcus* infection, acute viral hepatitis, norovirus, scabies, influenza | A single laboratory-confirmed case should prompt further investigation. |
| 4. Specific pathogens causing serious outbreaks | Ear and sinus infections, fungal oral and skin infections, and herpetic skin infections | Associated with underlying comorbid conditions and reactivation of endogenous infection. |
| B. Infections that could be considered in surveillance |
| 1. Infections with limited transmissibility in a healthcare setting | Surgical site infections, central-line-associated bloodstream infections, and ventilator-associated pneumonia | LTCF-specific definitions were not developed. Refer to the National Healthcare Safety Network’s criteria (http://www.cdc.gov/nhsn/TOC_PSMcManual.html). |
| 2. Infections with limited preventability | |
| C. Infections for which other accepted definitions should be applied in LTCF surveillance (may apply to only specific at-risk residents) | | |
Estimates for Europe*

- LTCF residents with signs and symptoms of an infection on any given day in the EU: 117,800-140,600
- Average duration of an infection episode: 10 days
- Total number of infections in LTCFs in EU/EEA countries: 4.3 million each year based on signs and symptoms
- 2.6 million would be confirmed as HAIs

* Assuming an occupancy rate of 95%

Healthcare Associated infections in Long-Term care facilities (HALT) project from December 2008 to May 2011.

Aims:
• to support prevention of HAIs and AMR in European LTCFs
• to provide a tool for assessment of the prevalence of HAIs (repeated point prevalence surveys) antimicrobial use, performance indicators for IPC practices and antimicrobial stewardship in LTCFs.

Estimated population:
• at least 62,000 LTCFs in the EU in 2010, with a capacity of about 3.1 million beds
  ➢ 58% general nursing homes (residents needing 24-h medical or highly skilled nursing supervision)
  ➢ 32% in residential homes (residents needing 24-h supervision of daily activities)
  ➢ 10% in mixed facilities
European prevalence survey of antibiotic & infection in nursing homes, 2010

- First EU-wide point prevalence survey from May to September 2010
- Total of 64,007 residents surveyed in 722 LTCFs in 25 countries
- Participating LTCFs: nursing homes (75%), mixed facilities (15%) and residential homes (7%)
- Confirmed HAI in 1,488 (2.4%) residents
- Most frequently reported HAI types: respiratory tract infections (33.6%), urinary tract infections (22.3%), skin and soft tissue infections (21.4%), conjunctivitis (8%) and gastro-intestinal infections (4.6%)
- 4.3% received at least one antimicrobial agent
- 48.9% of all antimicrobial agents prescribed for a UTI
- Uro-prophylaxis: 27.7% of all prescribed antimicrobial agents

Protective and risk factors associated with healthcare-associated infections in European studies

<table>
<thead>
<tr>
<th>Country</th>
<th>Protective factors</th>
<th>Risk factors</th>
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<tbody>
<tr>
<td>Italy [14]</td>
<td>None</td>
<td>Degree of dependency, the presence of co-morbidities and invasive devices</td>
</tr>
<tr>
<td>Ireland [16]</td>
<td>None</td>
<td>Urinary catheter, incontinence, pressure sores, other wounds, surgery in the past 30 days</td>
</tr>
<tr>
<td>France, Switzerland [21]</td>
<td>Presence of a psycho-behavioural disorder</td>
<td>Nutrition abnormalities, diabetes, chronic bronchitis, swallowing disorders, intravenous catheter, urinary catheter and other catheters</td>
</tr>
<tr>
<td>Germany [22]</td>
<td>None</td>
<td>Urinary catheters, gastric tubes, age &gt;80 years</td>
</tr>
<tr>
<td>Norway [28]</td>
<td>None</td>
<td>Bedridden or a stay of &lt;28 hours in the facility, presence of chronic heart disease, urinary incontinence, an indwelling catheter, a skin ulcer</td>
</tr>
</tbody>
</table>

The degree of dependency was derived from the number of disabilities for activities for daily living (ADL): 3-4 and 5-6 were risk factors [29].

Device-Associated Infection Rates, Device Utilization, and Antimicrobial Resistance in Long-Term Acute Care Hospitals Reporting to the National Healthcare Safety Network, 2010

Infect Control Hosp Epidemiol 2012;33(10):993-1000

Amit S. Chitnis, MD, MPH;1,2 Jonathan R. Edwards, MStat;1 Phillip M. Ricks, PhD;1 Dawn M. Sievert, PhD;1 Scott K. Frankin, MD;1 Carolyn V. Gould, MD, MSCR1
Klebsiella pneumoniae carbapenemase (KPC)-producing Enterobacteriaceae

- Outbreak investigation (2008)
- 14 acute care hospitals, 2 LTACHs, and 10 nursing homes
- 42 cases
- 27.5% mortality
- 60% of cases were in one LTCFs
- Only 10% of cases were acquired in acute care hospital

Won et al, CID 2011
MRSA colonization among LTCF residents

Studies in Europe: 0.9-22%

Methicillin-Resistant Staphylococcus aureus (MRSA) Nasal Carriage in Residents of Veterans Affairs Long-Term Care Facilities: Role of Antimicrobial Exposure and MRSA Acquisition

Infect Control Hosp Epidemiol 2012;33(6):551-557

Nimalie D. Stone, MD; Donna R. Lewis, MSN; Theodore M. Johnson II, MD; Thomas Hartney, MD; Doris Chandler, MSN; Johnita Byrd-Sellers; John E. McDonough Jr, MD; Fred C. Tenover, PhD; John A. Jernigan, MD; Robert P. Gaynes, MD

for the Southeast Veterans Affairs Long-Term Care Methicillin-Resistant Staphylococcus aureus Cooperative

OBJECTIVE. To identify risk factors associated with methicillin-resistant Staphylococcus aureus (MRSA) acquisition in long-term care facility (LTCF) residents.

DESIGN. Multicenter, prospective cohort followed over 6 months.

SETTING. Three Veterans Affairs (VA) LTCFs.

PARTICIPANTS. All current and new residents except those with short stay (<2 weeks).

METHODS. MRSA carriage was assessed by serial nares cultures and classified into 3 groups: persistent (all cultures positive), intermittent (at least 1 but not all cultures positive), and noncarrier (no cultures positive). MRSA acquisition was defined by an initial negative culture followed by more than 2 positive cultures with no subsequent negative cultures. Epidemiologic data were collected to identify risk factors, and MRSA isolates were typed by pulsed-field gel electrophoresis (PFGE).

RESULTS. Among 412 residents at 3 LTCFs, overall MRSA prevalence was 58%, with similar distributions of carriage at all 3 facilities: 20% persistent, 39% intermittent, 41% noncarriers. Of 254 residents with an initial negative swab, 25 (10%) acquired MRSA over the 6 months; rates were similar at all 3 LTCFs, with no clusters evident. Multivariable analysis demonstrated that receipt of systemic antimicrobials during the study was the only significant risk factor for MRSA acquisition (odds ratio, 7.8 [95% confidence interval, 2.1–28.6]; P = .002). MRSA strains from acquisitions were related by PFGE to those from a roommate in 9/25 (36%) cases; 6 of these 9 roommate sources were persistent carriers.
C. difficile in LTCF/nursing homes

- Large outbreak of CDIs, ribotype 027 in Northern France.
- 38 healthcare facilities (mainly LTCF and nursing homes), 529 CDIs over a 22-month period (281 laboratory-confirmed 027)
- Most cases were over 80 years-old (mean age: 79.8 years)
- Incidence: 1.19 cases/10,000 hospitalisation days in acute care facilities (range: 0.1 to 4.5) and **2.39 in LTCF** (range: 0.15 to 19.8)

### 37 pathogens associated with 206 outbreaks in Nursing Homes, 1996-2008

<table>
<thead>
<tr>
<th>Microorganism</th>
<th>Median attack rate %</th>
<th>Median case fatality rate %</th>
<th>Median duration</th>
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<tr>
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<td>20</td>
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<td>Norovirus</td>
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<td>Sarcopes scabei</td>
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Source: Utsumi M, Age and Aging 2010  
Courtesy: ML Moro
Multiple Outbreaks of Hepatitis B Virus Infection Related to Assisted Monitoring of Blood Glucose Among Residents of Assisted Living Facilities — Virginia, 2009–2011

Weekly
May 18, 2012 / 61(19);339-343
### Table 16: Topics on which AB guidelines exist for NHs

<table>
<thead>
<tr>
<th>Country</th>
<th>General AB use recommendations</th>
<th>Urinary tract infection</th>
<th>Pneumonia</th>
<th>Upper respiratory tract infection</th>
<th>Wound infection</th>
<th>Gastrintestinal infection</th>
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<tr>
<td>Total no (%)</td>
<td>10</td>
<td>14</td>
<td>13</td>
<td>12</td>
<td>7</td>
<td>6</td>
<td>5</td>
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<tr>
<td></td>
<td>(48%)</td>
<td>(67%)</td>
<td>(62%)</td>
<td>(57%)</td>
<td>(33%)</td>
<td>(29%)</td>
<td>(24%)</td>
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</table>

C: community    NH: nursing home    H: hospital
Figure 12: Number of residents with antimicrobial use per 100 eligible residents in NHs in Europe, distribution by country.

Source: ESAC
Factors associated with AMR in the elderly

- Transfer to the LTCF of colonized or infected patients from other institutions
- Excessive and inappropriate use of antibiotics, especially broad-spectrum antimicrobial agents:
  - Prescribing antibiotics for unproven bacterial infections (e.g. upper respiratory viral infections) or “prophylactic” antibiotics for residents/patients with chronic urinary catheters.
  - Prolonged use beyond the standard recommended duration
- Factors increasing the probability of microbial colonization (and subsequent infection): malnutrition, immunosuppression, urinary catheters, feeding tubes, pressure ulcers, and chronic immobility
- Inadequate adherence to infection-control measures
# Infection control programs in long term care

- IC Structure: Infection Control Practitioner (full-time every 250-300 beds?) and IC Committee
- Surveillance
- Outbreak control
- Isolation and precautions
- Hand hygiene
- Resident health
- Employee health
- Antibiotic stewardship
- Education
- Other aspects: policies and procedures, facility management, disease reporting, performance improvement/resident safety)
Infection control for MDROs in LTCFs

Routine control
• monitoring MRSA and VRE culture results
• communicating MDRO data to HCWs
• assessing compliance with isolation precautions and HH
• monitoring antimicrobial usage
• notifying receiving or transmitting facilities of the presence of a MDRO
• environmental cleaning for residents previously known to be infected or colonized with MDROs

Additional control measures
• consultation from experts
• intensification of education
• increased efforts to control antimicrobial use
• active surveillance cultures
• point-prevalence culturing of targeted units
• intensification of isolation with compliance assessment
• monitoring environmental cleaning

SHEA/APIC Guidelines 2008
UTI prevention in LTCF – same as in acute care

- Limiting use of catheters
- Insertion of catheters aseptically by trained personnel
- Use of as small diameter a catheter as possible
- HH before and after catheter manipulation
- Maintenance of a closed catheter system
- Avoiding irrigation unless the catheter is obstructed
- Keeping the collecting bag below the bladder
- Maintaining good hydration in residents
- Urinary catheters coated with antimicrobial materials: have the potential to decrease UTIs but have not been studied in the LTCF setting

*SHEA/APIC Guidelines 2008*
LRTI prevention in LTCF

- HH after contact with respiratory secretions
- Wearing gloves for suctioning
- Elevating the head of the bed 30 to 45 degrees during tube feeding and for at least 1 h after to decrease aspiration
- Vaccination with pneumococcal vaccine in individuals over the age of 65 years

SHEA/APIC Guidelines 2008
Outbreak of Carbapenem-Resistant Enterobacteriaceae at a Long-Term Acute Care Hospital: Sustained Reductions in Transmission through Active Surveillance and Targeted Interventions

Amit S. Chitnis, MD, MPH;†· Pam S. Caruthers, RN;† Adam K. Rao, MD;†· JoAnne Lamb, MPH;* Robert Lurvey, MD, JD; Valery Beau De Rochars, MD, MPH;†· Brandon Kitchel, MS;† Margarita Cancio, MD;† Thomas J. Török, MD, MPH;‡· Alice Y. Guh, MD, MPH;† Carolyn V. Gould, MD, MSCR;† Matthew E. Wise, PhD, MPH

OBJECTIVE. To describe a *Klebsiella pneumoniae* carbapenemase (KPC)-producing carbapenem-resistant Enterobacteriaceae (CRE) outbreak and interventions to prevent transmission.

DESIGN, SETTING, AND PATIENTS. Epidemiologic investigation of a CRE outbreak among patients at a long-term acute care hospital (LTACH).

METHODS. Microbiology records at LTACH A from March 2009 through February 2011 were reviewed to identify CRE transmission cases and cases admitted with CRE. CRE bacteremia episodes were identified during March 2009–July 2011. Biweekly CRE prevalence surveys were conducted during July 2010–July 2011, and interventions to prevent transmission were implemented, including education and auditing of staffing, isolation and cohorting of CRE patients with dedicated nursing staff and shared medical equipment. Trends were evaluated using weighted linear or Poisson regression. CRE transmission cases were included in a case-control study to evaluate risk factors for acquisition. A real-time polymerase chain reaction assay was used to detect the *bla* _<sub>KPC</sub>_ gene, and pulsed-field gel electrophoresis was performed to assess the genetic relatedness of isolates.

RESULTS. Ninety-nine CRE transmission cases, 16 admission cases (from 7 acute care hospitals), and 29 CRE bacteremia episodes were identified. Significant reductions were observed in CRE prevalence (49% vs 8%), percentage of patients screened with newly detected CRE (44% vs 0%), and CRE bacteremia episodes (2.5 vs 0.0 per 1,000 patient-days). Cases were more likely to have received β-lactams, have diabetes, and require mechanical ventilation. All tested isolates were KPC-producing _K. pneumoniae_, and nearly all isolates were genetically related.

CONCLUSION. CRE transmission can be reduced in LTACHs through surveillance testing and targeted interventions. Sustainable reductions within and across healthcare facilities may require a regional public health approach.

*Infect Control Hosp Epidem* 2012;33(10):984-992
C. difficile outbreak control

- **Control measures**: isolation precautions according to standards, reinforcement of hand hygiene (ABHR + HW) wearing gloves, dedicating equipment, environmental cleaning with hypochlorite solutions (0.5%), and a specific process for waste management.

- **Reinforcement**: implementation of cohorting units with isolation in private rooms and dedicated staff personnel.

Hand hygiene compliance in LTCFs
Hand hygiene in LTCFs – expert consensus

- In specialized nursing homes (mentally or physically disabled residents and mainly cared for in a dedicated space with dedicated equipment), the patient zone concept and hand hygiene recommendations should be applied in the same way as for hospitals.

- In residential facilities (semi-autonomous residents living in a community, having their own room or shared accommodation and moving within the home facility) hand hygiene recommendations apply only to situations where health care is delivered to residents (e.g. rehabilitation sessions, vital signs check), i.e. at the point of care (where the care procedure takes place) and do not cover any social contacts with or among LTCF residents unrelated to health-care delivery.
Your Moments for **Hand Hygiene**

Care in a residential home

**1. BEFORE TOUCHING A PATIENT**

1. **WHY?** Clean your hands before touching a patient.
   **WHY?** To protect the patient against harmful germs carried on your hands.

2. **WHEN?**
   **WHEN?** Immediately before performing a clean/aseptic procedure.
   **WHEN?** To protect the patient against harmful germs, including the patient's own skin, from entering his/her body.

**2. AFTER CLEAN/ASEPTIC PROCEDURE**

3. **WHEN?** Clean your hands immediately after performing a clean/aseptic procedure.
   **WHEN?** To protect yourself and the environment from harmful patient germs.

**3. AFTER BODY FLUID EXPOSURE RISK**

4. **WHEN?** Clean your hands immediately after a procedure involving exposure risk to body fluids and after glove removal.
   **WHEN?** To protect yourself and the environment from harmful patient germs.

**4. AFTER TOUCHING A PATIENT**

**WHEN?**
   **WHEN?** Clean your hands after touching the patient at the end of the encounter or when the encounter is interrupted.
   **WHEN?** To protect yourself and the environment from harmful patient germs.
# LTCFs and hand hygiene improvement (1)

<table>
<thead>
<tr>
<th>Author</th>
<th>Type of study</th>
<th>Setting</th>
<th>Intervention</th>
<th>Results</th>
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<tbody>
<tr>
<td>Loeb M, 2003</td>
<td>Observational, prospective</td>
<td>50 Nursing Homes, Canada and US</td>
<td>Increased staffing, antibacterial soap use, number of sinks</td>
<td>Reduced risk of MRSA: Reduced risk of TMP-SMX R Enterobacteriaceae</td>
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<tr>
<td>Huang TT, 2008</td>
<td>Before-after</td>
<td>Taiwan, LTCFs</td>
<td>HH training program</td>
<td>HH compliance from 9.3% to 30.4%. Infection incidence from 1.7% to 1.5%</td>
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<tr>
<td>Makris AT, 2000</td>
<td>Controlled trial, before-after</td>
<td>LTCFs in US</td>
<td>IC educational program including HH</td>
<td>Infection incidence from 6.3% to 4.1%</td>
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</table>
## LTCFs and hand hygiene improvement

<table>
<thead>
<tr>
<th>Author</th>
<th>Type of study</th>
<th>Setting</th>
<th>Intervention</th>
<th>Results</th>
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<tbody>
<tr>
<td>Ho M, 2012</td>
<td>Clustered randomized controlled trial,</td>
<td>18 LTCFs in Hong Kong</td>
<td>ABHR (WHO formulation), ABHR racks, pull reels, HH posters and reminders,</td>
<td>Significant increase of HH compliance in intervention arms (27% to 61% and 22% to 49%)</td>
</tr>
<tr>
<td></td>
<td>before-after</td>
<td></td>
<td>a health talk, video clips, training materials, and performance feedback</td>
<td>Decrease of respiratory outbreaks (IRR, 0.12; 95% CI, 0.01–0.93; ( P ) .04) and MRSA infections requiring hospital admission (IRR, 0.61; 95% CI, 0.38–0.97; ( P ) .04)</td>
</tr>
<tr>
<td>Yeung WK, 2011</td>
<td>Clustered randomized controlled trial,</td>
<td>7 LTCFs in Hong Kong</td>
<td>Pocket- sized containers of ABHR reminder materials, education</td>
<td>HH compliance from 25.8% to 33.3%. Incidence of serious infect. from 1.42/1000 to 0.65/1000</td>
</tr>
</tbody>
</table>
Before a clinical examination
Before helping the patient to mobilize
Before aseptic task
Before aseptic task
After body fluid exposure
After patient contact

Fuente OMS
Coordinación de Cooperación Asistencial y Sociosanitaria
After contact with patient surroundings
15,304 facilities from 161 countries, > 3.8 mio beds and 13 mio health-care workers

http://www.who.int/gpsc/5may/registration_update/en/index.html
5 May 2013 call to action:

1. *Continue to focus on hand hygiene monitoring and feedback!*  
   http://www.who.int/gpsc/5may/monitoring_feedback/en/index.html

1. *Patients have a voice too!*  
   http://www.who.int/gpsc/5may/5may2013_patient-participation/en/index.html

- Identify the best way to gather *patient participation* in hand hygiene promotion and improvement, according to the local culture and your facility’s approach
Thank you

WHO Clean Care is Safer Care

Find all information at www.who.int/gpsc/5may
Send enquiries to savelives@who.int