Educational Workshop

EW08: Infection control issues in long-term care facilities, rehabilitation and continuity of care

Arranged with ESGIE

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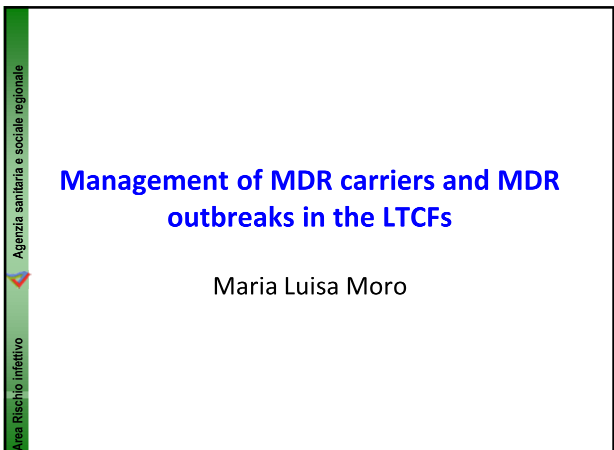


Colonization vs infection with MDROs

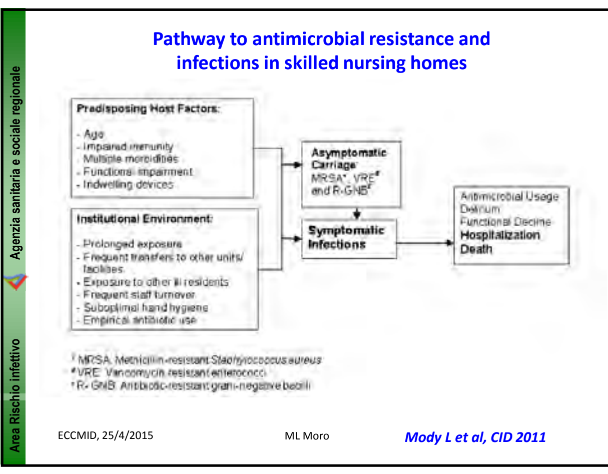
Colonization

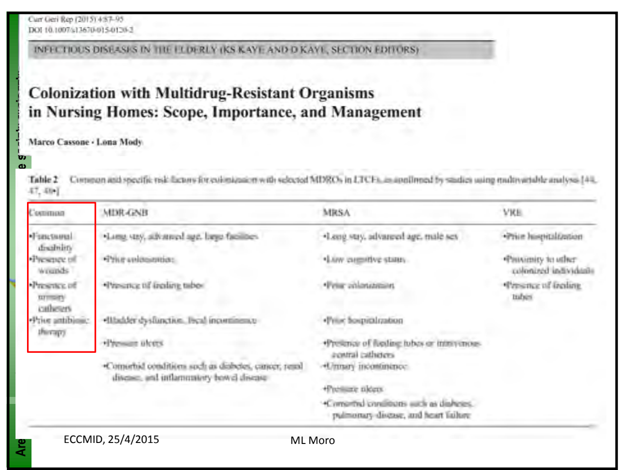
- **Frequent event**: over 35% of residents may be colonized at a given time **(Cassone M et al, 2015)**
- Residents colonized with one R organism have higher likelihood of colonization with others R organisms
- **Duration**: colonization is often prolonged **(Nicolle L, 2012)**: antimicrobial pressure is an important risk factor.

Infection

- Progression from colonization to infection is not common **(Moro ML, 2013)**: 10-15% for MRSA compared to 30-60% in hospitalized patients **(Manzur A, 2012)**
- Infections primarily occur in residents with the highest acuity **(Nicolle L, 2012)**

ECCMID, 25/4/2015 ML Moro





Curr Geri Rep (2015) 4:87–95
DOI 10.1007/s13670-015-0120-2

INFECTIOUS DISEASES IN THE ELDERLY (KS KAYE AND D KAYE, SECTION EDITORS)

Colonization with Multidrug-Resistant Organisms in Nursing Homes: Scope, Importance, and Management

Marco Cassone · Lona Mody

Table 2 Common and specific risk factors for colonization with selected MDROs in LTCFs, as confirmed by studies using multivariable analysis [44, 47, 48•]

Common	MDR-GNB	MRSA	VRE
•Functional disability	•Long stay, advanced age, large facilities	•Long stay, advanced age, male sex	•Prior hospitalization
•Presence of wounds	•Prior colonization	•Low cognitive status	•Proximity to other colonized individuals
•Presence of urinary catheters	•Presence of feeding tubes	•Prior colonization	•Presence of feeding tubes
•Prior antibiotic therapy	•Bladder dysfunction, fecal incontinence	•Prior hospitalization	
	•Pressure ulcers	•Presence of feeding tubes or intravenous central catheters	
	•Comorbid conditions such as diabetes, cancer, renal disease, and inflammatory bowel disease	•Urinary incontinence	
		•Pressure ulcers	
		•Comorbid conditions such as diabetes, pulmonary disease, and heart failure	

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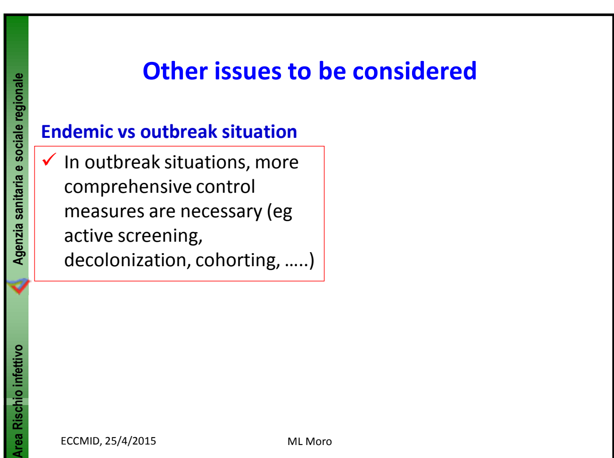

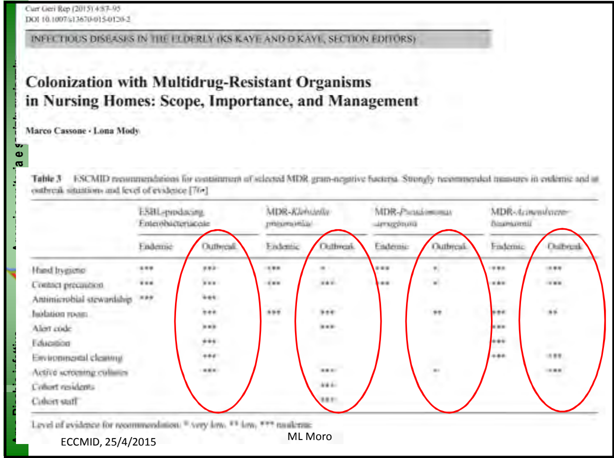

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INFECTIOUS DISEASES IN THE ELDERLY (KS KAYE AND D KAYE, SECTION EDITORS)

Colonization with Multidrug-Resistant Organisms in Nursing Homes: Scope, Importance, and Management

Marco Cassone · Lona Mody

Table 3 ESCMID recommendations for containment of selected MDR gram-negative bacteria. Strongly recommended measures in endemic and at outbreak situations and level of evidence [76•]

	ESBL-producing Enterobacteriaceae		MDR-*Klebsiella pneumoniae*		MDR-*Pseudomonas aeruginosa*		MDR-*Acinetobacter baumannii*	
	Endemic	Outbreak	Endemic	Outbreak	Endemic	Outbreak	Endemic	Outbreak
Hand hygiene	***	***	***	*	***	*	***	***
Contact precaution	***	***	***	***	***	*	***	***
Antimicrobial stewardship	***	***						
Isolation room		***	***	***		**	***	**
Alert code		***		***			***	
Education		***					***	
Environmental cleaning		***					***	***
Active screening cultures		***		***		*		***
Cohort residents				***				
Cohort staff				***				

Level of evidence for recommendation: * very low, ** low, *** moderate

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Other issues to be considered

Endemic vs outbreak situation

- ✓ In outbreak situations more comprehensive control measures are necessary (eg active screening, decolonization, cohorting, …..)

Individual residents vs population burden

- ✓ More intensive measures may be necessary if the objective is to reduce the prevalence of a specific bug in the population (depending on the level of treath)

The long term care context

- ✓ Measures which are sustainable in acute care setting may be not in the home care context

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The Care Home context

* <u>**Permanent domicile**</u>
* Staffing: scarse and under-qualified; high turn-over
* Lack of diagnostic tools
* Private facilities/industrial chains

- **lower total staffing levels** (especially licensed staff) and reduced quality of care
- **high staff turnover and poor resident outcomes**
  (Bostik JE, J Am Med Dir Assoc 2006; 7: 366–376)

Not-for-profit nursing homes deliver higher quality care than do for-profit nursing homes
(Commodore VR, BMJ 2009; 339:b2732)

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Infection control and meticillin-resistant *Staphylococcus aureus* decolonization: the perspective of nursing home staff

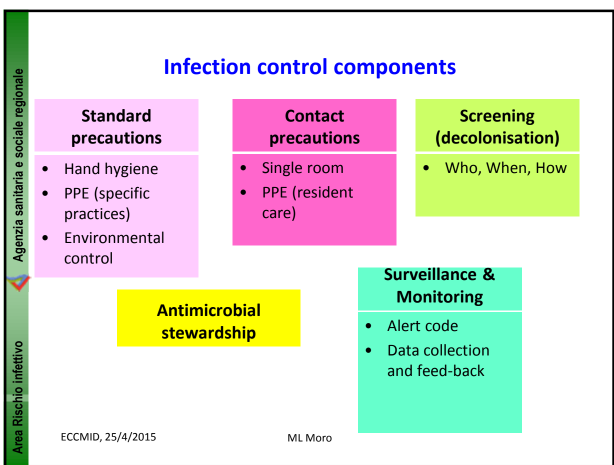
Journal of Hospital Infection 81 (2012) 264–269

P. McClean[a], M. Tunney[a], C. Parsons[a], D. Gilpin[a], N. Baldwin[b], C. Hughes[a,*]

- Factors beyond staff control

Factors influencing IC and MRSA decolonization in NHs:

- **Organizational factors** (e.g. time, financial resources, environment, management and culture)
- **External factors** (e.g. hospitals, regulation and GPs)
- Unmanageable **workload**
- More financial **resources** necessary
- Conflict in maintaining an **environment both 'homely' and clinical**
- Difficult to achieve good ICP with confused residents, some families, GPs and members of staff **resistant to change**
- **Risk of re-colonization**, particularly from hospital admissions



The resident case-mix may vary significantly across Long term care facilities

Mentally or physically disabled/ Clinically severe residents

- ✓ Mainly cared for in dedicated space with dedicated equipment
- ✓ Exposed to invasive devices
- ✓ In need of assistance for daily living activities

Semi-autonomous residents

- No invasive device
- Less need for care

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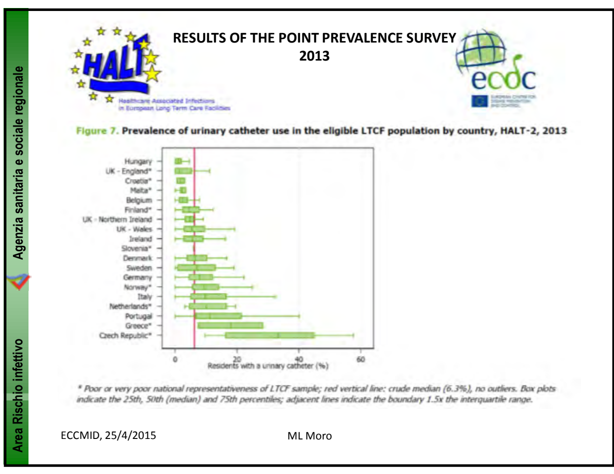

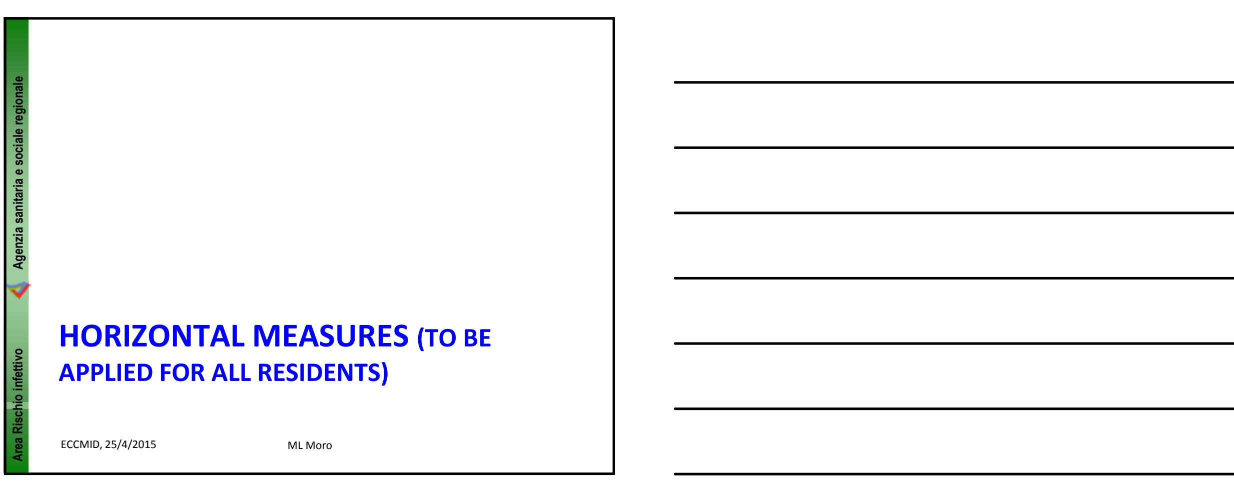

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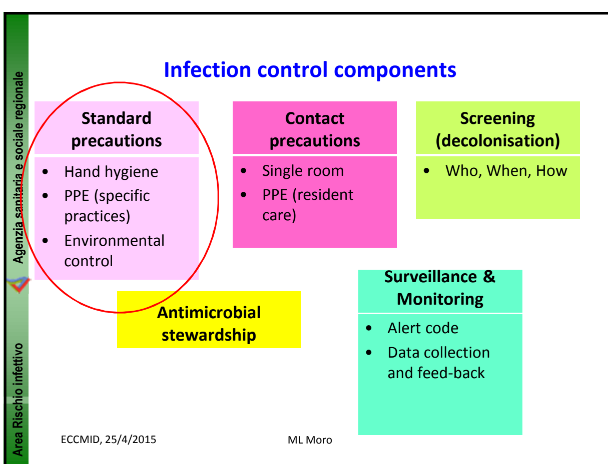
HORIZONTAL MEASURES (TO BE APPLIED FOR ALL RESIDENTS)
ECCMID, 25/4/2015
ML Moro



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Infection control components
Standard precautions
Hand hygiene
PPE (specific practices)
Environmental control
Contact precautions
Single room
PPE (resident care)
Screening (decolonisation)
Who, When, How
Antimicrobial stewardship
Surveillance & Monitoring
Alert code
Data collection and feed-back
ECCMID, 25/4/2015
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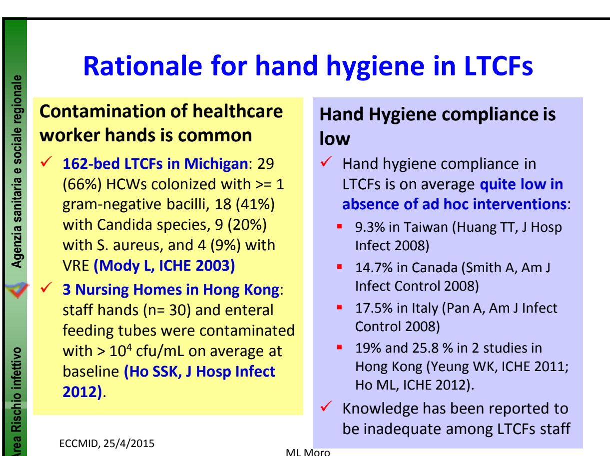

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Rationale for hand hygiene in LTCFs
Contamination of healthcare worker hands is common
162-bed LTCFs in Michigan: 29 (66%) HCWs colonized with >= 1 gram-negative bacilli, 18 (41%) with Candida species, 9 (20%) with S. aureus, and 4 (9%) with VRE (Mody L, ICHE 2003)
3 Nursing Homes in Hong Kong: staff hands (n= 30) and enteral feeding tubes were contaminated with > 10^4 cfu/mL on average at baseline (Ho SSK, J Hosp Infect 2012).
Hand Hygiene compliance is low
Hand hygiene compliance in LTCFs is on average quite low in absence of ad hoc interventions:
9.3% in Taiwan (Huang TT, J Hosp Infect 2008)
14.7% in Canada (Smith A, Am J Infect Control 2008)
17.5% in Italy (Pan A, Am J Infect Control 2008)
19% and 25.8 % in 2 studies in Hong Kong (Yeung WK, ICHE 2011; Ho ML, ICHE 2012).
Knowledge has been reported to be inadequate among LTCFs staff
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Hand hygiene is effective

✓ Promising evidences on HH & infection prevention

Author	Type of study	Setting	Intervention	Results. HH compliance	Results. HAIs
Huang TT, 2008	Before-after	Taiwan, 3 LTCFs	Hand hygiene training program	From 9.3% to 30.4%.	From **1.74% to 1.52%**
Yeung WK, 2011	Cluster RCT	7 Hong-Kong LTCFs with elderly residents	Pocket- sized containers of alcohol-based gel, reminder materials, education	26% to 33.3% (int. LTCFs) vs 26% to 30% (control LTCFs)	Serious infect. from **1.42/ 1000 to 0.65/ 1000**
Ho ML, 2012	Cluster RCT	18 LTCFs in Hong-Kong	Observation & FB, education, reminder mat.	22% to 60% (Int LTCFs) vs. 19% to 20% (control LTCFs)	IRR Resp. Outbr. **0.12 (0.01-0,93)** MRSA infect **0.61 (0.38-0.97)**

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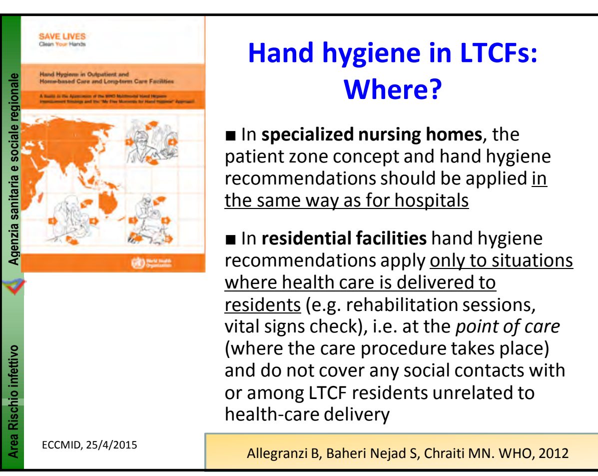

Hand hygiene in LTCFs: Where?

- In **specialized nursing homes**, the patient zone concept and hand hygiene recommendations should be applied in the same way as for hospitals
- In **residential facilities** 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

Allegranzi B, Baheri Nejad S, Chraiti MN. WHO, 2012

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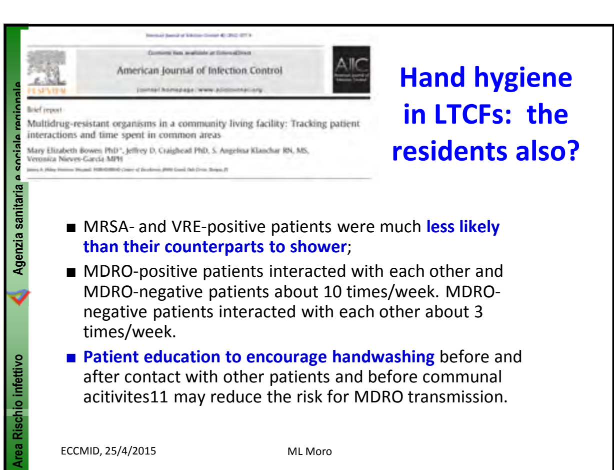
American Journal of Infection Control

Brief report

Multidrug-resistant organisms in a community living facility: Tracking patient interactions and time spent in common areas

Mary Elizabeth Bowen PhD, Jeffrey D. Craighead PhD, S. Angelina Klanchar RN, MS, Veronica Nieves-Garcia MPH

Hand hygiene in LTCFs: the residents also?

- MRSA- and VRE-positive patients were much **less likely than their counterparts to shower**;
- MDRO-positive patients interacted with each other and MDRO-negative patients about 10 times/week. MDRO-negative patients interacted with each other about 3 times/week.
- **Patient education to encourage handwashing** before and after contact with other patients and before communal acitivites11 may reduce the risk for MDRO transmission.

Extended-Spectrum β-Lactamase–Producing Enterobacteriaceae in French Nursing Homes: An Association between High Carriage Rate among Residents, Environmental Contamination, Poor Conformity with Good Hygiene Practice, and Putative Resident-to-Resident Transmission

Hélène Cochard, DN; Benjamin Aubier, MB; Roland Quentin, MD; Nathalie van der Mee-Marquet, PhD, PharmD for the Réseau des Hygiénistes du Centre

The environment role?

OBJECTIVE. We evaluated the spread of multidrug-resistant Enterobacteriaceae in 38 nursing homes (NHs) in the Centre region of France.

METHODS. We conducted a multicenter prevalence study and evaluated extended-spectrum β-lactamase– and carbapenemase-producing Enterobacteriaceae (ESBLE and CPE, respectively) colonization of 1,155 residents. The colonizing isolates were studied by randomly amplified polymorphic DNA typing. We observed hygiene practices and studied the contamination of the environment in 8 NHs.

RESULTS. A total of 114 residents were ESBLE carriers (9.9%); none were CPE carriers. A total of 82.6% of the ESBLE were *Escherichia coli*. ESBLE colonization was associated with poor health status ($P = .002$), malignancy ($P = .006$), urinary incontinence ($P = .007$), fecal incontinence ($P = .002$), previous hospitalization ($P = .033$), and carbapenem treatment ($P = .040$). The clonal relationship between isolates within NHs suggested resident-to-resident ESBLE transmission in 15 NHs. ESBLE isolates were recovered from 6 of 232 bedrooms studied. A total of 1,533 observations revealed low rates of conformity for hand hygiene (25.7%), the use of gloves (45.9%) and protective clothing (13.3%), and waste management (46.7%). Conformity rates correlated inversely with ESBLE carriage rates.

CONCLUSIONS. In most of the participating NHs, improved application of standard precautions during incontinence care is needed, and greater efforts to clean the environment of residents are required.

Infect Control Hosp Epidemiol 2014;35(4):384-389

VERTICAL MEASURES (TO BE APPLIED FOR COLONIZED/INFECTED RESIDENTS WITH MDRO)

Contact precautions in hospitals vs long term care facilities

Situation	Hospital	LTCF
Prevalence of MDRO	Low except in intensive care units; many patients are admitted from the community and have not been previously exposed to a MDRO or recent antibiotic therapy	High; most residents have been previously exposed to a MDRO in a hospital and have received many antibiotics
Need for mobility, rehabilitation and socialization	Low	High
Presence of highly vulnerable patients (immunocompromised [current chemo/radiation therapy, organ/bone marrow transplant)	Common	Uncommon

California Guidelines on Enhanced Standard Precautions for LTCFs, 2010

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www.sciedu.ca/jnep Journal of Nursing Education and Practice, 2014, Vol. 4, No. 8

Negative consequences of isolation among the elderly?

REVIEWS

Improving clinical practice in the management of elderly patients hospitalized with antimicrobial resistant organisms

Natasha Antonio[1], Louise Jensen[2]

- Negative physiological effects of isolation on elderly patients were the **occurrence of preventable adverse events**. Adverse events such as falls, malnutrition, the development of pressure ulcers, and fluid electrolyte imbalances were commonly reported as the result of a decrease in nursing and rehabilitation services, and increased length of hospital stay.
- **Adverse psychological consequences** included feelings of depression, anxiety, hostility, fear, loneliness, neglect, and low self-esteem. These authors also report a sense of stigmatization, contamination, and imprisonment being described by elderly patients.

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Are evidences available on the risk of sharing a room?

- Sharing the room with an MRSA-positive resident -

- ✓ **Only 9 (3.5%), of 254 residents** initially at risk, were likely to have acquired MRSA from their roommate. The majority of roommates who were probable sources of transmission were **persistent carriers with a mean growth score of 4** ***(Stone N et al, ICHE 2011)***
- ✓ Having an MRSA-positive roommate was not associated with MRSA acquisition ***(Furuno JP et al ICHE 2011)***

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Are evidences available on the risk of sharing a room?

Sharing the room with an MDR gram neg-positive resident -

- ✓ **Among 5 (10%) of the 52 residents who acquired an MDR gram-negative** bacterial organism during the study period, genetically related MDR gram-negative strains were isolated from cultures of samples obtained at baseline from their roommates **(3.7% of 135 residents)** ***(O'Fallon E et al, ICHE 2010).***

All residents or focus on high risk residents /specific MDRO only?

- ✓ High risk residents for MDROs (invasive device, functional disability,…)
- ✓ Infected residents, excessive, uncontained wound drainage, fecal incontinence, or other body fluids

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Defining a High-Risk Group: Residents with Indwelling Urinary Catheters and Feeding Tubes

- **Indwelling urinary catheters:**
  - ✓ persistent bacteriuria
  - ✓ more likely to have UTIs or bacteriuria with MDROs and commonly colonized with MDROs (MRSA, VRE, and R-GNB) at other body sites
- **Enteral feeding tubes, nasogastric or percutaneous gastrostomy (PEG):**
  - ✓ PEG tube sites are routinely colonized with organisms; 90% become colonized
  - ✓ often colonized with MDROs at other body sites, such as nares, oropharynx, and groin

Mody L et al, Clin Infect Dis 2011;52(5):654–661

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TABLE 1. Comparison of Facility A Residents with Sputum Colonized with *Acinetobacter baumannii* by Selected Characteristics, Sputum Colonization Survey, California, March 15, 2010

Characteristic	No. (%) of colonized residents ($n = 70$)	OR (95% CI)	P
Female sex	7/32 (22)	1.24 (0.38–4.00)	.72
Male sex	7/38 (18)	Ref	
Age 65 years or more	8/32 (25)	1.78 (0.54–5.81)	.34
Age less than 65 years	6/38 (16)	Ref	
Subacute care section	13/57 (23)	3.55 (0.42–29.89)	.44
Long-term care section	1/13 (8)	Ref	
ADL dependent	12/53 (23)	2.20 (0.44–10.98)	.49
Not ADL dependent	2/17 (12)	Ref	
Indwelling catheter	13/52 (25)	5.67 (0.69–46.84)	.10
No indwelling catheter	1/18 (6)	Ref	
Antibiotics	4/7 (57)	7.07 (1.37–36.52)	.03
No antibiotics	10/63 (16)	Ref	
Ventilator vs no respiratory care			
Ventilator	9/23 (39)	10.29 (1.16–91.63)	.03
No respiratory care	1/17 (6)	Ref	
Tracheostomy vs no respiratory care			
Tracheostomy	4/30 (13)	2.46 (0.25–24.02)	.64
No respiratory care	1/17 (6)	Ref	
Ventilator vs tracheostomy			
Ventilator	9/23 (39)	4.18 (1.09–16.04)	.05
Tracheostomy	4/30 (13)	Ref	

NOTE. Facility A residents comprised patients with tracheostomies (with or without ventilatory support) or who could cough with sputum production. ADL, activities of daily living; CI, confidence interval; OR, odds ratio.

Mortensen E et al, ICHE 2014

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Multivariate Analysis of Risk Factors for Carbapenem-Resistant Enterobacteriaceae (CRE) Isolation (Long Term Care and Acute care Hospital)

Variables	Whole cohort[a] aOR	95% CI	P
Weighted index comorbidity >3	4.85	1.64–14.41	.004
Immune suppression	3.92	1.08–14.28	.038
Indwelling devices	5.21	1.09–24.96	.039
Any antibiotic exposure	3.89	0.71–21.46	.119

Bhargava A, ICHE 2014

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Table 2. Multivariable Cox Proportional Hazards Regression Model of Risk Factors Associated With Fluoroquinolone (FQ)–Resistant *Escherichia coli* Colonization Among Residents of Long-Term Care Facilities

Variable	HR (95% CI)	P
Age	1.02 (.99–1.04)	.22
Fecal incontinence	1.78 (1.04–3.06)	.04
FQ receipt in past 30 days	2.04 (.27–15.6)	.49
Amoxicillin-clavulanate receipt after enrollment[a]	6.48 (1.43–29.4)	.02
Urinary catheter use[a]	3.81 (1.06–13.8)	.04

Abbreviations: CI, confidence interval; HR, hazard ratio.
[a] Modeled as a time-varying covariate.

Han JH, J Infect Dis 2013

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Contact precautions vs standard precautions

- ✓ 120 beds Nursing Home
- ✓ From CP for healthy colonized residents to SP (**CP for ill dependent resident only**)
- ✓ Staff perceptions, infection rate, cost

- Average monthly infection rate 4.73/1,000 resident days vs 5.52/1,000 resident days before SP implementation
- Hospitalizations stable at 65, compared to 62
- No increase in MDRO colonization (average 10 residents with known colonization both before and after policy change)
- $42,000 saved in supply costs and staff productivity ($6,000 annualized per resident)
- MDRO colonized residents reported decreased isolation (54%) and increased staff interaction (73%), along with improved mood (73%) and QOL (64%).

Erin Brooks, et al. JAMDA (2014); 15: B3-B28

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Focus on residents with indwelling devices

- 12 community based Nursing Homes
- Participants were **high-risk NH residents with urinary catheters, feeding tubes, or both.**
- Multimodal intervention:
  - preemptive barrier precautions,
  - active surveillance for MDROs and infections (baseline, day 15, monthly for 1 year),
  - NH staff education (informational pocket cards + interactive education program)

Mody L et al. JAMA Intern Med (2015), 15 March

- **Decrease in the overall MDRO prevalence density** (rate ratio, 0.77; 95%CI, 0.62-0.94).
- **Lower rate of new MRSA acquisition** in the intervention group than in the control group (rate ratio, 0.78; 95%CI, 0.64-0.96).
- **Hazard ratios for the first and all clinically defined catheter-associated urinary tract infections** were 0.54 (95%CI, 0.30-0.97) and 0.69 (95%CI, 0.49-0.99), respectively, in the intervention group and the control group.
- **No reductions** in new VRE or resistant gram-negative bacilli acquisitions or in new feeding tube–associated pneumonias or skin and soft-tissue infections.

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Table 1. Overview of Targeted Infection Prevention (TIP) Program Interventions

Variable	Intervention Group (TIP)	Control Group (Usual Care)
Precautions		
Enrolled residents (with urinary catheter and/or feeding tube)	Preemptive barrier precautions Glove and gown use for direct care Transmission-based precautions as needed per NH policy	Standard precautions Transmission-based precautions as needed per NH policy
Nonenrolled residents	Standard precautions Transmission-based precautions as needed per NH policy	Standard precautions Transmission-based precautions as needed per NH policy
Surveillance		
Multidrug-resistant organisms	Active surveillance Cultures collected at baseline, day 15, and then monthly, with data reported back to the facilities every month	Passive surveillance Cultures collected at baseline, day 15, and then monthly for outcome measurements only, with no reports given to the facilities
Infections	Infections identified by study definitions and reported back to the facilities every month, along with reminders of key strategies to prevent infections	Infections identified by study definitions for outcome measurements only, with no reports given to the facilities
Education		
NH staff	Hand hygiene promotion Posters, videos, Glo Germ gel (Glo Germ Company), pre-post cultures Interactive infection prevention modules; ten sessions for health care workers Infection surveillance pocket cards provided to nurse, nurse's aide, physician, and infection preventionist on resident enrollment Half-day miniconference on infection surveillance; each NH infection preventionist was invited to participate	Education provided as needed (eg, annual requirements, in response to state surveys or audits)

Abbreviation: NH, nursing home.

Mody L et al. JAMA Intern Med (2015), 15 March

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"We designed the TIP intervention by engaging community based NHs with little experience in conducting prospective research and with few infection prevention resources to demonstrate strategies that could be adopted in this traditionally resource-poor setting.»

Mody L et al. JAMA Intern Med (2015), 15 March

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All residents or focus on high risk residents /specific MDRO only?

- High risk residents for MDROs (invasive device, functional disability,…)
- Outbreak situation, especially if prolonged or high mortality
- Emergence of high threats MDROs in the area

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Opinion/ Comment

Journal of Infection Prevention

Multiple drug resistant organisms in healthcare: The failure of contact precautions

Bryan P Simmons[1] and Elaine L Larson[2,3]

What can be done to improve?

- Monitor **compliance** with contact precautions
- **Limit the use of contact precautions** for patients colonized or infected with MRSA, VRE, and extended spectrum beta-lactamase producing gram negative rods
- Use active screening of patients for **prolonged outbreaks of MDRO or those associated with a high mortality**
- ………………………
- Target for decolonization and eradication those **MDRO that cause severe and deadly epidemics**
- ……………………

ECCMID, 25/4/2015 ML Moro

Measures to control methicillin-resistant Staphylococcus aureus (MRSA) dissemination in long-term-care facilities (LTCFs)

Not recommended
Require screening prior to transfer to an LTCF
Refuse or delay admission of patients known to be infected or colonized with MRSA
Obtain surveillance cultures to identify MRSA carriers
Decolonize of residents or healthcare personnel
Restrict colonized patients from common areas or from group activities

A. Manzur and F. Gudiol, Clin Microbiol Infect 2009; 15 (Suppl. 7): 26–30

ECCMID, 25/4/2015 ML Moro

Recommended	
Routine measures	During an outbreak of MRSA infections
Standard precautions for all patients. Enforce hand washing. Use of gloves when there is exposure to body fluids or non-intact skin	Isolate or cohort patients with symptomatic infections
Follow routine, standardized housekeeping practices	Screen personnel and residents in contact with infected patients
Register symptomatic MRSA infections	Isolate (or remove from duty) those carriers linked to infected patients
Implement a protocol for MRSA outbreaks	Consider the use of nasal mupirocin for carriers
Educational programmes for healthcare staff	Consult with public health authorities for advice and molecular typing

A. Manzur and F. Gudiol, Clin Microbiol Infect 2009; 15 (Suppl. 7): 26–30

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Control of CPE in Long-term acute and post-acute care hospitals

4 US Long-Term Acute Care Hospitals (LTACH) **(Hayden MK, Clin Infect Dis 2015)**

- 2010-2013, stepped wedge design
- bundled intervention (**screening patients for KPC** rectal colonization upon admission and every other week; **contact isolation and geographic separation** of KPC positive patients in ward cohorts or single rooms; **bathing all patients daily with chlorhexidine gluconate**; and healthcare- worker education and **adherence monitoring**)

13 Israeli Post-Acute Care Hospitals **(Ben-David D, Infect Control Hosp Epidemiol 2014)**

- 2008-2011, prospective cohort interventional study
- multifaceted intervention (periodic **on-site assessments of IC policies and resources**; assessment of **risk factors for CRE colonization**; national guidelines for CRE control in PACHs involving **active surveillance and contact isolation of carriers**; and **3 cross-sectional surveys of rectal carriage of CRE** in representative wards).

TABLE 2. Israeli National Guidelines for the Care of Patients with Carbapenem-Resistant Enterobacteriaceae in Acute Care versus Post-Acute Care Hospitals

		Post-acute care hospitals	
Variable	Acute care hospitals	Skilled nursing/chronic ventilated/subacute wards	Rehabilitation wards
Room assignment	Private or cohorting with other CRE carriers	Private or cohorting with other CRE carriers	No regulation regarding room assignment
Dedicated nursing staff for CRE carriers	Required	Not required	Not required
Use of gloves and gowns in care of CRE carriers	Mandatory on room entrance	Mandatory on room entrance	According to standard precautions
Admission CRE screening of high-risk groups[a]	Required	Required	Not required, except in outbreak setting
CRE screening of patient contacts	Required	Required	Required
Participation in group activities	Prohibited	Allowed	Allowed
Standard protocol for discontinuation of contact isolation	Yes	Yes	Yes
Regular mandatory census reporting to NCIC	Yes	Yes	Yes

NOTE. CRE, carbapenem-resistant Enterobacteriaceae; NCIC, National Center for Infection Control.
[a] High-risk groups were defined as patients transferred from other facilities or patients with earlier hospitalization within the previous 6 months.

(Ben-David D, Infect Control Hosp Epidemiol 2014)

Area Rischio infettivo – Agenzia sanitaria e sociale regionale

Control of CPE in Long-term acute and post-acute care hospitals

4 US Long-Term Acute Care Hospitals (LTACH) **(Hayden MK, Clin Infect Dis 2015)**

- **The incidence rate of KPC colonization** fell, from 4 to 2 acquisitions per 100 patient-weeks (P = .004 for linear decline).
- **Average rates of clinical outcomes declined**: KPC in any clinical culture (3.7 to 2.5/1000 patient-days; P = .001), KPC bacteremia (0.9 to 0.4/1000 patient-days; P = .008), all-cause bacteremia (11.2 to 7.6/1000 patient-days; P = .006) and blood culture contamination (4.9 to 2.3/1000 patient-days; P = .03).

13 Israeli Post-Acute Care Hospitals **(Ben-David D, Infect Control Hosp Epidemiol 2014)**

- **Infection control score increased from 6.8 to 14.0** (*P* < .001).
- **Prevalence of carriage among those not known to be carriers decreased** from 12.1% to 7.9% (*P*=.008).
- **Overall carrier prevalence decreased** from 16.8% to 12.5% (*P*=.013).
- Alcohol-based hand rub, use of gloves, CRE surveillance at admission were independently associated with lower new carrier prevalence.

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Curr Transl Geriatr and Exp Gerontol Rep (2013) 2:113–124
DOI 10.1007/s13670-013-0051-8

INFECTIOUS DISEASES IN THE ELDERLY (SF BRADLEY, SECTION EDITOR)

Emergence and Control of Antibiotic-resistant Gram-negative Bacilli in Older Adults

Dror Marchaim · David E. Katz · L. Silvia Munoz-Price

Transition of care

Clear documentation upon interfacility transfers of any cultures with multidrug resistant Gram-negative organisms—bodily sources and dates—not just from the most recent admission, but also from previous healthcare stays.

ECCMID, 25/4/2015 ML Moro

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MRSA decolonisation

Source	Infection Type	Objective	Study Design	Sample[a]	Type of Intervention	Intervention	Outcome Measures[b]	Results	Statistically Significant[c]
Mody et al.[19] 2003	Multiple Drug-Resistant Organisms	To compare efficacy of intranasal ointment with that of placebo in reducing *S. aureus* colonization	RCT, 6-month follow-up	127 persistent carriers of *S. aureus*, mean age 76.2, from 2 long-term care facilities	Therapy	Mupirocin therapy or placebo administered twice daily for 14 days to nares or wound surfaces	*S. aureus* colonization, reduction in *S. aureus* infections in residents treated with mupirocin	Mupirocin significantly eradicated colonization in 93% of intervention group; 85% of placebo group remained colonized	+
Wendt et al.[25] 2007	Multidrug-Resistant Organisms	To assess whole-body washing with chlorhexidine for eradicating MRSA	RCT, intervention duration 5 days, 30-day follow-up	114 MRSA-positive residents, mean age 71.4, in intervention group, from hospital and area NHs	Therapy	Whole-body washing using chlorhexidine solution or placebo for 5 days; both groups received mupirocin nasal ointment 3 times a day for 5 days and used chlorhexidine mouth rinse twice daily	MRSA eradication	No difference in overall MRSA eradication rate after 30 days between intervention and placebo	–

Uchida M, J Am Geriatr Soc 61:602–614, 2013

ECCMID, 25/4/2015 ML Moro

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Take home messages

- ✓ **Hand hygiene and environmental control** should be promoted in all types of long-term care facilities and residents
- ✓ **Contact precautions** (single room, gloves and gowns) should be individualized, balancing infection risks with the need for more than one occupant in the room, the presence of risk factors that increase the likelihood of transmission, and the potential for adverse psychological impact on the infected or colonized resident.
- ✓ **In outbreak situations and for high-level threat MDROs** more intensive intervention may be necessary:
  - Single room
  - Active screening
  - Decolonisation

ML Moro ECCMID, 25/4/2015