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ESCMID guidelines for the management of the infection control measures to reduce transmission of multidrug-resistant Gram-negative bacteria in hospitalized patients

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55 pages!

- Very comprehensive
- Best practices for acute care facilities
- Additional special approaches for ongoing transmission
- Stratified by microbial species and type of intervention

Level of evidence: all moderate to very low

Interventions

- Hand hygiene
- Contact precautions and isolation room
- Active screening cultures
- Environmental cleaning
- Cohort patients and staff
- Staff education
- Antibiotic formulary interventions
- Screening of health care workers

All evaluated according to the GRADE approach (<http://www.gradeworkinggroup.org>)

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Clear separation:

1) 4 categories of quality of evidence:

⊕⊕⊕⊕ (High), ⊕⊕⊕○ (Moderate), ⊕⊕○○ (Low), ⊕○○○ (Very low)

- methodological quality of evidence
- likelihood of bias
- by outcome and across outcomes

2) 2 grades for recommendations:

conditional(weak) or strong for or against an intervention

- balance of benefits and downsides
- values and preferences
- resource use
- quality of evidence

*www.GradeWorking-Group.org

Advised interventions differ in outbreak or endemic situations

- Hand hygiene and contact precautions are always strongly recommended for outbreak and endemic settings and for all different multidrug-resistant Gram-negative species
- One exception: the recommendation for contact precautions is not strong for ESBL-positive *E. coli*

- An isolation room is strongly recommended in **endemic and epidemic** situations for:
 - MDR *Klebsiella pneumoniae*
 - MDR *Acinetobacter baumannii*
- An isolation room is also strongly recommended in **outbreak** situations for:
 - ESBL-positive Enterobacteriaceae
 - MDR *Pseudomonas aeruginosa*

- For the other interventions there is more variation in how strong they are recommended, and they differ for the different types of MDR species

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ESCMID guidelines for the management of the infection control measures to reduce transmission of multidrug-resistant Gram-negative bacteria in hospitalized patients

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Interventions

- **Hand hygiene**
- **Contact precautions and isolation room**
- Active screening cultures
- Environmental cleaning
- Cohort patients and staff
- Staff education
- Antibiotic formulary interventions
- Screening of health care workers

Active screening cultures

- Principle: Patients *colonized* with multidrug-resistant pathogens constitute a significant reservoir
- Without active search by screening they will remain undetected
- Discussion points: how and how frequent
- Important: before starting screening define what control measures will be taken for positive patients

Active screening cultures

- Strongly recommended in outbreak settings
- Screening must be followed by contact precautions
- Insufficient evidence for use in endemic settings

Table 1. Comparison of 3 Surveillance Strategies to Detect Multidrug-Resistant *Acinetobacter* Among 1111 Patients Admitted to Selected Medicine Units in the Johns Hopkins Hospital, March Through June 2006^a

	Clinical Surveillance	Clinical and Universal Active Surveillance	Clinical and Targeted Active Surveillance
Patients previously known to have MDR <i>Acinetobacter</i> , No.	5	5	5
Patients with MDR <i>Acinetobacter</i> detected within 48 h of admission, No.	2	5	3
Patients with MDR <i>Acinetobacter</i> detected more than 48 h after admission, No.	2	3	3
Admissions screened, No.	0	1223	52
Surveillance cultures performed, No.	0	1688	99

Abbreviation: MDR, multidrug-resistant.

^aClinical surveillance represents clinical patient cultures ordered by the clinician; universal active surveillance represents admission and weekly MDR *Acinetobacter* surveillance cultures for all admitted patients; targeted active surveillance represents cultures only of all patients admitted directly from a long-term care facility. All strategies include flagging, identification, and isolation on readmission of patients previously known to have MDR *Acinetobacter*.

Maragakis et al
JAMA, 2008, 299:2513

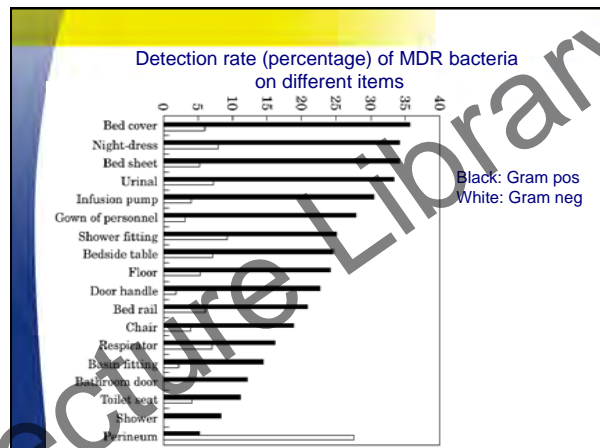
Environmental cleaning

- In general:
 - Gram positive bacteria (VRE, *Clostridium*, MRSA) can survive and contaminate dry surfaces
 - Gram negative bacteria do not survive well in dry environments
 - Exception: *Acinetobacter*

Distribution of multi-resistant Gram-negative versus Gram-positive bacteria in the hospital inanimate environment

S.W. Lemmen^{a,*}, H. Häfner^a, D. Zolldann^a, S. Stanzel^b, R. Lütticken^c
J Hosp Inf 2004, 56:191

- 20 different locations around 190 patients
 - 54 patients with MRSA or VRE
 - 136 patients with MDR Gram neg bacteria
- MRSA and VRE: 25% positive samples (174/705)
- MDR Gram neg: 5% positive samples (89/1827)
- Hands of patients and personnel: more often Gram positive bacteria
- Environmental contamination: the same in ICU compared to general wards



Environmental cleaning

In outbreak settings: strongly recommended

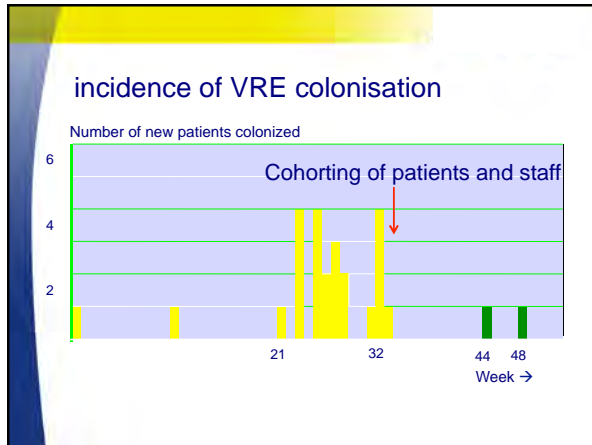
- Monitor cleaning performance
- Consider intensive cleaning

In endemic setting:

- Regular environmental cleaning
- For *A. baumannii*: if possible, dedicated equipment

Cohorting patients and staff

- Can be considered in outbreak settings
- (see example of VRE on hematology ward)



Education
Antibiotic stewardship

Always important!

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