Isolation policies and procedures.

Rola Atoui M.D.

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Summary:

- Dilemma?.
- Definition of MDRO.
- Risk factors for MDRO.
- Screening.
- Isolation policies and procedures.
- Duration of isolation.

Dilemma?.

To accept or not ??

A patient 48years,without PMH,who was admitted elsewhere for M.I. for less then 24 hours and needs cardiac cath at your institution??

Admit without isolation

- To accept or not ??
- 84 years old male who was admitted elswehere for pneumonia ,intubated ,culture positif for acinetobacter??
- Do not admit OR admit on contact isolation??
- Depend on medical benefit and local policies of the hospital??
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- To accept or not??
- 60 y.old male ,diabetic,COPD on steroids who was admitted elsewhere for appendicitis ,and he had IAI post OR.

- Admit and do cultures,put him on contact isolation till you get result of cultures??
- Do not admit ??
- Do not do cultures and isolate?
- Admit without precautions?

- To accept or not??

- 60y.old female patient who was admitted elsewhere for M.I. intubated for 7 days,needs to be transferred for cardiac cath.

- Admit ,do ASC,isolate till you get results of cultures?
- Do not admit?
- Admit without precautions?

Screening:

- MDRO.
- Transmissible infections.

- When?
- How?
- Why?

- MDRO surveillance is the use of active surveillance cultures (ASC) to identify patients who are colonized with a targeted MDRO .

- Several reports have concluded that ASC, in combination with use of Contact Precautions for colonized patients, contributed directly to the decline or eradication of the target MDRO
- However, not all studies have reached the same conclusion.

Needs also :

- Environmental cleaning.
- Chlorhexidine bathing.
- Audit H-H,new product for H-H.
- Education.
- Cohorting.
- Application of Std precautions.

Area	Surface	No. samples	MRSA		CR *A. baumannii*		VRE		Ceph-R *Klebsiella* spp.*	
			Positive (%)	Organism density (c.f.u. cm^{-2})	Positive (%)	Organism density (c.f.u. cm^{-2})	Positive (%)	Organism density (c.f.u. cm^{-2})	Positive (%)	Organism density (c.f.u. cm^{-2})
Immediate patient environment	All sampled areas	50	82	0.42	40	0.47	4	0.29	–	–
	Bed frame	25	88	0.41	48	0.47	8	0.29	–	–
	Overbed table	25	76	0.44	32	0.46	–	–	–	–
Commonly used equipment	All sampled areas	13	62	0.83	15	0.31	–	–	–	–
	Glucometer	2	50	1.54	–	–	–	–	–	–
	Stethoscope	6	67	0.64	–	–	–	–	–	–
	BP cuff	5	60	0.84	40	0.31	–	–	–	–
Commonly touched surfaces	All sampled areas	19	63	0.59	10	0.11	–	–	–	–
	Bedside medical computer	6	100	0.37	17	0.11	–	–	–	–
	Door handle	7	43	0.87	14	0.12	–	–	14	0.35
	Telephone	6	50	0.76	–	–	–	–	–	–
	All sites	82	74	0.51	29	0.42	2	0.29	1	0.29

*Ceph-R, third-generation cephalosporin resistant.

- Most studies for MRSA,VRE.
- ??for MDR GNR??.
- Endemic v/s epidemic situation?
- Previous status of the primary hospital??

- The decision to use ASC as part of an infection prevention and control program requires additional support for successful implementation, including:

1. personnel to obtain the appropriate cultures,
2. microbiology laboratory personnel to process the cultures.
3. mechanism for communicating results to caregivers,
4. concurrent decisions about use of additional isolation measures triggered by a positive culture (e.g. Contact Precautions) and
5. mechanism for assuring adherence to the additional isolation measures

Definition of MDRO:

For epidemiologic purposes, MDROs are defined as microorganisms, predominantly bacteria, that are resistant to one or more classes of antimicrobial agents.

Epidemiologically important pathogens:

1. A propensity for transmission within healthcare facilities .

2. Antimicrobial resistance implications.

3. Associated with serious clinical disease.

4. A newly discovered or reemerging pathogen.

Types:

- MRSA,VRE,ESBL,CRE or CPE.
- Acinetobacter.
- Pseudomonas MDR.
- Stenotrophomonas and burkolderia.
- C.diff.

Organism	Survival time*	Prior room occupancy risk increase[$]
MRSA	7 days to >12 months	1.5
VRE	5 days to >46 months	2.25
Pseudomonas aeruginosa	6 h to 16 months	1.75
Clostridium difficile	>5 months (spores)	2.5
Acinetobacter baumannii	3 days to 11 months	3.5
CRE	19 days	
Norovirus (feline calicivurus)	8 h to 7 days	Limited data
Rotavirus	6–60 days	Limited data

Adapted from Kramer *et al.* [2006], Otter *et al.* [2013], and Havill *et al.* [2014].

*Survival times of multidrug-resistant organisms (MDROs) on dry inanimate objects. Range depends on experimental design and methods of assessing contamination.

[$]Ratio of increased risk associated with the room being previously occupied by patients infected with common MDROs.

Risk factors for MDRO:

- Location (e.g. ICU with high MDRO rates).
- Antibiotic exposure history.
- Presence of underlying diseases.
- Prolonged duration of stay.
- Exposure to other MDRO- colonized patients.
- Patients transferred from other facilities known to have a high prevalence of MDRO carriage.
- Having a history of recent hospital or nursing home stays .

Ct'd:

Risk factor	MRSA	VRE	ESBL
Age	x		X
Mechanical ventilation			X
Comorbidities	x		X
Underlying immunodeficiency	x		
Severity of illness			X
Invasive devices	x		X
Previous (broad-spectrum) antibiotics	x	x	X
Previous stay in hospital, ICU or LTCF	x		X
Previous (emergency) surgery	x		X
Prolonged hospital or ICU stay		x	X
Admission for emergency abdominal surgery			X
(Surgical) wounds	x		
Haemodialysis	x		
Enteral feeding		x	
International travel			X

Risk factors for MDR in UTI:

- Previous ATB use.
- Urinary catheterization.
- Previous hospitalization.
- Nursing home residence.

- Presence of skin lesions.
- Active infection.
- Antibiotic treatment.
- History of a surgical procedure.
- Previoushospitalization outside of Europe.

EXPOSURE
- History of MDRO
- Colonization pressure (facility rates of MDRO infection/ colonization)
- Recent antibiotics
- Recent hospitalization
- Comorbidity/Dependency (need for contact care)
- Dialysis

"FERTILE GROUND" FOR BACTERIAL PROLIFERATION
- Wounds
- Indwelling devices
- Dental plaque
- Structural lung disease/bronchiectasis, COPD (Pseudomonas)

Clinical importance:

Important concepts in transmission:

Once MDROs are introduced into a healthcare setting, transmission and persistence of the resistant strain is determined by:

- The availability of vulnerable patients.
- Selective pressure exerted by antimicrobial use.
- Increased potential for transmission from larger numbers of colonized or infected patients (“colonization pressure”).
- The impact of implementation and adherence to prevention efforts.

Methods for ASC:

- MRSA: Studies suggest that cultures of the nares identify most patients with MRSA and perirectal and wound cultures can identify additional carriers .

- VRE: Stool, rectal, or perirectal swabs are generally considered a sensitive method for detection of VRE. While one study suggested that rectal swabs may identify only 60% of individuals harboring VRE, and may be affected by VRE stool density , this observation has not been reported elsewhere in the literature.
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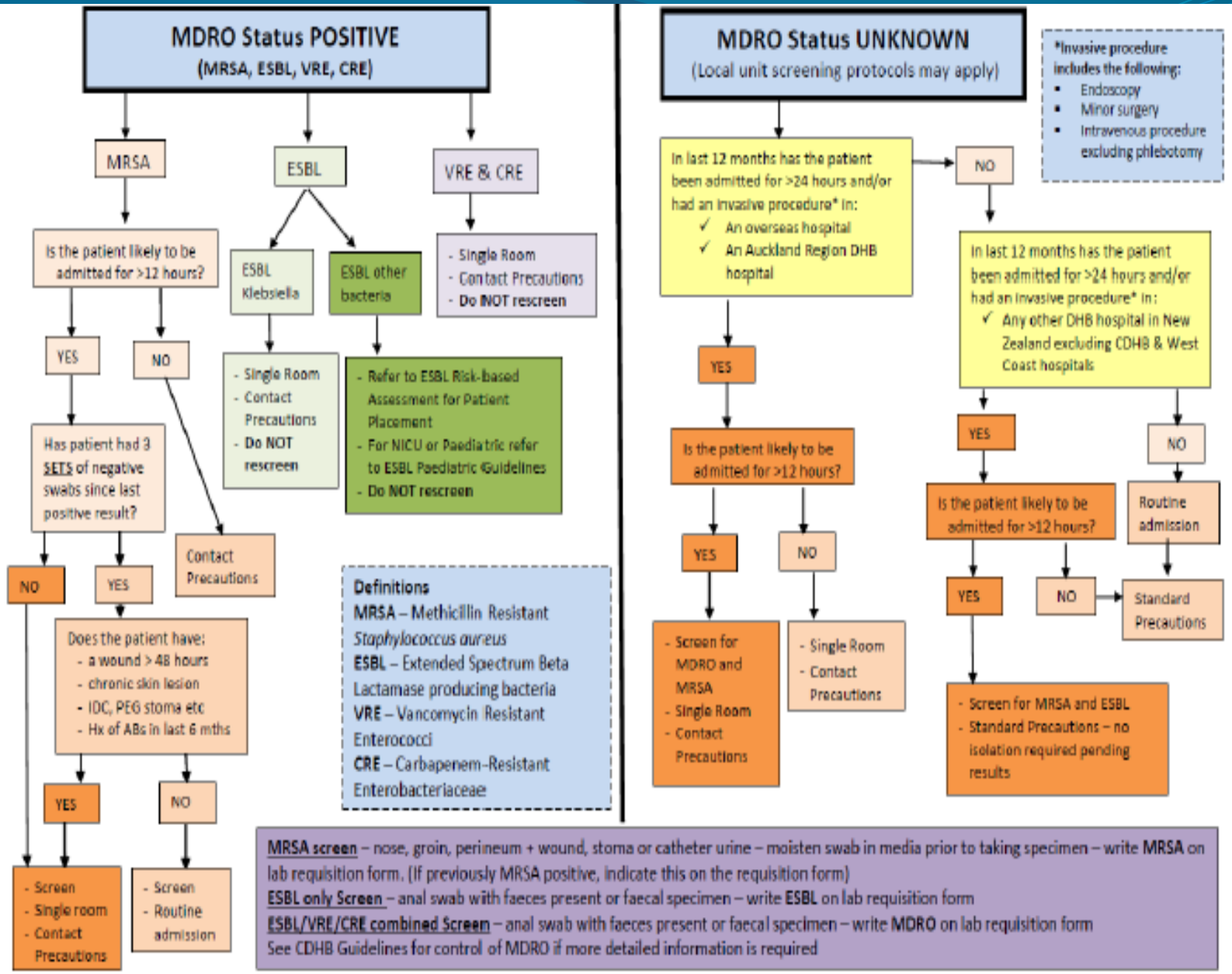
- MDR-GNBs: Several methods for detection of MDR-GNBs have been employed, including use of peri-rectal or rectal swabs alone or in combination with oro-pharyngeal, endotracheal, inguinal, or wound cultures.


MDRO Status POSITIVE
(MRSA, ESBL, VRE, CRE)
MRSA
ESBL
VRE & CRE
Is the patient likely to be admitted for >12 hours?
ESBL Klebsiella
ESBL other bacteria
- Single Room
- Contact Precautions
- Do NOT rescreen
YES
NO
- Single Room
- Contact Precautions
- Do NOT rescreen
- Refer to ESBL Risk-based Assessment for Patient Placement
- For NICU or Paediatric refer to ESBL Paediatric Guidelines
- Do NOT rescreen
Has patient had 3 SETS of negative swabs since last positive result?
Contact Precautions
NO
YES
Does the patient have:
- a wound > 48 hours
- chronic skin lesion
- IDC, PEG stoma etc
- Hx of ABs in last 6 mths
YES
NO
- Screen
- Single room
- Contact Precautions
- Screen
- Routine admission
Definitions
MRSA – Methicillin Resistant Staphylococcus aureus
ESBL – Extended Spectrum Beta Lactamase producing bacteria
VRE – Vancomycin Resistant Enterococci
CRE – Carbapenem-Resistant Enterobacteriaceae
MDRO Status UNKNOWN
(Local unit screening protocols may apply)
In last 12 months has the patient been admitted for >24 hours and/or had an invasive procedure* in:
✓ An overseas hospital
✓ An Auckland Region DHB hospital
NO
YES
Is the patient likely to be admitted for >12 hours?
YES
NO
- Screen for MDRO and MRSA
- Single Room
- Contact Precautions
- Single Room
- Contact Precautions
In last 12 months has the patient been admitted for >24 hours and/or had an invasive procedure* in:
✓ Any other DHB hospital in New Zealand excluding CDHB & West Coast hospitals
YES
NO
Is the patient likely to be admitted for >12 hours?
Routine admission
YES
NO
Standard Precautions
- Screen for MRSA and ESBL
- Standard Precautions – no isolation required pending results
*Invasive procedure includes the following:
• Endoscopy
• Minor surgery
• Intravenous procedure excluding phlebotomy
MRSA screen – nose, groin, perineum + wound, stoma or catheter urine – moisten swab in media prior to taking specimen – write MRSA on lab requisition form. (If previously MRSA positive, indicate this on the requisition form)
ESBL only Screen – anal swab with faeces present or faecal specimen – write ESBL on lab requisition form
ESBL/VRE/CRE combined Screen – anal swab with faeces present or faecal specimen – write MDRO on lab requisition form
See CDHB Guidelines for control of MDRO if more detailed information is required
Ref 0214
Authorised by: CDHB IPCC 2016
v2 February 2017

ESBL Risk-based Assessment for Patient Placement

Adult patient identified with ESBL (check organism)

HIGH RISK OF SPREAD

- Diarrhoea or urinary / faecal incontinence
- ESBL Klebsiella species

PRECAUTIONS

- Contact Precautions for all direct patient care
- Single room
- Ensuite or dedicated toilet/ commode
- Dedicated equipment (patient monitoring, hoist etc) otherwise disinfect after use on exit from the isolation room
- Patients should not use communal areas of ward e.g. patient lounge
- Inform patient of importance of good hand hygiene

MEDIUM RISK OF SPREAD

- Abdominal drainage/stoma
- Tracheostoma
- Indwelling urinary catheters/ intermittent catheterisation
- Large wounds that require dressing
- High levels of hands on care
- Non-compliance with basic hygiene
- ESBL Klebsiella species

PRECAUTIONS

- Contact Precautions for hygiene and toileting cares
- Single room
- Ensuite or dedicated toilet/ commode
- Dedicated equipment (patient monitoring, hoist etc) otherwise disinfect after use on exit from the isolation room
- Wounds are well covered with no strike through
- No restrictions on patient movement
- Inform patient of importance of good hand hygiene

LOW RISK OF SPREAD

- Bowel colonisation only

NB: ESBL Klebsiella sp. is never categorised as Low Risk as this organism carries a higher risk of cross infection

PRECAUTIONS

- **Standard Precautions** at all times
- Inform patient of importance of good hand hygiene

Not suitable for ESBL Klebsiella species as this organism carries a higher risk of cross infection

DISPOSAL OF BODY FLUIDS IN A DIRTY UTILITY ROOM IS A HIGH RISK ACTIVITY

- Ensure apron and gloves are worn when disposing of infectious waste in dirty utility room
- Dispose of body fluid into sluice, taking care not to cause splashing
- If possible, place the waste receptacle into the sanitiser immediately
- Clean and disinfect sluice bench and sanitiser handle with chlorine-based disinfectant after disposing of body fluid regardless of whether any spillage occurs
- Remove and dispose of apron and gloves in dirty utility room, then perform hand hygiene using either ABHR or the antimicrobial (green) liquid soap

**Risk refers to the risk of spread to other patients in the healthcare setting*
To be used in conjunction with CDHB IPC Guidelines for Control of MDRO

Infection control:

- No studies have directly compared the efficacy of Standard Precautions alone versus Standard Precautions and Contact Precautions, with or without ASC, for control of MDROs. Some reports mention the use of one or both sets of precautions as part of successful MDRO control efforts; however, the precautions were not the primary focus of the study intervention .

Standard precautions

- Have an essential role in preventing MDRO transmission, even in facilities that use Contact Precautions for patients with an identified MDRO.
- Colonization with MDROs is frequently undetected; even surveillance cultures may fail to identify colonized persons due to lack of sensitivity, laboratory deficiencies, or intermittent colonization due to antimicrobial therapy.

Hand hygiene:

- Might be affected in case of contact precaution.
- Might be affected in case of use of gloves.

Contact precautions

- Are a set of measures intended to prevent transmission of infectious agents, including epidemiologically important microorganisms, which are transmitted by direct or indirect contact with the patient or the patient's environment.

- Contact Precautions also apply where:
- The presence of excessive wound drainage.
- Fecal incontinence.
- Other discharges from the body suggest an increased transmission risk.

- A single-patient room is preferred for patients who require Contact Precautions.
- When a single-patient room is not available, consultation with infection control is necessary to assess the various risks associated with other patient placement options (e.g., cohorting, keeping the patient with an existing roommate).

- Placement options (e.g., cohorting, keeping the patient with an existing roommate).
- In multi-patient rooms, ≥3 feet spatial separation of between beds is advised to reduce the opportunities for inadvertent sharing of items between the infected/colonized patient and other patients.

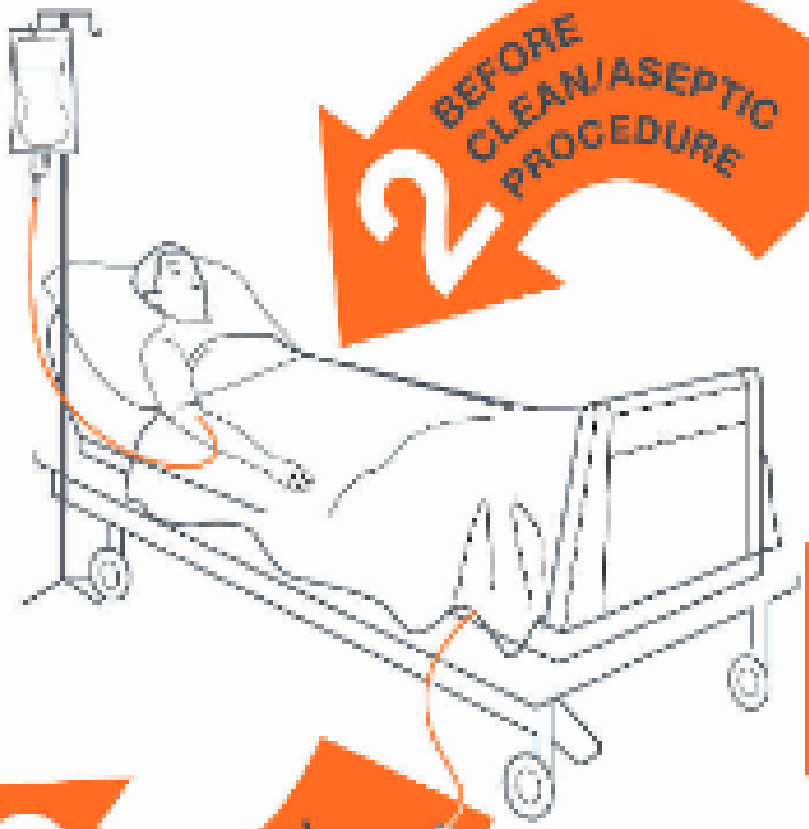
- HCP caring for patients on Contact Precautions should wear a gown and gloves for all interactions that may involve contact with the patient or potentially contaminated areas in the patient's environment

- Donning gown and gloves upon room entry and discarding before exiting the patient room is done to contain pathogens, especially those that have been implicated in transmission through environmental contamination (e.g., VRE, *C. difficile,* noroviruses and other intestinal tract agents; RSV) .

- Dedicated medical equipments.
- H-H before and after entering the room.

1 BEFORE TOUCHING A PATIENT

2 BEFORE CLEAN/ASEPTIC PROCEDURE



3 AFTER BODY FLUID EXPOSURE RISK

4 AFTER TOUCHING A PATIENT

5 AFTER TOUCHING PATIE SURROUNDINGS

Duration of isolation:

- MRSA:
- Policy.
- If no ATB:3 negatives screening weekly cultures.
- If chronic wound or outside outbreak setting or symptomatic patients:extend the duration of isolation till the discharge of the patient.

VRE:

- VRE:3 weekly negatives cultures.

- Hospitals should consider extending CP prior to assessing for CP discontinuation in VRE infected patients who are:

(1) highly immunosuppressed.

(2) receiving broadspectrum systemic antimicrobial therapy without VRE activity.

(3) receiving care in protected environments (eg, burn units, bone marrow transplant units, or settings with neutropenic patients).

(4) receiving care at institutions with high rates of VRE infection.

MDR-E:

- If a hospital uses CP for patients infected or colonized with MDR-E (ESBL-E and/or CRE):
- Establishing a policy for discontinuation of CP for MDR-E that includes the following:

a. Maintaining CP for ESBL-E and CRE for the duration of the index hospital stay when infection or colonization with these bacteria is first detected.

B-Considering discontinuation of CP on a case-by-case basis, taking into account the following criteria:

(1) At least 6 months have elapsed since the last positive culture.

(2) presence of a clinical infection and ongoing antibiotic use, where discontinuation of CP should be discouraged in the setting of suspected or known infection with ESBL-E or CRE, and concurrent broadspectrum antibiotic use that may select for these organisms.

(3) procurement of an adequate number of screening samples, with at least 2 consecutive negative rectal swab samples obtained at least 1 week apart to consider an individual negative for ESBL-E or CRE colonization.

CRE:

- CRE:indefinitely.

C.diff:

- 48 hours after stopping diarrhea.
- If persistent symptoms:till discharge.

- ***Overview of the MDRO control literature.*** Successful control of MDROs has been documented in the United States and abroad using a variety of combined interventions.
- These include improvements in hand hygiene, use of Contact Precautions until patients are culture-negative for a target MDRO, active surveillance cultures (ASC), education, enhanced environmental cleaning, and improvements in communication about patients with MDROs within and between healthcare facilities.

References:

1- Jane D. Siegel Management of Multidrug-Resistant Organisms In Healthcare Settings, 2006,CDC.

2- Justin Tenney etal,Risk factors for aquiring multidrug-resistant organisms in urinary tract infections: A systematic literature review,Saudi Pharmaceutical Journal,Volume 26, Issue 5, July 2018, Pages 678-684.

3- Roy F. Chemaly etal,The role of the healthcare environment in the spread of multidrug-resistant organisms: update on current bestpractices for containment,Ther Adv Infect Dis (2014) 2(3_4) 79_90.

4- Bryan P Simmons1 etal,Multiple drug resistant organisms in healthcare: the failure of contact precautions,J Infect Prev. 2015 Jul; 16(4): 178–181.

5- Kaspar et al.Colonization with resistant microorganisms in patients transferred from abroad: who needs to be screened? Antimicrobial Resistance and Infection Control (2015) 4:31.

6- Steven Bock BA BSN,Modifying the CDCs Guidelines for Isolation Precautions for Multi-Drug Resistant Organisms (MDROs): Using Contact Precautions Only for Clearly Defined Portals of Exit , APIC 2016.

7- Paul Drinka, MD,Assessment of Risk Factorsfor Multi-Drug Resistant Organismsto Guide Empiric Antibiotic Selectionin Long Term Care: A Dilemma. 2011 American Medical Directors Association.

References:

8-Guidelines for the Control of Multidrug Resistant Organisms,Canterbury,District health broad, 2016

9- Infection control and hospital epidemiology: SHEA expert guidance on Duration of Contact Precautions for Acute-Care Settings,2017.

- Thank you.