

# **GUIDELINES FOR THE PREVENTION AND MANAGEMENT OF MULTIDRUG-RESISTANT ORGANISMS**

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# **Guidelines for the Prevention and Management of Multidrug-Resistant Organisms**

## **INTRODUCTION**

Antimicrobial resistance is fast becoming a global concern with rapid increases in multidrug-resistant bacteria. Some pathogens are becoming untreatable. The Commonwealth of Kentucky, in collaboration with individuals expert in the areas of microbiology, clinical practice, infection control and epidemiology previously developed guidelines for the prevention and management of both methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant enterococcus (VRE). It is now apparent that these are not the only multidrug-resistant organisms posing threats to patient safety. Although, we have not yet encountered a case of glycopeptide-insensitive *S. aureus* (GISA), we must gear our prevention and control methods to such a situation. In response to this trend, both of the aforementioned documents have been reviewed, revised and combined to formulate this new document. *Guidelines for the Prevention and Management of Multidrug-Resistant Organisms* will offer assistance in dealing with the current intricate and difficult problems of managing these organisms. It is prudent to recognize that involvement across the continuum of patient care, including acute and non-acute care settings, outpatient care settings and the home, must occur in order to address this issue. Key points addressed in this document will include the following:

- the importance of appropriate antimicrobial use
- the role of the microbiology laboratory
- infection prevention and control strategies
- training and continuing education
- examples of staff, patient and caregiver education guides
- a glossary of definitions and terms

For the purposes of this document, the focus will be primarily with the multidrug-resistant organisms MRSA and VRE. This does not negate the need to closely monitor individual facility antibiograms as a means for early identification of trends and early interventions. MRSA and VRE, as multidrug-resistant organisms, can be defined as follows:

- MRSA (resistant to methicillin, cephalosporins, all beta lactams, and occasionally gentamicin, erythromycin and trimethoprim/sulfamethoxazole)
- VRE (resistant to vancomycin, ampicillin, and/or gentamicin). This applies to *Enterococcus faecalis* and *Enterococcus faecium*.

Both of these organisms require control strategies, which may be expensive, difficult to implement consistently and have varying degrees of success. Appropriate placement upon discharge from an acute care facility may be challenging and preventing epidemics within an alternative care setting is problematic and expensive. Therefore, preventing multidrug-resistant organisms becomes the most logical approach.

Defining multidrug-resistant gram-negative organisms is more challenging. A broad definition includes gram-negative rods resistant to more than two of the primary antimicrobials of choice.

Preventing such epidemics involves interventions at varying points along the epidemic continuum. Four major interventions are: antimicrobial surveillance, microbiologic surveillance, infection surveillance, and control strategies.

## **APPROPRIATE ANTIMICROBIAL THERAPY**

Antimicrobial agents are the most important tool available for managing infectious diseases. Their proper use is not only essential for patients to recover from the infectious process, but also to avoid potential toxic effects, reduce associated costs, and reduce the emergence of resistance. Studies suggest that inappropriate antimicrobial use generally precedes the emergence of antimicrobial resistance. Therefore, it is essential to address this issue as the cornerstone of a program designed to prevent the emergence of multidrug-resistant organisms.

Antimicrobial management involves a multidisciplinary approach. This team ideally includes the physician, pharmacist, microbiologist, and infection control practitioner. Additionally, each facility is encouraged to develop guidelines which outline and assist in the appropriate use of antimicrobials, based on national standards and local experience.

The core of the guidelines should include the following:

- **formulary management**
- **pharmacodynamic principles**
- **principles for empiric therapy**
- **principles of known pathogen therapy**
- **principles of switch therapy**
- **principles for prophylactic therapy**
- **principles of prevention and control of nosocomial infections**

Because MRSA and VRE are the predominant transmissible multidrug-resistant organisms, appropriate use of antimicrobials associated with these two organisms must be addressed. Enterococci are normal inhabitants of the gastrointestinal tract and the female genital tract. Vancomycin is often used to treat MRSA and can lead to selective pressure on co-existing

enterococci. When this selective pressure occurs and VRE proliferates in a constant low level of vancomycin or other broad-spectrum antimicrobials in the gut, this resistant organism becomes the predominant organism. Depending upon the hygienic practices of the patient, the organism may colonize the skin or lead to infection at surgical or device entry sites. Vancomycin, clindamycin, ciprofloxacin, metronidazole, imipenem, and third-generation cephalosporins have all been associated with the development of VRE, so it is prudent to develop antimicrobial management strategies that deal with **all** antimicrobials. However, because vancomycin overuse has been a particular problem, the following highlights should be addressed when evaluating its use:

#### **Situations in which the use of vancomycin is appropriate or acceptable**

- For treatment of serious infections caused by beta-lactam resistant gram-positive organisms. Vancomycin may be less rapidly bactericidal than are beta-lactam agents for beta-lactam susceptible staphylococci.
- For treatment of infections caused by gram-positive organisms in patients who have serious allergies to beta-lactam antimicrobials.
- When antibiotic-associated colitis fails to respond to metronidazole therapy or is severe and potentially life-threatening.
- Prophylaxis, as recommended by the American Heart Association, for endocarditis following certain procedures in patients at high risk for endocarditis.
- Prophylaxis for major surgical procedures involving implantation of prosthetic materials or devices at institutions that have a high rate of infections caused by MRSA or methicillin-resistant *S. epidermidis*. A single dose of vancomycin administered immediately before surgery is sufficient unless the procedure lasts more than six hours, in which case the dose should be repeated. Prophylaxis should be discontinued after a maximum of two doses. A patient with MRSA infection should be treated with IV vancomycin unless the patient is participating in a clinical research protocol involving alternative therapy or if the decision has been made by the patient/family/caregivers to withhold treatment for life-threatening infections.

#### **Situations in which the use of vancomycin should be discouraged**

- Routine surgical prophylaxis other than in a patient who has a life-threatening allergy to beta-lactam antibiotics.
- Empiric antimicrobial therapy for a febrile neutropenic patient, unless initial evidence indicates that the patient has an infection caused by gram-positive microorganisms (e.g., at an inflamed exit site of a Hickman catheter) and the prevalence of infections caused by MRSA in the facility is substantial.
- Treatment in response to a single blood culture positive for coagulase-negative staphylococcus, if other blood cultures taken during the same timeframe are negative (i.e., if contamination of the blood culture is likely). **Because contamination of blood cultures with skin flora could result in inappropriate administration of vancomycin, phlebotomists and other personnel who obtain**



**blood cultures should be trained to minimize contamination of specimens.**

- Continued empiric use for presumed infections in patients whose cultures are negative for beta-lactam resistant gram-positive microorganisms.
- Systemic or local (e.g., antibiotic lock) prophylaxis for infection or colonization of indwelling central or peripheral intravascular catheters.
- Selective decontamination of the digestive tract.
- Eradication of MRSA colonization.
- Primary treatment of antibiotic-associated colitis.
- Routine prophylaxis for very low birth weight infants (i.e., weight <1500 g).
- Treatment (chosen for dosing convenience) of infections caused by beta-lactam sensitive gram-positive microorganisms in-patients who have renal failure.
- Use of vancomycin solution for topical application or irrigation.

## **SCREENING PROCEDURES**

In some facilities, antimicrobial susceptibility testing of multidrug-resistant isolates, specifically enterococcal isolates, from urine or nonsterile body sites is not performed routinely. Therefore, identification of nosocomial colonization and infection in hospitalized patients may be delayed. In facilities where organisms such as VRE have not yet been detected, implementing special measures, such as the following, may promote earlier detection of these multidrug-resistant organisms.

Antimicrobial susceptibility surveillance may be performed by periodic susceptibility testing on an epidemiologic sample of enterococcal isolates recovered from all types of clinical specimens, especially from high-risk patients. These may include patients in an intensive care unit, oncology, or organ transplant unit. The optimal frequency of testing and number of isolates to be tested will vary among facilities, depending on the patient population and number of cultures performed. Facilities which process large numbers of culture specimens need to test only a fraction (e.g., 10%) of enterococcal isolates every 1-2 months, whereas facilities processing fewer specimens should consider testing of all isolates during the survey period. This should be performed in conjunction with the hospital epidemiologist, infection control practitioner, or individual acting in that capacity.

In tertiary medical centers and other hospitals that have critically ill patients at high risk for VRE infection or colonization, periodic culture surveys of stool or rectal swabs (preferred) of such patients can detect the presence of VRE. Because most patients colonized with VRE have intestinal colonization with this organism, fecal screening of patients is recommended even though VRE infections have not been identified clinically. If other multidrug-resistant pathogens have been found to be sporadically problematic, these same mechanisms may be used in periodic screening and evaluation of appropriate specimens for investigation of that particular organism.

The frequency and intensity of surveillance should be based on the size of the population at risk and the specific areas within the facility that are involved. If VRE or MRSA have been detected in other healthcare facilities within the area, and/or if a facility decides to determine whether multidrug-resistant organisms are present in the facility despite the absence of recognized clinical cases, culture surveys may be useful. If looking for other multidrug-resistant organisms, other specimens such as oral-pharyngeal cultures may be obtained. It is important to recognize that the pathogen for which you are surveying may have specific reservoirs or modes of transmission. Obtain cultures using that organism-specific/transmission-specific information. The cost of screening can be reduced by inoculating specimens onto selective media and restricting screening to those patients who have been in the hospital long enough to have a substantial risk for colonization (e.g., five to seven days) or who have been admitted from a facility where the targeted multidrug-resistant organism has been identified.

After colonization with a multidrug-resistant organism has been detected, appropriate mechanisms to determine the extent of the problem should be rapidly undertaken. If VRE is not endemic within the facility, enterococcal isolates from other patients might be screened for vancomycin resistance. If an epidemic of MRSA or VRE has been identified, other patients within the vicinity of the index patient should be screened. Using the epicenter approach for outbreak investigation can be most helpful. Once a multidrug-resistant organism is identified, containment efforts should be intensified and should include all patients infected and colonized with the targeted organism.

## **ROLE OF THE MICROBIOLOGY LABORATORY**

The microbiology laboratory is the first line of defense against the spread of resistant organisms in healthcare facilities. The laboratory's ability to promptly and accurately identify organisms and their associated susceptibilities is essential for recognizing both colonization and infection due to multidrug-resistant organisms. In addition, cooperation and communication between the laboratory and the infection control practitioner will facilitate control efforts. This communication should allow for information sharing on a 24-hours-a-day basis. Response which occurs days after identification of a problematic organism does not lend itself to adequate control.

### **Identification of Multidrug-Resistant Organisms**

**Definition:** any organism which develops resistance to two or more antibiotics above the natural resistance profile.

*(Example: Enterobacter/Citrobacter/Serratia/Morganella/Providencia spp. are commonly resistant to ampicillin and cefazolin. If resistant to these two antibiotics plus two additional antibiotics, then the organism should be considered multiresistant.)*

**Each laboratory should be familiar with the typical susceptibility profile of organisms commonly recovered in its facility.**

#### **Tests for Antimicrobial Susceptibility**

- Use only National Committee for Clinical Laboratory Standards testing methods, quality control strains, and interpretive criteria.
- Know the limitations of each test method and what method is acceptable for testing each group of organisms.
- Do not test antibiotics that are not indicated for the organism being tested.

#### **When Multidrug-Resistant Organisms are Isolated from a Clinical Specimen**

- If there is assurance that the susceptibility profile is correct, the laboratory is responsible for notifying the attending clinician and the infection control practitioner.
- All multidrug-resistant isolates should be saved for the purpose of additional epidemiologic studies. Such studies may include outbreak situations, clustering in a specific area of the institution, the possibility of a new strain having been discovered (which may possess a new resistance mechanism), and those where there is the possibility of transmission to another facility following discharge or transfer of the patient.

#### **CULTURING**

- In the absence of an epidemic, cultures of the patient should be limited to those obtained in the course of a diagnostic workup.
- Culturing of healthcare workers is indicated only in an epidemic situation. Cultures of environmental surfaces or objects would be indicated only in very unusual epidemiologic circumstances.

#### **RECOMMENDATIONS FOR ADMISSIONS, DISCHARGES AND CULTURING**

The distinction between colonization and infection depends upon the clinician's evaluation. Appropriate precautions are to be taken depending on the site of infection.

#### **PATIENT ADMISSION GUIDELINES TO ACUTE CARE**

- Patients with suspected or confirmed multidrug-resistant organisms must be placed in a private room and appropriate isolation precautions initiated. If these patients have diarrhea and are unable to demonstrate comprehension of instructions, they **must** have a private room. The nursing unit is to notify the infection control practitioner when any patient is admitted with a multidrug-resistant organism. Patients with one multidrug-resistant organism should **not** be roomed or cohorted together with a patient hosting a different multidrug-resistant organism.

- A semi-private room may be utilized only under the following circumstances:
  - a. Cohort patients with a **like** multidrug-resistant organism positive patient; or
  - b. Medical patient with no devices, incisions, or sources of contamination (i.e., no Foley catheter, no percutaneous endogastrostomy (PEG), no recent surgery with unhealed incision, no central line, no open wounds).

## **PATIENT ADMISSION GUIDELINES TO NON-ACUTE CARE**

A patient with clinical multidrug-resistant organism infection may be admitted to a non-acute care facility if the following standards are met:

- A clinician has evaluated and determined the patient has colonization with the multidrug-resistant organism.
- If infection is identified, it should be treated appropriately. Presence of infection does **not** preclude admission.
- Resolve diarrhea in patients prior to discharge from the transferring facility, if multi-drug resistant organisms are in the stool.
- A patient with multidrug-resistant organism colonization should be admitted to non-acute care, if otherwise eligible.
- **Do not** allow the practice of requiring negative cultures prior to nursing home placement. This only encourages MORE antibiotic use and does not differentiate between colonized and infected patients and keeps patients who are ready for long-term care settings in the acute care setting unnecessarily.

## **RECOMMENDATIONS FOR CLINICAL MANAGEMENT OF MULTIDRUG-RESISTANT ORGANISMS (MINIMUM STANDARDS)**

Follow institutional guidelines which should include, at a minimum, the following:

- Standard precautions shall be practiced by all entering the patient's room.
- Use appropriate signage denoting the type of isolation precautions.
- Handwashing will be done before and after any skin-to-skin contact which is more than incidental with a patient. Turning a patient requires handwashing afterward; simply touching dry skin does not. Handwashing is also to be done between care for different anatomical sites on the same patient, before eating or drinking, after toileting, and before and after glove use. Use of an antimicrobial or disinfecting agent with activity against gram-positive organisms is favored (e.g., chlorhexidine gluconate).
- Gloves will be worn for any contact with a wound, open lesion, invasive site, or mucous membrane of a patient. Gloves must be changed between procedures.
- Fomite transmission is generally not involved in transmission of MRSA. Patient waste will be disposed of in the ordinary manner which is appropriate for all solid waste. *Fomite transmission **is** involved in transmission of VRE--an organism capable of living for seven days on a dry surface.*
- Gowns should be used for any contact with the patient.

- Daily, routine cleaning must be done in all patient areas to reduce the bacterial load. Cleaning must be done with an Environmental Protection Agency/Food and Drug Administration-approved disinfectant and cleaning performed in a sanitary manner consistent with facility procedures. Meticulous cleaning must be done when the patient with VRE is discharged.
- Adhere to standard infection control principles, especially aseptic technique, decontamination and disinfection.
- Remove gloves before leaving the room.
- Wash hands with an antiseptic agent (e.g., chlorhexidine gluconate).
- Dedicate equipment for patients with multidrug-resistant organism(s).
- Use only a disposable thermometer and leave it in the room.

### **TRANSPORTING PATIENTS WITH MULTIDRUG-RESISTANT ORGANISM INFECTION/COLONIZATION IN THE ACUTE CARE SETTING**

If a patient with a multidrug-resistant organism requires in-house transport for a medically-essential test or procedure, the following recommendations must be observed, keeping in mind that all therapies and diagnostic procedures are to be done in the patient's room, if at all possible:

- The receiving department must be notified prior to transport that the patient has a multidrug-resistant organism and what precautions are necessary.
- The receiving department must wear apparel consistent with isolation guidelines/facility policy.
- A notation is to be placed on the outside of the patient's record indicating the type of isolation precautions.

### **TRANSPORTING PATIENTS WITH A MULTIDRUG-RESISTANT ORGANISM INFECTION/COLONIZATION IN THE NON-ACUTE CARE SETTING**

Patient transport should be limited to situations required for medical care, and precautions need to be continued to prevent contamination of environmental surfaces.

- Residents may travel out of their room, if they are able to understand and practice basic instructions about personal hygiene, are continent of stool (or diapered to contain stool), and are wearing clean clothing.
- To the extent possible by the resident's comprehension and by the availability of handwashing facilities; residents need to be taught, and to practice, good hygiene and handwashing.
- Room restrictions probably are appropriate only for residents with a draining wound not contained by a dressing or for those who are incontinent or who have diarrhea.

## ISOLATION PROCEDURES

The facility should follow the Centers for Disease Control and Prevention's (CDC) Guideline for Isolation Precautions In Hospitals, 1996. These guidelines have been structured in a transmission-based format and may be implemented in various ways. The basis is knowing the organisms, the routes of transmission, patient placement and precautions, use of barrier protection and strategies designed to contain the organism.

More aggressive approaches (such as those usually recommended for epidemic situations) may be initiated at any time based on the perceived needs of the facility. This may be costly and the benefits in nonepidemic situations are largely unknown. Individual institutions may have unique circumstances dictating different approaches.

## RECOMMENDATIONS FOR TREATMENT

### INDICATIONS FOR DECOLONIZATION OF MRSA

**Except in epidemic situations** routine decolonization is not a recommendation for the management of MRSA as there is varying support within the literature. Decolonization should be undertaken only after careful consideration of the situation and generally with the assistance of a physician trained in infectious diseases or epidemiology. The local health department may also assist in these decisions. However, it should be considered on a case-by-case basis under the following circumstances:

- If the patient has a medical condition, particularly one involving immunosuppression (i.e. diabetes mellitus, renal failure or is on high-dose steroids or chemotherapy), which would place him/her at unusual risk for morbidity or mortality should the colonization progress to infection. This does not imply decolonization is an automatic standard.
- If the patient is unusually likely to spread the organism to other persons. An example would be the mentally challenged or confused individual who cannot keep a decubitus covered, and who has frequent contact with other patients.
- If the patient is going to a facility which is MRSA-free but has many high-risk patients.
- If decolonization is considered, the ability of the patient to tolerate the recommended medications must be weighed. The benefits of any medical therapy must be weighed against the risks. Decolonization and treatment is of limited value without concomitant staff education. Successful decolonization or treatment may be of limited use if patient care practices do not limit the ability to recontaminate or recolonize. Adherence to infection control standards is vital.

Methods for MRSA decolonization are outlined below.

### METHODS FOR USE IN DECOLONIZATION

	Pediatrics*	Adults*
Systemic Oral Therapy	Rifampin 20 mg/kg/day + 8mg TMP/40mg SMX** per kg/day	Rifampin 600 mg po q day + 80mg TMP/400 SMX po bid <b>or</b> Rifampin alone 600mg once daily***
Topical, Intranasal	2% mupirocin ointment applied to nares qid	2% mupirocin ointment applied to nares qid
Topical, Skin	2% mupirocin ointment applied to colonized skin sites qid	2% mupirocin ointment applied to colonized skin sites qid
Topical, Skin Bathing	Not recommended.	2% chlorhexidine gluconate used during bathing once a day avoiding all areas where a break in skin integrity is present. Avoid contact with ears, eyes and mucous membranes.

\* Protocol should be continued for 7-10 days.

\*\*TMP=Trimethoprim, SMX=Sulfamethoxazole

Use of TMP/SMX is contraindicated in infants less than 2 months of age.

\*\*\*Rifampin used alone may promote emergence of resistance.

### TREATMENT OF INFECTION

Infection with MRSA should be treated using currently-accepted therapy. Traditionally, this has been vancomycin. At present, a new classification of drugs, streptogramins, are awaiting FDA approval. Quinupristin/dalfopristin (Q/D), trade name Synercid, is the current drug awaiting final approval and is currently part of several clinical trials and remains available for compassionate use. It is the only such drug at present.

## RECOMMENDATIONS FOR MANAGEMENT OF A MULTIDRUG-RESISTANT ORGANISM EPIDEMIC

The following constitutes a multidrug-resistant organism epidemic situation:

- a substantial increase in the number of cases in an institution with endemic multidrug-resistant organisms. (Baseline trending for multidrug-resistant organisms is strongly recommended.);
- three or more nosocomially-acquired cases which are epidemiologically associated. (These isolates may or may not be in the same patient care area. DNA molecular typing may be of value in this determination.);
- Epidemiologic association refers to a relationship in person, place, or time. For example, if a nosocomially-acquired case of a multidrug-resistant organism occurred within a week following a case in an adjoining room or where there are commonalities such as equipment sharing, that new case may be epidemiologically associated. Making this association requires system analysis as well as an understanding of organism-specific transmission.

When an epidemic is recognized, all patients in the unit or units where cases have occurred should be considered for culture simultaneously. Appropriate cultures should be performed. A hospital or reference laboratory should be consulted to assist with interpretation of results.

Patient care personnel should only be cultured if epidemiologically implicated in transmission. If an employee is cultured, specimens should be taken from the nares in addition to any nonintact skin sites. Multiple specimens may be required in order to identify the organism, but should be done only if the evidence implicating the caregiver as a vehicle for transmission is strong. An epidemiologically-implicated, culture-positive caregiver should be counseled regarding infection control precautions and the employee/personnel health nurse and infection control practitioner involved. More definitive measures such as decolonization of the employee or removal of that employee from care of high-risk patients may be considered if initial steps fail.

## COHORTING

- If a facility has an epidemic rate for a drug-resistant organism, all patients colonized or infected with the organism must be placed in a like-organism cohort (or cohorts, if special medical care needs require that patients be in different care units of a specialized facility). Patients in a cohort should be separated from other patients to the extent permitted by the architectural and environmental limitations of the facility. **To the maximum extent possible, staff assigned to the cohort should work with the cohort patients only.** When crossover is unavoidable, hands should be THOROUGHLY washed before and after crossover. Care should be given to the noncohort patients first, on a given



shift, if possible. Generally, a cohort member can be permitted to ambulate in other sections of the facility and socialize with other patients so long as the patient does not have secretions from MRSA pneumonia or heavy respiratory colonization that cannot be contained and as long as any invasive site can be well covered, and the patient demonstrates understanding of instructions. Once a patient is placed in a cohort, he/she should typically stay there while in residence at that facility. However, when a patient's risk status begins to improve (e.g., when a decubitus begins to heal) it may be feasible to reevaluate the need for cohorting. The following guidelines are recommended:

- Consult with the infection control practitioner to evaluate if isolation can be discontinued.
- If the patient's clinical status has improved, check all multidrug-resistant organism sites with two cultures at least 14 days apart. If the patient has received medication for decolonization, the patient must be off the antibiotic for 48 hours before cultures are done. If negative, notify the infection control practitioner to evaluate if isolation may be discontinued. In the case of a newborn nursery epidemic, infants are never released from the cohort until discharge.
- Special arrangements are needed if a newborn intensive care nursery is involved in any epidemic. These situations are best managed under the supervision of a pediatric infectious disease specialist.
- Any epidemic can best be managed with the assistance of an individual trained in hospital epidemiology.

## **EPIDEMIOLOGIC INVESTIGATION**

In a multidrug-resistant organism epidemic, epidemiologic investigation should include the following data:

- patient's location in the institution,
- date of admission, and a record indicating which days were spent in which location,
- which caregivers had direct contact with the patient,
- severity of decubitus ulcer, assessment of wounds, presence of invasive devices, and history of invasive procedures or devices,
- age and sex,
- diagnosis, especially conditions with negative impact on patient's immune competence,
- treatment given, especially antibiotics,
- birth weight, if an infant,
- laboratory data including dates of cultures, specimen sites, and any quantitative information.

The unit or facility should be closed to admission during an epidemic **only** if a bed is not available in the multidrug-resistant organism cohort or in the rest of the unit (whichever is appropriate for that patient).

An internal working group should be organized to assist the person primarily responsible for investigating the epidemic. The local health department must be notified of the epidemic (902 KAR 2:020).

A written report summarizing the epidemic should be completed, using facility policies, by the infection control practitioner or hospital epidemiologist promptly following the investigation. This report should be used for internal review with the goal being education and strategic planning for preventing a repeat occurrence.

### **PATIENT DISCHARGE GUIDELINES FROM ACUTE CARE**

- Discharge from an acute care facility may occur when the multidrug-resistant organism infection has been adequately treated. A patient with multidrug-resistant organism colonization may be discharged whenever the physician deems the patient medically ready.
- Timely communications between acute and non-acute settings should include the following information:
  - Laboratory results (include the fact some may be pending)
  - Treatment
  - Appropriate infection control practices
  - Patient and family education

### **PATIENT DISCHARGE GUIDELINES FROM NON-ACUTE CARE**

- Multidrug-resistant organism colonization is not a contraindication to sending the patient home, if the patient can adequately be cared for at home from other standpoints. Multidrug-resistant organisms, like other staphylococci or enterococci, rarely cause serious infection in healthy family members.

### **DEVELOPING AN ANTIMICROBIAL SURVEILLANCE TEAM**

Within a given facility, there may be interest in developing a process for systematic management and monitoring of antimicrobial use. The following points will provide assistance in this development: A document should be developed which offers guidelines addressing specific indications for therapy. This document should encourage a system of antimicrobial management which:

- addresses the appropriate spectrum and dose
- considers drug toxicity
- provides the ability to quickly narrow the spectrum once susceptibility is established

- encourages transition to oral agents
- provides mechanisms to stop therapy as appropriate
- dedicates appropriate levels of staff to implement and monitor the program
- educates staff and physicians
- provides ample time to formulate, implement and monitor the program
- is supported by facility administration
- provides a mechanism to report information and respond to problems
- provides for computer support and analysis of data
- provides microbiologic support
- provides infection control and prevention involvement
- includes a physician advisor with expertise in antimicrobial therapy.

## RECOMMENDATIONS FOR HOME CARE

Admission and transfer of patients with a multidrug-resistant organism to or from the home is not a concern, other than to alert the receiving facility or agency. In addition, there is no need to disrupt housing arrangements because a household member has a multidrug-resistant organism. Caregivers with healthy immune systems who practice good hygiene are **not** at increased risk of becoming colonized or infected with a multidrug-resistant organism.

Efforts to control multidrug-resistant organism transmission in the home should focus on preventing cross-contamination via the nursing bag, clothing, and equipment which are carried to and from the home by the healthcare provider. Hands should be washed before leaving the home. After washing, the use of a waterless antimicrobial agent such as alcohol foam or gel might be considered.

Other persons in the home should be educated about multidrug-resistant organisms and instructed to clean and disinfect toilet facilities used by the patient and to contain and dispose of dressings and other disposable materials that may be contaminated.

No special precautions for linen, dishes, or personal clothing are indicated. If persons in the home provide direct care, they too should be guided on the importance of handwashing, glove use, and other barriers as reasonable and appropriate to the situation.

## GLOSSARY

The following definitions apply to these terms as used in *this* document:

**cohort**-- *two or more patients in a facility, physically separated from other patients, and cared for, as much as possible, by staff who do not care for other patients*

**colonization**--the condition of a patient when a multidrug-resistant organism has entered a body site, is multiplying but no clinical consequences are occurring

**endemic**-- when multidrug-resistant organism colonizations and/or infections are occurring in a facility all or almost all of the time, with relatively constant frequency (the baseline rate of infection/colonization within a given facility)

**epidemic**-- when multidrug-resistant organism colonization and/or infection is occurring in a facility at a significantly higher rate than usual for that facility

**epidemiologic investigation**--the gathering of information on patients and staff of a facility regarding demographics, illness factors, and exposure factors, and the tabulation of that information in order to establish associations between illness and any antecedent risk factors for that illness

**eradication**--the complete removal of all multidrug-resistant organisms from all patients and staff of a facility

**GISA**--glycopeptide-insensitive *Staphylococcus aureus*

**infection**--the condition of a patient when a multidrug-resistant organism has entered a body site, is multiplying, and causing clinical consequences such as fever, a suppurative wound, and/or tissue destruction

**invasive site**--any place on a patient's body where the normal skin or mucous membrane barrier is broken whether by natural or artificial means: decubitus ulcers, surgical incision sites, intravenous or urinary catheters, and feed tubes are examples.

**MRSA**—methicillin-resistant *Staphylococcus aureus*

**non-acute care setting**--any residential healthcare or rehabilitation facility other than an acute-care hospital

**segregation**--the physical separation of a single patient from others in the facility (Care of that patient is assigned to one staff member per shift. That staff member should limit care for other patients as much as practical.)

**transmission**--the passage of a multidrug-resistant organism from a colonized or infected person to a person previously free of the organism

**VRE**—Vancomycin-resistant enterococcus generally refers to the species *E. faecalis* or *E. faecium* when discussing pathogenic VRE.

## PATIENT INFORMATION ON VRE

**What is VRE?** VRE stands for vancomycin-resistant enterococcus. Vancomycin is an antibiotic used to treat infections. Enterococcus is a germ normally found in the digestive tract and, in females, in the vagina. Sometimes this germ is able to resist the antibiotic vancomycin. This is called VRE.

**Who gets VRE?** People with weak immune systems or those who have had many antibiotics are most likely to get VRE. It can also occur in people who have been in the hospital for a long time.

**Where is VRE?** People may be “colonized” with the germ, which means that they have the germ which is most often found in bowel movements, but it can also be present in the urine, infected wound, other body fluid, or wherever it can be carried by the bloodstream. It is not making them sick. Others may be “infected” which means they have the germ and it is making them sick.

**How is it treated?** Some VRE can be treated with antibiotics if the patient is infected. Often, if the patient is colonized, he or she is not treated with drugs. Patients sometimes get rid of VRE on their own as their bodies get healthier and they are taken off antibiotics. Most of the time this takes a few months but VRE can stay with a person longer.

**Can VRE be spread?** Yes, it can be spread to other people. VRE is usually spread by hands but can also be spread by contact with a contaminated surface. It is not airborne. To keep from spreading the germ, certain steps have to be taken.

- Gowns and gloves must be worn by **everyone** who gives you care. Gowns and gloves must be left in the container inside your room and hands washed before leaving your room.
- Handwashing is the most effective measure to help stop this spread. Wash your hands with an antiseptic soap before leaving the room. Your environment will be kept clean with a disinfectant. Equipment will be set aside for your use only.
- Your nurse will review good hygiene practices with you before you go home. You need to do those things until your doctor or nurse tells you that you no longer have VRE.
- An isolation room is necessary. The door may remain open.

**Why am I isolated?** Isolation is designed to prevent the spread of the bacteria which has been found in your body.

**How long will I be in isolation?** The duration of isolation depends upon your body's response to the germ. Your doctor, together with the Infection Control Department of the facility, will say when isolation can be stopped.

## **Patient Information on VRE (Continued)**

**How is this decision made?** Laboratory tests must be done to make sure you no longer have the germ. Samples taken may be of urine, blood, or wound drainage. Also, the nurse may get rectal swab samples to make sure the germ is clear from your digestive tract.

**May I have visitors?** Yes. Visitors will need to thoroughly wash their hands when they leave.

## **VRE IN THE PATIENT AT HOME**

VRE is a very hardy germ. It can survive on hard surfaces for 5-7 days and on hands for hours. It is easy to kill with the proper use of disinfectants and **good handwashing**.

This germ does not travel through the air.

- If you prepare food, wash your hands thoroughly before doing so.
- Do not share eating utensils or have others take bites of your food.
- Wash your hands, especially after using the toilet and before eating.
- Obtain rectal swab/urine cultures as ordered by your doctor.
- Please tell any doctors or nurses that you have contact with about your VRE before treatment.

### **Hand Care**

- Wash your hands with soap and running water for at least 10 seconds after contact with a VRE patient or with any items that patient has touched.
- Wear rubber or vinyl gloves if you must handle urine or stool.
- Wash your hands after taking gloves off.

### **Dishes**

- Do not share dishes or utensils and wash hands before eating.
- If you have no dishwasher, use dish soap and hot water.

### **Cleaning your house**

- You can use a solution of 1 part bleach to 10 parts water. Make a new batch each week. Store in a container protected from light. If you would rather, use any commercial disinfectant instead. Dilute according to manufacturer's directions. It may not be effective on wooden surfaces.
- VRE is easy to kill on surfaces as long as it is in contact with the disinfectant for enough time. If you wet a surface well and let it air-dry, that is usually long enough.
- If possible, the patient should have his/her own bathroom. If not, clean the sink and toilet if obviously soiled.

### **Waste Management and Laundry**

- Put all disposable wastes like bandages/dressings in a plastic bag and tie securely. This can go into the regular trash.
- If they are heavily soiled with body fluids, wash the patient's clothes separately in detergent and bleach.
- Clothes not soiled with body fluids can be washed with the family's clothing.

## PATIENT INFORMATION ON MRSA

**What is MRSA?** MRSA stands for “Methicillin-Resistant *Staphylococcus aureus*”. Staphylococcus is a germ found in the nose or throat of many individuals. MRSA is staphylococcus that is resistant to specific antibiotics.

**Why is isolation needed?** This special precaution prevents the spread of this germ to others. Visitors may be asked to wear gowns and gloves when entering this room as a prevention method. Handwashing when leaving the room as well as placement of the gown and gloves in the trash inside the room also prevents the spread of MRSA.

**Where did MRSA come from?** Patients who stay in the hospital or nursing home for a long time are at risk for getting MRSA. Patients in the ICU, Burn Unit or Organ Transplant Unit are at greatest risk. Sometimes the antibiotics used to treat one infection cause this germ to multiply. It is also seen in the community due to overuse of antibiotics. MRSA may be transmitted by touching someone’s unwashed hands, skin, or infected body fluids.

**How is it treated?** MRSA infection will often be treated with a drug called Vancomycin. Sometimes a special nasal ointment is also used.

**How can MRSA be prevented?** The most important thing to do to prevent the further spread of MRSA is to wash hands thoroughly. This means all healthcare workers, family, and visitors must wash hands before leaving the room. Also, be sure to follow all instructions on the isolation signs posted on the door of your room.

**What about after I am discharged?** If continued precautions are needed, your nurse will instruct you. Generally, good handwashing and personal hygiene are all that is needed at home. It is important to always tell your doctor, nurse or hospital personnel, before your treatment, that you have MRSA when you keep your appointments and if you have to be readmitted to the hospital any time in the future.



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