

## **Decolonization for MRSA**

The question should physicians recommend decolonization therapy for patients colonized with MRSA has not generated a solid answer. Most of the research on decolonization has been on adults with hospital acquired MRSA versus community acquired MRSA. Most policies recommend that the physician make a decision on a case- by – case basis, however the criteria to make this decision is often lacking. Below you will find an assortment of recommendations and study abstracts that I hope will help you make clinical decisions. I have also included a website that is currently recruiting study participants to enroll in a study that will examine this issue more closely in community acquired MRSA. I hope this is helpful in assessing and treating your patients.

### **Infectious Disease News; May 2007**

#### **Many factors involved in decolonization of S. aureus**

#### **Current treatment strategies demonstrate varying levels of effectiveness.**

**by Edward A. Bell, PharmD, BCPS**

#### **Decolonization studies**

Controlled studies of decolonization have primarily been conducted in the adult population. A large controlled trial of adult surgical patients found that intranasal mupirocin significantly reduced surgical infection in patients who were nasal carriers of S. aureus. Nasally applied mupirocin has also been shown to significantly reduce S. aureus infection in adult dialysis patients.

Several studies have evaluated the ability of mupirocin to eradicate nasal S. aureus carriage in health care workers. Nasally applied mupirocin significantly reduced S. aureus nasal colonization, and although re-colonization occurred in many patients, at one year of follow-up, fewer patients who had received mupirocin harbored nasal S. aureus as compared with controls. In an uncontrolled study in an ICU setting, nasally applied mupirocin and chlorhexidine baths given to all patients growing nasal MRSA reduced rates of nosocomial MRSA infection during the five years of observation.

Not all studies evaluating mupirocin have been positive. In a randomized, double blind trial, mupirocin and chlorhexidine body washing were compared with placebo in 102 hospitalized adult patients colonized with MRSA. Other body sites (groin, skin, urine), in addition to the nose, were cultured for the presence of MRSA. The primary study objective was the rate of eradication of overall MRSA colonization. There was no difference in the rate of overall MRSA eradication of the treatment group (25%) compared with placebo (18%). The eradication rate of nasal MRSA in the treatment group was low in this study: only 44%. The researchers speculate that additional infection control practices may be necessary to control MRSA colonization. In a large (n=1,602) randomized, double blind, placebo-controlled trial, nasal mupirocin prophylaxis was evaluated in preventing nosocomial *S. aureus* infection in nonsurgical patients. No difference was found in infection rates between the treatment and placebo groups in this study.

In another study, decolonization treatment was compared with no treatment in an attempt to eradicate MRSA from multiple body sites (nares, perineum, skin, medical device exit site). In an open-label, randomized manner, hospitalized adults growing MRSA from at least one body site received nasally applied mupirocin plus chlorhexidine body washes plus Rifampin and Doxycycline (all for seven days) or no treatment. The primary outcome was MRSA eradication from all body sites at three months of follow-up. Note that this study included two systemic treatments, in addition to mupirocin, and included a longer time of follow-up. At three months of follow-up, 74% of treatment patients remained negative for MRSA growth, compared with 32% of patients receiving no treatment ( $P < 0.05$ ). Patients who remained colonized at three months were more likely to grow a mupirocin-resistant isolate.

Professional medical societies and organizations recommend that mupirocin and other decolonization therapies be considered as part of an infection control treatment strategy. In a consensus statement published by the Chicago-area Neonatal MRSA Working Group, recommendations for the prevention and control of MRSA colonization and infection in the neonatal ICU setting included the use

of mupirocin for decolonization of neonates and health care workers as part of a comprehensive strategy, if deemed necessary. The 2006 Red Book states that mupirocin can be considered in select patients (chronic carriers, those predisposed to infection with *S. aureus*) or health care workers in an attempt at eradication. However, mupirocin should not be used routinely or in all patients, as resistance has occurred.

### **Conclusion**

Pharmacologic decolonization treatment strategies have demonstrated success in some studies of patients colonized with MRSA. Not all studies, however, have demonstrated effectiveness in reducing rate of infection. Most studies have evaluated mupirocin and other agents for this use in adult hospitalized patients, and mupirocin is FDA labeled for use only in those aged 12 years and older. Most studies have evaluated twice daily dosing for five-day duration, and mupirocin is FDA labeled for this dose (using 0.5 gm applied to each nostril, or one-half of a 1 gm single-dose tube). Resistance to mupirocin has occurred in studies, and a high-level mupirocin resistant gene has been identified in community-acquired MRSA strains.

When attempting to decolonize MRSA and reduce the risk of infection from this organism in a specific patient or group of patients, several important factors remain unknown, such as whether the most effective treatment regimen is the use of topical agents, such as mupirocin, or topical agents plus systemic antibiotics. The use of systemic agents, such as Rifampin, present additional considerations (e.g., drug-drug interactions, resistance, systemic adverse effects). While the anterior nares remain an important site of MRSA colonization, other body sites can still harbor MRSA.

The duration of decolonization from treatment has not been well studied or delineated. The use of mupirocin for decolonization and infection rate reduction in ambulatory patients has not been studied, thus pharmacologic decolonization treatment strategies should not be routinely used. Mupirocin may benefit some colonized children who suffer from numerous infections or who are at increased

risk of severe infection. The use of additional infection control practices, such as frequent hand washing, should continue to be emphasized.

**Randomized Controlled Trial of Chlorhexidine Gluconate for Washing, Intranasal Mupirocin, and Rifampin and Doxycycline Versus No Treatment for the Eradication of Methicillin-Resistant Staphylococcus aureus Colonization**

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Identifiers Clinical Infectious Diseases, volume 44 (2007), pages 178–185

DOI: 10.1086/510392

PubMed ID: 17173213

Availability This site: [PS](#) | [HTML](#) | [PDF \(222.5k\)](#)

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**Abstract** Background. Eradication of methicillin-resistant Staphylococcus aureus (MRSA) carriage may reduce the risk of MRSA infection and prevent transmission of the organism to other patients. Methods. To determine the efficacy of decolonization therapy, patients colonized with MRSA were randomized (3 : 1 allocation) to receive treatment (2% chlorhexidine gluconate washes and 2% mupirocin ointment intranasally, with oral Rifampin and Doxycycline for 7 days), or no treatment. Follow-up samples for MRSA culture were obtained from the nares, perineum, skin lesions, and catheter exit sites monthly for up to 8 months. The primary outcome measure was detection of MRSA at 3 months of follow-up. Univariate and multivariable analyses were performed to identify variables associated with treatment failure. Results. Of 146 patients enrolled in the study, 112 patients (87 treated; 25 not treated) were followed up for at least 3 months. At 3 months of follow-up, 64 (74%) of those treated had culture results negative for MRSA, compared with 8 (32%) of those not treated ( $P=.0001$ ). This difference remained significant at 8 months of follow-up, at which time, 54% of those treated had culture results negative for MRSA ( $2=64.4$ ;  $P<.0001$ , by log-rank test). The results of the multivariable analysis

indicated that having a mupirocin-resistant isolate at baseline was associated with treatment failure (relative risk, 9.4; 95% confidence interval, 2.831.9; P=.0003), whereas decolonization therapy was protective (relative risk, 0.1; 95% confidence interval, 0.040.4; P=.0002). Mupirocin resistance emerged in only 5% of follow-up isolates. **Conclusions.** Treatment with topical mupirocin, chlorhexidine gluconate washes, oral Rifampin, and Doxycycline for 7 days was safe and effective in eradicating MRSA colonization in hospitalized patients for at least 3 months.

### **Relapse Rate of Methicillin Resistant Staphylococcus aureus (MRSA) in Successfully Decolonized MRSA Carriers.**

WITSCHI AT, BOLLIGER D, FREI R, WIDMER AF.

Abstr Intersci Conf Antimicrob Agents Chemother Intersci Conf Antimicrob Agents Chemother. 2003 Sep 14-17; 43: abstract no. K-1749.

University Hospital of Basel, Basel, Switzerland.

**BACKGROUND:** Decolonization has become a standard procedure for patients colonized with MRSA. Whether MRSA eradication is effective over time has however rarely been investigated. We assessed the MRSA relapse rate in patients successfully decolonized in our hospital over the last ten years.

**METHODS:** We contacted all the patients in whom MRSA had been eradicated at least three months before the onset of our study. Successful decolonization was defined as three negative multiple body site ( $\geq 6$  sites) screenings after standard decolonization (nasal mupirocine, chlorhexidine body and pharyngeal washes, oral vancomycin in case of gut colonization). The participants had swabs taken from their nares, the throat and from all the body sites previously positive for MRSA. MRSA was identified by positive PBP2a agglutination and by detection of the *mecA*- Gene (PCR). **RESULTS:** 37 of 64 (57.8%) persons were retested. 9 refused, 14 could not be reached and 4 had died. These persons did not differ from the participants in terms of age, gender and underlying morbidity. The median time of follow-up was 16 months (range 3-108), the median age of the participants 56 years (range 20-85), 40.5% had a Charlson's comorbidity

index of 0 and 48.6% were women. Half of the participants had more than 3 body sites positive for MRSA (range 1-7) before eradication and 45.9% showed colonization of the gut. Wounds were present in 54.1% before and in 37.8% still after decolonization. 3/37 (8.1%) persons were found to be recolonized with the same MRSA strain they had had before, one person showed a new MRSA strain. 18/37 (48.6%) had methicillin susceptible staphylococci (MSSA) and 16/37 (43.2%) had negative swab cultures for both MRSA and MSSA.

**CONCLUSIONS:** The MRSA relapse rate after eradication was low even at long term follow-up. This shows that MRSA decolonization had a long lasting effect in the present study. MRSA decolonization may therefore have an impact on the spread of MRSA in the community.

### **Decolonization Therapy for Eradication of Methicillin-Resistant Staphylococcus aureus (MRSA) Colonization.**

FUNG SK, LOUIE M, SIMOR AE.

Abstr Intersci Conf Antimicrob Agents Chemother Intersci Conf Antimicrob Agents Chemother. 2000 Sep 17-20; 40: 408. Univ. of Toronto, Toronto, ON, Canada

**BACKGROUND:** In order to reduce the risk of transmission of MRSA in hospitals, an attempt is often made to eradicate MRSA carriage in patients. However, optimal decolonization therapy has not been determined. In this retrospective analysis we determined the efficacy of combined topical and systemic decolonization therapy for the eradication of MRSA carriage. **METHODS:** Charts of adult in-patients who were colonized with MRSA between Feb. 1996-Feb. 1999 were reviewed. All patients had been assessed by one of two infectious diseases physicians to determine suitability for decolonization therapy. The outcome of patients treated with 2% mupirocin ointment (applied to the anterior nares tid for 7 days) and oral antibiotics (Rifampin 300 mg plus cotrimoxazole DS or Doxycycline 100 mg bid, each for 7 days) was determined. Follow-up cultures for MRSA were obtained at 1 week and then monthly for up to 6 months for those still in hospital. **RESULTS:** A total of 207 patients (122 males; 85 females) were

identified. 104 (50%) patients received decolonization therapy. Patients who were treated were older (mean age 74 yrs vs. 69 yrs;  $p < 0.05$ ), but less likely to have an indwelling urinary catheter (40% vs. 64%;  $p < 0.05$ ), an IV catheter (55% vs. 81%;  $p < 0.05$ ), or an extra-nasal site of MRSA colonization (16% vs. 36%;  $p < 0.05$ ). Follow-up cultures were available for 69 (66%), 36 (35%), and 19 (18%) patients at 1, 3, and 6 months respectively. MRSA was not detected in 97%, 89%, and 100% of these patients respectively. **Conclusion:** A combination of topical and oral antimicrobial therapy is effective in eradicating MRSA colonization for at least 3 months in select hospitalized patients, especially in those without extra-nasal sites of colonization.

**North Carolina Guidelines for Control of Antibiotic Resistant Organisms, Specifically Methicillin-Resistant Staphylococcus aureus (MRSA) and Vancomycin-Resistant Enterococci (VRE)**

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January 1997

**Decolonization Therapy** - Decolonization is the use of antibiotics to treat colonized patients for the purpose of reducing the magnitude of the reservoir.

**a. Patients**

(1) MRSA - Routine decolonization for MRSA is not recommended. The need for decolonization should be based on the patient's medical condition and expected outcome. Topical or systemic antibiotics, including trimethoprim-sulfamethoxazole, Rifampin, ciprofloxacin, erythromycin, Doxycycline, bacitracin and mupirocin have been used with variable results to eradicate colonization by MRSA. Vancomycin is not indicated for decolonization therapy, as it is ineffective for this purpose.

(2) VRE - There is no clinically proven decolonization regimen for VRE.

**b. Employees**

(1) MRSA - Healthcare personnel should be cultured only if epidemiologic data implicates them (e.g., by geographic location or patient care team) as a possible source of dissemination of MRSA. Identified infected personnel with hand or skin

lesions should be treated. Decolonization should be considered for those employees with persistent MRSA nasal carriage (e.g., chronic sinusitis), especially if the healthcare worker had contact with patients who were subsequently found to be positive for the same strains. Intranasal mupirocin appears to be an effective agent for eradicating nasal carriage of MRSA; prolonged therapy should be discouraged.

(2) VRE - Carriers of Enterococci have been rarely implicated in transmission of this organism. For facilities with continued VRE cross-transmission, see Attachment C.

**METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS (MRSA)  
Infection Control Guidelines for Long-Term Care Facilities  
Massachusetts Department of Public Health Division of Epidemiology and  
Immunization**

Decolonization of residents or staff is not routinely recommended. This has not proven to be an effective control measure for large populations because recolonization occurs. However, in an outbreak situation, if an individual can be identified as the source of transmission (e.g., Massachusetts Department of Public Health, Division of Epidemiology and Immunization MRSA Page 6 of 7 Revised 8/27/2001 a healthcare worker with several patients having identical strains of MRSA and phage typing of the outbreak strain and this healthcare worker's being identical), then s/he should be removed from work while efforts are made to achieve MRSA decolonization (with adequate infection control consultation).

**Clinical Trial Opportunities**

The Natural History of Community-Associated MRSA Infections and Decolonization Strategies

***This study is currently recruiting participants.***

Verified by Washington University School of Medicine, July 2007

Sponsored by: Washington University School of Medicine

Information provided by: Washington University School of Medicine

ClinicalTrials.gov Identifier: NCT00513799

**Purpose**

The purpose of this study is to determine the natural history of community-associated *Staphylococcus aureus* infections in both adult and pediatric patients by monitoring the rate of recurrent infections in those colonized with *S. aureus*. In addition, this study will evaluate the efficiency of commonly prescribed decolonization measures in patients presenting with *S. aureus* skin and soft tissue infections.

<http://clinicaltrials.gov/ct2/show/NCT00513799?term=decolonization&rank=1>