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Developing guidelines for S. aureus decolonization a difficult task
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The Centers for Disease Control and Prevention estimates that about 30% of the general population is colonized with *Staphylococcus aureus* in their nasal mucosa. The majority are colonized with methicillin-sensitive *S. aureus* (MSSA), with up to 10% harboring methicillin-resistant *S. aureus* (MRSA). *S. aureus* also colonizes the oropharynx, rectum and skin folds.

Risk factors for *S. aureus* colonization include health care exposure (previous hospitalization, long-term acute care facility or nursing home residents), certain comorbid conditions (HIV infection, chronic dialysis, eczema) and groups in close contact (prisoners, military recruits and athletes).


Decolonization strategies have been used to reduce the burden of or eradicate pathogen carriage, with the goal of decreasing the risk of transmission and subsequent infections.

**MRSA vs. MSSA: Decolonize both?**

The burden of MRSA infections among children increased for several decades, with emergence of the epidemic USA300 strains of community-associated MRSA. Recent years have seen an overall rise in methicillin susceptibility among *S. aureus* isolates, with identification of similar USA300 strains among these isolates (Sutter DE, et al. *Pediatrics.* 2016;137:e20153099).

Studies also suggest that among patients hospitalized with invasive *S. aureus* infection, overall morbidity and mortality between MRSA and MSSA are similar (Wang JL, et al. *Clin Infect Dis.* 2008;46:799-806). These trends suggest that attempts to decolonize both MSSA and MRSA may be prudent for some patients.

**Duration of colonization**

The reported median duration of MRSA colonization varies from 21 days to nine months and even years (Calderwood MS, et al. *Clin Infect Dis.* 2015;60:1497-1499). Most data represent colonization detected by surveillance cultures at hospital readmission. The shorter duration was described in the setting of MRSA SSTI, where 92% of patients received appropriate systemic antibiotics (Cluzet VC, et al. *Clin Infect Dis.* 2015;60:1489-1496).

Longer duration of MRSA colonization has been associated with older age, repetitive health care facility exposures and ongoing contact with colonized household members. Further, studies of colonization are problematic due to variations in body sites sampled, with many based on nares-only surveillance.

**S. aureus decolonization strategies**

Decolonization regimens often combine topical nasal antibiotics (mupirocin, retapamulin) and antiseptic body washes (chlorhexidine gluconate (CHG) or bleach baths), with or without environmental decontamination. Systemic antibiotics, including rifampin, generally are not recommended.

*S. aureus* is frequently transmitted among household members, and evidence supports decolonization of all household members of individuals with recurrent *S. aureus* SSTIs. However, in a recent multicenter study, total...
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Decolonization agents in the community setting usually are prescribed as short regimens (i.e., five to seven days). Longer regimens have not been shown to decrease the rate of medically attended recurrent SSTI (Kaplan SL, et al. Clin Infect Dis. 2014;58:679-682). However, concerns regarding duration of protection of short regimens lead some experts to recommend periodic decolonization in patients with multiple recurrences (Creech CB, et al. Infect Dis Clin North Am. 2015;29:429-464.)

Hospitals often use decolonization regimens to prevent health care-associated infections (HAIs), targeted to colonized patients or implemented to all high-risk patients. Several studies in pediatric and neonatal intensive care units (NICUs) have shown that various decolonization strategies reduce the burden of S. aureus colonization and the risk of HAIs.

The success of decolonization varies across studies, ranging from 25%-95% depending on the regimen, population and adherence. Recolonization following decolonization is frequent, with rates as high as 60% among hemodialysis patients (Price A, et al. J Hosp Infect. 2015;90:22-27).

Topical antimicrobial use is not without the risk of resistance. Rates of in-vitro and genotypic mupirocin and CHG resistance vary widely across reports and need further exploration.

The unpredictable success of decolonization with varying regimens and the conflicting data on its success have made it difficult to develop general guidelines. The decision to decolonize in the community setting should be patient-specific, based on that individual's burden of disease or recurrence risk.

Patients and families should understand the variable success of decolonization methods, lack of a superior regimen, the importance of simultaneous decolonization if considering total household regimens and adherence to the chosen regimen.

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