# DECOLONIZATION OF *STAPHYLOCOCCUS AUREUS* CARRIERS: INDICATIONS, ADVANTAGES AND LIMITATIONS

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**ABSTRACT:** The objective of this article was to establish the main indications, advantages and limitations of the decolonization of patients with *Staphylococcus aureus*. An integrative literature review was performed on the LILACS, MEDLINE, Science Direct, SCOPUS and Isi Web of Knowledge databases for articles published after 1999. The main indications for decolonization pertained to high-risk patients (admitted to the ICU, post-operative, long stay, etcetera). The advantages were based on the eradication of the microorganism, reducing infection rates and the spread of the microorganism. The observed controversies were due to the possibility of increasing bacterial resistance and lack of scientific evidence regarding the effectiveness of the eradication of the colonizing microorganism, as well as reducing infection rates. Thus, it was observed that decolonization should not be indicated routinely; rather, it should only be recommended for patients at risk and during outbreaks.

**DESCRIPTORS:** Infection control. Methicillin-resistant *Staphylococcus aureus*. Cross infection. Bacterial drug resistance.

# DESCOLONIZAÇÃO DE PORTADORES DE *STAPHYLOCOCCUS AUREUS*: INDICAÇÕES, VANTAGENS E LIMITAÇÕES

**RESUMO:** O objetivo deste artigo foi estabelecer as principais indicações, vantagens e limitações da descolonização de pacientes portadores de *Staphylococcus aureus*. Procedeu-se a uma revisão integrativa da literatura, com busca de artigos nas bases de dados LILACS, MEDLINE, Science Direct, SCOPUS e *Isi Web of Knowledge*, e em publicações a partir de 1999. As principais indicações encontradas foram direcionadas aos pacientes considerados de alto risco (admitidos em UTI, submetidos à cirurgia, com longa permanência, etc.). As vantagens fundamentaram-se na erradicação do microrganismo, redução da taxas de infecção e na disseminação destes. As controvérsias se deram pela possibilidade do aumento da resistência bacteriana e pela falta de evidências científicas sobre a eficácia da eliminação do microrganismo colonizante e da redução da taxa de infecção. Observou-se que a descolonização não deve ser indicada como rotina, mas, sim, deve ser recomendada apenas para pacientes de risco e durante surtos.

**DESCRITORES**: Controle de infecções. *Staphylococcus aureus* resistente à meticilina. Infecção hospitalar. Farmacorresistência bacteriana.

# DESCOLONIZACIÓN DE PORTADORES DE *STAPHYLOCOCCUS AUREUS*: INDICACIONES, VENTAJAS Y LIMITACIONES

**RESUMEN:** El objetivo fue establecer las principales indicaciones, ventajas y limitaciones de la descolonización de los pacientes infectados por *Staphylococcus aureus*. Se realizó una revisión integrativa de literatura, buscando artículos, publicados a partir de 1999, en las bases de datos LILACS, MEDLINE, Science Direct, SCOPUS y el ISI Web of Knowledge. Las principales indicaciones fueron dirigidas a los pacientes de alto riesgo (ingresados en la UCI, sometidos a cirugía, con una estancia de larga duración, etc), los beneficios se fundamentaron en la erradicación y reducción de la propagación de microrganismos y la reducción de las tasas de infección. Las controversias observadas fueron debido a la posibilidad de aumentar la resistencia bacteriana y la falta de evidencia científica sobre la eficacia de la eliminación de los microorganismos colonizadores, así como la reducción de la tasa de infección. Se observa que la descolonización no debe ser administrada de manera rutinaria ya que sólo debe ser recomendada para los pacientes en riesgo y durante los brotes específicos.

**DESCRITORES:** Control de infecciones. *Staphylococcus aureus* resistente a meticilina. Infección hospitalaria. Farmacorresistencia bacteriana.

## INTRODUCTION

Bacterial resistance is a current worldwide public health issue. For healthcare professionals, it is a growing challenge as the alternative for treatments of certain infections caused by multi-drug resistant microorganisms (MDRM) are becoming more and more limited. In addition, the fact that about 70% of the pathogens isolated in American hospitals are resistant to at least one antimicrobial drug confirms the need for concern regarding this issue.[1]

The phenomenon of bacterial resistance is characterized by the capacity that microorganisms, particularly bacteria, have to resist one or more classes of antimicrobial agents. Several factors contribute to the evolution of bacterial resistance. One factor that should be highlighted is the inappropriate use of antibiotics.[1-2]

This aspect is highly important considering the fact that about half of the inpatients are prescribed, at some time during their stay, at least one parenteral antibiotic. What is alarming to note is that half of these drugs are considered inappropriate in terms of means of administration, dose, and even their indication.[3]

There has been a rise in healthcare-associated infections (HAIs) involving MDRM, mainly in critical care units such as intensive care units, as these settings can be considered ideal for the emergence and dissemination of multi-drug resistance, particularly considering the critical profile of the patients, as well as the healthcare professionals' poor adherence to biosafety measures, excessive workload, and, often, a shortage of personnel.[3]

The major consequences of HAI caused by MDRM are an increase in morbidity-mortality rates, higher healthcare costs, and personal, professional and emotional losses.[1,3-4]

One of the most common microorganisms involved in HAI occurrences that must be highlighted is *Staphylococcus aureus,* due to its high virulence and prevalence in healthcare institutions. Furthermore, with the emergence of bacterial resistance, methicillin-resistant *Staphylococcus aureus* (MRSA) has drawn more attention related to the severity of these complications since the 1990s.[5-7]

It is estimated that about 30% of the overall population of the United States is colonized by *Staphylococcus aureus*, and 1.5% by methicillin-resistant *Staphylococcus aureus*.[1,4,8] In Brazil, there are no systemized data showing the rates of MRSA colonization in the overall population, but some studies performed with specific populations (e.g. patients treated in a dermatology outpatient clinic) report that the prevalence of *Staphylococcus aureus* ranges between 15.5% and 68.79%.[9-11]

Until the 1980s, MRSA strains were only found in healthcare institutions and in individuals with some form of morbidity or other risk factors, termed *hospital-acquired* MRSA (HA-MRSA). However, infections within the community and in healthy individuals have been reported and are related to a genetically and phenotypically modified strain of MRSA, as opposed to those commonly found in health institutions. Infections occurring in the community are termed *community-acquired* MRSA (CA-MRSA).[12]

The emergence of CA-MRSA raises serious concerns because there are a growing number of admissions of individuals colonized with this particular strain; hence the community is referred to as a reservoir. Therefore, it was emphasized the importance of promoting interventions to prevent the dissemination of *Staphylococcus aureus*, particularly MRSA, taking precautions to minimize the transmission of infections caused by this particular microorganism.[6]

*Staphylococcus aureus* is generally transmitted directly (via the contaminated hands of healthcare professionals or patients) or indirectly (via contaminated surfaces). Within this context, colonization is an important issue, characterized as the presence of the microorganism in the host, but without evidence of the infection or clinical response. In other words, the individual acts as a carrier of the microorganism. [13]

Colonization, therefore, corresponds to a risk factor for the development of HAI, particularly for infections caused by *Staphylococcus aureus*.[1,4-5] The nostrils are considered the main colonization site in patients, but the following sites should also be noted: throat, perianal and gastrointestinal areas, and wounds.[6]

In view of the importance of the patient's state as a carrier or colonized individual, decolonization treatments are brought forth as a possible means to control and prevent these complications. Decolonization is understood as the process of eliminating the microorganisms in carriers or infected individuals, aiming at eradicating it from the individual's resident flora.[1]

Nevertheless, controversy regarding the decolonization procedure exists in terms of its indication, advantages and limitations. Therefore, seek-

ing to discuss this approach, the purpose of the present study is to perform an integrative review of the literature regarding the main indications, advantages and limitations of decolonization.

## METHOD

This study is an integrative literature review, performed for the purpose of gathering and synthesizing the evidence available in the form of original articles on decolonization. The following guiding question was used: what are the main indications, advantages and disadvantages of decolonizing patients carrying *Staphylococcus aureus*?

An article search was performed on the Coordination for the Improvement of Higher Education Personnel (CAPES), the Virtual Health Library (BVS) and the National Library of Medicine (PubMed) portals, using the following databases: Latin-American and Caribbean Literature on Health Sciences (LILACS), Medical Bibliography (MEDLINE®), and Scientific Electronic Library Online (SciELO), Science Direct and ISI Web of Knowledge.

The following health sciences descriptors (according to www.decs.bvs.br) were used in the article search: *Staphylococcus aureus*, *Staphylococcus aureus*; methicillin-resistant *Staphylococcus aureus* resistente à meticilina, *Methicillin-Resistant Staphylococcus aureus;* and farmacorresistência bacteriana, *bacterial drug resistance*. Besides these descriptors, the following terms were also used: descolonização, *decolonization*; colonização, *colonization*; and erradicação, *eradication.*

The inclusion criteria for the articles were: be an original article, address the effectiveness of the decolonization of adult patients previously colonized with *Staphylococcus aureus* and/or MRSA, include advantages and disadvantages and published after 1999. This date was chosen based on the fact that 1999 was the year that the first international guidelines with information on decolonization were published.

Seventy-five articles were selected by reading the titles. Fifty-two were excluded because they were not original articles, did not address the effectiveness of the decolonization of patients carrying *Staphylococcus aureus,* or their full-text was not available. Therefore, 23 (30.7%) articles were analyzed in full. An electronic instrument was created using *Microsoft Office Excel* 2007 to evaluate the selected articles and collect the information that was necessary for the present study.

After analyzing the articles, a selection was made of international guidelines published by the major health societies and agencies that, to some extent, addressed health-associated infection control, particularly the control of *Staphylococcus aureus*, which were available in English or Portuguese. Six guidelines were selected, which were used to discuss the main formal indications and contraindications of decolonization therapies.

In this way, the main findings from the articles were compared with the guidelines. Next, an analysis was performed of the information obtained from the studies and the guidelines regarding the effectiveness of decolonization and its indications, advantages and limitations.

## RESULTS

The 23 selected articles included specific characteristics regarding the studied population, objectives, methodology, sample size and protocols that were followed for decolonization. The distribution of the articles according to the year of publication was as follows: 2010, 17.4%; 2009, 13.0%; 2008, 13.0%; 2007, 8.7%; and 2006 or older, 47.9%.

Regarding the type of patient who underwent decolonization, the highlighted cases were the inpatients of general clinical medicine, 34.7%; surgery, 26.2%; intensive care unit, 26.2%; patients with skin infections, 4.3%; urologic infections, 4.3%; and patients in long stay units, 4.3%.

In relation to the objectives of the present study, 47.8% of the articles aimed at determining the effectiveness of decolonization on the eradication of microorganisms; 47.8%, on the effect of decolonization on reducing infection rates; and 4.4% discussed the effectiveness of decolonization in regards to preventing the transmission of microorganisms. It should be highlighted that 8.6% of the studies were performed with more than one objective.

Of the analyzed studies, 56.5% were prospective and cohort observational studies and 30.8% were historical control studies. In 69.2% there were no methods of group control. There were also randomized experimental studies (34.8%) and retrospective observational studies (8.7%).

The sample sizes ranged between five and 5,094, both found in prospective observational studies. The median of the samples of the studies was 236 patients.

In 95.7% of the analyzed studies, decolonization was performed only on colonized patients,

while in the others the process was performed on all patients. In 39.1% of the analyzed studies, the nursing team was responsible for the decolonization, whereas in one study (4.3%) it was reported that the patient was responsible for his or her own decolonization, after receiving a medical prescription and instructions (using a mupirocin ointment and bathing with chlorhexidine). In the other studies (56.6%) this information was not included.

Regarding the duration of the treatments, 56.5% of the protocols lasted five days; 13.0% lasted seven days; 4.3% lasted three days; and 4.3% included fourteen days of treatment. The other studies (21.7%) did not report the treatment duration.

The drugs used for decolonization reported in the analyzed studies were: mupirocin (69.6%); chlorhexidine (49.8%); tea tree oil (8.7%); prontoderm – polyhexanide (8.7%); octenidine dihydrochloride (8.7%); fusidic acid (4.3%); polysporin (4.3%); vancomycin (4.3%); rifamycin (4.3%); povidone-iodine (4.3%); and doxycycline (4.8%). It should be highlighted that 47.9% of the studies reported using combinations containing more than one of the aforementioned drugs, namely the combination of mupirocin with chlorhexidine (21.7%). Furthermore, 52.1% of the studies evaluated antibiotics in association with antiseptics, 30.4% used antibiotics exclusively, and 17.4 used antiseptics alone.

Therefore, among the 52.1% studies that used single agents, the following are highlighted: mupirocin (33.3%); chlorhexidine, prontoderm and tea tree oil (16.7% each); and fusidic acid (8.3%).

For the analysis, studies using similar methodology, drugs and monitored patients were grouped. The main results for each group are summarized in chart 1.

**Chart 1 – Articles according to the type of study, analyzed patients, tested decolonization therapies and main results. Belo Horizonte-MG, 2011**

(continua)

| Types of study | Analyzed patients | Tested decolonization therapies | Main results |
|---|---|---|---|
| Prospective observational | Surgical | Mupirocin[14] | Decolonization was effective in reducing infection |
| | | Mupirocin + Chlorhexidine[15-16] | Decolonization was effective in reducing infection in orthopedic patients. |
| | ICU inpatients | Chlorhexidine[10] | Effective in interrupting the transmission of some strains of MRSA |
| | | Prontoderm[17-18] | No statistically significant difference / Prontoderm could be an alternative for treatment with mupirocin |
| | | Mupirocin + Chlorhexidine[19] | Significantly effective on reducing MRSA infections |
| | Clinical Medicine | Mupirocin + octenidine dihydrochloride [20-21] | Decolonization was effective in reducing colonization / Incomplete eradication and required excessive time |
| | | Mupirocin + Chlorhexidine + povidone-iodine[22] | No statistically significant difference |
| | | Mupirocin + Chlorhexidine + others[23] | Decolonization was effective for patients who completed the protocol |
| | | Polysporin + chlorhexidine[24] | Eradication was effective for the majority of patients |
| | Urologic | Mupirocin + vancomycin + povidone-iodine[25] | Eradication was ineffective. Vancomycin was not well tolerated |
| Retrospective observational | Patients with wounds | Mupirocin + Chlorhexidine[26] | Effective in decolonization, but with no changes in infection rates |
| | Patients with skin wounds | Mupirocin[27] | No statistically significant difference |

(conclusão)

| Types of study | Analyzed patients | Tested decolonization therapies | Main results |
|---|---|---|---|
| Randomized experimental | Surgical | Mupirocin[28] | No statistically significant difference |
| | | Chlorhexidine[29] | Effective in reducing colonization, hospital stay and infection rate |
| | ICU inpatients | Tea tree oil[30] | Tea tree oil was effective, safe and well tolerated. However, there were no statistically significant results |
| | General Clinical Medicine | Mupirocin + Chlorhexidine[31] | Statistically significant reduction in infection rates, particularly in surgical patients |
| | | Fusidic Acid [32] | Should not be used alone, emergence of resistant strains |
| | | Tea Tree Oil[11] | Tea tree oil was more effective than mupirocin. However, the result was not statistically significant |
| | | Mupirocin + Chlorhexidine + rifamycin + doxycycline[12] | Treatment was effective for 3 months for 2/3 of patients, and for 8 months for 1/2 of patients |
| | Long stay units | Mupirocin[33] | Effective eradication, reduction in infection rates |

Chart 2 presents a summary of the main indications, advantages and limitations of the decolonization therapies.

**Chart 2 – Summary of the main indications, advantages and limitations according to the analyzed studies. Belo Horizonte-MG, 2011**

| | |
|---|---|
| **Indications** | Surgical patients<br>Patients hospitalized in Intensive Care Units<br>Patients hospitalized in long stay units<br>Patients with wounds |
| **Advantages** | Eradication of the microorganism<br>Reduction in infection rates<br>Effective in interrupting the transmission of some MRSA strains |
| **Limitations** | Emergence of resistant strains<br>Lack of evidence regarding the reduction of HAI<br>Lack of studies with rigorous methodological designs and significant samples |

## DISCUSSION

Surgical patients and intensive care unit inpatients are among the most studied subjects regarding decolonization, as they represent the individuals with the highest risk factors (invasive procedures, surgical wounds, use of antimicrobial agents, and pressure ulcers) for the development of *Staphylococcus aureus*-associated infections.[5] Furthermore, several studies report that colonization with *Staphylococcus aureus* represents an independent risk for the development of infection.[1,5]

Among the designs, prospective observational studies were the most frequent, which may be explained by the fact that this type of study requires smaller financial resources compared to randomized experimental studies. In general, clinical studies are considered to be capable of obtaining results that are more trustworthy, as they reduce bias as much as possible.[34] On the other hand, retrospective studies, as well as those involving historical controls (particularly observational studies) appear to be more limited.[14]

The fact that most studies included inpatients from different units impedes the generalization of the data, and this is one of the main aspects causing controversy regarding the effectiveness of decolonization.

Furthermore, it should also be noted that the poor adherence of patients to the decolonization therapies can compromise the study results, considering that the effectiveness of decolonization depends on high adherence to treatment.[35] Poor adherence can be avoided by making the nursing team or research professionals accountable for conducting the decolonization, or by establishing a protocol supervision scheme, as reported in many of the analyzed studies.

Regarding the treatment duration, it was observed that most studies adopted a five-day treatment. Although most of the analyzed guidelines did not recommend a specific period of treatment, the United Kingdom guideline indicated a five-day treatment period.[36] Furthermore, it should be considered that there is a premise that treatments should not be long, because of the possibility of bacterial resistance occurring.[1,37]

In terms of available decolonization treatments, it is observed that they may involve a systemic treatment (by means of the oral administration of antibiotics) or topical treatment (using local medications or baths containing antibacterial agents). However, evidence is lacking for which type of treatment (topical or systemic) is more effective in this procedure.[38]

The systemic treatments for the eradication of *Staphylococcus aureus* are not widely used. In general, topical drugs are more commonly used as decontamination agents.[12,23,36,37] This occurs mainly because of the concern regarding the emergence of strains resistant to antimicrobial agents.[39]

The main systemic antimicrobial agents used were vancomycin, rifamycin, fusidic acid and doxycycline.[12,25,32]

In the main international guidelines – World Health Organization (WHO), Centers for Disease Control and Prevention (CDC) and the British Society for Antimicrobial Chemotherapy- regarding indications for use of systemic treatments for decolonization, the recommendation is that the drug be chosen based on consultation with the physicians specializing in infectious diseases and epidemiology in each individual hospital.[1,37]

In terms of vancomycin, some guidelines contraindicate its use because of the possibility of increasing bacterial resistance to this particular drug.[36] It is highlighted that many patients exhibit low tolerance for vancomycin, and the following side effects are most common: dry mouth, unpleasant taste, stomatitis, nausea, abdominal pain, diarrhea, and flatulence.[25]

Analyses have been performed on the isolated use of fusidic acid, but no statistically significant results were found regarding its effect on the reduction of MRSA infections. This drug increased the emergence of bacterial resistance, which reinforces the idea that the drug should not be indicated for use alone for the eradication of *Staphylococcus aureus* in colonized patients.[32] It is considered to be the strongest antibiotic of its class, and is recommended for the treatment of topical and systemic infections caused by microorganisms of the *staphylococcus* genre. However, it is contraindicated as a monotherapy for decolonization, and its indication is only as complementary to, or to boost the potential of, rifamycin (systemic).[36]

Another systemic drug is doxycycline, which corresponds to an antibacterial agent of the subgroups chloramphenicol and tetracycline.[12] It was used in combination with other topical drugs (mupirocin and chlorhexidine), as well as a systemic drug (rifamycin). This combination achieved effective outcomes, as shown in Chart 1.

Topical treatments are widely used and evaluated, with the following highlighted as the main topical antimicrobial agents tested: mupirocin, chlorhexidine, octenidine dihydrochloride, povidone-iodine, tea tree oil, prontoderm and polysporin.[10-12,14-31,33]

Nasal mupirocin is considered the best topical agent for the eradication of gram-positive bacteria immediately following the treatment, when the adherence to this protocol is high.[35]

As shown in chart 1, 68.8% of the studies that used topical mupirocin for patient decolonization achieved an effective outcome.[12,14-16,19-20,22,25,31,33] Corroborating this result, it is found that topical treatment using mupirocin is indicated by most international health guidelines, including those of the CDC and WHO.[1,5,36-37,40]

The CDC recommends using topical mupirocin alone in colonized patients for only short periods of time and for professionals who have an epidemiological relationship with the transmission of the organism.[1] On the other hand, the WHO considers the use of mupirocin and/or chlorhexidine in MRSA carriers, but does not specify the indications, contraindications and time of usage.[5]

The guidelines from the British Society for Antimicrobial Chemotherapy indicated the use of mupirocin exclusively for eradication therapy, when nostrils are the only colonization site, and contraindicating its use for a therapeutic purpose. In other words, it should be used only for prevention, and not for the treatment of diseases.[36] However, it discourages the use of mupirocin alone in patients or healthcare professionals with skin wounds, based on evidence that it does not reduce *Staphylococcus aureus* infections in these cases.[27,36]

It should also be considered that the National Institute of Clinical Excellence (NICE) in the United Kingdom does not recommend the use of topical antimicrobials in any situation, as NICE does not consider that there is enough evidence that this practice reduces HAIs, either globally or those caused by MRSA. Furthermore, NICE states that the reasons why topical treatments with mupirocin are ineffective for infection control remain unknown. Therefore, further studies focused on decolonization are called for.[41]

It is important to highlight that another reason for the contraindication of mupirocin concerns bacterial resistance to this agent, considering that the increase in resistance has a direct relationship to repeated treatments with the same antibiotic.[35] There are two types of mupirocin-resistant *Staphylococcus aureus*: high- and low-level resistance. Both are related to the failure to completely eradicate the microrganism.[35] Furthermore, in cases of resistance to mupirocin, four weeks after the treatment has ended there is a high risk of endogenous re-colonization.[9] Nevertheless, resistance to mupirocin is still considered low (approximately 4.0% in a Canadian hospital), but is steadily increasing: 1.6% between 1995 and 1999 and 7.0% between 2000 and 2004.

In some situations, however, mupirocin proved to be effective in reducing MRSA infections, with no clinical indication of bacterial resistance emerging during the studied period, as this occurrence was assigned to the repeated use of the drug.[7]

Baths with antimicrobial agents, such as chlorhexidine, are also indicated as control measures against the infection or colonization by *Staphylococcus aureus*, considering that chlorhexidine is highly effective against gram-positive microorganisms, while being less effective against gram-negative microrganisms.[5,37] Nevertheless, studies indicated that when used as an agent for the decolonization of MRSA, despite interrupting its transmission,[10] the effectiveness of chlorhexidine is improved when used with other drugs, such as mupirocin.[26,42]

Among the analyzed studies, 90.9% of those that tested chlorhexidine obtained effective outcomes for decolonization,[10,12,15-16,19,22,24,26,29,31] observing that 72.7% of them used chlorhexidine in combination with other drugs.[12,15-16,19,22,24,26,31]

Octenidine dihydrochloride and povidone-iodine are topical antimicrobial agents, both used for skin cleansing and antisepsis for the purpose of preventing infections.[43-44] The latter is used more frequently, and in the analyzed studies regarding decolonization, they were always used in combination with other drugs and proved to be effective.[20-23,25]

The other analyzed drugs –tea tree oil, prontoderm and polysporin – do not appear in any of the analyzed guidelines. However, with the emergence of resistance to the commonly used drugs and the search for new antimicrobial agents, they may be seen as alternative treatments for the decolonization process of patients in the battle against bacterial resistance. It is emphasized that these drugs are probably not addressed in the guidelines due to the lack of evidence regarding their effectiveness and indications.

Tea tree oil (*Melaleuca alternifólia*) is extracted from a plant common in Australia,[11] and has been demonstrated to be effective in decolonization, although these results are not statistically significant compared to other therapies.[11,30]

Both prontoderm and polysporin are antimicrobial substances commonly used in wound care and are highly effective against *Staphylococcus aureus*.[18] Considering the former, in both analyzed studies, despite the drug being effective in the decolonization of patients the results were not statistically significant.[17-18] For the latter, although there was no control group to allow for comparisons, the drug was effective in the eradication of the microorganism in 82% of patients within a four month follow-up period.[24]

The decolonization of patients was not recommended mainly due to the following reasons: the chance of promoting the occurrence of bacterial resistance, particularly considering longer periods of treatment, and the lack of evidence that this measure is effective in reducing infections by *Staphylococcus aureus* or in reducing overall infection rates.[41] This is due to the fact that decolonization may promote the occurrence of infections caused by other microorganisms in the absence of *Staphylococcus aureus,* and whether this in fact occurs was unclear in the studies.[41]

## FINAL CONSIDERATIONS

After this review, considering this is a controversial and contentious issue, it is considered that decolonization should not be performed as a routine procedure due to the risk of causing bacterial resistance to the antimicrobial agent

in use, the lack of standardization regarding the length of the therapy, no consensus or pattern regarding what drug to use and the shortage of evidence regarding decolonization as a means to control HAIs. Therefore, decolonization should be indicated only for patients considered at risk, such as those in intensive care units, surgical patients and long stay inpatients.

Further studies surrounding this topic are needed in order to clarify the benefits and risks associated with the use of antibiotics in colonized patients as a means for controlling infection. Special attention should be given to the need for studies with a rigorous methodological approach and larger samples, which would permit researchers to clarify the relationship between decolonization and a reduction in infection rates.

This topic deserves further special attention in settings that defend the rational use of antimicrobial agents, aiming at minimizing the risks of bacterial resistance.

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