

# Addition of Nasal Mupirocin to Chlorhexidine Baths for Prevention of Methicillin-resistant Staphylococcus aureus (MRSA) bloodstream infections

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## INTRODUCTION

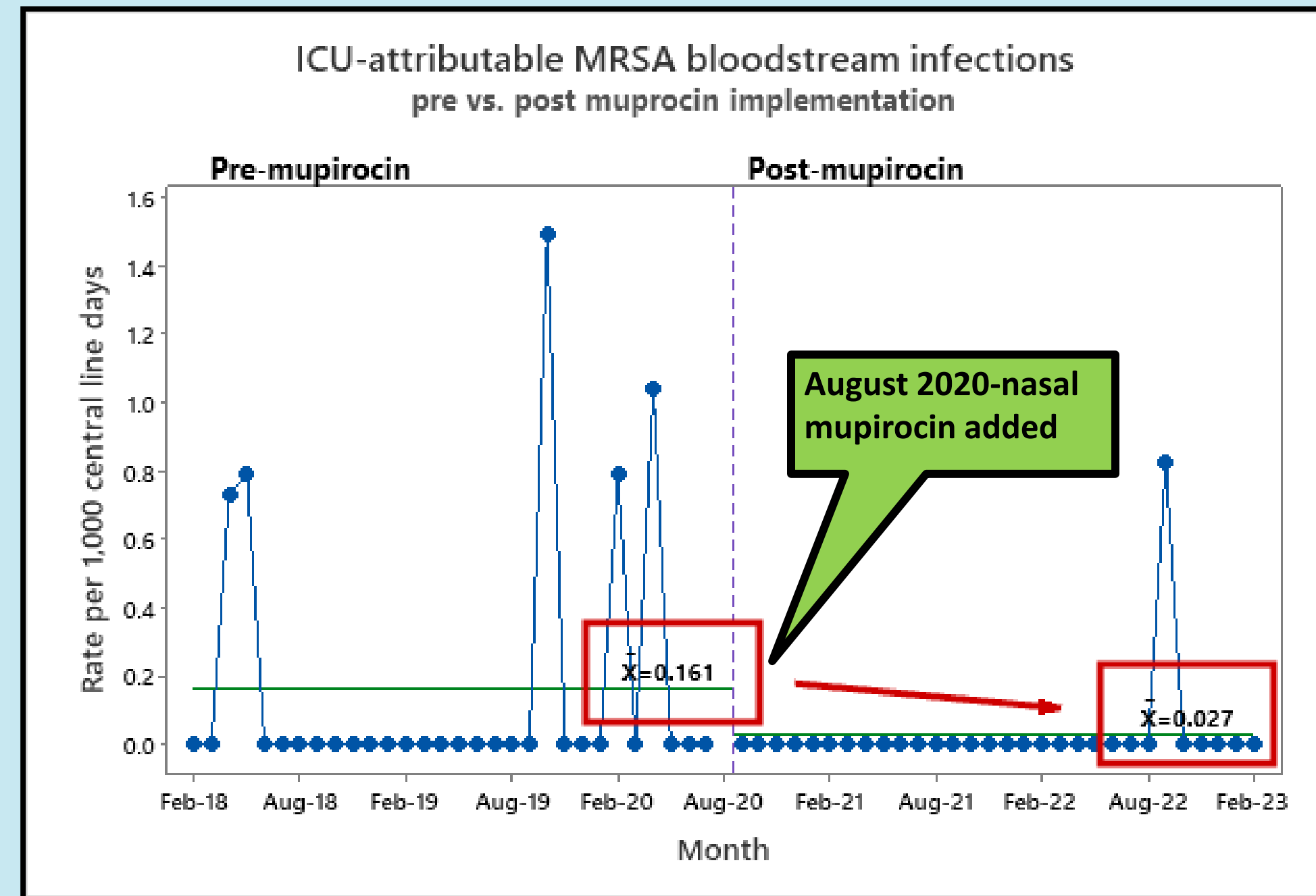
- The purpose of this research is to determine if addition of nasal mupirocin to an existing CHG bathing protocol will decrease MRSA hospital-associated bloodstream infections.
- Patients in Intensive Care Units (ICUs) are at risk of acquiring Methicillin-resistant Staphylococcus aureus (MRSA) colonization, increasing the risk of a subsequent MRSA infection.
- Universal decolonization, with chlorhexidine (CHG) baths and nasal mupirocin, has the potential to reduce MRSA bloodstream infections.

## RESULTS

- We measured how many MRSA-positive patients were successfully decolonized at Day 15:
  - 1,239 patients had MRSA PCR collected on admission and nasal culture at  $\approx$  Day 15, Jan 2021 to Jun 2023
  - 93 of the 1,239 patients were MRSA PCR-positive on admission
    - For these 93 MRSA positive patients, at Day 15 nasal culture:
      - 88% (of 93) were negative for MRSA
      - 12% (of 93) remained MRSA-positive

## METHODS

- Setting
  - Adult ICUs in 500-bed tertiary-care hospital
  - Already established practice of daily CHG baths in adult ICU patients since Nov 2011
- Intervention
  - August 2020: automated information systems protocol implemented to add:
    - Nasal mupirocin twice daily for five days
    - On ICU admission, nasal PCR screen for MRSA
    - Day 15, if still in hospital: nasal culture for MRSA
- Methods for measuring impact of intervention
  - Incidence of ICU-attributable MRSA bloodstream infections was measured pre- and post- implementation of mupirocin protocol.
    - Pre-mupirocin: 30 months before August 2020
    - Post-mupirocin: 30 months after August 2020
  - National Healthcare Safety Network (NHSN) criteria were used to define qualifying bloodstream infections.<sup>1</sup>



- To assess the clinical impact of adding nasal mupirocin to CHG baths, we measured ICU-attributable NHSN-qualifying MRSA bloodstream infections: (see FIGURE)
  - Pre-mupirocin period: 30 months before August 2020 (Feb 2018 -Jul 2020)
    - Six MRSA bloodstream infections (0.16 cases per 1,000 ICU central-line days)
  - Post-mupirocin period: 30 months after August 2020 (Sep 2020 - Feb 2023)
    - One MRSA bloodstream infection (0.02 cases per 1,000 ICU central-line days) in study period after the addition of nasal mupirocin to daily CHG baths
  - Comparison: (p=0.049, by one tailed z-test)

## DISCUSSION

- Our research was modeled on an earlier universal decolonization study showing that nasal mupirocin/CHG bathing was associated with an overall reduction in ICU bloodstream infections and MRSA clinical isolates.<sup>2</sup> In our study, we assessed the contribution of adding five days of nasal mupirocin to a pre-existing CHG bathing protocol. At Day 15, 88% of MRSA-positive patients became MRSA-negative by nasal culture, demonstrating successful real-life protocol implementation among ICU patients. Most importantly, we observed a decrease in MRSA bloodstream infections.
- Limitations include the use of historical controls. Complicating factors during the research period included the onset of the SARS-COV-2 pandemic—nationally there was an increase in MRSA BSIs. Future work is important to determine if decolonization of ICU patients will have sustained effects on MRSA bloodstream infections as well as other hospital-associated infections.

## CONCLUSIONS

- This study found that nasal mupirocin twice daily for five days added to daily CHG baths in adult ICUs was associated with a decreased rate of MRSA bloodstream infections.
- It also demonstrated that 88% of patients who were MRSA PCR positive on admission became MRSA-negative at Day 15 nasal culture.
- Automating the protocol is essential for operational consistency.

## REFERENCES

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2. Huang, Susan S et al. "Targeted versus universal decolonization to prevent ICU infection." The New England Journal of medicine vol. 368,24 (2013): 2255-65.
3. Lastinger LM, Alvarez CR, Kofman A, et al. Continued increases in the incidence of healthcare-associated infection (HAI) during the second year of the coronavirus disease 2019 (COVID-19) pandemic. Infection Control & Hospital Epidemiology. 2023;44(6):997-1001.

## DISCLOSURES

I have no actual or potential conflict of interest and no financial relationships to disclose in relation to this presentation.