

# QUALITY IMPROVEMENT PROJECT TO IMPROVE EMPIRIC ANTIBIOTIC THERAPY FOR SKIN AND SOFT TISSUE INFECTIONS USING THE NASAL METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS POLYMERASE CHAIN REACTION

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## Purpose

Large cohort studies from the Veteran's Administration support the negative predictive value of the methicillin resistant *Staphylococcus aureus* (MRSA) nasal polymerase chain reaction (PCR) swabs for skin and soft tissue infection (SSTI). We investigated the use of the nasal MRSA PCR swab to reduce the inappropriate empiric use of vancomycin and piperacillin-tazobactam for SSTIs at our institution.

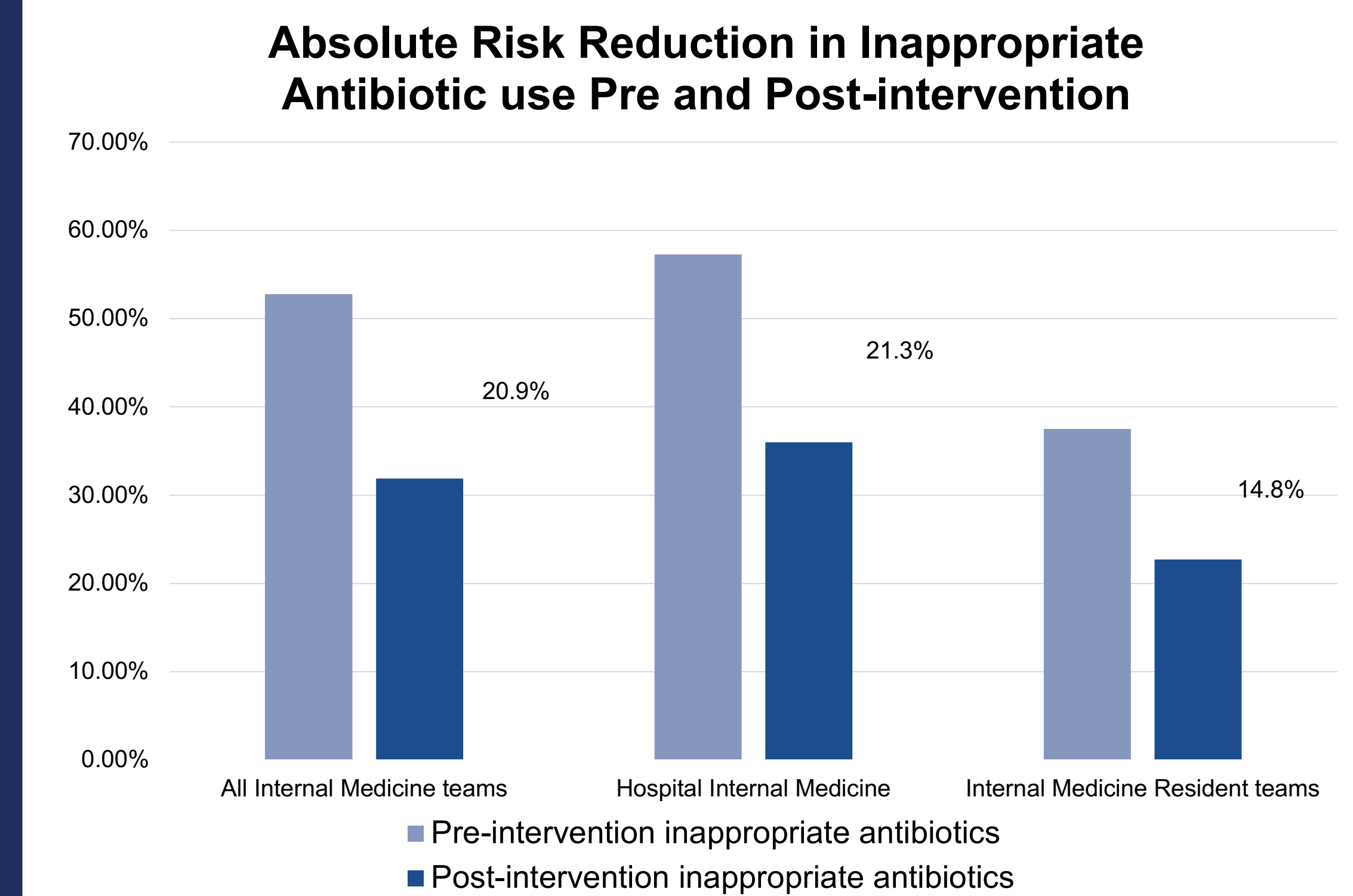
## Methods

- From July to August 2021, we educated Hospital Internal Medicine (HIM) and Internal Medicine Residents (IMR) on basic SSTI management and the utility of a negative nasal MRSA PCR swab via a series of noon conferences.
- Data on the empiric use of vancomycin and piperacillin-tazobactam for SSTIs was collected from 3/1/2021 to 7/1/2021 (pre-intervention) and 8/30/2021 to 12/29/2021 (post-intervention).
- Exclusion criteria: patients who didn't have an SSTI, weren't managed by IMR or HIM, or whose empiric antibiotics were for another indication.
- To account for antibiotics started in the emergency department (ED), a patient was regarded as having received appropriate empiric antibiotics if they were de-escalated in the first 24 hours of being admitted to IMR or HIM.

## Figure 1

Figure 1: Example of education material. These fliers were distributed to resident rooms following a series of noon conferences

## Figure II



## Table I

Characteristics	Combined Group		HIM		Teach	
	Pre (n=106)	Post (n=72)	Pre (n=82)	Post (n=50)	Pre (n=24)	Post (n=22)
Median Age (y)	65	63	65.5	63	63.5	58.5
Sex, male	62 (58.5%)	41 (56.9%)	49 (59.8%)	26 (52%)	13 (54.2%)	15 (68.2%)
MRSA risk factors	44 (41.5%)	27 (37.0%)	31 (37.8%)	20 (40%)	13 (54.2%)	7 (31.8%)
MRSA nasal PCR	43 (40.6%)	41 (56.9%)	34 (41.5%)	25 (50%)	9 (37.5%)	16 (72.7%)
+Cultures	54 (50.9%)	36 (50%)	42 (51.2%)	20 (40%)	12 (50%)	16 (72.7%)
+MRSA culture	3	7	1	4	2	3

## Results

Pre-intervention (106 patient encounters)

- 52.8% patients placed on inappropriate empiric antibiotics
- 40.6% had Nasal MRSA PCR performed

Post-intervention (72 patient encounters)

- 31.9% patients placed on inappropriate empiric antibiotic
- 56.9% had Nasal MRSA PCR testing performed

Absolute Risk Reduction (ARR) in inappropriate antibiotic use

- All teams: 20.9% with 95% CI (6.52 - 35.25). **Significant.** Number needed to treat 4.78 patients
- HIM: 21.3% with 95% CI (4.24 - 38.39). **Significant**
- IMR: 14.8% with 95% CI (-11.34 to 40.88).

## Conclusions

- Positive ARR was seen in whole and sub-group analyses. Residents stated nasal MRSA PCR made empiric choices easier
- Lack of statistical significance among IMR likely because of smaller sample sizes; leaving us underpowered to show significance even if it may exist
- Education on SSTI treatment coupled with increased use of the MRSA nares PCR improved empiric antibiotic choices.

## Future Directions

- Standardized education and expansion to include the ED, where antibiotic treatment is usually started.
- Creation of an EPIC™ tool that will prompt consideration for a nasal MRSA PCR if vancomycin is ordered for SSTI

## References

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