Title: The Impact of MRSA Nasal PCR Testing and Vancomycin Usage

Background: Vancomycin, a glycopeptide antibiotic, is commonly used in acute care settings to empirically treat respiratory infections like pneumonia, bronchitis, and COPD exacerbations. Vancomycin has to be monitored since it can cause renal toxicity and ototoxicity. There are also vancomycin-resistant strains arising from incorrect usage of vancomycin like prolonged duration and unnecessary MRSA coverage. *Methicillin-resistant Staphylococcus aureus* is a superbug resistant to many antibiotics like methicillin, oxacillin, and penicillin. MRSA nasal PCR swab involves collecting a sample from the nares to detect for MRSA colonization. Early detection of MRSA can aid in better patient outcomes and better utilization of hospital resources. MRSA PCR can be used to remove unnecessary vancomycin therapy in patients with respiratory infection indications if MRSA is not detected. The advantage of using MRSA nasal PCR test over cultures is being able to get the result within hours rather than days. This can allow practitioners to discontinue unneeded vancomycin therapy sooner which not only saves the patient from unneeded vancomycin drug exposure which decreases their risk of adverse effects, but also helps reduce healthcare spending as well.

Methods: This retrospective, single-center, pre-policy and post-policy study was conducted at Hannibal Regional Hospital in Hannibal, Missouri. The collected data from October 1st, 2022 to October 31st, 2023. Hannibal Regional Hospital implemented a new policy allowing pharmacists to order MRSA nasal PCR tests to patients who were prescribed vancomycin for a respiratory indication, including indications such as pneumonia (community-acquired and non-community acquired), COPD exacerbations, and bronchitis. Hannibal Regional Hospital's MRSA nasal PCR testing policy for vancomycin therapy was enacted on April 12th, 2023. Pre-policy data was collected from October 1st, 2022 to April 11th, 2023. Post-policy data was collected from April 12th, 2023 to October 31st, 2023. The number of MRSA nasal PCR tests was also noted through running a computer analysis of MRSA nasal PCR tests ordered. Data was gathered to show the correlation between vancomycin usage for respiratory indications was found in terms of days of therapy, while also noting the number of MRSA nasal PCR tests conducted.

Results: Once the policy was enacted, there were 323 MRSA nasal PCR tests given from May 2023 through October of 2023. Pre-policy October of 2022 had 106 total days of vancomycin therapy, while post-policy October of 2023 had 86 total days of vancomycin therapy. The average days of vancomycin therapy pre-policy was 120, while the post-policy average days of vancomycin therapy was 68. Throughout the year, when looking at the pre-policy and post-policy data, there were overall less days of vancomycin therapy in the post-policy group.

Conclusion: Overall, we had a great decrease in the days of vancomycin therapy in the post-policy group. Our study notes that the average days of vancomycin therapy pre-policy was 120, while the post-policy average days of vancomycin therapy was 68. This shows how the

policy did decrease the overall days of vancomycin therapy greatly. Shortened vancomycin duration can result in cost saving for both the patient and hospital, while also allowing for better utilization of resources. Antibiotic stewardship is always a priority and de-escalation of antibiotic therapy when possible is advised, resulting in better patient outcomes and less chance of resistant superbugs.