Integrating a Rapid Diagnostic Test and Antimicrobial Stewardship: Optimizing Discharge Antibiotics in Skin and Soft Tissue Infections (SSTI)

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Introduction

- *S. aureus* (SA) is the leading cause of SSTI
- Empirical treatment should have activity against both methicillin-resistant SA (MRSA) and methicillin-susceptible SA (MSSA), e.g. clindamycin
  - Clindamycin resistance rates are nearly 20% at CMH
- Early differentiation between MSSA and MRSA by using a rapid antigen test that detects PBP2a may allow early targeted antimicrobial therapy
- PBP2a testing was implemented for invasive SA and results were faxed to Antimicrobial Stewardship Program (ASP) who reviewed all cases

Objectives

- This quality-improvement project aims to optimize antibiotic usage in SA SSTIs through utilization of the PBP2a rapid diagnostic test

Methods

- Baseline antimicrobial use evaluated from January 2013 – December 2013
- Education of PBP2a interpretation to hospitalists and housestaff
- PBP2a rapid diagnostic test initiated by Department of Microbiology for *S. aureus*-associated SSTI in January 2014
- Interim analysis time period: Jan 2014 – Sept 2014
- Data collection points:
  - Service Line
  - PBP2a result (positive/negative)
  - Time between PBP2a and Vitek result
  - Empirical and discharge antibiotic
  - Antibiotic therapy change prior to final susceptibility
  - Discharge prior to final susceptibility
  - ASP Intervention (yes/no)
  - Adherence of intervention (yes/no/N/A)

Results

Figure 1. Pre-PBP2a Implementation: Antimicrobial Usage

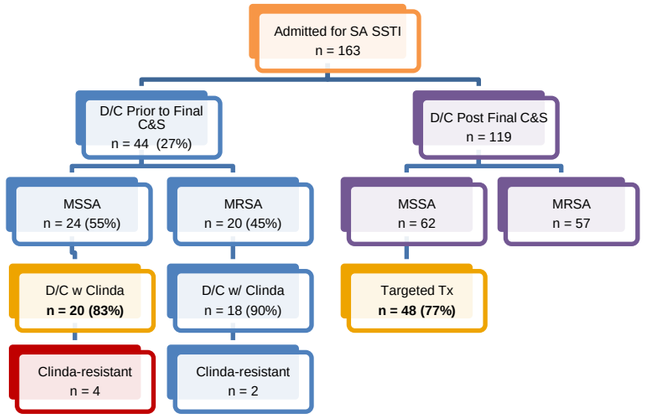


Figure 2. Post-PBP2a Implementation: Preliminary Antimicrobial Usage

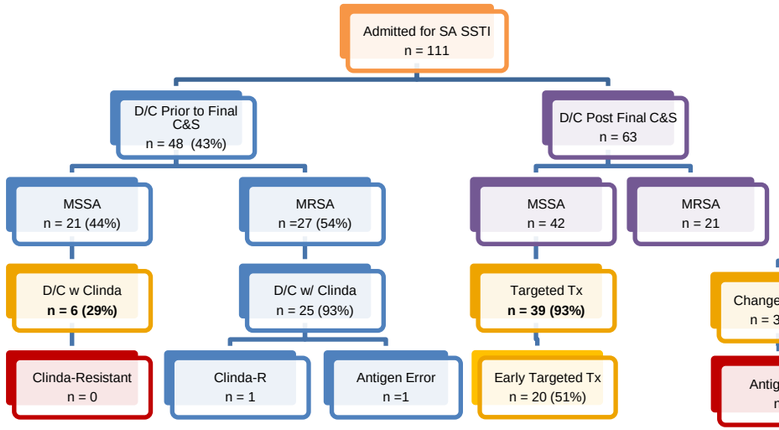
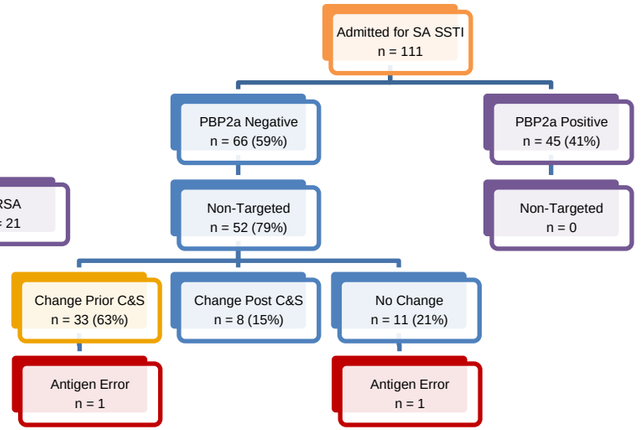


Figure 3. ASP and PBP2a Feedback

Figure 4. PBP2a Result Utilization



Discussion

- Accuracy of the PBP2a antigen test was high (98%)
- Mean time between antigen test and final susceptibility was 13 hours
- Clindamycin use for MSSA decreased post-implementation for patients who were discharged prior to final susceptibility (83% vs. 29%) ($p < 0.001$)
- Results allowed for early initiation of targeted therapy (beta-lactam) for MSSA (negative PBP2a result)
  - Nearly two thirds (63%) of patients on non-targeted therapy switched to targeted therapy prior to final susceptibilities
- Medical teams used the PBP2a results to guide early targeted treatment and did not require frequent feedback from ASP; however, there were few missed opportunities

Conclusions

- Rapid testing for methicillin-resistance allows for early targeted therapy, especially for patients who are discharged prior to final susceptibilities
  - Early identification of MSSA can decrease unnecessary clindamycin use
  - Could potentially lead to early discharge
- Additionally, this integrated rapid diagnostic test may be sustainable without continual ASP feedback

References

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Disclosures

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