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Impact of Rapid Phenotypic Antimicrobial Susceptibility Testing on De-Escalation of Antibiotic Therapy

Emilia Marrero, M Ed, M(ASCP)CM, Jessica Cobian, PharmD, BCIDP, Joseph Lauretta, MLS(ASCP), Zaena Mheir Al-Saadi, MS, MLS(ASCP)CM, SM, MB
Lakeland Regional Medical Center
Lakeland, FL

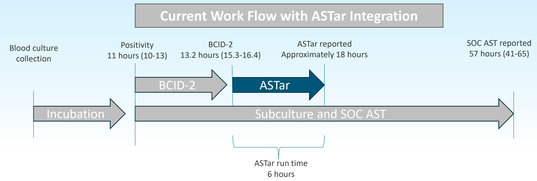
Emilia.Marrero@myLRH.org

Introduction & Objectives

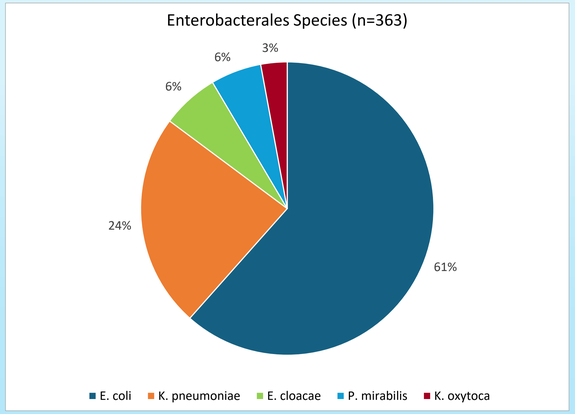
- Use of appropriate antimicrobials in the treatment of sepsis or septic shock is imperative in reducing mortality[2]
- Use of broad-spectrum antibiotics can lead to adverse reactions including kidney injury, *Clostridiodes difficile* infection, and antimicrobial resistance[2]
- Utilization of rapid diagnostics can enable clinicians to develop individualized treatment plans[4]
- The Qlinea ASTar system provides rapid AST from positive blood cultures in approximately 6 hours, compared to greater than 48 hours (average) when using Standard of Care (SOC) methods[5]
- The purpose of this study is to determine if the use of rapid phenotypic antimicrobial susceptibility testing (AST) will decrease the time to de-escalation in non-MDRO monomicrobial Enterobacterales blood stream infections (BSI)

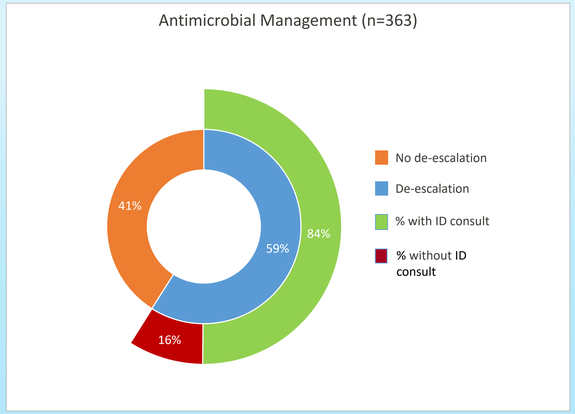
Methods

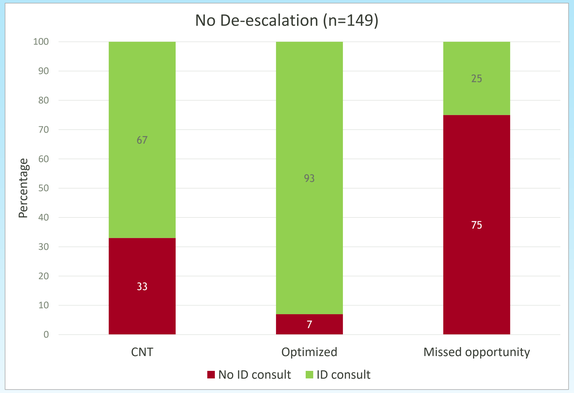
- Retrospective cohort analysis
- Source data: positive blood cultures identified by BCID-2
- Timeframe: 1/1/2024-12/31/2024
- Include: Enterobacterales blood stream infections
- Exclude: MDRO identified by genetic testing, polymicrobial bacteremia, Gram positive bacteremia or fungemia
- Data collection: organism species, empiric start date/time, MIC report date/time, new drug start time in those with antibiotic changes, ID consult, de-escalation and/or optimization date/time
- Outcomes:
  - Percent de-escalated
  - Percent optimized
  - Time to de-escalation/optimization

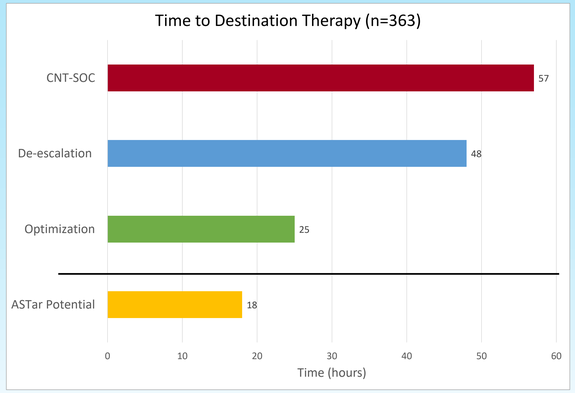


Results









Definitions:
CNT: Continued on narrow spectrum therapy based on BCID results (negative CTX-M)
Optimized: kept on broad spectrum due to clinical status/patient specific factors or optimized based on pathogen isolated (ex. *Enterobacter cloacae*)
Missed opportunity: no clinical symptoms that warranted extended broad spectrum of therapy and/or lack of streamlining based on culture results

*Results are reported as medians
Time to SOC (CNT patients): T0 was empiric therapy, first dose of antibiotic to MIC report time for confirmation of susceptibility
Time to de-escalation: T0 was empiric start time of broadest therapy before de-escalation occurred
Time to antibiotic changes: T0 empiric therapy, first dose to change implemented

Discussion

- **ASTar impact on time to destination therapy [CNT, De-escalation, Optimization]**
  - 39, 30, 7 hours sooner (respectively)
- **Limitations**
  - Retrospective, single-center, non-interventional design
  - Empiric and destination therapy timing was based on medication administration data not when order was initiated which is a true reflection of provider intent
  - For de-escalation therapy, empiric therapy T0 was based on the broadest spectrum agent ordered prior to the de-escalation
  - Lack of clinical outcomes

Conclusions

- **Potential benefits to be determined from future evaluation**
  - Decrease in adverse events from using broad-spectrum antibiotics
  - Minimize antimicrobial resistance
  - Timely initiation of individualized targeted treatment plans
  - Decreased mortality/morbidity and/or length of stay
  - Reduced cost
- **Future directions**
  - Evaluation of de-escalation/optimization post implementation
  - Encourage antimicrobial stewardship involvement in workflow to ensure prompt action based on AST results

References

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