

# Reducing Hospital-Acquired Infections in a Medical Intensive Care Unit



THE OHIO STATE UNIVERSITY  
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## Learning Objectives

Discuss effective methods to reduce Central Line-Associated Bloodstream Infections (CLABSI) and Catheter-Associated Urinary Tract Infections (CAUTI).

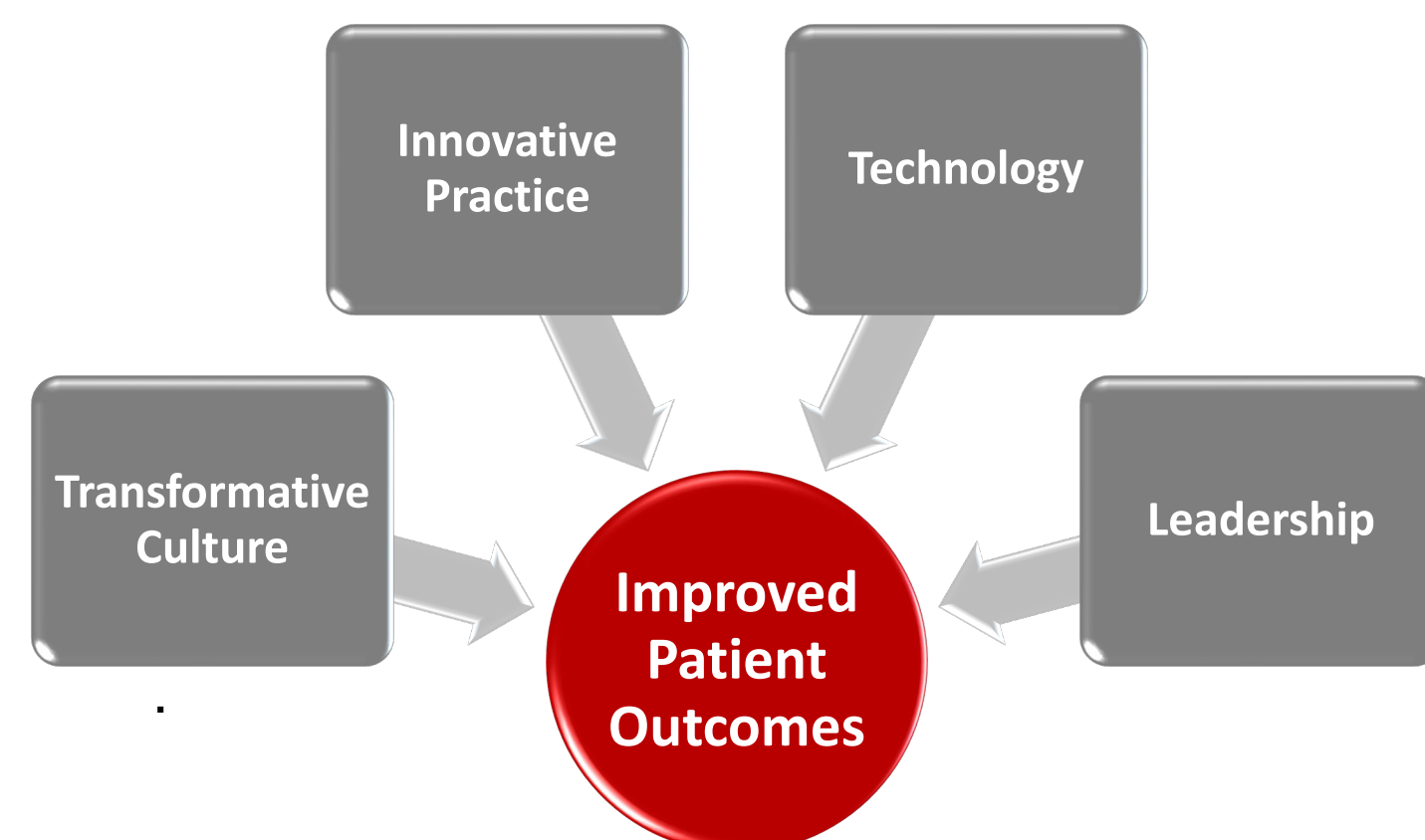
Describe diagnostic options that can be used to identify secondary sources of infection.

## Background

The Centers for Disease Control (CDC) carefully monitors Healthcare-Associated Infections (HAIs) through their National Healthcare Safety Network (NHSN) to ensure patients receive high quality care. CMS and other payers use data from NHSN to pay for performance.<sup>1</sup>

As hospital-acquired infections increased in a large academic medical center, quality, nursing, physician and infection prevention leaders collaborated to develop innovative corrective measures with a goal of reducing HAIs by more than 10%.

A thorough retrospective case review, implementation of daily leader rounds, and a real-time proactive approach to CLABSI and CAUTI monitoring, our team significantly improved patient outcomes in a medical intensive care unit (MICU).



## Methods

### Transformative Culture

- Standardized, hands-on, educational review of quality initiatives & bundles level-set best practices for 325 critical care nurses.
- A proactive cultural change in care delivery resulted after inspiring the frontline team to recognize the importance of their contribution to quality patient outcomes.

### Leadership Presence & Support

- Implementation of daily leader rounds for patients with invasive lines engaged the frontline teams to discuss line removal and alternatives.
- Monthly, proactive, nurse-led rounds with hospital executive leaders continued to emphasize the goal of reducing HAI's.

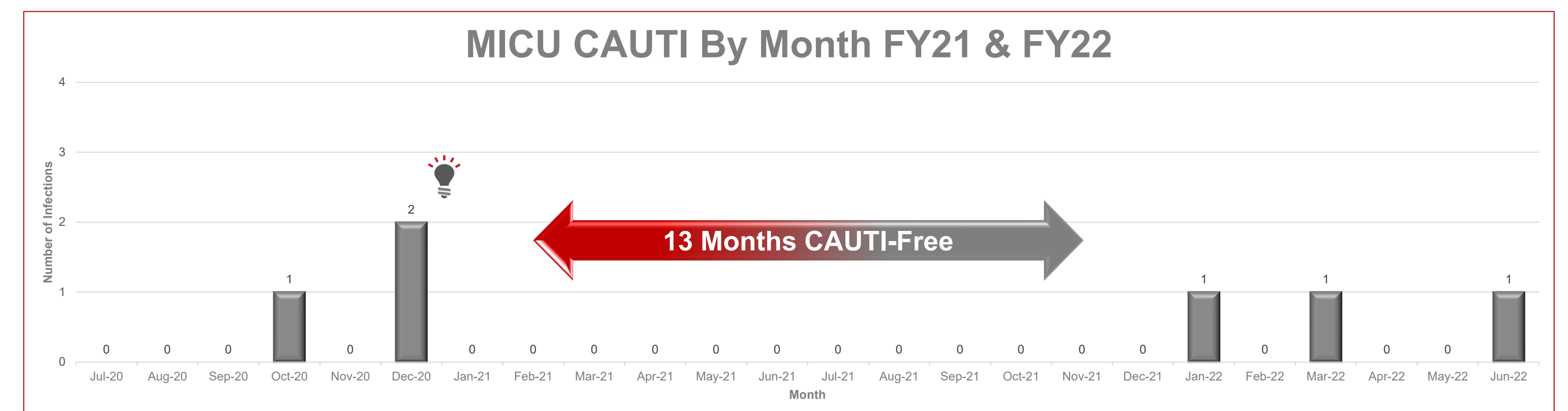
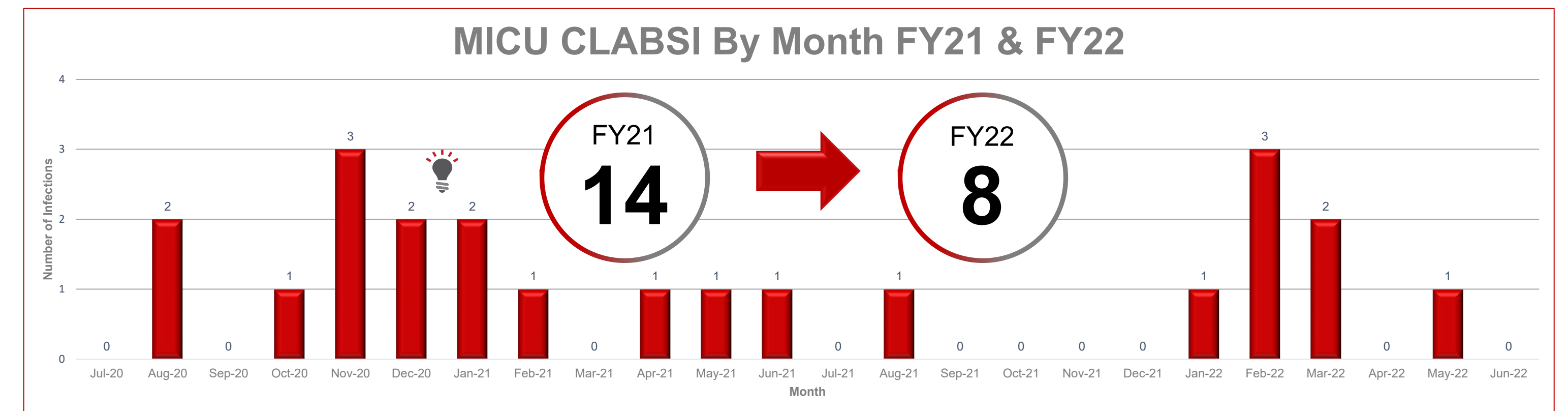
### Innovative Practice

- The team committed to a Just Culture in review of unit-based HAIs. Sharing of each HAI included a root cause analysis and review for NHSN.
- Development of a Blood Culture Decision Guide (BCDG) informed providers of necessity for repeat blood cultures. The BCDG facilitated multidisciplinary collaboration to reduce microbiology labs by 20%.
- Creation of a Positive Blood Culture Algorithm helped guide providers to search for the source of infection based upon clinical symptoms.

### Real-Time Use of Technology

- Use of EHR reporting helped to identify patients at-risk for CLABSI or CAUTI and monitor adherence to quality bundles.
- The Clinical Nurse Specialist (CNS) began to monitor abnormal blood cultures in real-time to support identification of infectious sources by the MICU team.

## Outcomes



## Lessons Learned & Takeaways

The team has maintained momentum by celebrating quality milestones and keeping our metrics front of mind.

Focusing conversations on line necessity, lab optimization, and alternatives to invasive lines has reduced line days and microbiology lab accession.

Real-time review of abnormal microbiology results by the CNS promotes a closer look at the infectious process for each MICU patient.

## References

<sup>1</sup> National Healthcare Safety Network (NHSN). (2022). Centers for Disease Control and Prevention (CDC). <https://www.cdc.gov/nhsn/index.html>.

## Contact & Speaker Disclosures

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The authors have no relevant financial relationships to disclose.



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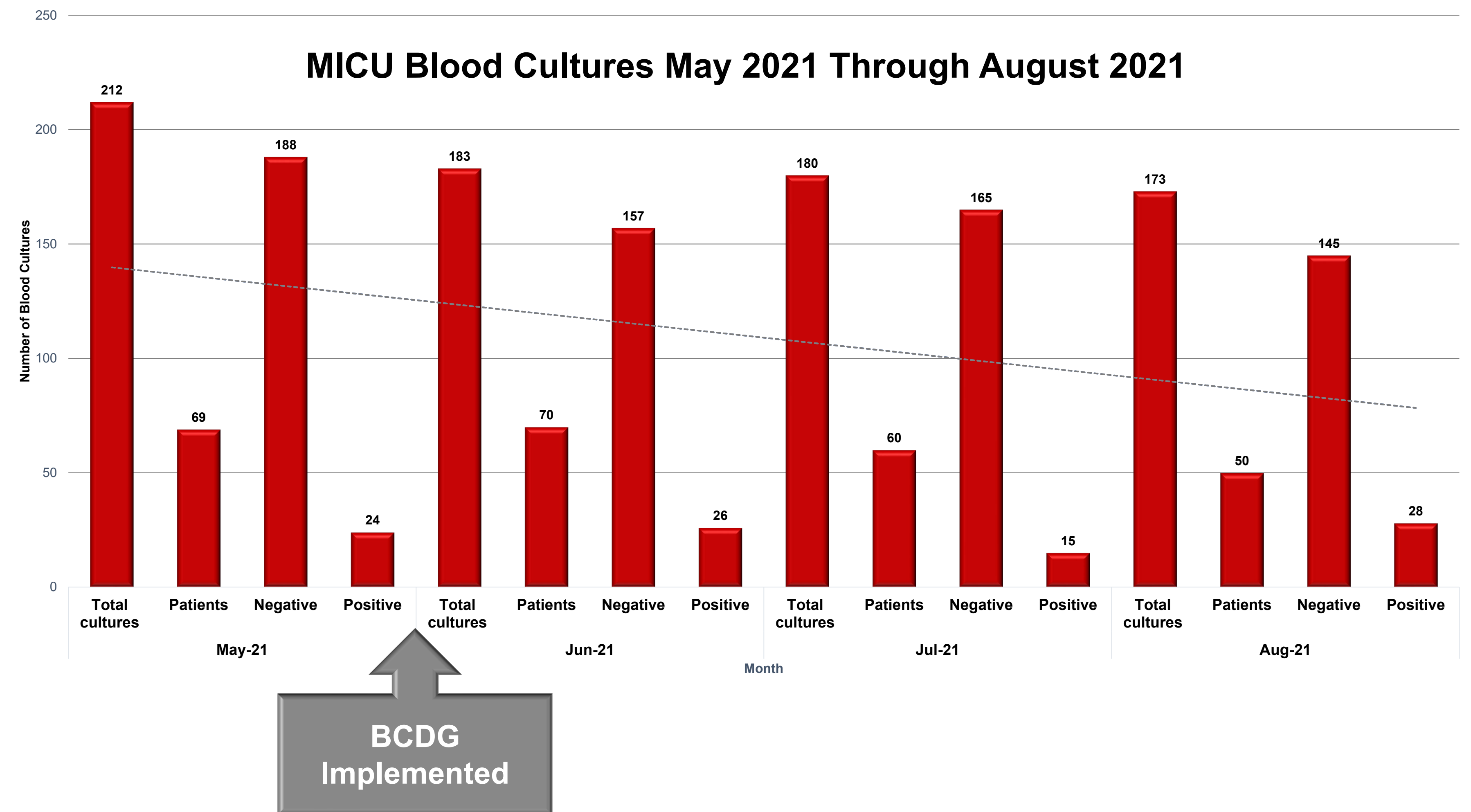
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## Blood Culture Decision Guide (BCDG)

First Time Blood Cultures		Any Follow Up Blood Cultures Per Admission	
<i>Initial blood cultures are typically obtained within first two calendar days of admission</i>		<i>Repeat blood cultures should not be obtained within 72 hours of the most recent cultures unless criteria below are met.</i>	
Primary Criteria for initial blood cultures	Criterion	Primary Criteria	Obtain Culture?
Temperature $\geq 103^{\circ}\text{F}$	■	Temperature $\geq 101^{\circ}\text{F}$ & leukocytosis $> 48$ hours OR Temperature $\geq 100.4^{\circ}\text{F}$ & neutropenia	■
Known or Suspected Infection	■	Known or suspected endocarditis	■
Consider is patient is admitted with Central Line	■	Presence of pathogens known or suspected to be resistant to standard antibacterial agents	■
Primary Criteria Decision for First Time Blood Cultures	Order Blood Cultures if ANY of the above boxes are checked	Primary Criteria Decision for Follow Up Blood Cultures	Order Blood Cultures if ANY of the above boxes are checked*
Secondary Criteria	Criterion	Secondary Criteria	Obtain Culture?
Temperature 100.4 – 102.9°F	■	Follow-Up Blood Cultures for a Patient with Gram-Positive Pathogens to confirm clearance	See Below*
Hypotension (SBP < 90 mmHg)	■	Known or suspected site of infection with limited antimicrobial penetration	See Below*
Leukocytosis or Leukopenia	■	Presumed source of infection in abdomen or central nervous system	See Below*
Immunosuppression	■	Presence of prosthetics vascular grafts, intravascular lines, or cardiac devices	See Below*
PMN Bands > 5%	■	<b>Any Follow Up blood cultures meeting secondary criteria should be discussed in multidisciplinary rounds PRIOR to ordering blood cultures.</b>  Reason for obtaining follow up blood cultures meeting secondary criteria should be documented in the patients plan of care.  * Additional Diagnostics (CT, CXR, Wound or Respiratory Cultures) should be considered to identify primary source of infection when considering follow up blood cultures.	
Platelets < 150,000 cells/mm3	■		
Chills	■		
Age > 65 years	■		
Creatinine > 2.0 mg/dL	■		
Secondary Criteria Decision for First Time Cultures	Order Blood Cultures if 2 or More of the above boxes are checked		

If more than one CVC is in place, a set of blood cultures should be obtained from each CVC. These cultures should be in addition to one set from a peripheral site.



### Innovative Practice

- Development of a Blood Culture Decision Guide (BCDG) informed providers of necessity for repeat blood cultures.
- The BCDG facilitated multidisciplinary collaboration to reduce unnecessary microbiology labs by 20% in the first 90 days.
- A successful pilot in our 24-Bed MICU for the BCDG was rolled out across our entire health system.

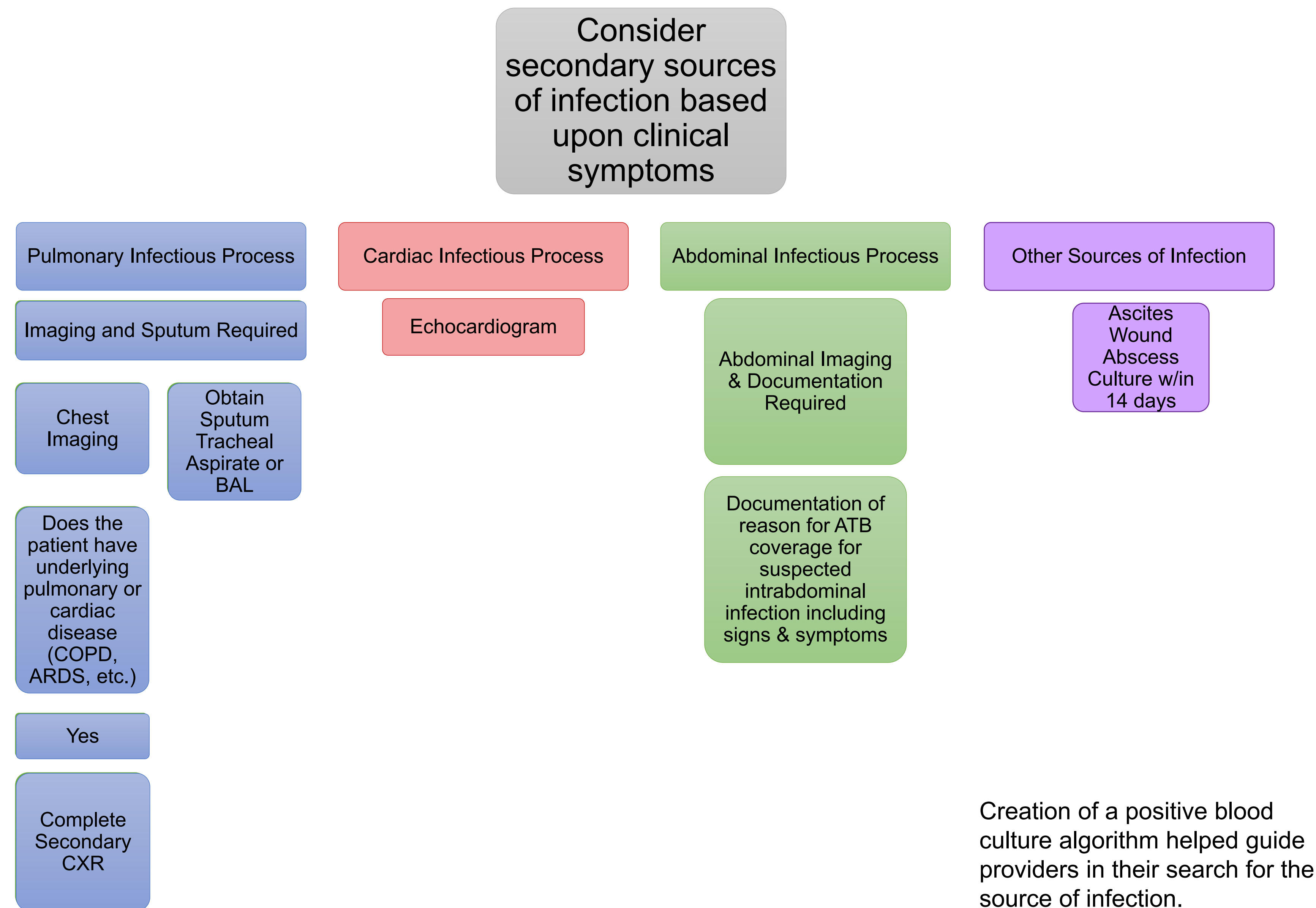
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## Positive Blood Culture Algorithm



Creation of a positive blood culture algorithm helped guide providers in their search for the source of infection.