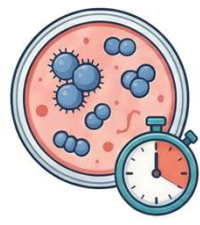


# New protocol for the detection of methicillin-resistant *Staphylococcus aureus* (MRSA) in positive blood cultures using microfluidic RT-PCR technology

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## Background



**The Burden of MRSA Bacteremia**  
*Staphylococcus aureus* infections are a leading cause of hospital morbidity and mortality, often resulting in prolonged stays and elevated healthcare costs.

**Study Objective**  
 To evaluate the diagnostic performance of a novel protocol using microfluidic RT-PCR technology (Vivalytic kit) for rapid MRSA detection in positive blood cultures.



**The Diagnostic Gap**  
 Conventional phenotypic methods require up to 48 hours for MRSA detection, creating a critical delay in administering targeted antibiotic therapy.



**Hospital Morbidity & Mortality**  
 Staphylococcus aureus bloodstream infections are a leading cause of severe patient decline.

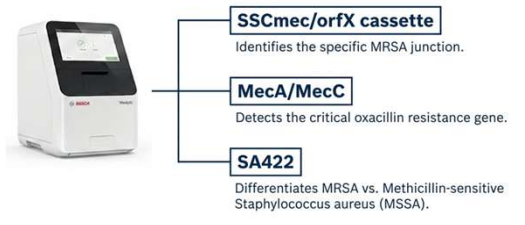
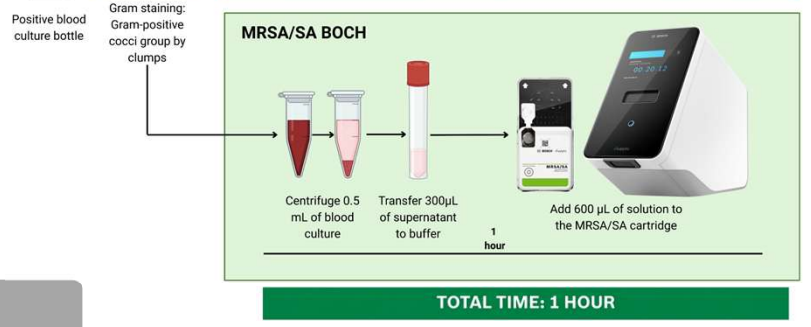
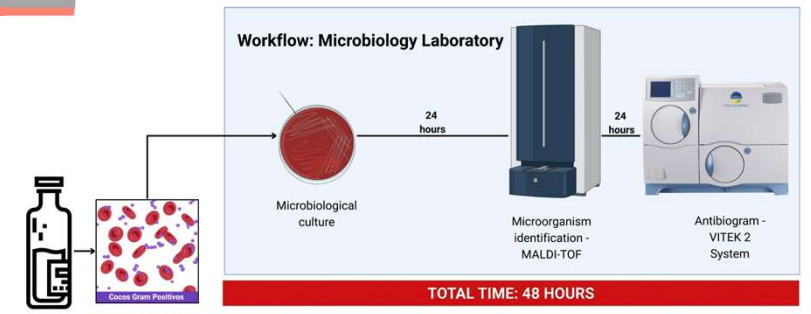
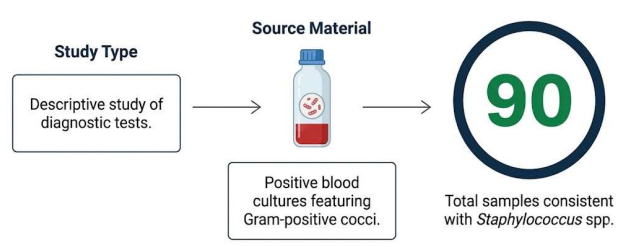


**Prolonged Hospital Stays**  
 Methicillin resistance significantly extends the duration of inpatient care.



**Increased Healthcare Costs**  
 Delayed discharge and complex interventions drive severe economic impact.

## Methods



## Results

The Vivalytic MRSA/SA RT-PCR test (BOSCH®), which uses microfluidic real-time PCR and was originally designed for nasal samples, demonstrated excellent diagnostic performance in positive blood culture samples

### Results: Diagnostic Performance

**100%** Sensitivity & 98% Specificity

The Vivalytic MRSA/SA test demonstrated near-perfect accuracy in identifying true positive and true negative MRSA cases.

96% PPV and 100% NPV

**96%** **100%**

**99% Diagnostic Accuracy**

Total agreement with the gold standard reached 99%, with a Cohen's kappa coefficient of 0.97, indicating almost perfect reliability.

Sensitivity	100%
Specificity	98%
Diagnostic Accuracy	99%
Positive Predictive Value (PPV)	96%
Negative Predictive Value (NPV)	100%
Cohen's Kappa	0.97

## Conclusions

- The Vivalytic MRSA/SA microfluidic RT-PCR test demonstrated high applicability and diagnostic performance for the detection of MRSA in positive blood cultures, being faster, more reliable, and less costly than other RT-PCR systems.
- The implementation of these molecular tests could optimize the diagnosis of methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia, thereby improving the therapeutic response and patient outcomes.