

During the past two decades major improvements has been made in the diagnostic performance of blood culture diagnostics through actions on pre-analysis and time-to-result” Lamy et al (2019).

Abstract:

Background: Bloodstream infection (BSI) is a major public health burden worldwide, with high mortality. Patient outcome is critically influenced by delayed therapy, and fast and accurate pathogen diagnostics decisively improves the care of patients. During the past two decades major improvements has been made in the diagnostic performance of blood culture diagnostics through actions on pre-analysis and time-to-result.

Objectives: To review and discuss the literature for standard procedures and the progress in BSI pathogen diagnostics, and to propose a new mindset to reach an improved diagnostic workflow.

Sources: Scientific articles and reviews available through NCBI/Pubmed.

Content: Blood culture performance relies largely on the quality of its pre-analytical phase that is improved with educational actions monitored by using key performance indicators, and external quality assessment. Advanced blood culture systems now provide tools for an automated estimation of the bottle filling. These proved efficient to facilitate effective training for improving blood collection. On analytic aspects, rapid methods for pathogen identification, among which matrix-assisted laser desorption/ionization time of flight mass spectrometry dominates, and rapid antimicrobial susceptibility testing are reviewed. These technical developments call for improvements in all other steps, especially in pre- and post-analytic logistics to give the full reciprocation of these techniques on patient management. This aspect is summarized in the term of “microbiologistics” that covers all possible improvements in the logistic chain from sampling to report.

Implications: Progress in BSI pathogen diagnostics is based on a bundle approach that includes optimization of the pre-analytical parameters, rapid start of incubation, the use of rapid methods, re-organisation (e.g. 24/7, transportation service) and a close involvement of antimicrobial stewardship teams. These developments lead to define a new standard for bloodstream infection diagnostics.

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Reference:

Lamy, B., Sundqvist, M., Idelevich, E.A. (2019) Bloodstream infections - Standard and progress in pathogen diagnostics. *Clinical Microbiology and Infection*. November 21st. DOI: <https://doi.org/10.1016/j.cmi.2019.11.017> .