

Point-of-Care Testing at Acute Cardiac Care brings Positive Outcome

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Purpose of point-of-care testing (POCT) is fundamental for the analysis of patients, which encourages better sickness analysis, observing, and administration.¹ It presents the opportunity for improved care, but whether beneficial outcomes are realized depends on the balance of quality and clinical need. Stringent monitoring is required for clinical outcomes, drug monitoring, and eventual blood product utilization during major bleeding event.²

The worldwide POCT showcase is required to develop from US\$ 23.16 to US\$ 36.96 billion at the compound annual growth rate of 9.8% from 2016 to 2021.³

Point-of-care testing is a delivery option for performing laboratory testing closer to the patient. Due to increasing health care pressures for faster turnaround time (TAT) of laboratory results and the development of a broader menu of testing devices, POCT is growing in popularity. Devices today are more portable, require less blood, and have connectivity capabilities.⁴

Using information technology systems (connectivity solutions), POCT coordinators and end-users in hospitals are now able to manage patient data and clinical results remotely. Clinical data, if provided timely, allow taking decisions on treatments faster. POCT device technologies today allow performing of analysis promptly and reliably for better patient management. Thromboelastometry and coagulation tests such activated clotting time, activated partial thromboplastin time, and platelet function are performed at POCT with high incidence, thereby improving patient outcome and reducing hospital costs, by aiding to choose the right blood product. Today, patients in the cardiovascular (CV) operating room, trauma, liver transplantation, postpartum hemorrhage, and interventional neuroradiology constantly rely on POCT for unfractionated heparin monitoring, FIB activity, and dual antiplatelet therapy (P2Y12 and TXA2) status. Acute care departments can also benefit from the accessibility of these technologies.⁵ POCT for emergency assessment of coagulation in patients treated with direct oral anticoagulants like rivaroxaban and dabigatran therapy due to faster TAT treatment protocols are immediately begun.⁶

Biosensors (biological component with a physicochemical detector) are one of the most critical components of POCT and are directly responsible for the performance of an assay. Technologies, such as viscoelasticity, light transmission aggregometry, spectrophotometry, etc., have been developed or improved and adapted to POCT. Complementary technologies, microfluidics, ongoing quality controls (even during test using patient blood samples), system integration, and device automation allow to make constant improvements in these devices.⁷

Point-of-care testing as a remote extension of the laboratory generate medical information that leads to clinical action. Correct application of viscoelastic testing and better drug management can reduce inappropriate blood transfusion and improve hemostasis management.

Maintaining high levels of accuracy, precision, and operator technical competency is a crucial requirement for adopting POCT solutions. Procedure standardization and algorithms utilization will complete the POCT philosophy and help in better management of hospital resources.

Point-of-care testing devices are simple to operate, but a quality assurance program is recommended due to clinical implication of using such tests. Expertise in the technical aspects of POCT devices brings reliability and efficiency at higher level. An algorithm-based POCT program in the cardiac critical intensive care unit brings positive patient outcomes.

Future Perspectives

Clinical research in the developing world often focuses on communicable diseases; however, CV disease remains the leading cause of death worldwide and does not spare even the low- and middle-income countries. In resource-limited environments where geographic and financial constraints limit the availability of centralized laboratories, catheterization facilities, and specialty CV care, the relationship between diagnostic testing and CV disease management differs dramatically from heavily populated urban centers. Thus, these settings will require dedicated clinical research to understand how POCT can answer the unique needs of these

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environments. In principle, POCTs that minimize instrumentation and infrastructure demands offer particular promise in these settings. Several platforms in development that use “lab-on-a-chip” technologies featuring integrated sample acquisition, processing, and measurement may address these needs. Those that interface with smartphone technologies are particularly attractive given the broad availability of cell phones in rural areas and the developing countries.^{7,8}

Conflict of Interest

None.

References

- 1 European Commission. Supporting patient blood management (PBM) in the EU: a practical implementation guide for hospitals. March 2017
- 2 Shander A, Fink A, Javidroozi M, et al; International Consensus Conference on Transfusion Outcomes Group. Appropriateness of allogeneic red blood cell transfusion: the international consensus conference on transfusion outcomes. *Transfus Med Rev* 2011;25(3):232–246.e53
- 3 Triulzi D, Gottschall J, Murphy E, et al; NHLBI Recipient Epidemiology and Donor Evaluation Study-III (REDS-III). A multicenter study of plasma use in the United States. *Transfusion* 2015;55(6):1313–1319, quiz 1312
- 4 Leahy MF, Hofmann A, Towler S, et al. Improved outcomes and reduced costs associated with a health-system-wide patient blood management program: a retrospective observational study in four major adult tertiary-care hospitals. *Transfusion* 2017;57(6):1347–1358
- 5 Gombotz H. Patient blood management: a patient-orientated approach to blood replacement with the goal of reducing anemia, blood loss and the need for blood transfusion in elective surgery. *Transfus Med Hemother* 2012;39(2):67–72
- 6 Ebner M, Birschmann I, Peter A, et al. Point-of-care testing for emergency assessment of coagulation in patients treated with direct oral anticoagulants. *Crit Care* 2017;21(1):32
- 7 Wikkelsø A, Wetterslev J, Møller AM, Afshari A. Thromboelastography (TEG) or thromboelastometry (ROTEM) to monitor haemostatic treatment versus usual care in adults or children with bleeding. *Cochrane Database Syst Rev* 2016;22(8):CD007871
- 8 Im H, Castro CM, Shao H, et al. Digital diffraction analysis enables low-cost molecular diagnostics on a smartphone. *Proc Natl Acad Sci U S A* 2015;112(18):5613–5618