Letter to the Editor

Point of Care Tests - The Future of Diagnostic Medicine

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Abstract

Dear Editor,

We want to highlight the gargantuan impact that Point of Care Tests (POCTs) have had on diagnostic medicine, and how it will change the landscape of the healthcare system as we know it. POCTs were initiated by Dr. Kost at Davis Medical Centre, California University in the early 1980s [1]. Point of Care Testing (POCT) in the healthcare ecosystem refers to performing rapid, effective, convenient and accurate diagnostic tests near the patient instead of the much more common method of procurement of results via centralized laboratories, which lead to delays in patient care. This can be of particular importance when it comes to time sensitive cases, like sepsis or acute coronary syndrome [2, 3].

One of the most important features of POCTs are their convenience, allowing testing to take place anywhere, from hospitals, clinics, resources limited areas and, in some cases, even a patient's home. This accessibility is extremely useful in rural/ poverty-stricken regions where labs may not be available, ensuring that disparities in the quality of healthcare provided are reduced severely.

Another positive aspect of POCTs are the fact that they are driving innovation when it comes to diagnostic medicine. Examples of this are microfluidic technologies that have been implemented in recent years to check for specific biomarkers, helping to diagnose cancers, tumors and other such mutations (via lateral flow assays) before they have become too widespread in the body to treat [4, 5].

They have also been used in conjunction with biosensors to create self-testing, wearable and fully integrated point of care systems [6]. Successful implementation of such POCT technologies could lead to minimal user intervention during operation to reduce user errors; user-friendly, easy-to-use and simple detection platforms; high diagnostic sensitivity and specificity and immediate clinical assessment.

POCTs were even used to detect infectious diseases like COVID-19, helping minimize turnaround times, enhance patient care, satisfaction and enabling healthcare providers to make real-time decisions [7]. This leads to improved patient management, resource allocation and better utilization of healthcare resources.

The initial investment in POCT devices is substantial, but the long-term benefits like reduced hospital stays, unnecessary procedures, and improved patient outcomes, outweigh the cost. POCTs has some disadvantages, mainly due to the potential for less accurate results compared to traditional laboratory testing mainly due to variable personnel training and control over pre-analytical and analytical phases, which requires stringent oversight by the central laboratory [8]. Hence quality assurance, regulatory compliance, operator training, data management and interpretation of tests by med students and doctors are also among the key factors that need to be addressed to ensure the reliability and integrity of POCT results [9, 10]. Additionally, while POCT offers convenience and accessibility, it should be used in conjunction with standard lab testing, particularly in cases where the assays may not be as efficient or accurate at producing results.

Recent advancements in artificial intelligence (AI) have greatly influenced POCT. For example, AI enabled image analysis and pattern recognition algorithms now allow for quick interpretation of lab reports, increasing the efficiency of this diagnostic modality with optimal quality assurance [11]. The greatest advantage of AI in point-of-care testing will be its capability to conduct essential diagnostic tests reliably and accurately without requiring skilled or trained personnel. This will have a significant impact on community healthcare, with significant harmonization and standardization [12].

In conclusion, Point of Care Testing has and will continue to cause a radical change in diagnostic medicine, offering rapid, convenient, and cost-effective solutions for healthcare delivery. By bringing testing closer to the patient, POCT empowers healthcare providers with timely information to make informed clinical decisions, ultimately improving patient outcomes and enhancing the efficiency of healthcare delivery. As technology continues to evolve and more and more diseases can be diagnosed via these tests, POCT will undoubtedly play an increasingly integral role in shaping the future of diagnostics and transforming the landscape of healthcare.

Declaration of Conflict of interests

The authors of this article declare that there is no conflict of interest with regard to the content of this manuscript.

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