



Industry Speak

Technological advancements and emerging trends

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Over the past three decades, the power of simplicity and ease-of-use has enabled many technologists to report fast and accurate patient results in the most critical settings. Moving forward, the industry is aligned in designing innovative products that meet and exceed the expanding needs of critical care, biochemistry, and hematology segments within various hospital classes and private labs in India and globally.

Blood gas measurements have evolved from gas tank-based, large analyzers to small, compact analyzers that are easy to use and operate with self-contained, liquid-tonometered calibrators in convenient snap-in packs. The technology interface used in many blood gas analyzers facilitates measurement of PO_2 , PCO_2 , and pH, as well as electrolytes, utilizing disposable, maintenance-free electrodes. The development of simplified user interfaces using complex, internal algorithms has allowed for the expansion of result reporting to include calculation of parameters important for accurate and timely patient care, such as temperature correction, oxygen saturation, base excess, and bicarbonate concentrations.

The use of minimal sample volumes allows for testing in environments where the collection of syringe samples is not achievable, such as neonates with cardiopulmonary problems where capillary samples are the preferred choice. Blood gas analyzers commonly include universal samplers, which aid in accommodating varying sample collection devices, such as syringes or capillaries used in diverse patient populations.

Acid-base disturbances are common in hospitalized patients, especially in patients with severe viral infections, such as COVID-19. The accurate interpretation of blood gas results is key to managing the progression of disease of patients in critical condition. The prevalent patient conditions and the need for timely results are key factors when deciding on a blood gas analyzer.

Most hospitals, laboratories and COVID-19 centers are in search of a system that will deliver total automation at affordable pricing without making any civil changes in set up, since space is also a major constraint.

In all, those in search of a blood gas analyzer should consider the following features during the selection process:

- Simplicity in operation;
- Accuracy and precision of results;
- Software that supports a quality-control program acceptable worldwide, such as Levey-Jennings charts and plots;
- Consumption of reagent should be as minimal as possible, resulting in lower cost per sample; and
- Capabilities, such as barcode reading and LIS/HIS connectivity are important for accurate result reporting and improvement in the turn-around-time of reporting patient results.

some metabolites in the whole blood specimen. The technological advancement in the past decade has significantly improved the method of diagnosis and treatment in the healthcare facilities. The recent advances have enabled clinicians to direct therapy and improve patient outcomes.

Modern analyzers come in a variety of sizes from handheld to portable desktop systems, which are more user-friendly, more automated, and require less technical expertise and maintenance by the end user compared with earlier analyzers.

Current new analyzers are a typical instrument for point-of-care testing (POCT) and are being installed in emergency treatment facilities and can rapidly evaluate multiple items. PoC analyzers combine increased accessibility and cost-effectiveness with reduced maintenance requirements compared with more traditional benchtop analyzers, facilitating their increasing use in routine perioperative and intensive care settings.

PoC blood gas and electrolyte analyzers also facilitate analysis of the blood sample near the bedside (and especially in the delivery room), which results in accelerated clinical decision making versus that in the hospital central laboratory. Arterial, venous, and capillary blood gas samples can now be analyzed in the NICU, reducing pre- and post-sample collection errors and reducing time to results.

The oxygen saturation of hemoglobin calculation fails to account for dyshemoglobins. A co-oximeter is preferable in this instance as it can directly measure different hemoglobin species. For this reason, most modern blood gas analyzers also incorporate a co-oximeter.

Introduction of innovative technologies in combination analyzers has led to drastic evolution of blood gas and electrolyte measurement and analysis and has also allowed the advent of hybrid, portable analyzers. Latest technologies incorporated in these systems also facilitate the introduction of blood analysis with the smallest possible quantity of blood sample.

The market is also witnessing introduction of analyzers that are compact in nature, and offer more sensitive test results, along with increasing multi-parameter monitoring capabilities. Recently, there has also been a significant increase in the demand of high throughput and integrated systems that are capable of integrating with EMRs/EHRs enabling high efficiency and workflow.

According to Global Market Insights, India is one of the fastest growing markets in APAC region and is expected to grow at a CAGR of 10.5 percent from 2019–2023 attributed to rise in awareness regarding diagnosis of asthma, and other respiratory disorders. The country