ABG: EASY AS 1, 2, 3

By Stephanie Richardson

Much has changed since blood gas analyzers were first introduced in 1957. State-of-the-art devices are smaller and faster than ever with more powerful data management capabilities and improved ease of use. Blood gas analysis is performed by respiratory therapists or trained lab technicians in hospital patient rooms, emergency rooms or clinical laboratories. They are "stat" tests that must be performed as quickly as possible after blood samples are collected. A delay in testing for blood gas analysis or for arterial blood gases (ABGs) can result in data inaccuracies and compromise patient safety, Here are some of the innovations respiratory therapists have come to expect for speedy and accurate test results that help lead to improved patient diagnoses.

Color touch screens

As technology advances, RTs will find blood gas testing easier than ever. Although they are more sophisticated, the latest blood gas analyzers offer features that improve ease of use and cut down on technician training time.

One of the first changes is simpler user interfaces. Color touch screens are setting a new industry standard for blood gas analyzers. Some of these touch screens display picture-based instructions, which efficiently guide users through each step to achieve faster results. These icons replace function keys and complicated switches for data entry. They also give at-a-glance information such as battery level and date/time. Included in the images on some analyzers is a touch screen QWERTY keyboard. This cuts down on the device's footprint because the keyboard is on-screen for quick data entry. It also streamlines and simplifies the entry of accurate data.

Color touch screens also allow the analyzers to show integrated video help tutorials. These tutorials may feature online help menus and other information to help technical and non-technical users learn about the device quickly.

More test parameters

The addition of more testing parameters has led to greater accuracy, smaller sample sizes, and faster measurement times. Many advanced blood gas analyzers offer 20 or more testing parameters. These parameters may include: Hct, tHb, O2Hb, COHb, HHb, MetHb, sO2, glucose, lactose, creatinine, total bilirubin, BUN, HCO3 and pH. For optimal use, the analyzers may allow individually adjustable parameter configurations that the operator can coordinate with a user-definable display. This set-up helps provide results in less than one minute with some devices.

Therapists will see manufacturers continue including additional parameters with blood gas testing because it results in providing a complete acute care profile with a single device. By offering several testing parameters, one device will be able to provide a large panel of tests formerly provided by different equipment. This cuts down on sample and labor costs. In addition, expanded parameters let therapists perform more tests on a smaller blood sample. Some new blood gas analyzers will run a myriad of tests on a sample as small as 50 microliters. And smaller sample sizes promote faster test turnaround. In high-pressure testing situations (e.g., emergency department or critical care), some analyzers provide turnaround times of two minutes or less.

Quality control

Automating manual functions such as quality control (QC), calibration and maintenance makes blood gas analyzers easier to use, faster and more reliable. Technological advances help respiratory therapists spend more time with patients by saving them time and labor. Computerized automation of QC has eliminated one of the most time-consuming tasks of operating blood gas analyzers – performing and documenting daily QC. Computerized self-calibrating, self-monitoring and self-correction of each analysis and calibration has led to simple, one button, walk-away automation. And because QC is automated, it cuts down on the labor usually required for daily maintenance.

Unlike their traditional predecessors, some new ABGs have QC modules that continuously monitor and check components in real time to ensure results are accurate. These QC modules immediately detect and correct errors, as well as document system events and corrective action. This ensures that each patient test result meets establish quality specifications, preventing the report of results if the ABG's tolerance limits are exceeded.

Additionally, automatically correcting errors, patient safety and care is enhanced because errors are reduced.

Information management

As more facilities implement hospital-wide information systems, connectivity has become an integral part of laboratory processing. The ability to remotely recall patient results and modify a blood gas analyzer's configurations from anywhere in the hospital is key to efficient operations.

New lines of blood gas analyzers can be integrated with laboratory information systems. This allows respiratory therapists and physicians to access and search patient or quality control data from any networked computer. Additionally, by linking a blood gas analyzer to the central network, therapists can receive and process orders from the lab information system. This eliminates the need for a computer by each analyzer, which reduces the ABG footprint in the lab.

Stephanie Richardson is a freelance medical writer based in Philadelphia.