

CONFERENCE ISSUE

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CDS IS COMING!

FOR REAL THIS TIME ... PROBABLY

The penalty phase could be delayed, but practices should start getting ready now.



EMBRACING THE DARK SIDE

A new imaging technique may help change the future of radiology.

BRINGING WORK HOME

Medical displays are adapting to fit the needs of working-from-home radiologists.

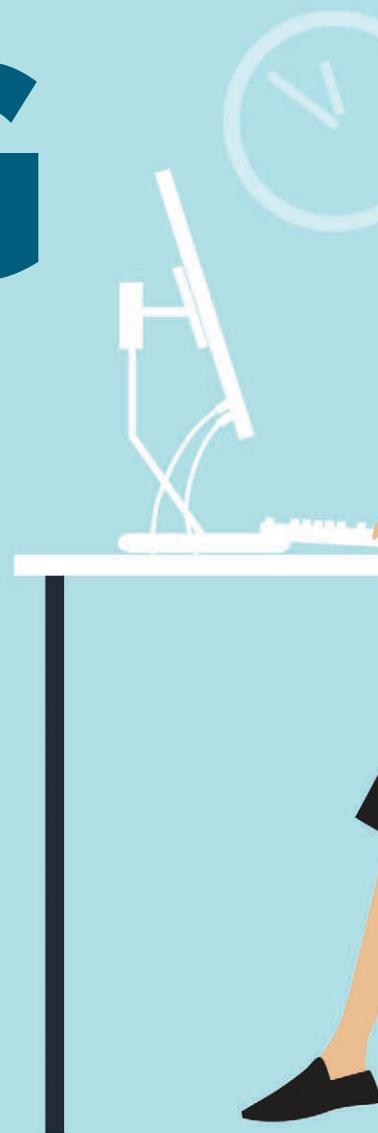
HOT AND COLD

Interventionalists explain why microwave ablation or cryoablation should be frontline strategies for lung sarcomas.

BRINGING WORK HOME

Medical displays are adapting to fit the needs of working-from-home radiologists.

BY KEITH LORIA



Technology trends in the medical display industry continue to follow what's been happening the past couple of years as customers continue to look for displays that show crisp, clear, and sharp images with less noise.

"Some technologies address image accuracy in medical displays, including uniformity correction, which provides much more consistent brightness and color across the entire display," says Ryan Warren, global lead for health care and life sciences at Lenovo, which announced at RSNA 2021 that it has partnered with LG

Business Solutions to advance new medical imaging solutions, combining LG medical monitors with Lenovo workstations.

Tara Neill, director of sales and marketing for Double Black Imaging, notes that there have been significant medical display advancements in both hardware and software.

"With the rise of color use in graphic user interfaces and multimodality imaging, the market has seen a shift from monochrome to color displays," she says. "Software advances allow more in-depth testing, reporting, and configurable alerting functions."

On the hardware side, LED-backlit displays are providing improved contrast and brightness levels with longer life and higher resolution.

"Large format options in a variety of resolutions are now available for those users wanting one display vs two," Neill says. "Photosensors built into the displays for auto-calibration are more accurate and used in conjunction with



sophisticated calibration. They also display fleet monitoring software. Color and gray levels are calibrated more accurately to much tighter tolerances.”

Pandemic Trend Takes Hold

Countless hospital systems, reading groups, and individual radiologists were thrust into quickly creating a robust, easy-to-use teleradiology solution two years ago and, although it was overwhelming, the available equipment made the process work.

“Double Black Imaging has worked with enterprises, radiology groups, and individuals to provide unique COVID-19 workstations to help expedite

the process,” Neill says. “Complete systems include displays, configured CPUs [central processing units], and ergonomic workstations—ensuring radiologists have everything required to read safely and comfortably from home with the confidence of knowing their system exceeds industry standards for diagnostic interpretation.”

Since the onset of the pandemic, technology companies have worked tirelessly to ensure remote radiologists have all the tools they need. Radiologists require not only a computer system to run their preferred PACS but also diagnostic monitors that allow them to read images with a high degree of accuracy.

“When it comes to such monitors, a smart display that will help maintain the necessary luminance levels is required for radiologists who read many studies per day,” says Stephen K. Hu, head of medical monitors at LG Business Solutions USA.

As telemedicine remains prevalent and many radiologists have acquired a taste for working from home, interest in reading diagnostic studies remotely has grown. This trend has become an essential piece of the health care puzzle, allowing for better flexibility and, more importantly, enabling images to be read in a timely fashion, around the clock.



Double Black Imaging's Phoenix II Workstation

Still, radiologists transitioning from reading rooms to home office environments create challenges and opportunities.

"The remote reading trend has accelerated since March 2020 and is still going strong," Neill says. "Maintaining the highest level of diagnostic integrity and ensuring diagnostic displays meet DICOM, ACR, and specific state standards are paramount. Workstation ergonomics become increasingly important as users work to reduce stress, burnout, and fatigue while enhancing productivity and comfort."

As more radiologists choose to work from home, Geert Carrein, executive vice president of diagnostic imaging at Barco, says it's vital that medical displays in the home environment be as advanced as those in a diagnostic setting. This means that displays should have enhanced contrast specifications and be as fast as those in traditional health care environments. When selecting a diagnostic monitor, remote

radiologists who read many studies per day require the best monitor display to help sustain the luminance levels.

"In addition, diagnostic monitors enable radiologists to see even the most subtle irregularities and ease the eye strain associated with reading so many studies," Carrein says.

Another trend is the emergence of dual function medical displays. For example, some LG displays from Lenovo offer multiple features that make home setup simpler.

"For example, with the 12MP display, replacing a dual monitor setup with a dual head setup that features LG's IPS technology and a wide viewing angle ensures that medical images divided into multiple windows can be viewed clearly from any angle with minimal color distortion," Warren says.

A read-from-home market was already beginning to form before the pandemic began, but there was one major entry barrier: cost.

"Generally, industry prices were often very high, and many radiologists were forced to pay out of their own pocket if they wanted to work from home," Warren says. "Before the pandemic, if you asked a group of radiologists to pay a premium for a display, most would continue to work from their imaging center or hospital's radiology workspace. Fast-forward two years, and, although many radiologists still work from imaging centers and hospitals, the pandemic accelerated market growth [for home reading] and more attractive prices allowed it to happen on a large scale."

New and Improved

Medical display technology is being improved to accommodate radiologists' needs. One example is LG's recently announced, soon-to-be-released, 3MP, 21.3-inch, high-brightness diagnostic monitor which will introduce localized brightness control to optimize radiological image review, analysis, and diagnosis. The new 3MP monitor will have a lightweight body and one-click ergonomic stand, offering users convenient adjustments for height, tilt, and pivot to help reduce chronic pain caused by long hours of viewing and poor posture.

"The display's multiple sensors ensure an optimized diagnostic environment regardless of room condition," Hu says. "The monitor is designed to facilitate review of MRI and CT images through Focus View, allowing users to see specific parts of an image more closely with magnification and brightness adjustment."

AI on Lenovo's workstations allows radiologists to detect abnormalities in medical images with greater accuracy, which improves patient care.

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“An example of how medical displays are changing is LG’s 12MP unit and its multimodality, split-screen capabilities,” Hu says. “For instance, with one display, radiologists can read everything from mammography studies, including colored mammo ultrasound images, from one monitor. In the past, because of high prices and a heavily segmented market, each reading type required a different display.”

Additional features on the LG Diagnostic displays are focus view, which allows users to review specific parts of an image more closely, and presence sensor, as well as other internal sensors, Warren notes.

“The auto luminance sensor ensures screen brightness is always optimized for the ambient lighting conditions, reducing the risk of eye strain,” he says. “The built-in presence sensor automatically turns off the display when no motion is detected. This reduces power consumption while dramatically reducing the hassle of manually turning the display on and off.”

On the software side, because radiologists are often paid per study, it’s critical for them to be able to determine a diagnosis in a timely manner. Given the financial incentive, many depend on these displays to leverage PACS software quickly for remote diagnoses.

“Radiologists simply appreciate the fact that they have the opportunity to work consistently from home,” Hu says.

Radiologists require a workstation that allows them to confidently render a diagnosis, especially when reading from home without a PACS/IT team to maintain the workstations. Having automatic calibration, reporting, and e-mail alerts that communicate back to the enterprise or are configured to alert them directly gives them that assurance.

Double Black Imaging offers a wide range of auto-calibrating diagnostic, mammo/tomo, and clinical displays, all managed with a web manager to fit areas within the entire enterprise.

“Our 12MP large format display allows radiologists multimodality flexibility in a single workstation, including digital breast imaging,” Neill says. “Our calibration software is developed here in the USA; it is designed to exceed North American standards. This enables quick response to customer requests and incorporates features to improve radiologist efficiency.”

Additionally, the company bundles the entire solution, including displays,



The LG 21HQ513D
3MP Monitor

graphic controllers, CPUs, and ergonomic workstations for deployment in an enterprise or home office.

“The new DBI proprietary Phoenix Ergonomic Workstation line is designed with the user’s productivity and comfort in mind,” Neill says. “These ergonomic workstations are fully customizable with corner options, and offer multimonitor articulating functionality, single and dual surface configurations with ambient lighting built in, wireless charging, noise blocking panels, and ergonomic seating options.”

Barco’s QAWeb Enterprise cloud-based quality assurance software guarantees regulatory compliance across the globe, ensuring home reading is of equal quality as hospital reading.

A Peek Into the Future

Technology in the commercial display and TV market is constantly changing and evolving, with many of these advancements expected to filter into the medical display market as well.

“We anticipate the incorporation of OLED and QLED technology into medical displays, which will raise brightness while enhancing black-and-white levels without compromising the color values,” Neill says. “Displays will also follow their commercial counterparts, providing higher resolutions as well as thinner and sleeker footprints with even longer lifespans.”

Also, software tools will further advance productivity, she notes. Service, support, and understanding the

unique nature of each medical imaging environment will increase in importance, continuing advancements in medical imaging.

Industry insiders agree that display technology and software features will continue to make improvements that will increase radiologist efficiency and reduce the strain on radiologists. One area that is interesting to Lenovo is how the medical display business will intersect with virtual reality (VR) head-mounted displays (HMDs).

“I believe we will start to see VR headsets make their way into the radiology display segment as a mobile medical display,” Warren says. “VR HMDs won’t replace traditional diagnostic displays, but we will start to see VR being used in the medical education and training space of radiologists.”

In the future, he believes radiologists from across the country or the globe will have the capability to meet in a digital twin of the radiology reading room to discuss, document, and mark up case images while in the office, at home, or even at the beach. As project-specific displays continue to increase and costs continue to decrease, remote working capabilities will continue to improve and radiologists will have more options for what monitors they prefer and where they prefer to use them. ■

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