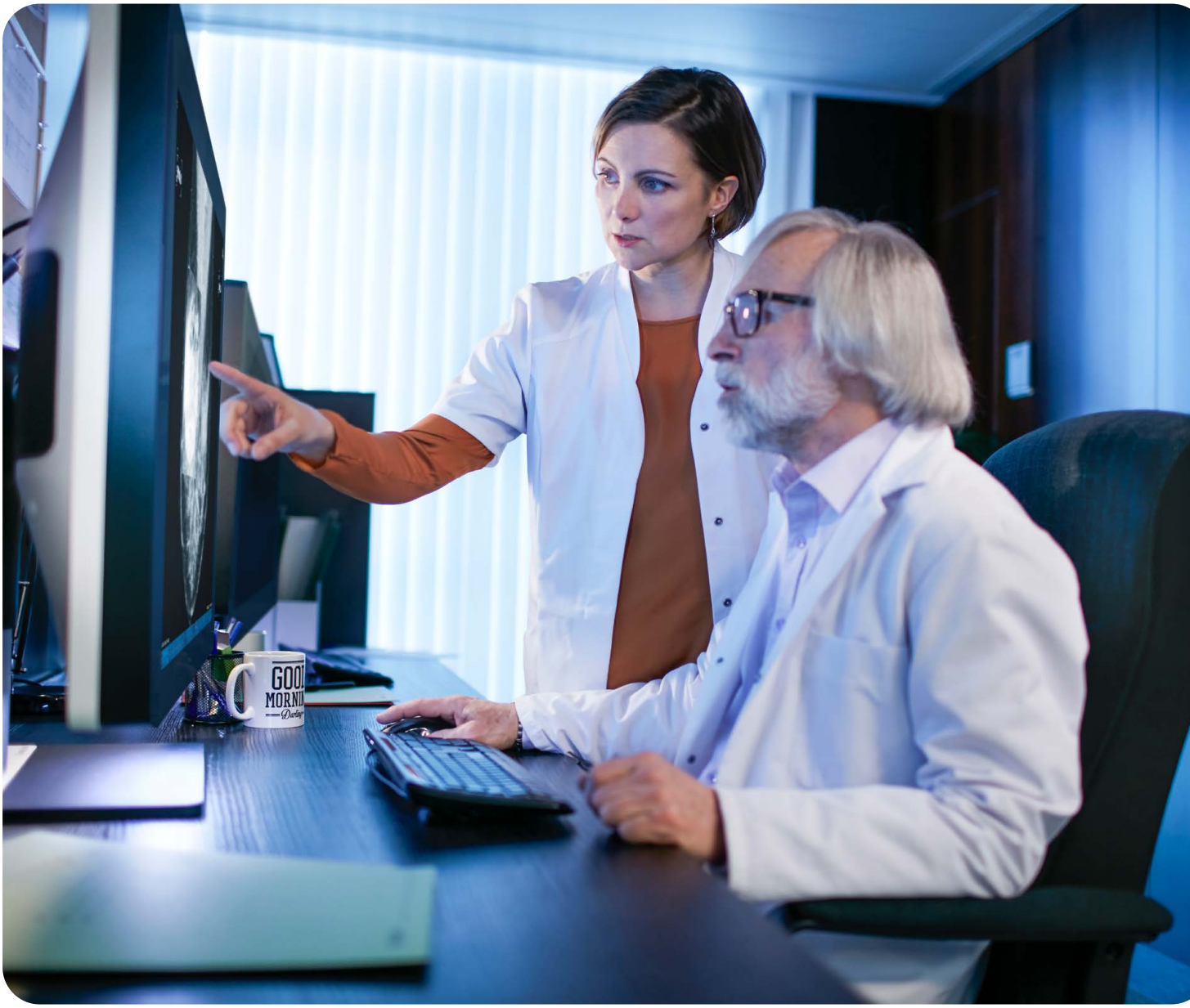
Consumer vs. medical-grade displays: Which one should you buy?



Clear and consistent images are imperative to making accurate diagnoses and determining treatment. And so is having the right display to view them. New consumer displays promote specs that seem to approach those of some medical-grade systems, and often cost less. But there is more to consider than just these specs. So why choose a medical display? Here are four good reasons:

BARCO

They increase your accuracy

Radiologists using medical displays read with greater confidence, speed and precision. The reason is simple: medical-grade imaging solutions meet set requirements for image quality, grayscale and color viewing, and conform with DICOM and other standards.

Brighten up your day

Consider the brightness of your screen, for example. A higher luminance results in more just noticeable differences (JNDs) and a broader spectrum of grayscales, which makes it easier to detect subtle lesions, and thus diagnose faster. And faster diagnosis means faster treatment and a greater chance for a successful outcome.

But don't be misled by luminance specs. Though recent consumer displays may seem to offer sufficient brightness at first sight, they tend to degrade quickly over time. Medical displays can go to 1,000 cd/m^2 or more – some of them even have built-in features to temporarily boost brightness to unseen levels – but more importantly, their luminance output remains steady over time. This also means that compliance with DICOM 3.14 is guaranteed at all times.

> After just one year of use, the commercial display may degrade enough to negatively impact diagnostic and visual search performance
>
> Elizabeth A. Krupinski,
> Ph. D., Research Professor,
> Department of Radiology

Everyday, everywhere

In medical imaging, it is important that images are displayed consistently over time – but also across displays. Medical-grade displays are equipped with built-in stabilization and some even with patented front-screen sensors.

In this way, they guarantee consistent image brightness and clarity – not only throughout the display's entire lifespan, but on every display that is connected to the enterprise network. This means colleagues in different locations see identical images as well, which greatly facilitates accurate remote collaboration.

Less 'noise', more consistency

LCD panels suffer from inherent luminance uniformity imperfections, which cause arbitrary patterns or 'noise'. This 'noise' negatively impacts reading efficiency. Some LCD displays can suffer from 25-30% non-uniformity.

Many medical-grade systems tackle this issue via integrated uniformity technologies. These provide consistent brightness and improved grayscale presentation, ensuring better visualization of subtle radiographic abnormalities.

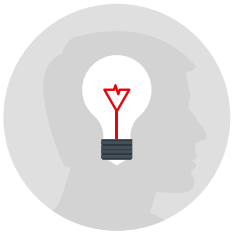
Different perspectives, consistent conclusions

Medical workstations often combine multiple heads. This means viewing inevitably happens from different angles. When looking at medical images, you need a luminance ratio of at least 350 cd/m^2. But not all displays can guarantee that luminance ratio when images are viewed off center. This can impact interpretation.

Medical displays should be 100% ACR compliant across the screen, preserving a minimum of 350 cd/m^2 for general radiology and minimum of 500 cd/m^2 for mammography, a high contrast ratio and excellent color values under different viewing angles.

> A good diagnostic display system is a medical-grade system that ensures permanent, consistent brightness over time
>
> Dr. Alfonso Lozano,
> neuroradiologist
> at the Centro de Imágenes

They make you work smarter instead of harder



As the volume and complexity of patient exams continues to grow, radiologists face increasing demands to boost their productivity. That's why medical displays can often be personalized to streamline reading and thus increase efficiency.

The perks of multi-modality

There are so many types of imaging exams (e.g. MR, X-ray, CT, mammograms, etc.) which need to be displayed following specific standards. Not every screen is able to support these different needs, which is why 3 or 4 monitors at one desk is a common occurrence.

Many medical displays have been specifically designed for multimodality imaging. Their display form factor allows viewing of multiple modalities (both color and grayscale) on a single screen, enabling side-by-side comparisons and image fusions in no time, without switching displays.

Minimizing manipulations

Sometimes, bigger is really better. Bigger medical screens, for example, enable radiologists to view an image in full on a single screen, without the need to pan or zoom. The scale-to-fit capability in many medical screens makes reading more efficient as well.

> It saves me a click on each image, significantly increasing my reading speed on virtually every case I view
>
> James Ruiz, MD,
> Radiologist and Breast Imaging Specialist

Reducing eye and neck strain

According to a study by The MarkeTech Group, 87% of radiologists experience some form of physical discomfort when reading images. From eye fatigue (66%) and neck strain (56%) to back pain (52%), there are numerous reasons to improve the ergonomics of the reading room.

Some medical displays come with built-in features (to control ambient lighting or boost display brightness, for example) and non-reflective glass to improve reading ergonomics. Some of the best medical displays have been specifically designed to present images within the optimal field of vision to maintain effortless visual acuity. Needless to say, opting for a single, bigger screen – instead of a multi-head workstation setup – will eliminate extensive head and eye movements for an even better reading experience.

Routine task automation

For healthcare professionals, there is no time to waste. But too often, valuable time is lost on small tasks that, in the end, can make for long hours. That's why some medical displays offer tools that help automate routine tasks for even more efficient screenings.

They allow for simple toggling between multiple screens, for example, customization of user profiles, automated adjustments of color and luminance profiles and so on. This way, radiologists can speed through their workload with ease.

They offer maximum uptime

A display that is used for viewing of medical images needs to comply with medical standards (DICOM, MQSA, AAPM, DIN, JESRA...). Only when 24/7 compliance is guaranteed, radiologists can have complete peace of mind about their reading performance. This requires continuous monitoring and management of a hospital's entire display network.

Automated compliance

Regulations for calibration, quality control and reporting are growing around the world, with many countries adopting their own standards and regulations.

Medical displays automate Quality Assurance and calibration in order to guarantee 24/7 compliance with medical standards. That's exactly what makes medical displays so reliable. It also makes them easy to integrate into various types of workstations or PACS applications, and work together seamlessly with other medical-grade solutions.

Radiologist, uninterrupted

As a radiologist, few things are less frustrating than being interrupted during prime reading hours. That's why many medical displays come with cloud-based quality assurance solutions that offer remote calibration - without interrupting radiologist workflow - for maximum performance.

Easy to control

The rise of home working, remote collaboration, multi-site hospitals... means medical images need to look consistent, anytime, anywhere. The ability to control display assets across the enterprise and across locations is of vital importance these days.

Exceptional medical displays come with advanced QA solutions that allow administrators to do just that. By automating (regional) compliance, reporting, maintenance, performance follow-up, and incident handling, medical displays are reliable at all times.

> QAWeb is a huge asset to us, reducing the manpower needed to keep our entire medical imaging display installed base running at an optimum level
>
> Riverside County Regional Medical Center

They save your hospital money

When it comes to comparing medical-grade with consumer displays, the old adage still rings true: "The lower-priced solution isn't always the most cost-effective". Here's how investment in a medical display can help you save a ton of money in the long run.

Reducing equipment costs

Medical-grade displays can save hospitals a lot of equipment money. They are designed – and sometimes validated – to work with medical workstations and PACS applications, which is not the case for regular consumer displays. In the end, that can save you the time and costs to invest in additional equipment/software in order to be fully operational. Time is money!

Display consolidation and standardization can cut additional costs. An all-in-one multimodality display, for example, can replace a number of dedicated displays. In that case, the total cost of investment will be substantially lower than with a mix of stand-alone screens.

By reducing operational costs

The cost of your display equipment doesn't end with its purchase price. In order to get a complete picture, you need to consider cost of servicing, support and infrastructure as well. Because of regional compliance differences, strict technical requirements and detailed reporting needs, managing a hospital's entire display fleet is no easy feat.

Medical displays bring solace by automating most of these processes, freeing up time and resources in your IT department. That's exactly why the total cost of ownership (TCO) of medical-grade displays is often a lot lower than that of consumer solutions.

In a typical medium-sized facility with 20 diagnostic displays, for example, Barco's QAWeb quality solution could reduce the QA and service costs by more than 10 percent. Additional benefits are the fact that IT can focus on more pressing priorities and assistance with budget planning, procurement and budgeting.

Through increased longevity

Though consumer displays may look like all you need at first sight, they will fail you significantly in the long run. Medical-grade displays are the only displays that ensure high brightness over their entire lifetime and guarantee all-time compliance with medical standards. That's also why they come with a longer warranty period (typically 3 to 5 years).

In addition, advanced quality assurance and intelligent maintenance data help prolong the longevity of your products. A long product lifecycle is key...

> Apart from the superior quality, these displays are super-easy to use and are low on maintenance
>
> Dr. Jyoti Arora,
> Senior Radiologist at the Medicity

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