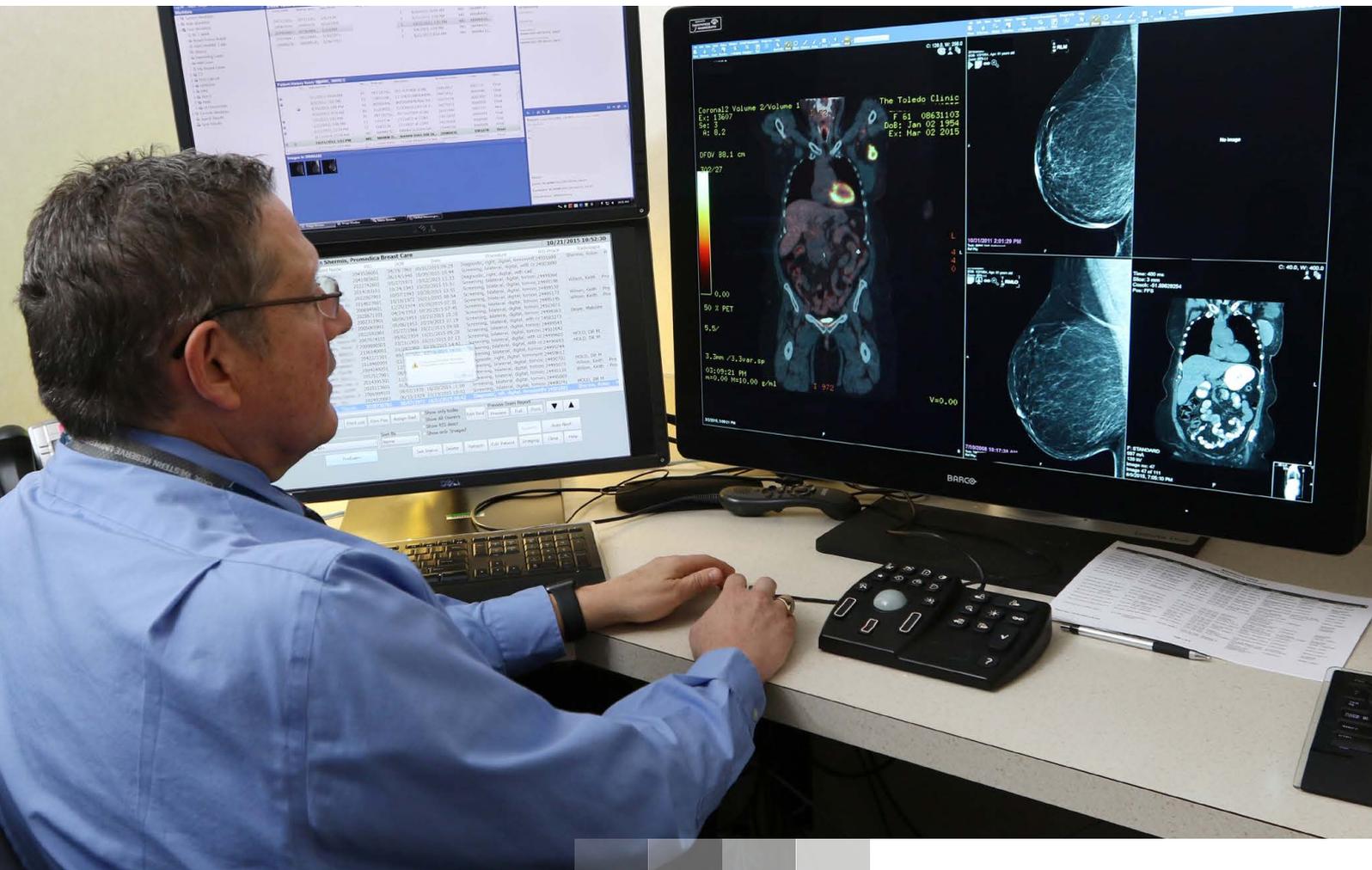


What to consider when choosing a mammography display



Screen size and resolution

In digital breast imaging, the quality of the medical display has a direct impact on the decisions you make. Next to display luminance, screen resolution – defined in megapixels (MP) – is the most influential factor in diagnostic interpretation.

1. Acquisition vs display

According to the ACR (American College of Radiology), the resolution of a mammography display should match the resolution of the imaging (or acquisition) system as closely as possible.¹

Only then, enough of the picture elements – meaning important image details such as subtle masses and calcifications – will be clearly visible on the screen. The graph below shows that display systems with a resolution between 5 megapixel and 12 megapixel best support the ACR guidelines.

	FDM Acquisition resolution	Coronis Uniti 12MP	Nio Color 5.8MP	Dual 5MP	Other displays
GE <	2400 x 3070	✓	✓	✓	x
Hologic <	3328 x 4096	✓	✓	✓	x
Siemens <	2816 x 3584	✓	✓	✓	x
Sectra <	4800 x 5200	✓	✓	✓	Optional
Fuji <	4728 x 5928	✓	✓	✓	x

The total resolution of Barco mammography displays is high enough to fit various acquisition resolutions.

2. More screen, fewer clicks

Also, if you have additional vertical resolution, you can fit more of the breast image on the display. Since the specified practice guideline in mammography is that all images should be viewed at 1:1 or 100% size¹, this is important for your reading workflow. Additional resolution will save you a number of clicks per day when getting the best image for analysis.

It's how Barco's Nio Color 5MP and Coronis Uniti® display require minimal panning and zooming and less windowing and leveling. And the less you need to manipulate, the more screenings you can perform. As an example: after an evaluation of twenty 2D mammogram studies, the Nio Color 5.8MP led to 13% fewer steps in the reading workflow.

3. Fusion increases productivity

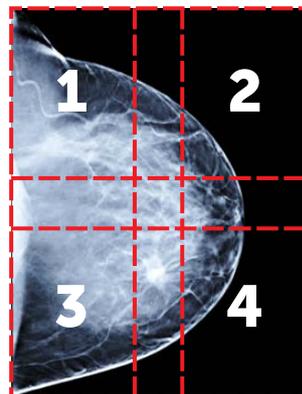
A Fusion format, which combines real estate of two displays into one, can also be helpful. You can lay out multiple images anywhere on the screen, for easy side-by-side comparisons of mammograms.

Barco's Fusion format has proven to increase reading productivity by up to 19%² and also minimizes head and eye movement for more comfortable reading sessions.

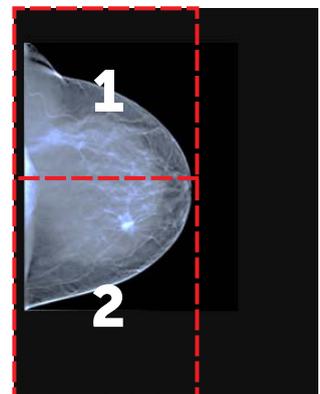


Barco's Coronis Uniti supports flexible color multimodality imaging. 2D, breast tomosynthesis, ultrasound and breast MR images can be laid out anywhere on the screen.

5MP display



5.8MP display



Barco's Nio Color 5.8MP and Coronis Uniti displays optimize mammography workflow by reducing the number of steps needed for 1:1 reading. A standard 5MP display requires 4 steps (clicks) to read the image, Nio Color 5.8MP requires only 2 steps.

Brightness

Digital mammography images require the highest resolution and brightest monitors for review. Because the higher the brightness, the bigger the chance to catch breast cancer.

1. Higher brightness, better detection

Luminance and visibility of details are undoubtedly intertwined. Studies have shown that thanks to its internal luminance booster (I-Luminate™), Coronis Uniti increases the detection probability of small details like microcalcifications by up to 30%!³

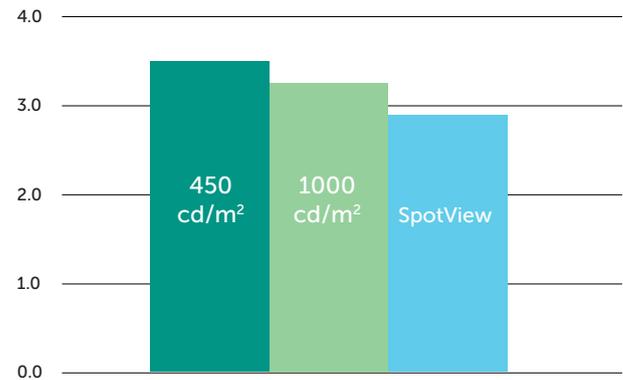
Feature	Nio Color 5.8MP MDNC-6121	Coronis Uniti MDMC-12133
DICOM calibrated luminance	500 cd/m ²	1000 cd/m ²
Maximum luminance	1000 cd/m ²	> 2100 cd/m ² (with I-Luminate)

Calibrated vs maximum brightness of Barco mammography displays.

2. Higher brightness, faster workflow

In addition, Barco displays come with a special clinical tool, called SpotView™, which increases luminance in a region of interest and dims the surrounding area. A recent study indicates that SpotView increases reading accuracy by up to 6.2%, while reducing reading time by up to 16%.⁴

Avg. time (s)



Because SpotView boosts display luminance to unseen levels, it speeds up reading workflow.



SpotView can decrease errors of perception and I have found it to be helpful in maintaining my focus when scanning patterns are made difficult by distractions or eye fatigue. I have found abnormalities using SpotView even though I thought I had finished searching a case.

Dr. James Ruiz, Woman's Hospital, US

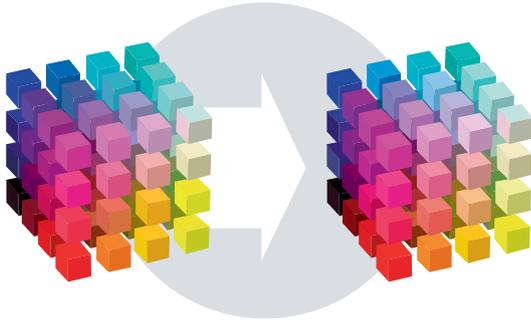


Multimodality workflow

With the rise of multimodality breast imaging, mammography displays need consistent color and image-enhancing technologies to render impeccable 2D/3D mammography images as well as perfect breast MRIs and ultrasounds.

1. Consistent color modalities

Combining mammograms with color modalities such as breast ultrasound and MR has proven to improve breast cancer detection rate. For that, you need a color display that assures consistent, perceptually linear color. This is guaranteed with Barco's patented SteadyColor™ calibration technology.

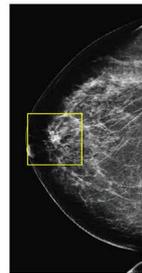


With Barco's SteadyColor technology, colors are more distinguishable and smoother.

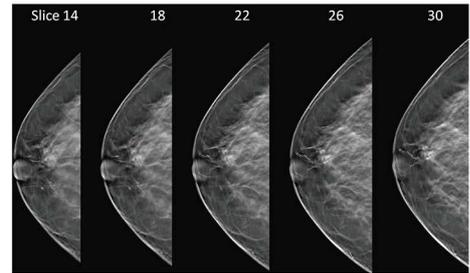
2. 2D vs 3D mammography

Also check if the display is designed for 3D mammography. The reason: it can take more time to diagnose digital breast tomosynthesis studies than 2D mammography exams because radiologists must scroll or cine through many images (and tomo studies keep getting larger). At the same time, it is more challenging to clearly detect microcalcifications in moving images.

Barco displays have proven to ensure 10% higher detection while scrolling digital breast tomosynthesis images compared to traditional mammography displays.⁶ Our patented RapidFrame™ technology counters almost every tomo challenge, ensuring crisp and in-focus moving images with no blurring.



2D "conventional" mammogram



3D breast tomosynthesis mammogram layers or "slices"

Detection rate increases when scrolling through breast tomosynthesis images with RapidFrame technology.



The color capability of Barco's Coronis Uniti is a step in the right direction for improved workflow and patient care. The ability to display a mammogram with an identified area of concern on the same display as the corresponding US and MR, certainly improves our efficiency in delivering an accurate diagnosis for our patients.

Dr. Alice Rim, Cleveland Clinic, US



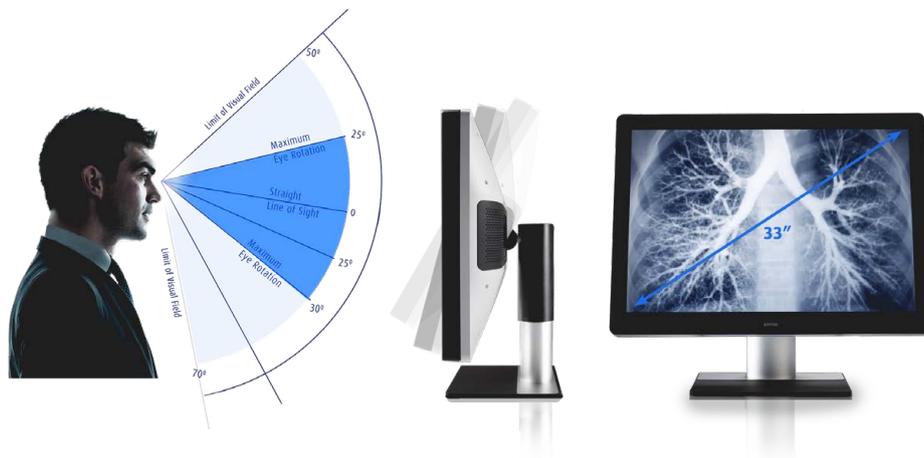
Ergonomics

Eye fatigue is one of the most prevalent problems for radiologists as they gaze intently at their screens for long hours. Barco displays incorporate ergonomic and performance features that improve reading comfort, such as a non-reflective glass and adjustable ambient lighting.

1. Reduced eye fatigue

Tasked with reading dozens of studies per day in an environment with low levels of ambient light, radiologists often experience eye fatigue. Display brightness and ambient light conditions are critical to maintaining the radiologist's visual acuity.

Barco displays offer a highly calibrated brightness – as well as built-in features to control ambient light – ensuring optimal reading conditions.



2. Comfortable reading

Another major cause of discomfort is neck strain, which results from frequent head movements when viewing images on multiple screens.

That's why the design of the unique 33" screen of Barco's Coronis Uniti eliminates the distraction of the center bezel present on a dual 5MP display. It is designed to mirror a human's natural field of vision to minimize head, neck and eye movement.



The combination of the field of view and the luminance is without a doubt reducing the stress and fatigue I feel over the course of a day or a reading session. The reduction in eye fatigue is noticeable and there is an overall increased level of reading comfort due to the reduction in hand, head and eye movement. The workflow focus the user gains as a result is the key. It is human nature that **when we are less tired, we are smarter.**

Dr. James Ruiz, Woman's Hospital, US



Uptime and reliability

Uptime and reliability of mammography displays ensures optimal clinical workflow and confidence. For ultimate peace of mind, select a system that automates compliance with medical guidelines and warrants every part of the display.

1. Automated compliance

Medical regulations are growing around the world, with each country adopting its own standards. These regulations are designed to assist medical practitioners in providing appropriate care for their patients. If you want to be confident about your diagnoses, following these guidelines is the best way forward.

For ultimate peace of mind, Barco's mammography displays come with software to automate compliance with regional standards (e.g. MQSA, EUREF, FDA, DICOM, JESRA...). This process can be done remotely so all medical requirements are met - even when your hospital has multiple sites located across different regions - without the need to interrupt your workflow.



It used to take me hours to calibrate all our medical displays. Today, I can sit in my office and most is done automatically – that really helps me save a lot of time.

Ms. Maria Wirenstedt, radiology engineer, Blekinge Hospital, Sweden



2. All-inclusive warranty

Not all warranties are the same. Barco mammography displays are backed by a 5-year warranty. Unlike other warranties, it covers the entire system, including the backlight, display controller, software and sensors. It means you can rely on impeccable images and smooth workflow, always, so you can ensure the best clinical care for your patients.



The Coronis Uniti is a remarkable display system with excellent performance and has everything we will need for the future.

Dr. Andreas Martin, radiologist, radprax, Germany



About Barco Healthcare

Improving the quality and value of care are the leading priorities for healthcare professionals today. At a time when the amount of data is growing rapidly and there is more demand for mobility, healthcare systems struggle to work more efficiently, and to provide personalized care to a growing number of patients in an affordable way.

Focused on transforming the delivery of care, Barco connects healthcare professionals at every patient touch point, from the imaging room, to radiology, through specialist consultations and in the surgical suite. We offer a network of medical imaging solutions that deliver the complete picture to support more informed decisions, when and where it matters most.

It's why we are considered the gold standard for medical visualization and how we are there at every stage of the patients' journey. So healthcare professionals can focus on patients' needs and, in the end, achieve the best clinical outcome.

Barco, enabling bright outcomes

Footnotes

¹ ACR–AAPM–SIIM PRACTICE PARAMETER FOR DETERMINANTS OF IMAGE QUALITY IN DIGITAL MAMMOGRAPHY, revised 2017

² Weschler, M. (2012). 6MP Displays Offer Speed, Comfort Benefits. Auntminnie, 2012

³ Kimpe, T. R. & Xthona, A. (2012). Quantification of Detection Probability of Microcalcifications at Increased Display Luminance Levels. Breast Imaging, Springer 7361, 490-497. 2012

⁴ Krupinski, E. (2018). Reducing Radiation Dose in Digital Mammography by Increasing Display Luminance. Proceedings of SIIM, 2018

⁵ Marchessoux, C., et al. (2011). Validation of New Digital Breast Tomosynthesis Medical Display. Proceedings of SPIE, 7966, 79660R, 2011