Why you need a 5MP display for mammography screening

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.

There is plenty of room for 1, 2 or 3 megapixel monitors in the breast imaging system. But when it comes to the act of actual screening and diagnosing breast exams, a minimum of 5 megapixels is the standard. Here’s why...
Breast imaging is about the details. Studies report that 70% of radiology errors directly result from the failure to perceive a radiographic abnormality. Mammographs and chest radiographs expose radiologists to the greatest risk in this regard. In fact, breast cancer is the most frequently missed diagnosis in radiology.

To ensure that the smallest details in a mammogram are visible on screen, the ACR (American College of Radiology) guideline recommends that display device specifications should match the acquisition software resolution matrix as closely as possible. At acquisition, the native resolution of digital mammography images is so high (see table below) that you need at least 5 million pixels (5 megapixels) per display to effectively view them. Only then, enough of the picture elements – and hence important image details such as subtle masses and calcifications – will be reproduced when viewed on screen.

For digital breast imaging, a dual-head 5MP display is only the absolute minimum. Providing additional pixels can lead to even better detection. This is confirmed by a 2014 study about the wants and needs of radiologists where 80% of radiologists said that higher spatial resolution would improve their reading experience.

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<tr>
<th>FFDM acquisition</th>
<th>Coronis Uniti°</th>
<th>Nio Color 5MP</th>
<th>Dual 5MP</th>
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1 L. Berlin, Radiologic errors, past, present and future, 2014
2 M. Raskin, Survival Strategies for Radiology: some practical tips on how to reduce the risk of being sued and losing, 2006
4 The MarkeTech Group, What makes a good read for radiologists?, 2014
Compliance for complete confidence

Industry organizations around the world have defined standards and guidelines for mammography imaging to warrant the quality of mammogram screenings. The FDA (US), EUREF (Europe), the Central Committee on Quality Control of Mammographic Screening (Japan) and the ACR-AAPM-SIIM Practice Guideline for Determinants of Image Quality in Digital Mammography (US) all recommend the use of monitors with a minimum spatial resolution of 5 megapixels in a 21” panel.

Less panning and zooming

When a display doesn’t have sufficient resolution (meaning there are more picture elements in the acquired image than pixels available on the display), you’ll need to manipulate the image in order to view it at full-size resolution, which is recommended in breast screening. By panning, zooming, and scaling, you’ll be able to view the image at the resolution at which it was acquired.

With a high-resolution (featuring 5 megapixels or more) display, you can fit more of the breast image on the display, requiring minimal panning and zooming and less windowing and leveling to get the best image for analysis. And the less you need to manipulate, the more screenings you can perform.

Presenting high-resolution images with minimal manipulation is also key to an ergonomic viewing experience. It helps avoid typical radiologist injuries, such as carpal tunnel syndrome. For example, with Barco’s 12 megapixel Coronis Uniti® display, radiologists perform up to 4 fewer mouse clicks per screening. When you know that a typical radiologist reads about 40 studies per day, having more pixels at hand can substantially improve your reading comfort and productivity.

A 5 megapixel monitor requires less zooming and panning for image interpretation when the mammography radiologist desires to view the full resolution image dataset compared to a lower resolution display.

In mammography screening, the monitor should allow for inspection of the image at full size in full resolution [...] Normally two images are viewed at the same time, and with the current technology it is therefore recommended that diagnostic workstations with two large (19-21”), high-quality, 5 megapixel monitors are used.

It’s just a matter of time before these guidelines for digital breast imaging will expand to other regions beyond the US, Japan, and Europe. 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, display manufacturers have designed 5 megapixel medical displays with software to automate compliance with regional standards. 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.

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.