

PHILIPS

Radiology Informatics

White paper



Patient ID	Procedure Type	Status
44307034	CT Head with Contrast	CT QT
88141185	XR Neck, Salt Taxis	DK
93519847	CT Head with Contrast	CT QT
92824793	MRI Brain with	MR
94800403	MRI Brain with w/	MR
65485484	CT Abdomen AND Pelvis w/	CT
65485484	CT Abdomen AND Pelvis w/	CT
32164846	CT Brain with IV Contrast	CT
32164846	CT Brain with IV Contrast	CT
33219846	MRI Brain with w/	MR
24702388	DK OT	DK OT
24702388	DK OT	DK OT
19484770	MS SCREENING W/TONO	OT MS
19484770	MS SCREENING W/TONO	OT MS
19102448	MS SCREENING W/TONO	OT MS
19102448	MS SCREENING W/TONO	OT MS
37320706	WBUS SCREENING SEME..	US
37320706	WBUS SCREENING SEME..	US
347231010	WBUS SCREENING SEME..	US
347231010	WBUS SCREENING SEME..	US
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176881786	MS SCREENING HO TOMO	OT MS
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November 2023

Enhancing the remote radiologist user experience

How Philips and Barco end-to-end solutions improve the home reading workspace

BARCO

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Executive summary

Addressing remote radiology issues

How Philips and Barco offer an end-to-end solution for the home reading environment

One of the most pressing challenges facing healthcare organizations is staff shortages. Simply put: Hospitals lack radiologists compared to the growing workload.

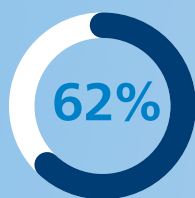
A study in the Journal of American College of Radiology reported that nearly **20%** of radiologists separated from a practice in a single year.

During the four-year period of the study, **41%** of all radiologists left at least one job¹

According to a survey in the Medscape Radiologist Lifestyle, Happiness and Burnout Report, prior to the COVID-19 pandemic, radiology was ranked at **86%** for the happiest specialties in their lives outside of work.

Today, that percentage has fallen to **61%**.²

Radiologists reported feeling burned out and depressed. Contributing factors include:



Too many hours



Lack of control/ autonomy



Government regulations



Electronic health records

This alarming trend makes it necessary to improve radiologists' experience and job satisfaction. Giving them the option to work from home, improving the environment in which they work and focusing on their health and well-being can help.

While it has some advantages, working remotely can be frustrating and inefficient without appropriate equipment, tool set and support. Technical considerations include infrastructure, image quality, calibration and compliance reporting. Then there are the more human aspects of remote reading, including how to collaborate effectively and even the ergonomic well-being of the radiologist.

Remote radiology reading has grown dramatically out of necessity during the COVID-19 pandemic, with 77% of departments now allowing remote reading.³ While returning to the on-site work environment has become a reality, many radiologists discovered working from home offers some distinct advantages, including improved work-life balance, time saving on commutes, and for some, fewer interruptions resulting in higher productivity. Working from home allows radiologists to perform on-call and late-evening duties in a flexible way.

Offering innovative solutions

The Philips and Barco relationship makes sense due primarily to the strengths of each organization. Philips is recognized as a global leader in diagnostic imaging workflow, with a breadth of offerings and years of experience. Barco is a frontrunner in diagnostic and clinical review displays, offering a package that includes quality assurance, graphics cards and integrated workflow tools and has a proven track record as a reliable and trustworthy partner. Together the two are offering customers their best solutions to improve their work and make their remote reading as intuitive as if they are working on-site.

Philips and Barco solutions address the issues remote radiologists experience, including performance and workflow, security and patient privacy, quality and compliance; together they create an environment, experience and dependability on par with that of a hospital.



Enhancing clinical productivity for remote radiologists

Provide a reading experience that includes speed, accuracy, intuitiveness and flexibility

Exceptional patient care starts with exceptional software and equipment

Radiologists working from home should have an all-in-one workspace that provides access to the information needed to report the cases. **Philips image management solutions** include an advanced smart worklist, embedded advanced visualization and native reporting to simplify the installation and upgrade and reduce the need for special integrations to be done at home.

Focused solutions and workflows improve speed without compromising accuracy. A well-imagined space and the right tools can support radiologists' productivity; reduce office space requirements; improve radiologists' job satisfaction, health and well-being; and deliver reliable service.

Philips image management solutions ease the radiologist workflow, allowing smooth reporting and simple inclusion of image measurements into the report while manipulating the images. They support productivity with shorter turnaround times and high image quality. Cloud architecture makes image management functionality available for remote reading. Radiologists have access to an all-in-one, fully integrated solution with an enterprise imaging platform embedded in the diagnostic viewer, with simple, efficient access to all the tools they need.

Radiologists need to provide referring physicians with results while adhering to rapid turnaround times, giving them the data they need, when they need it, at the point of care. **Interactive Multimedia Reporting** is native in the Philips image management solution and helps save time and improve accuracy. It removes the need to navigate or jump between tabs, different places in the menu, or in the application. Interactive multimedia eliminates the need for a separate reporting solution. The radiologist can automate insertion of image-related information into the report and the referring physician receives a clearer, tracked, more insightful report with the ability to make simple volumetric comparisons.



Unique bookmarking capabilities, lesion images and measurements are saved, helping reduce or eliminate repeat work so radiologists can spend more time focused on the diagnosis. Interactive reporting saves time and reduces errors by auto populating DICOM and HI7 data. It improves the clarity and quality of radiology reports while shortening the time it takes to read them. Hyperlinks can be inserted by voice command and provide one-click access to bookmarked findings, prior studies, tables and graphs. Integrated collaboration makes it easy to message the radiologists to answer any questions with a single click.

Radiologists working remotely should have access to all the features, images, data tools and functionality radiologists expect when reporting on-site. Philips radiology diagnostic viewer enhances efficiency by eliminating the need to switch between workstations, consolidating multiple specialty workstations into a single, multifunctional workspace. The reporting tool sets are native to the platform, so organizations avoid the cost and complexity of third-party integration. Embedded voice recognition, advanced multimedia reporting and bookmarks help clinicians create reports with better data and greater clinical insight.

Optimizing performance begins with the most suitable display at your remote reading location

To enable an accurate clinical diagnosis, the diagnostic display must promote diagnostic confidence and contribute to a comfortable, collaborative work environment. In this way, the radiologist can enjoy consistent image representation throughout the display's full lifetime. The radiologist's workstation should tolerate and monitor reasonable levels of ambient light and assure that they always work in compliance with regional standards.

To provide accurate and reliable medical diagnosis, every detail matters. Radiologists play a pivotal role in detecting subtle abnormalities and making critical decisions for patient care. For years, Barco has been addressing the most pressing problems in radiology reading, by offering display solutions that focus on several key areas.

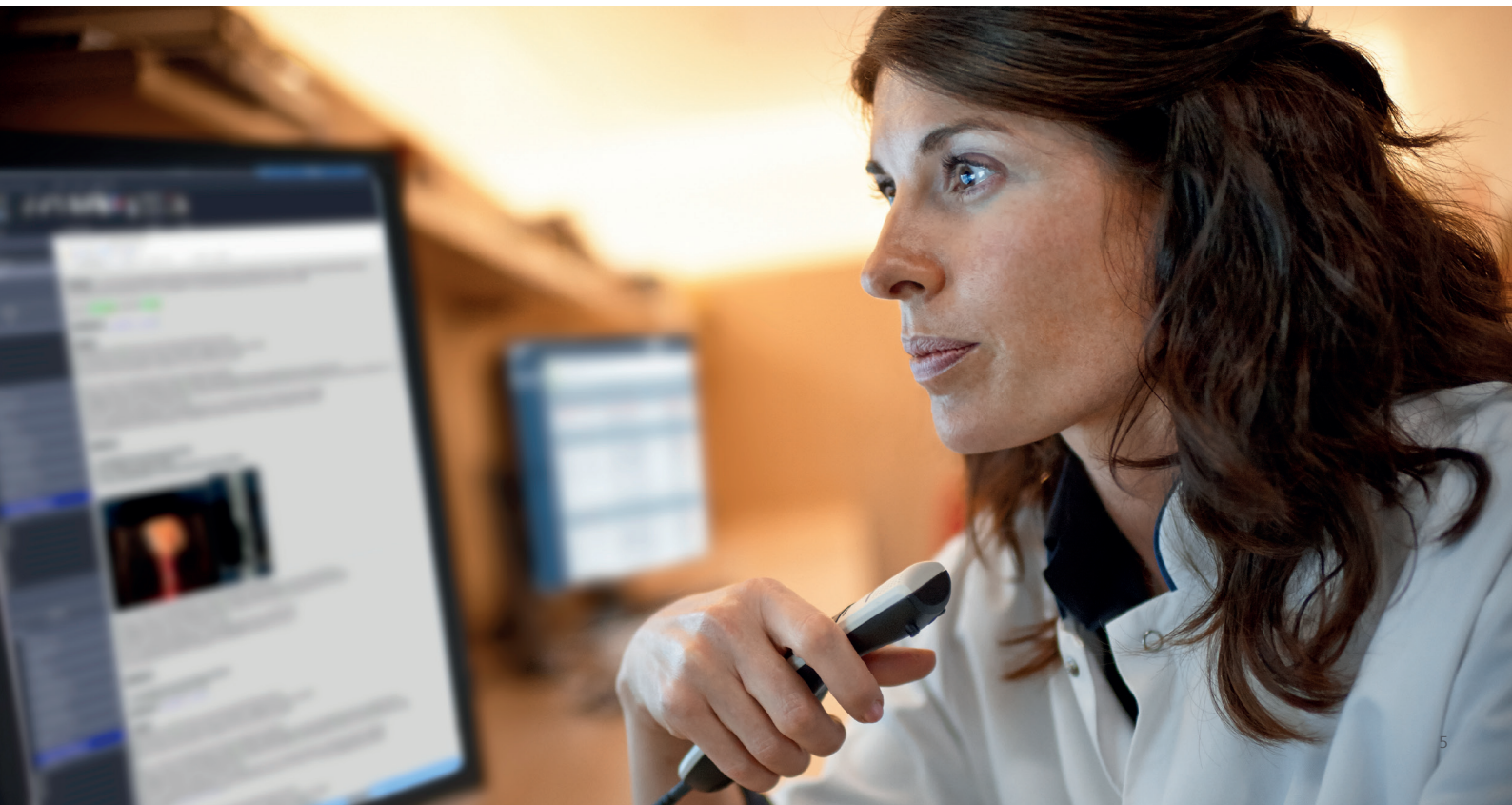




Image quality, precision and reliability

DICOM-calibrated brightness and contrast empower radiologists to accurately assess variations in image intensity. Additionally, Barco displays showcase medical images with high resolution, crucial for detecting small lesions or abnormalities. Patented technologies ensure screen uniformity, guaranteeing consistent image representation. Accurate, consistent color reproduction is a critical factor in distinguishing subtle details in tissue and pathology. Barco takes great care in minimizing pixel imperfections and variations that could potentially hinder a radiologist's ability to detect anomalies. An ambient light sensor actively measures and promptly notifies users when the diagnostic reading room ambient lighting falls short of the required standards. Radiologists can take necessary steps to enhance reading conditions because the reflection of ambient light on the display can potentially impact the accuracy of diagnostic reading.



Image consistency and stability

Medical images retain their consistency and reliability, especially in terms of brightness, colors and contrast, even over extended periods. The patented iGuard sensor continuously monitors and automatically calibrates these aspects without requiring any user intervention. This ensures faithful and dependable presentation of medical images.



Longevity and durability

Displays are meticulously engineered to endure continuous, uninterrupted use, day in and day out for many years.



Compliance with stringent quality standards and regulatory requirements

Displays adhere to rigorous quality standards and regulations while incorporating the latest norms for display quality control. Non-compliance with these standards can result in legal and regulatory challenges for Barco and its customers.



Predictable total cost of ownership

Customers have a highly predictable total cost of ownership with a standard five-year warranty, with the option to extend it to seven years.

The Barco Nio Color 8MP* delivers an exceptional home reading experience. The high-performance, 32-inch 8MP multi-modality diagnostic display solution provides radiologists with outstanding image quality, enabling them to make confident diagnoses and obtain critical clinical insights for their referred patients. It integrates state-of-the-art display technology, ergonomic design and workflow tools to enhance efficiency, allowing radiologists to effectively address complex challenges. It facilitates virtual collaboration by seamlessly integrating multimedia capabilities into the display, eliminating the additional cost of a webcam, microphone or speakers.

*This product is currently not cleared for commercial distribution in the United States as it is awaiting 510(k) clearance. It's pending CE marking in Europe but also product registration in several other countries worldwide.



Supporting collaboration to help achieve better patient outcomes

Read, communicate and consult remotely to enhance clinical decision-making

Radiologists and other healthcare professionals frequently engage with their peers to exchange expertise and seek additional viewpoints. Speed is essential; quicker diagnosis often means improved patient outcomes. In the current healthcare landscape, it's imperative to simplify the intricacies of clinical collaboration, bolster the ability to work remotely, maintain access to the necessary tools and data for well-informed decision-making while steadfastly adhering to compliance, security and patient privacy standards.

Both Philips and Barco have introduced solutions that empower healthcare professionals across various specialties to remotely access all pertinent image data for the same patient. These solutions provide a consistent user interface, experience and performance. This facilitates discussions through direct peer-to-peer interactions or within multidisciplinary team (MDT) meetings. This approach ensures diagnostic consensus and has the potential to further enhance patient care.

Everyone contributing to patient care decisions should have access to all patient data relevant for a precise radiology diagnosis and more comprehensive reports that can contain all relevant information. **Philips Enterprise Viewer** enables secure, instant access to medical images, documents, requests and reports. Radiologists and clinicians can view and interact with radiology images, non-DICOM images, videos, etc. It provides a complete overview of the entire medical history of a patient, even from home.

Enterprise Viewer encourages clinician collaboration using chat, live screen-sharing and sticky-note communication, including indication of critical results. It allows radiologists to easily switch between platforms and devices for internal and external communications and provides authorized stakeholders with the same level of usability and security.

Barco Nio Color 8MP ensures the same high display quality in remote reading locations as in a hospital setting, guaranteeing diagnostic accuracy and empowering you to make confident diagnoses. Moreover, it enhances your reading comfort with integrated speakers, microphone and webcam. This extends beyond the typical core features of a diagnostic display, facilitating seamless interactions among radiologists and clinical specialties, whether within the hospital or beyond its confines. This collaborative approach enhances the overall efficiency of healthcare delivery and can contribute to improved patient care outcomes.

Even when conducting diagnostic reading remotely, where radiologists or other medical professionals view and report on imaging exams, adherence to medical quality standards (such as ACR-AAPM-SIIM-DIN-JESRA) remains essential to uphold the accuracy of diagnoses. Maintaining quality control and compliance for a remote reading workstation, in alignment with established technical standards, presents a significant challenge for hospital quality control administrators.



Barco QAWeb Enterprise offers a comprehensive solution to manage quality control and display fleets across an entire enterprise, ensuring full visibility and control. Whether situated on-site or in remote reading locations, QAWeb Enterprise effectively oversees the entire display fleet, erasing inconsistencies across various hospital departments and remote reading locations.

For remote radiologists, QAWeb Enterprise supports a seamless, worry-free experience. This centralized cloud

platform facilitates remote and automatic DICOM calibration and conducts regional display compliance assessments. The platform helps radiologists have complete confidence in the compliance of their remote reading environment. The online dashboard empowers PACS managers or QA administrators with tools for performance monitoring, reporting, maintenance, follow-up and incident management, all accessible from any location without disrupting radiologists during their reading sessions.

Reimagining the remote reading environment

Strengthen home reading infrastructure and help enhance the radiologist experience

Remote reading has forced IT departments to scramble to build or strengthen the technical infrastructure necessary to allow business and patient care to continue as usual, remotely but securely. Additionally, trends have indicated that radiologists are leaving their jobs at an alarming rate, which means that healthcare organizations must take steps to improve radiologists' experience and job satisfaction.

Recently, addressing scalability, sustainability and staff retention has been a focus for healthcare organizations. Philips solutions are developed to help organizations maintain security, integrity and availability when working remotely, whether accessing clinical data stored on site or in the Philips Cloud. It provides a long-term solution for radiology data storage, integration, scalability and remote reading and reporting. Remote users can report securely from any location that has an internet connection. Clinicians and radiologists access reported images using viewing services delivered through a web viewer with server-side rendering.

Chat and screen sharing enhance remote clinical collaboration. Remote users connect using the web-deployed diagnostic viewer with native embedded reporting capabilities to read studies assigned to them. The enterprise retains full control over permissions. Organizations can protect themselves from technology obsolescence by outsourcing IT infrastructure security and scalability, which allows them to add services anytime and have continuous access to upgrades.

Setting up the workspace

Setting up a home reading environment can be challenging for both hospital and radiologist. Philips and Barco offer the support needed to create a comfortable, efficient home reading location.

Beyond the technical issues, the **Barco Nio Color 8MP** display addresses ergonomic reading comfort as well. Whether they work in the hospital or remote reading location, radiologists experience some common health issues.

- Ocular exhaustion – Prolonged exposure can trigger visual fatigue, causing discomfort in the eyes, headaches and decreased focus. This not only hampers radiologists' efficiency but also raises concerns about their overall physical and mental well-being.
- Ergonomic strain – Radiologists often spend extended periods scrutinizing images, maintaining static postures that can result in ergonomic discomfort. This can cause musculoskeletal issues and overall physical strain, impacting their long-term health and comfort.

To cater to ergonomic reading requirements, the Barco Nio Color 8MP display enhances reading comfort by offering a larger 32-inch screen. This enables radiologists to observe intricate details with reduced reliance on excessive clicking, panning and zooming. The larger display facilitates configuration of more complex hanging protocols and simplifies the process of comparing prior studies or series within a study.

In remote reading environments where space is at a premium, the Barco Nio Color 8MP can function as a versatile display that also serves private purposes. Its integrated keyboard video mouse (KVM) feature enables the control of multiple computers, including both hospital and private computers, using a single keyboard and mouse. Daisy-chaining capabilities streamline the connection of multiple monitors, contributing to a tidy workspace. The USB port offers convenient mobile device charging options.

Having a graphics card is essential for an effective remote workspace. **Barco MXRT graphics cards** play a crucial

role as they support higher refresh rates and resolutions, guaranteeing compatibility with evolving protocols and modality requirements. These sturdy graphics processing engines significantly boost the responsiveness of the Philips diagnostic client application and lead to quicker image loading and optimal performance when reviewing cines. As a result, reading time is reduced.

Healthcare organizations that have Barco MXRT graphics cards as a standard for diagnostic remote reading workstations will benefit from consistent and optimal display performance in all locations.



Checklist for your remote reading environment

From equipment to ergonomics and connectivity to lighting, your goal when setting up your remote reading space should be getting as close as possible to the environment in the hospital.

Internet connectivity – fast, secure internet connection is imperative

- Reliable internet service
- 1Gbps bandwidth, max. 30 ms latency recommended for 3s 1st image display

PC specs – recommendations for speed and efficiency

- Quad-core processor, 2.0 Ghz or higher
- 16 GB RAM
- 146GB disc space
- Windows 10 64Bit pro
- Video board: 2GB, DVI/DP ports, supporting 1536x2048 resolution

Medical-grade backed by FDA Class II and MDR Class IIa certifications

- High-resolution display – more reliable, more comfortable reading experience; quality improves as resolution increases
- Larger screen size – more efficient placement of multiple information sources simultaneously

Proper ergonomics reduce visual and physical fatigue and lowers the risk of repetitive strain disorders and injuries

- V-shaped keyboard
- Mouse – contoured with scroll
- Chair – adjustable height and depth, armrests, padding and lumbar support
- Desk – adjustable to proper height and allow standing

Ambient lighting – reflections caused by ambient light in the vicinity of diagnostic displays significantly impact the perception of contrast

- Maintain low ambient light levels to minimize reflections from the display
- Adjustable to align with the brightness of the monitor
- Dimmable light source that illuminates the area behind and surrounding monitor



If you have everything checked, perfect.
If not, contact us to improve the home reading workspace.

Ask us

Remote image diagnosis and sharing is not only viable; it's highly practical, relatively easy to set up and offers many benefits – improving productivity, reducing office space requirements, protecting coworker health, supporting emergency medicine during off-hours and more.

Philips and Barco implement technology solutions that support remote radiologists by optimizing their work-from-home environment. The solutions focus on enhancing collaboration without putting essential data at risk and helping healthcare organizations achieve better patient outcomes.

With a productive collaboration between the right vendors providing the right tools tailored to the specific reading workflow and the hospital IT department, we can help healthcare organizations deliver quality care, implement cost-effective, secure data storage and increase mobility through connected devices.

Are you thinking of leveraging work from home solutions for radiologists in your organization? Our solutions may be right for your team.

Philips

For more information about our radiology solutions, please visit www.philips.com/radiology-informatics or send us an email at healthcare@philips.com.

Barco

For additional information, please visit the Barco website. If you have any questions, reach out to your nearby Barco representative or contact us for more information.



1. Stefan Santavicca, MS, et al. Radiologist-Practice Separation: Recent Trends and Characteristics. *Journal of American College of Radiology*. Nov. 13, 2020.
2. Taschetta-Millane, Melinda. The Radiologist Burnout Crisis. *Imaging Technology News*. March 8, 2023.
3. Neitzel, Easton, et al. "The New Normal or a Return to Normal: Nationwide Remote Radiology Reading Practices After 2 Years of the COVID-19 Pandemic." *Journal of the American College of Radiology* (2023).

