Radiology without boundaries: designing workflow for a networked future

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Radiology has already become distributed. The systems that support it have not. What was once a largely site-based speciality, anchored to physical locations and local workflows, has evolved into a highly dynamic model of care delivery. Remote reporting, cross-site collaboration and subspeciality consultation across organisational boundaries are now routine rather than exceptional.

In addition, the demand for imaging continues to grow at 5-10% per annum.[1,2] Imaging is mandated more widely throughout diagnostic, post-treatment and follow-up pathways, while examination complexity and subspecialisation have increased. Radiologists are also reporting studies beyond their institutions. They are balancing multiple roles – local consultant, networked subspecialist, educator and mentor, and contributor to multidisciplinary team (MDT) discussions across traditional organisational boundaries – often within the same working day.

Despite these demands in clinical practice, many of the systems that underpin radiology workflows still reflect simpler times. The result is a growing mismatch between how radiology is practised and how it is supported.

The mismatch between modern practice and legacy systems

Many of the systems, processes and infrastructure supporting radiology were designed for single site workflows and static worklists, resulting – in today's working environment – in siloed data. While existing technologies can be extended to support remote access via virtual desktops or secure network connections, these approaches often serve as workarounds rather than purpose-built solutions.

The result is a fragmented user experience. To work effectively across sites, radiologists need to navigate multiple systems to access comparison imaging, related reports, prior studies and clinical context. Even in environments where image sharing is well established, broader contextual information, such as MDT outcomes or clinical notes, may remain difficult to access. While none of these steps is particularly complex, together they accumulate to cause significant friction and cognitive load.

From site-based workflows to imaging networks

So what changes when radiology is treated as a network, rather than a collection of sites?

AGFA HealthCare's Enterprise Imaging platform delivers a single, intelligent ecosystem that unifies imaging across specialities, care settings and geographies.

In response to growing demand and workforce pressures, many health systems, particularly in the UK, have created imaging networks, which aim to break down organisational barriers and enable work to be shared across organisations based on greater capacity and expertise.

In these networked models, cases are no longer tied to the location where imaging was acquired. Instead, they can be directed to the most appropriate radiologist within the network, for example, a subspecialist in paediatric radiology, neuroradiology or cardiac imaging, regardless of geography. This approach can be especially valuable in addressing workforce shortages, which remain a persistent challenge across many regions. In the UK, the radiology workforce gap is estimated at nearly 30%, with demand projected to outpace workforce growth for the foreseeable future.[3,4]

Importantly, effective networked radiology does not imply centralisation. Rather, it enables a broader, more connected team across locations, fostering collaboration, subspeciality support, workload balancing and shared expertise. The goal is not to centralise all studies, but to connect the right case to the right specialist at the right time, so that, where possible, results are delivered to support clinical pathways of care.

Done well, this can enable organisations and networks to smooth out peaks and troughs in demand, reduce reliance on escalation, and make better use of existing capacity, while also helping preserve clinician wellbeing and supporting more sustainable ways of working.

The hidden cost of workflow fragmentation

While imaging networks offer clear advantages, their success depends on how well workflows are coordinated across those organisational boundaries. In many environments, cross-site collaboration still depends on informal processes – individual relationships, manual coordination and local workarounds – rather than being systematically enabled within the systems that underpin the day-to-day work.

When clinical teams are responsible for managing how work is distributed, prioritised and escalated, the burden shifts from the system to the individual. Over time, this leads to increased manual workload and cognitive burden, as well as variability, inefficiency and risk, particularly around governance and traceability. A key contributor to this burden is context switching. Radiologists may move repeatedly between systems to gather the information needed to report a single study. Each step is small, and each interruption manageable, but over the course of a full day, the cumulative cognitive load becomes significant.

This reflects an opportunity for better system design. Many radiology systems were not built around the modern way of working, where care delivery is increasingly collaborative, distributed and information-rich, creating clear opportunities to improve workflow, user experience design, integration and automation. Orchestration solutions are available to healthcare providers using enterprise imaging, empowering them daily with faster turnaround, optimised subspeciality reading and improved report quality.

Rethinking user experience: from usability to cognitive reliability

In this context, the user experience needs to be reconsidered. It is no longer enough for systems to simply appear visually polished. What matters more is whether they reliably support clinical decision making under pressure, meaning when workloads are high, priorities are competing and teams are distributed across sites.

Well designed workflows reduce uncertainty about what matters right now. They surface relevant clinical context at the point of need, rather than requiring users to search for it. They minimise unnecessary decisions and integrate collaboration into the natural flow of work.

This can be described as cognitive reliability: the ability of a system to consistently support clinical judgement. Improving cognitive reliability is central not only to productivity, but also to reducing fatigue and supporting more confident, consistent clinical decisions.

Capacity, backlogs and the role of system design

Workforce shortages are widely recognised as a major challenge in healthcare. However, workforce constraints and system inefficiencies are closely intertwined. Imaging demand is rising faster than workforce capacity in many regions, further compounding operational pressure.[2,3]

When workflows are fragmented, the same volume of work requires more time and effort to complete. Capacity is effectively reduced not because fewer clinicians are available, but because systems do not enable them to work efficiently.

Sustaining performance under increasing demand, therefore, requires more than workforce expansion alone. It requires rethinking how work is orchestrated, prioritised and supported at a system level.

Emerging technologies, including AI, have an important role to play. Radiology remains at the forefront of AI adoption, accounting for a significant proportion of clinically-approved AI tools.[5] When thoughtfully embedded within workflows, AI can support prioritisation, enhance consistency and reduce avoidable manual effort, allowing individuals to focus on higher-value tasks.

Defining a modern networked radiology workflow

A truly networked radiology workflow is defined less by where systems are deployed and more by how effectively work is coordinated across, and beyond, the enterprise, supporting models such as cross-network collaboration and teleradiology.

Unified or federated worklists provide visibility across sites, enabling cases to be allocated based on clinical priority and available expertise. Intelligent workload distribution helps balance demand, reducing bottlenecks and improving turnaround times. Real-time collaboration tools allow clinicians to interact seamlessly, regardless of location.

Equally important is the integration of AI and automation within the workflow itself. These capabilities should operate as part of a coherent system that supports decision making at the point of need, rather than stand-alone tools. Interoperability underpins all of this; standards such as DICOM, HL7 and FHIR enable systems to share data and context in a consistent and scalable way.

From concept to care delivery – how enterprise imaging underpins NHS priorities

Across the NHS, the move towards integrated care, imaging networks and shared clinical services has accelerated the need for imaging platforms that work across organisational boundaries rather than reinforcing them. National initiatives, such as the Diagnostics Recovery and Transformation Programme, Getting It Right First Time (GIRFT) programme, and regional imaging networks, emphasise faster access to diagnostics, improved collaboration and better use of scarce specialist capacity.

Enterprise imaging platforms are designed to underpin these priorities by enabling secure, real-time access to imaging and clinical context wherever needed, without duplicating data or requiring complex local workarounds.

A recent example is from York and Scarborough Teaching Hospitals NHS Foundation Trust, where the enterprise imaging platform has been deployed to support cross-organisational image access as part of a wider networked care model. The trust's PACS team now enables clinicians to securely view radiology images and reports across multiple NHS organisations, supporting faster diagnosis and more informed decision making throughout the acute care pathway.

The real-time integration connects York and Scarborough with Harrogate, Hull and Northern Lincolnshire and Goole hospitals, and further expansion then connected Leeds

Teaching Hospitals and Sheffield Children's Hospital. This federated approach reflects a growing NHS preference for sharing access rather than moving data, aligning with standards and reducing friction for end users.

As imaging volumes continue to rise, this level of networked access is becoming operationally essential. At York, annual cross-organisation exchanges of images and reports have increased from approximately 7,000 per year a decade ago to an estimated 40,000 by 2026. This reflects a clear shift towards greater collaboration, improved resilience and system-wide optimisation, embedding the principles of networked radiology into everyday clinical practice.

From vision to implementation

For organisations looking to modernise, the starting point is not technology. It is workflow. Taking a holistic view of the imaging pathway helps identify where friction occurs and where improvements will have the greatest impact.

Transformation does not require replacing everything at once. Incremental changes, designed to work with existing systems, can deliver meaningful benefits while building towards a more integrated model over time.

Success depends on people as much as systems. Clear governance, defined roles and active engagement with clinical and operational teams are essential.

Looking ahead: a more coordinated future

Over the next three to five years, success in radiology will increasingly be defined by how effectively organisations work across people, systems and sites, aligning capacity with demand in a flexible and sustainable way.

Enterprise imaging will continue to shift from a collection of individual systems towards a unified platform that underpins day-to-day radiology and broader imaging workflows. Rather than requiring individuals to move between PACS, RIS and other AI and advanced visualisation tools, this will be brought together in a single, coherent environment.

Workloads will be balanced across sites and networks through intelligent orchestration, informed by real-time operational insights and clinical priority. Collaboration, across departments, organisations and regions, will be embedded into everyday workflows. Transparency will improve, with analytics providing visibility into demand, capacity and performance, supporting more informed operational and clinical decision making.

AI and automation will play a critical role, but their value will be truly realised when they are seamlessly integrated into the workflow. Within an enterprise imaging platform, AI can support prioritisation, surface relevant clinical context, and reduce unnecessary manual tasks, thereby minimising context switching and cognitive load. The goal remains simple: enabling the right clinician to focus on the right case at the right time, supported by the right information, within a platform designed as an intelligence hub reflecting how radiology works today, and how it will continue to evolve.

Conflict of interest

Paige Ward is AGFA HealthCare's Clinical Product Owner for Radiology and a former radiographer. An active member of several global radiology communities, Ward is well placed to consult on radiology projects, clinical standardisation and the best-practice application of enterprise imaging technologies.

References

1, *OECD. Health at a Glance: Europe 2022. Paris: OECD Publishing; 2022.*
2, *European Society of Radiology. ESR Workforce and Demand Report 2023. Vienna: ESR; 2023.*
3, *The Royal College of Radiologists. Clinical Radiology UK Workforce Census Report 2023. London: RCR; 2023.*
4, *The Royal College of Radiologists. Radiology Workforce Census 2022. London: RCR; 2022.*
5, *European Society of Radiology (ESR). Artificial Intelligence in Radiology: Current Status and Future Directions. Insights Imaging. 2023;14(1):100.*