

Is AI a friend or foe for the pathologist?



Artificial intelligence (AI) is rapidly emerging as one of the most talked-about developments in digital pathology. As laboratories digitise workflows and whole slide imaging becomes routine, AI tools are beginning to demonstrate their potential to support diagnosis, streamline workflows and help pathologists manage growing workloads. But alongside this growing momentum comes an important question: how can AI be integrated into pathology in a way that helps enhance clinical decision making while safeguarding expertise, patient trust and professional accountability?

This question formed the focus of a session at a **Digital Pathology Roundtable** convened by GE HealthCare in late 2025. The event brought together a cross-section of the UK pathology community, including clinical pathologists, service managers, and digital and IT specialists from NHS Trusts, Health Boards, pathology networks and private providers, creating an opportunity to explore how AI is beginning to help shape real-world practice. The discussion revealed strong views, but also a clear consensus: AI should be viewed as a friend rather than a foe, provided it is deployed responsibly, governed appropriately and integrated in ways that support, rather than replace, clinical expertise.

Artificial intelligence is rapidly being incorporated into digital pathology workflows, promising gains in efficiency, accuracy and workload management. But how should it be used responsibly? Insights from a UK roundtable explore the opportunities, risks and governance challenges that could help shape how AI is integrated into routine pathology in practice.

Supporting the pathologist

At the heart of this discussion was the principle that AI must function as an adjunct to the pathologist rather than a replacement. While algorithms may identify patterns or highlight abnormalities, clinical accountability must remain firmly with the reporting pathologist. In practice, AI is best viewed as a form of triage or digital second opinion – helping to prioritise cases, flag potential areas of concern and assist interpretation while leaving final judgement with the clinician. Other specialties – including radiology and surgery – are already clearly demonstrating how AI can aid in clinical decision making without replacing professional expertise.



Where AI adds value

In practice, AI is already beginning to demonstrate its value within **digital pathology**, with some participants already using it for triage and prioritisation. They discussed implementing algorithms that can highlight slides with potentially suspicious features, helping to prioritise cases requiring urgent review and improving turnaround times.

It was also noted that AI is perceived as having the potential to improve consistency in quantification, particularly in biomarker scoring where reproducibility is essential. Automated image analysis may help in providing more standardised measurements and reduce inter-observer variability. Other possible applications might include workflow optimisation by using algorithms to assist with quality control of scanned images, identifying artefacts and flagging potential errors earlier in the process. In some settings, AI may also contribute to more automated decision making, such as prompting additional tests as a next step. Early experience suggests these approaches could deliver efficiency gains in some laboratories, for example by reducing the number of unnecessary immunohistochemistry requests.



Balancing opportunity with caution

However, while these opportunities are showing great promise, it is crucial to acknowledge the limitations of AI systems and deploy them responsibly. One concern is the potential for de-skilling if pathologists become overly reliant on these kinds of technologies. Maintaining diagnostic expertise and experience will require careful integration of AI tools alongside ongoing training and professional judgement.

The performance of algorithms can also be constrained by the datasets on which models are trained, for example, systems validated on narrow datasets may perform less reliably when applied to more diverse clinical populations. Errors, including false positives or false negatives, can undermine confidence in algorithm-assisted diagnosis. Questions around patient trust also remain important, as attitudes toward AI in healthcare may vary across different patient groups.



Ensuring safe adoption

Addressing these risks requires robust validation and governance frameworks before AI tools can be used routinely in clinical practice. This includes thorough evaluation, which should typically encompass retrospective studies, prospective trials, audits and periods of parallel use alongside pathologists to confirm performance in real-world settings. However, the rapid pace of algorithm development presents additional challenges. Frequent updates may require repeated revalidation, and questions arise over whether earlier cases should ever be reassessed using improved algorithms. This is where clear governance frameworks will help; national guidance from professional bodies and regulators could help to ensure safe and consistent adoption across pathology services.



Embedding AI in workflows

Alongside governance, the practical impact of AI will depend heavily on how effectively it is integrated into existing digital pathology systems. Manual processes, fragmented workflows or off-site processing can introduce delays that undermine the efficiency gains AI promises. In a seamless model, AI algorithms would be embedded within laboratory information systems (LIS) and image management systems (IMS), with results integrated directly into reporting workflows. Local processing would help support this by reducing latency and strengthening data security.





The economics of AI

As organisations consider wider deployment of AI, economic factors also come into focus. Many algorithms are currently offered through licence-based or per-slide pricing models, raising concerns about long-term sustainability. While some organisations report that efficiency gains can offset these costs, uncertainty remains around how widely such benefits can be realised. Vendor lock-in is another concern where proprietary systems limit interoperability between platforms. Questions around data ownership also remain unresolved, particularly where patient images contribute to the development or improvement of commercial algorithms.



Maintaining resilience

As pathology services become increasingly reliant on digital and AI-supported workflows, resilience becomes a critical consideration. Cyberattacks, system outages or prolonged technical failures could disrupt clinical services if contingency plans are not in place. Maintaining access to glass slides and preserving core diagnostic skills remain important safeguards. Infrastructure must also be capable of supporting growth, with sufficient bandwidth, storage capacity and workstation availability to sustain expanding digital workflows.



Looking ahead

The roundtable hosted by GE HealthCare highlighted strong alignment across the pathology community for the potential of AI to benefit clinical practice, provided it is introduced thoughtfully and responsibly. In the years ahead, AI is likely to become an increasingly familiar component of digital pathology workflows and, if implemented carefully, it could help enhance diagnostic accuracy, streamline laboratory processes and help pathologists manage rising demand. Realising these benefits will depend on maintaining clear principles: AI augments and does not replace clinical expertise; algorithms must be rigorously validated and transparently governed; and deployment must be integrated, equitable and resilient. If these conditions can be met, AI may prove not to be a foe after all, but a powerful ally in the future of pathology.

The perspectives presented in this article reflect insights shared during the roundtable discussion and represent current experiences and expert opinion from participants, rather than formal positions of any individual organisation.