Accelerating Towards Digital Pathology

Accelerating towards digital: insights from the National Working Group

Fig 1. Stages of maturity for pathology networks in England.

Emerging
Constituent pathology services within a Network currently operate independently at Trust level, but with a Network programme board engaged to take forward network-wide understanding and development of a Network-wide plan.

Developing
Joint-working across Network with implementation of network-level plan underway.

Maturing
Fully established and implemented plans at Network level, and where applicable realisation of benefits and further innovation and improvement underway.

Pre-emerging
Constituent pathology service providers within a Network operate independently at Trust level.

Thriving
Fully integrated Network operation, and collaboration with other Networks within the region for regional academies, best practice evidence and standardisation across region.

Adoption of digital pathology has the potential to transform histopathology services within the NHS, but a cohesive strategy is required to realise the full benefits nationwide. Source LDPath looks at digital adoption so far and previews key recommendations from a forthcoming white paper from a National Working Group for Digital Pathology.

Histopathology, often described as the hidden powerhouse of the healthcare system, plays a pivotal role in disease diagnosis and is the foundation of directing patient care pathways. The demand for histopathology services is increasing by approximately 4.5% each year,[1] a growth rate that is outpacing the NHS's capacity to handle caseloads effectively. This surge is driven by an ageing population, rising incidences of complex diseases like cancer, and a shortage of reporting pathologists. Clinical expectations for rapid, accurate diagnostics continue to grow, underscoring the urgency for the NHS to improve its histopathology capabilities.

In response, the NHS has prioritised the digital transformation of histopathology as a critical step towards meeting the diagnostic demands of modern healthcare. Digital pathology has the potential to revolutionise diagnostic workflows by enabling faster more efficient diagnosis, supporting remote consultations and multidisciplinary meetings, and integrating seamlessly with electronic health records (EHRs).[2] Moving to a national coordinated digital pathology infrastructure is widely recognised as foundational to addressing diagnostic backlogs, improving workflow efficiency, and delivering timely, clinically actionable results to patients, all within existing budget constraints. Strategic investment and deployment in digital pathology are essential to achieve these goals.

Evidence-based transformation
Transitioning from traditional microscopy to digital solutions presents substantial benefits, including increased diagnostic accuracy, improved workflows, and faster reporting turnaround times. The digital shift also facilitates better collaboration among healthcare professionals, as digital images can be shared instantly, supporting remote consultations and multidisciplinary discussions. Evidence of these advantages can already be seen in both single-site and multi-site digital pathology deployments across the NHS.

In March 2022, Source LDPath launched a milestone digital pathology integration with East Kent Hospitals University NHS Foundation Trust (EKHUFT), successfully deploying a first-of-its-kind HL7 integration in the UK.[3] This integration later provided the foundation for a health economic assessment tool, enabling other NHS trusts to evaluate the potential impact of digital transformation within their departments – considering factors like financial savings, backlog reduction and patient life years saved over specified timeframes. Since this launch, several pathology networks have begun developing and aligning digitisation strategies both within individual hospitals and collectively across regions.

Digital maturity
Despite these successful deployments, scaling digital pathology nationwide presents challenges. The NHS is a vast
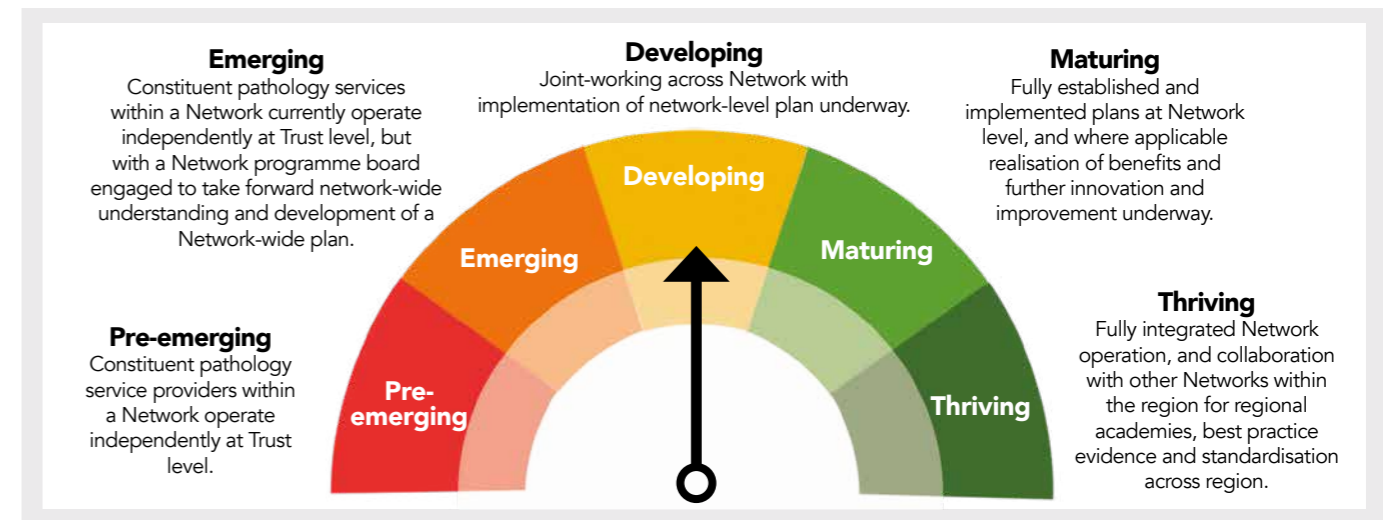

Increasing demand for services means the NHS has prioritised the digital transformation of histopathology as a critical step towards meeting the diagnostic demands of modern healthcare.

and complex system, and its regional diversity requires careful coordination to successfully deliver large-scale service transformation which can benefit patients from all geographical pockets of the UK. The NHS's 2022/23 Operational Planning Guidance commits to classifying all pathology networks as 'mature' in digital capability by 2024/2025, with a focus on driving digital interoperability within and between departments and a focus on maximising the digitisation of histopathology service delivery (Fig 1). According to an April 2024 review, across the 27 pathology networks in England, only 12 networks were considered maturing or above, and 15 networks considered developing. While there is progress taking place in ensuring all pathology networks are now in the development phase of digital maturity, the majority of pathology networks will require strategic guidance to maintain momentum for digital transformation.

Barriers to large-scale digital pathology
A significant challenge within the NHS's historic operational structure lies in the fragmented delivery of services. The distribution of resources, budget allocations, and specialist expertise vary considerably across regions, leading to inequitable progress in achieving digital maturity across pathology networks. Notably, there is a vast array of laboratory information management systems (LIMS) throughout the NHS, which further limits the potential for improved connectivity achievable through digital innovations. These regional disparities have resulted in inconsistencies in the adoption of digital pathology, preventing the NHS from establishing a cohesive, high-performing histopathology service at a national scale.

In recent years, substantial funding has been allocated towards advancing digital pathology, with NHS England committing millions to digital transformation initiatives, including digital imaging and interoperable reporting systems. However, the effectiveness of this investment depends on strategically implementing these funds to ensure they drive meaningful change. Without a coordinated effort to accelerate digital integration across clinical workflows, there is a risk that these funds may go underutilised and yield suboptimal returns.

If the transition to digital pathology is not accelerated across clinical workflows as a collective, the NHS will continue to face mounting challenges in meeting the rise in demand for diagnostics. The reliance on outdated systems, and therefore the lack of nationwide interoperability, may also exacerbate workforce pressures, increasing the burden on already stretched pathologists, biomedical scientists, and other clinical and operational staff. The absence of consistent digital maturity across histopathology departments affects not only those departments but the broader healthcare system, and therefore, the stagnation in digitisation cannot be viewed in silo.

National Working Group for Digital Pathology
In response to this, a National Working Group for Digital Pathology was formed. The primary aim of the Group was to shape key recommendations for accelerating the transition to digital pathology nationally, that sits alongside and further supports the NHSE 6-point histopathology plan. The subsequent aim was to outline the imperative for ringfenced funding for histopathology departments, with a critical set of recommendations on how best to utilise this budget for large-scale success.

The Working Group, chaired by Debra Padgett (IBMS Past President, North East and North Cumbria [NENC] Pathology Operational Lead) comprises essential stakeholders in UK histopathology service delivery, including key NHS clinical and operational leaders, representatives from the Institute of Biomedical Science and The Royal College of Pathologists and related organisations, as well as a partial industry seat. The upcoming whitepaper, scheduled for release in December 2024, is designed as an advisory resource to address the challenges and harness the opportunities in implementing large-scale digital pathology across the NHS. With members of the Group actively engaged in on-the-ground operations, their insights offer a valuable bridge to national decision-makers, fostering a collaborative approach that maximises the potential for successful digital transformation.

Recommendations
By focusing these recommendations on a clear, structured path to digitisation, the NHS can better navigate the challenges of integrating digital pathology into its existing healthcare system. The key to success lies in a coordinated national strategy, inclusive stakeholder engagement, and sustained investment in infrastructure, training, and innovation.

1. Foster a cultural shift
A cultural shift is essential to fully realise the benefits of digital pathology. The NHS must create a shared understanding that digital histopathology is not just a technological upgrade, but a critical step in improving the quality and efficiency of services. This cultural change should be supported through targeted educational programmes, continuing professional development, and the promotion of digital pathology as a key enabler of modern healthcare. Emphasising the role of digital pathology in enhancing patient
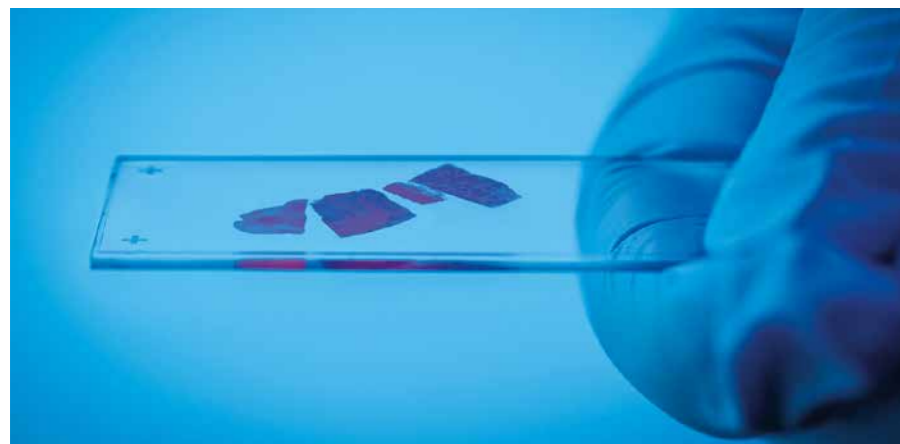
care and reducing diagnostic errors will help pathologists and other stakeholders view it as an integral part of the pathology service, rather than a peripheral innovation.

2. Establish a framework

To achieve a successful, system-wide shift to digital pathology, the NHS needs a clear, national framework to guide digitisation efforts. This framework should include common technical standards, interoperable systems, and clear guidelines to enable seamless integration across NHS Trusts. A unified approach will address current fragmentation, where legacy systems often hinder the adoption of modern digital solutions. The framework should support local flexibility to accommodate for departmental needs, workforce capabilities, and existing infrastructure, while ensuring compatibility across regions and institutions, avoiding duplication of efforts, and enhancing efficiency. Measurable outcomes should be set, with clearly defined success indicators such as adoption rates, interoperability benchmarks, and reductions in processing times.

3. Stakeholder engagement

For digital pathology to be successfully integrated into clinical practice, it is crucial to actively engage front-line healthcare workers - particularly histopathologists, biomedical scientists, and laboratory staff – in the entire process of design, development, and procurement. These professionals possess deep insights into the challenges and opportunities within current histopathology workflows, making their involvement essential in shaping the systems that meet clinical needs. By involving them from the outset, the NHS can ensure that the technology aligns with real-world requirements, enhances clinical outcomes, and promotes smoother adoption by users. This approach also allows for a whole-service redesign that integrates digital tools into everyday histopathology workflows, boosting both diagnostic efficiency and accuracy.

4. Adopt a dual approach

We must avoid automating a bad process, and therefore a complete service re-design may be required to see the full benefit of innovative digital solutions. A coordinated, dual bottom-up and top-down approach promotes a balanced pathway for the adoption of digital pathology. This strategy combines on-the-ground expertise to encourage practical, user-driven solutions (bottom-up) and leadership, standardisation, funding, and policy frameworks from a unified national force (top-down). By integrating both approaches, the NHS can foster
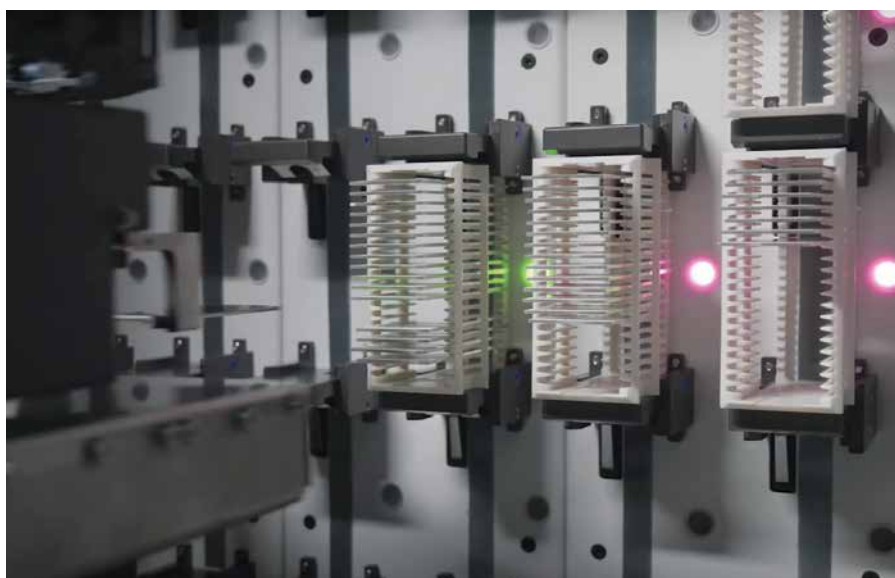
The National Working Group for Digital Pathology believes adopting digital pathology should be recognised as a fundamental transformation of pathology services, not just a technological upgrade.

an environment where digital pathology initiatives are innovative, scalable, and responsive to local and national needs.

5. Leverage digitisation insights

The NHS can draw valuable lessons from the successful digitisation efforts in other medical disciplines. The digitisation of radiology has demonstrated the potential of digital imaging to support remote interpretations, improve multidisciplinary collaboration, and integrate with EHRs. The NHS should apply these lessons to histopathology, particularly by focusing on the importance of robust IT infrastructure, data security, and clear communication channels between departments. Additionally, the experience of overcoming challenges like resistance to change, underutilisation of digital systems, and integration issues can inform the path to smoother, more effective adoption of digital pathology. The digital transformation seen in radiology was widely recognised as an essential evolution of the field, leading to dedicated funding and nationwide collaboration to support its development. Histopathology should be approached with the same level of importance and investment.

6. Utilise the private sector

Collaboration with the private sector can provide the expertise, resources, and innovation needed to accelerate the digital transformation of histopathology services. Engaging private companies in the development and provision of digital pathology solutions can relieve pressure on NHS resources and allow for faster deployment and scaling. The private sector can add value to NHS histopathology service delivery via two core channels – bringing innovative solutions for service

optimisation and acting as an extension of the NHS laboratory for increasing capacity, creating headspace for the NHS workforce to act on the digital transformation.

7. Secure dedicated funding

A successful nationwide rollout of digital pathology will require further significant financial investment, not only for initial equipment and software acquisition but also for ongoing costs such as training, system maintenance, and IT infrastructure. Policymakers must commit to long-term funding (capital and revenue) and ensure that resources are allocated effectively to support both national coordination and local implementation. Crucially, this funding must also account for the costs of supporting NHS Trusts in managing the transition, ensuring that institutions have the necessary resources, including staffing, to integrate digital pathology systems while maintaining high standards of patient care.

References

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