The Royal College of Pathologists
Pathology: the science behind the cure



Neuropathology workforce report

Foreword

Professor Sebastian Brandner, Chair of the Royal College of Pathologists' Specialty Advisory Committee (SAC) for Neuropathology

This report outlines the challenges facing the consultant neuropathology workforce. The neuropathology workforce is small, with just 66 consultants in the UK, but it is critical to accurate diagnosis and guiding treatment for brain tumours, neurodegenerative diseases and rare neurological disorders. It is a specialty where innovation makes an essential contribution to unlocking barriers to brain tumour and other neurological research.

The sustainability of this vital specialty is under threat: looming retirements, a persistent lack of trainees entering the field, rapidly increasing complexity and demand, as well as reduced time for research. There are several pressures converging to create a workforce crisis that will be felt by patients and families who depend on timely, accurate diagnoses, as well as putting additional strain on the profession.

Almost half (47%) of the current consultant workforce intends to retire within the next decade, with 29% planning to leave in the next 5 years. This is at a time when complexity in diagnostic requirements is increasing, including through integrated molecular (e.g. DNA) testing. These advances are integral to diagnosis and treatment planning, enabling a more personalised and effective approach for patients. The multi-step processes, essential for precision medicine, significantly increase workload and turnaround times and place additional strain on already overstretched teams.

Our findings show that, since 2021, the already small neuropathology workforce has decreased by 2.5 whole-time equivalents (WTE) with the biggest losses seen to academic work. In 2025, just 15% of neuropathology workforce time was dedicated to academic work, compared with 23% in 2021. There are also geographic inequities in the workforce with some areas – particularly outside of London – less well served.

Recruitment into training remains low and some posts remain unfilled. If this remains the case, succession planning will fail and – in the longer term – services risk collapse.

Investment in digital infrastructure, fairer distribution of resources and stronger academic mentorship are essential. Joint efforts from governments, the College and other professional organisations are needed to ensure that the workforce is aligned with the required service provision and allows adequate time for research and innovation.

I extend my thanks to College members who completed the Workforce Census, the consultants who contributed to our surveys, the British Neuropathological Society (BNS) for providing workload data and the Workforce and Engagement team for bringing this report together.

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Introduction

Neuropathologists provide a vital service in diagnosing brain tumours, other disorders of the central nervous system and neuromuscular diseases. This report highlights the fragile nature of the UK neuropathology services.

Increased complexity of testing is placing growing pressure on a small workforce, contributing to delays in patient diagnosis and treatment. At the same time, dwindling time for research and innovation threatens improvements to innovative life-saving treatments. Targeted workforce strategies are, therefore, needed to meet the needs of the entire population.

Our findings are drawn from data gathered through our Workforce Census,[i] direct-to-service data collection[ii] and workload data provided by the BNS[iii] up to the end of June 2025. The report provides a 'point-in-time' assessment of the current workforce, acknowledging that since the data was collected, vacancies may have been filled, and residents may have completed training.

Key findings



There are 66 neuropathology consultants in the UK. This comprises 57 consultants in England, 5 in Scotland, 2 in Wales and 2 in Northern Ireland.

30%

Consultants work 62.3 whole-time equivalents (WTE). The UK needs a 30% increase in consultant WTE to 81.1 WTE to meet estimated current demand.

10%

There are 7.0 WTE vacant consultant neuropathology posts – a vacancy gap of 10%.



Over half of the consultant neuropathology workforce is over 55. 29% intend to retire within the next 5 years and 47% within the next 10. However, concerningly, some training posts remain unfilled.



In 2025, only 15% of time was dedicated to academic work – including research – compared with 23% in 2021, reducing time allocated to developing new life-saving or life-altering treatments.

4%

Diagnostic neuropathology workload cases are increasing by around 4% per year. Demand and complexity related to molecular techniques are also increasing.

86%

86% of neuropathologists who work more hours than their contract do so without pay – the system is critically reliant on goodwill.



Some areas – particularly outside of London – are less well serviced and should be a priority for workforce investment.

[i] *In 2025, neuropathology had a response rate of 47%. In 2026, neuropathology had a response rate of 78%. Data used throughout this report was collected as part of the 2025 Workforce Census, however provisional analysis of 2026 data confirms broadly similar responses across both years.*

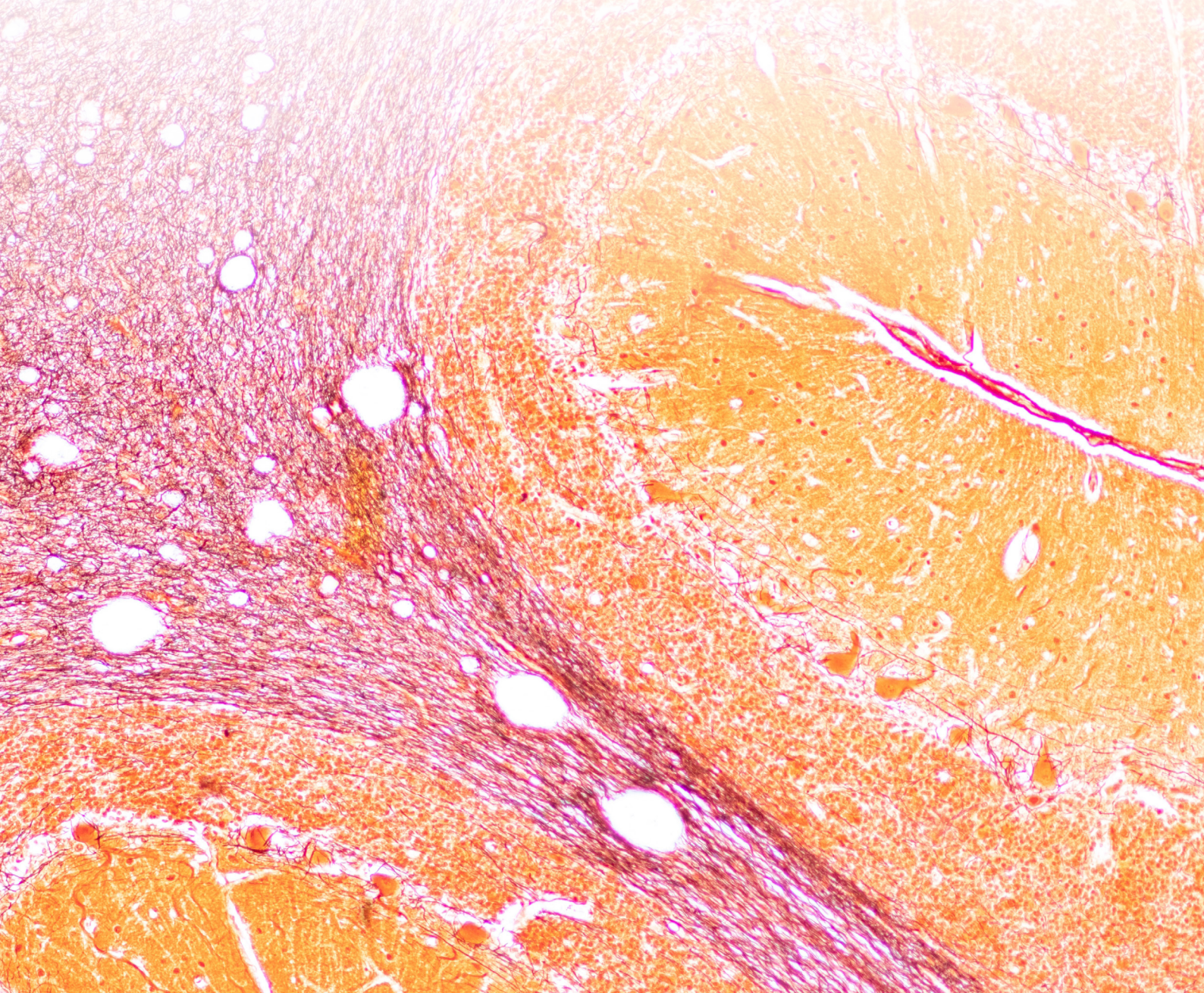
[ii] *A survey was sent to all neuropathology services (n=24) in the UK with consultant medical posts between April and June 2025 and we received a 100% response rate.*

[iii] *Workload data was provided by the BNS for the 4 financial years 2020–2023.*

The role of a neuropathologist

Neuropathologists are specialist medical consultants who focus on the diagnosis, treatment and research of neurological diseases and disorders of the brain, spinal cord, skeletal muscle and nerves using tissue samples. This includes brain tumours, dementia, epilepsy and neuromuscular diseases such as motor neurone disease (MND).

Neuropathology involves the reporting of neurosurgical specimens (tumour, central nervous system [CNS], peripheral nerve and muscle). Neuropathologists focus on diagnosing brain tumours and neurological diseases by studying tissue taken from biopsies and guiding treatment plans for oncological and inflammatory conditions. They are involved in cancer testing pathways and work with genomics services to facilitate molecular testing of tissue. They also support research through tissue banking and molecular analysis. Neuropathologists work with multidisciplinary teams (MDTs) to ensure the best, tailored treatment is available for their patients. Some also perform post-mortem examinations in hospitals and coronial settings (procurator fiscal in Scotland).



Neuropathology is a highly specialised discipline and some of the conditions dealt with are rare. There are 24 UK neuropathology units across the UK. Most diagnostic neuropathologists are based in regional neuroscience centres where they work closely with clinical colleagues. Additionally, and depending on local arrangements, in some centres, neuropathologists are also responsible for the diagnosis of disorders of other organs.[1]

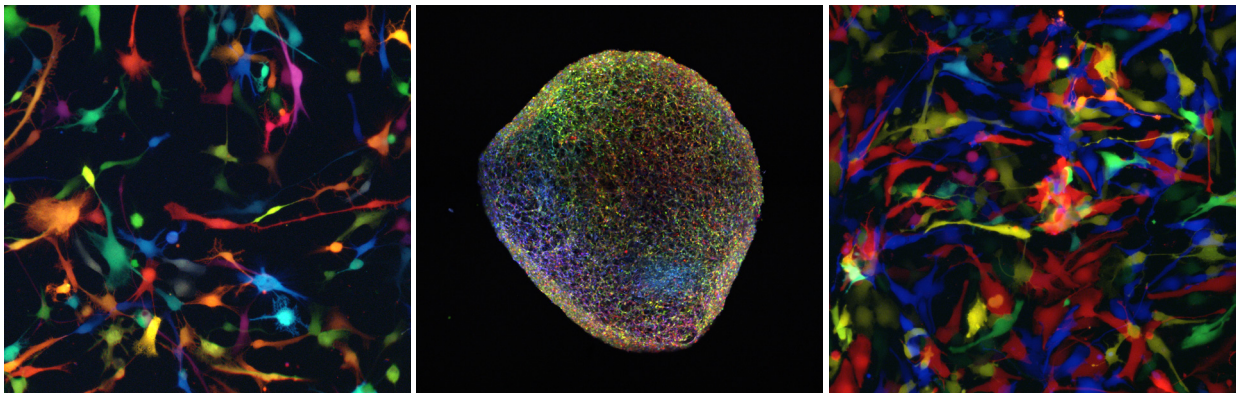
Many consultants have formalised academic responsibilities, including those at the forefront of research fields that are set as national priorities by governments, such as neurodegeneration, which includes Alzheimer's disease, Parkinson's disease and Huntington's disease.

This report is focused on the consultant neuropathology workforce, reflecting the membership of the College. The service, however, relies on significant contribution of the wider multidisciplinary workforce who play a critical role in the delivery of neuropathology services. As molecular testing becomes an increasingly integral component of diagnostic practice, biomedical scientists and professional laboratory staff with skills and expertise are more important than ever.

Neuropathology research

Neuropathologists play a central role in research. Their research spans neurodegenerative disorders, brain tumours, neuromuscular diseases, epilepsy, inflammatory and infectious diseases of the nervous system, and the mechanisms that drive these conditions. By combining expertise in tissue diagnosis, molecular pathology and translational science, neuropathologists help identify disease biomarkers, improve diagnostic accuracy, develop targeted therapies and support clinical trials. This research is vital for advancing patient care, particularly as neurological disorders represent a growing burden on health services and often have limited treatment options.

Neuropathology research faces significant challenges, including a small and ageing workforce, limited protected research time, difficulties securing funding for rare neurological diseases, increasing demands from diagnostic services, and the need to keep pace with rapidly evolving technologies such as genomics, digital pathology and artificial intelligence (AI). These pressures constrain research capacity and make it difficult to find time to develop life-saving or life-altering treatments for patients, and to develop the next generation of academic neuropathologists.



The workforce

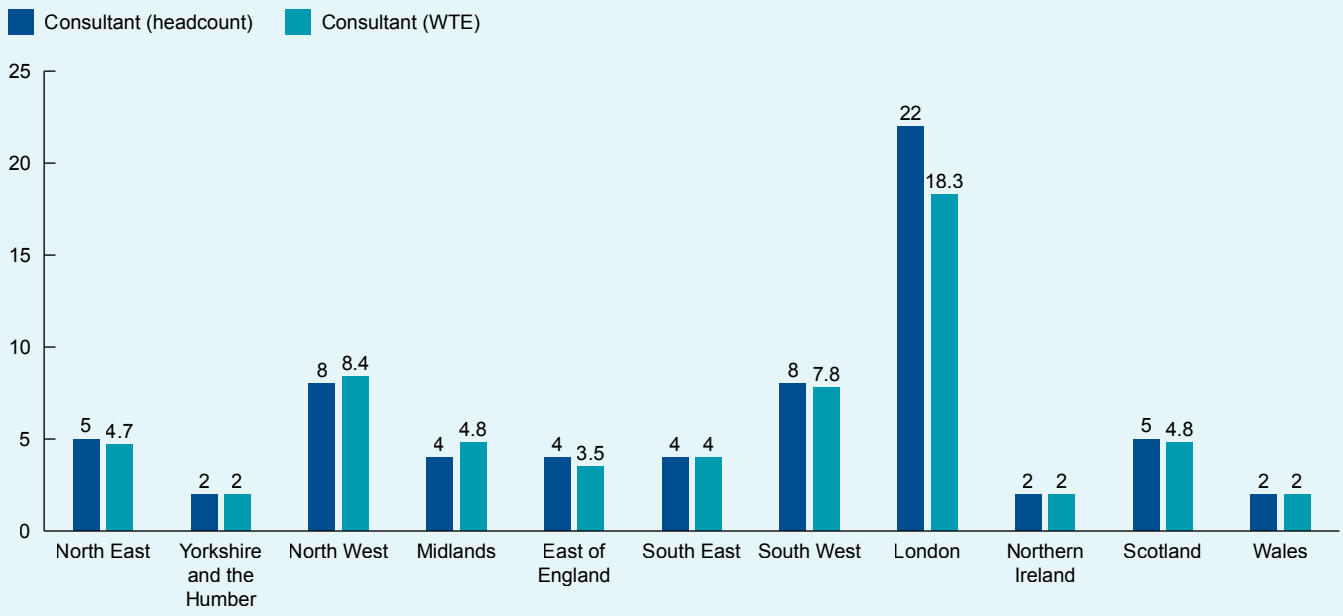
The consultant neuropathology workforce is made up of medically trained pathologists. Neuropathology is one of the UK's smallest specialties – it is highly specialised and a small pool of specialists means the workforce is in demand.

Consultant workforce

There are 66 consultant neuropathologists (headcount) in the UK, working 62.3 WTEs.

- In the North West and Midlands areas of England, the WTE is greater than the headcount, as some consultants in these areas are contracted to work more than 1 WTE (>10 programmed activities [PAs]).
- In addition to the consultant workforce, in London, there is 1 specialty, associate specialist and specialist (SAS) doctor and 1 locally employed doctor (LED) – a clinical fellow – each working 1 WTE.
- There are geographic inequities in the workforce with a high proportion of the workforce being based in London. Consultants are located across all 24 neuropathology units, however, some are very fragile with very low (1–2) numbers of consultants. Several neuroscience centres do not have on-site neuropathologists.

Figure 1: Consultant neuropathology workforce by region.



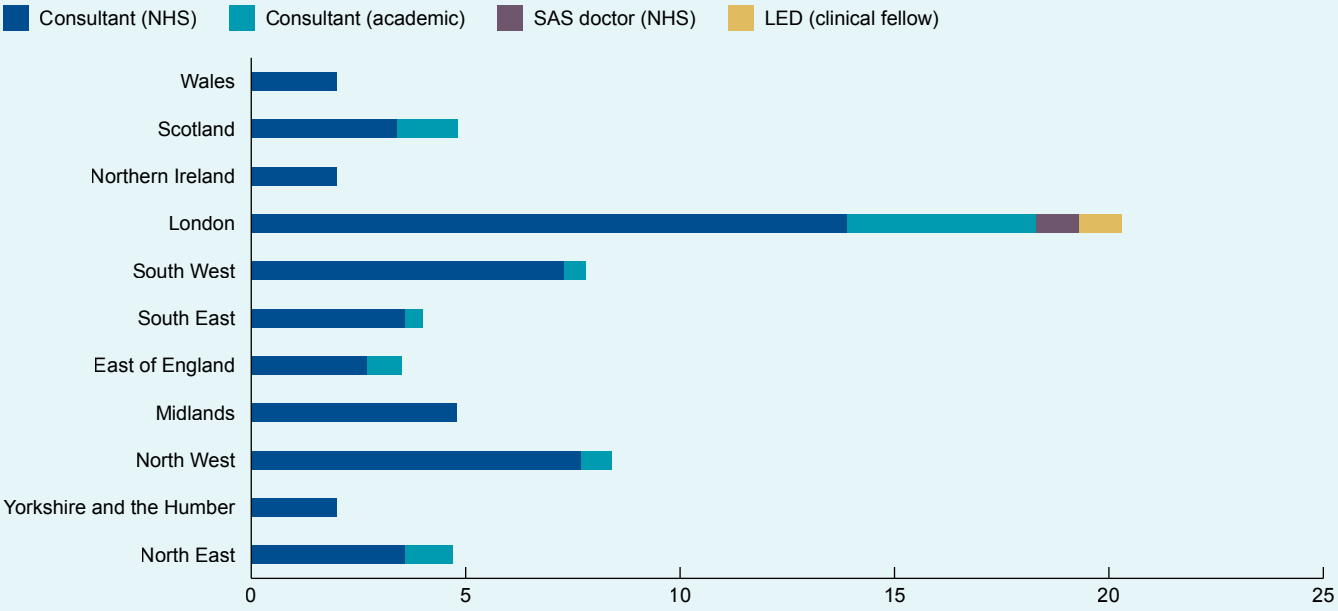
Research and academic activities

Neuropathology is a heavily research-orientated field and many neuropathologists hold joint academic and NHS contracts. Across the UK, 19 of the 66 consultants (29%) reported working in joint NHS and academic posts. London has the largest workforce allocated to research activities.

Respondents were asked to report how much of their time was allocated to NHS duties and to academic duties. Across the entire workforce, 53.0 WTE was allocated to NHS work and 9.3 WTE was allocated to academic work.[iv]

The proportion of the neuropathology workforce's time dedicated to academic work, including research, has fallen from 23% in 2021 to just 15% in 2025.

Figure 2: Neuropathology total workforce time allocated (WTE) by region and work type.



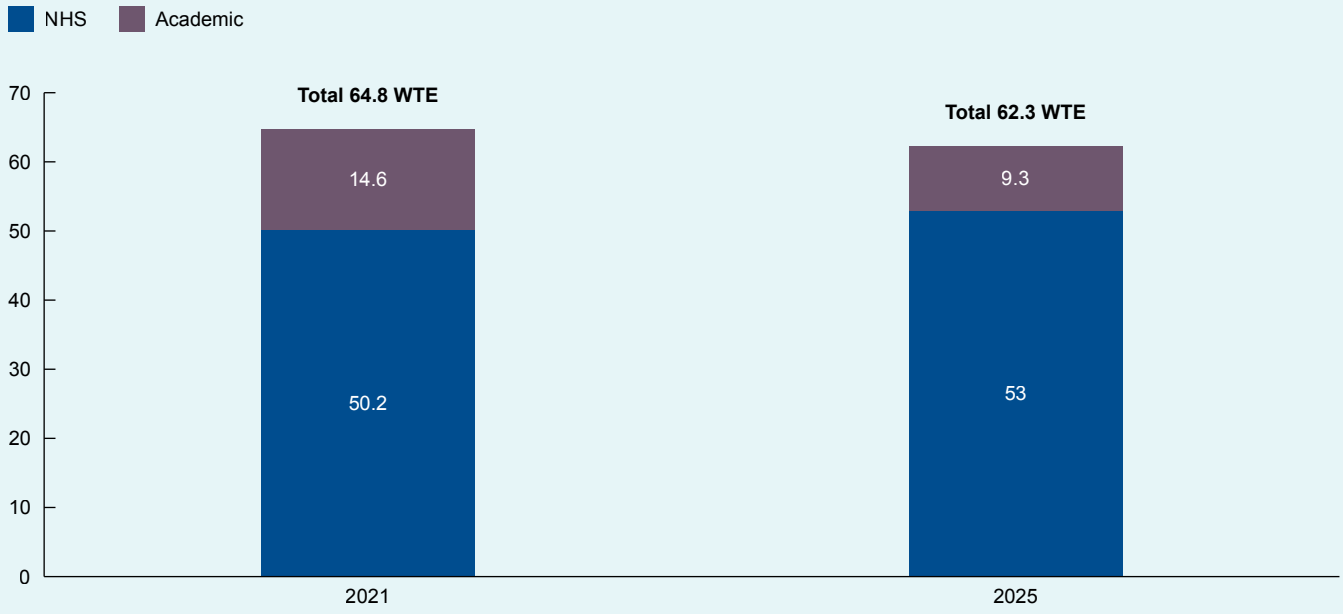
[iv] *Academic time is specific allocation (e.g. PAs) in contracts for research or other academic activity. It does not include supporting professional activities (SPA) allocations that are primarily intended to support continuing professional development, education, appraisal, governance and quality improvement activities.*

Neuropathology workforce changes since 2021

- The RCPath Workforce report on neuropathology published in 2023 – with data collected from 2021 – recorded 64 consultants across the UK working a total of 64.8 WTE.[2] This indicates a total growth of 2 headcount in 4 years but a decrease of 2.5 WTE, meaning the overall number of available work hours has decreased by 4%.
- Between 2021 and 2025, academic activity in neuropathology fell from 14.6 WTE to 9.3 WTE, representing a decrease of 5.3 WTE (36%). Over the same period, NHS activity increased from 50.2 WTE to 53.0 WTE (6%).
- As a proportion of total available workforce time, in 2025, only 15% was allocated to academic and research work compared with 23% in 2021. These findings suggest a shift in workforce capacity towards NHS service commitments and away from academic activities. While focus on direct clinical care (DCC) is necessary, this raises concerns about the specialty's future research, teaching and innovation capacity. A recent report from The Brain Tumour Charity highlighted that workforce capacity and protected time for innovation is an essential part of unlocking barriers to brain tumour research.[3] Increased overall workforce is needed to provide sufficient time for both clinical care and to allow for research activities.

> "Allocated PAs for research are often lost in covering diagnostic work. This is not new and has adversely affected my entire career. As a trainee, the research registrar was expected to cover maternity and sick leave and so much time was lost resulting in me temporarily leaving the NHS. There are better career paths now but there is still friction between NHS and university roles."

Figure 3: Neuropathology consultant workforce 2021 and 2025 WTE (UK total).



Vacancies

- There are 7 vacant consultant posts in the UK (comprising 7.0 WTE). Of the currently funded 69.3 WTE posts (73 headcount), 62.3 WTE (66 headcount) are filled.
- 7 out of 24 services (29%) reported having at least 1 consultant vacancy. In total, 10% of all funded consultant posts remain vacant.
- Vacancies are not evenly spread throughout the UK, with the highest percentage vacancy gaps in the Midlands and the South East areas of England. London, Yorkshire and the Humber, East of England, Northern Ireland and Wales reported no vacancies at the time of data collection.
- The total number of funded posts has remained the same as in 2021, where 9 consultant posts were reported vacant, and headcount was reported at 64 (64.8 WTE) – a total of 73 funded posts.
- Out of the 7 vacant posts, 5 posts have been vacant for over a year, 1 has been vacant for 6–12 months and 1 has been vacant for 1–2 months. Only 1 service (in Scotland) reported using locums to cover the vacancy. The reasons for the length of these vacancies are unclear, but recruitment is reported to remain a challenge.

The small number of consultants in some areas leaves services particularly vulnerable when there are vacancies.

Figure 4: Neuropathology consultant vacancy gaps by region.



- 61% of neuropathologists who responded to the 2025 Workforce Census agreed that issues with recruitment were a problem in their service. Services were asked reasons for the challenges and invited to choose multiple options – budgetary constraints (53%) and delays due to internal approvals or processes (42%) were the top reported reasons. It is unclear whether the budgetary constraints refer to budget not being released to cover vacancies, or whether it reflects challenges in seeking funding for new (desired) posts. This is an area for further investigation.
- Recruitment efforts should be focused on areas with vacancies to help promote more equitable service provision.

> "There needs to be help for smaller departments to appoint their own consultants. This would help to spread neuropathology to more centres and support recruitment of future neuropathologists."

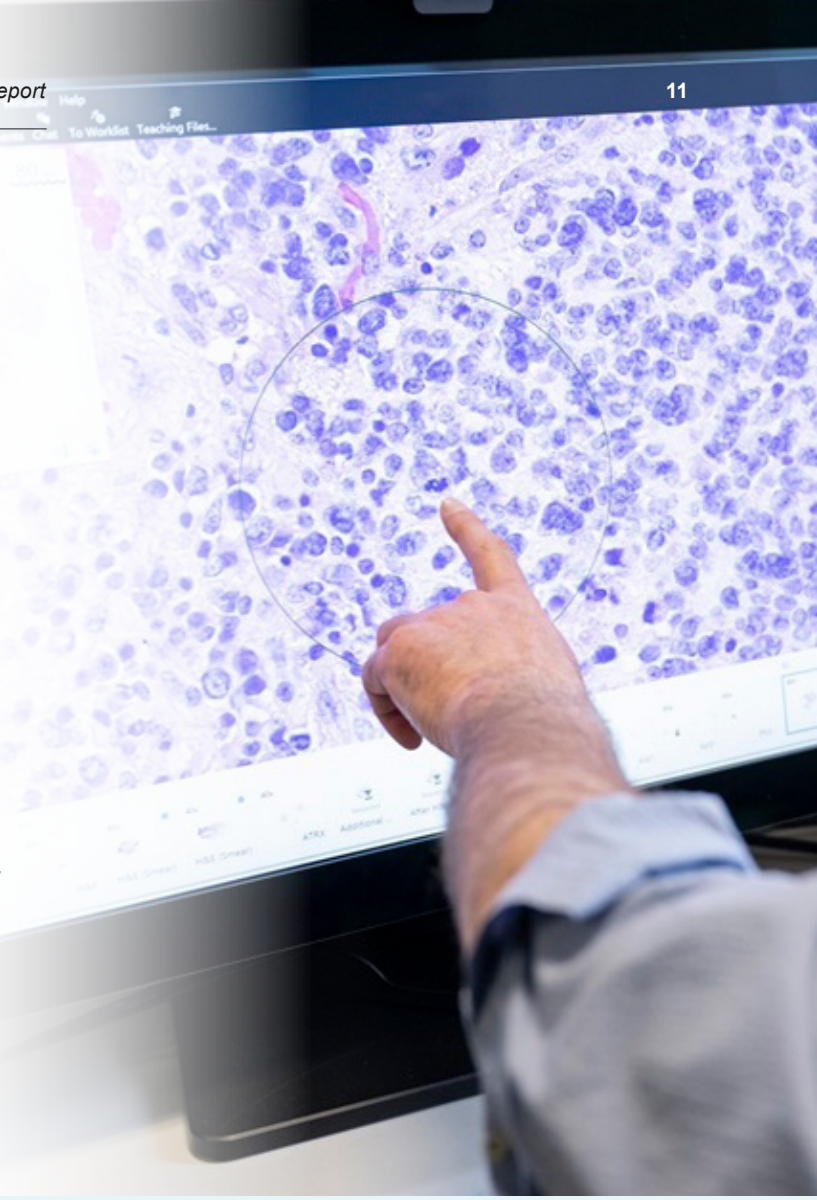
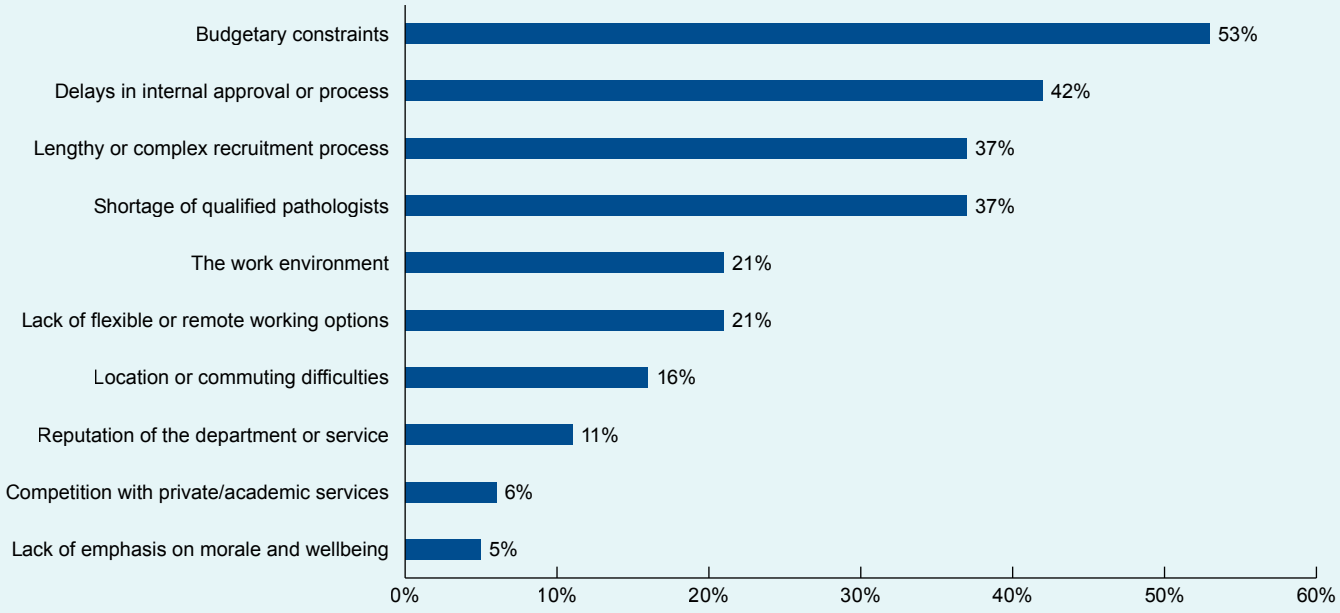


Figure 5: Reported challenges with recruitment.



Real workforce gap

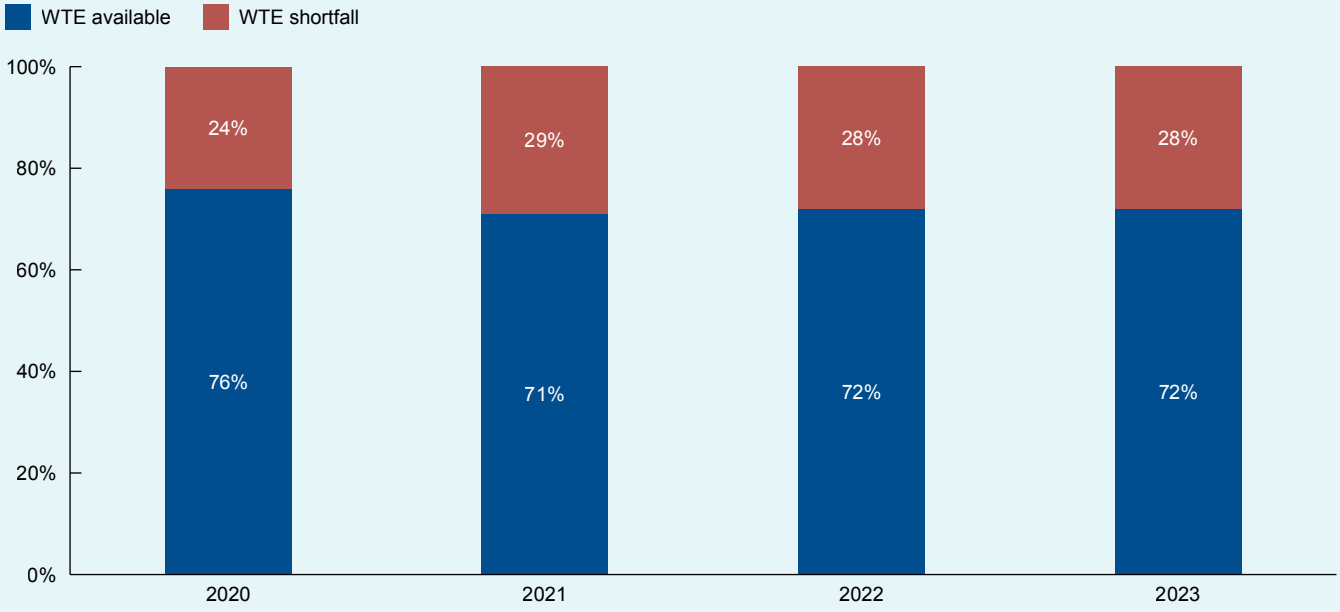
While vacancy rates tell part of the story, the real workforce gap is bigger. Even if these vacancies were filled, our members tell us there would not be enough consultants to deliver safe and effective care to the population.

Feedback from services has informed our estimate of the additional workforce required. The small number of consultants in some areas, including Wales and Northern Ireland where there are only 2 in each country, means some services are particularly vulnerable to workforce changes.

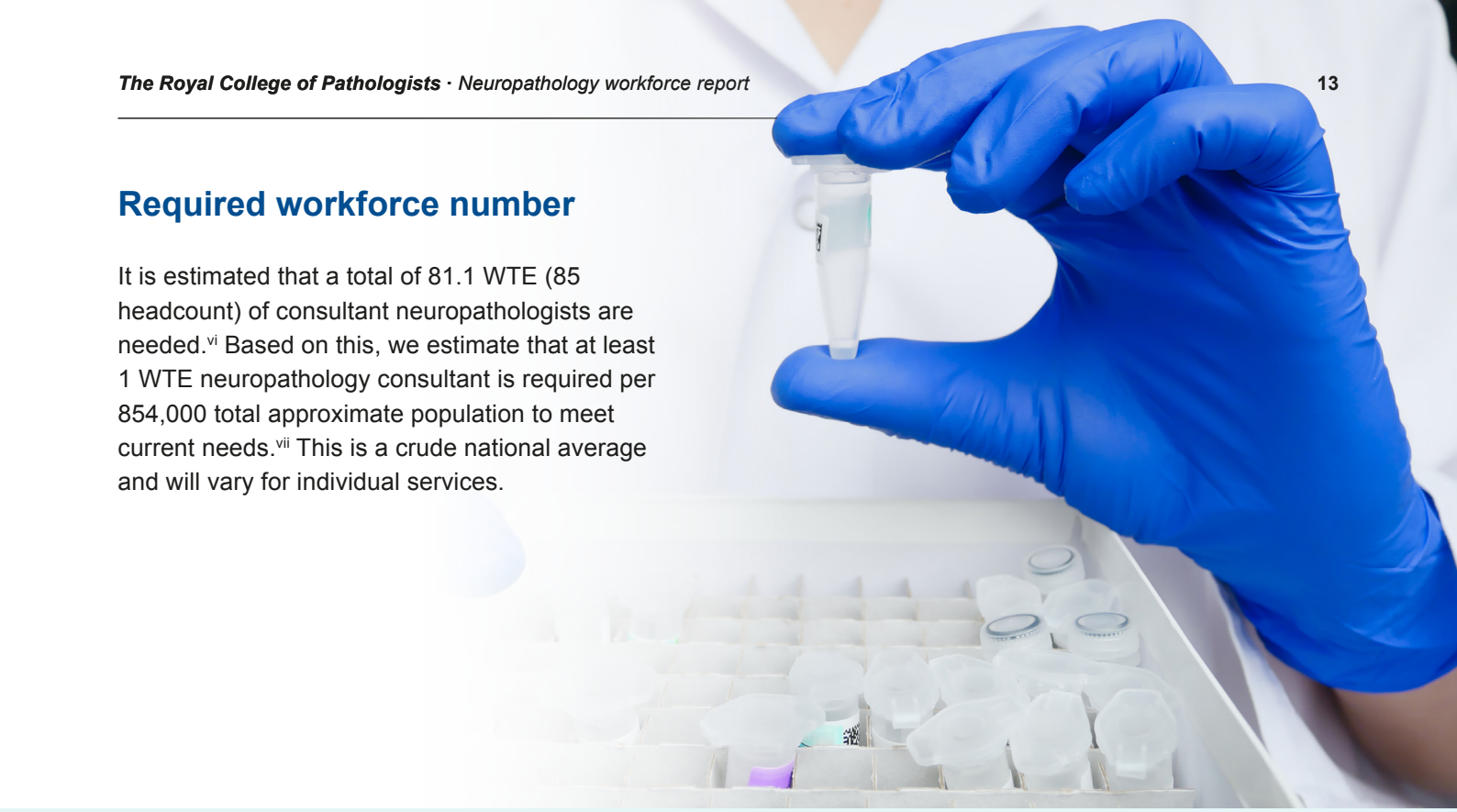
The College estimates that the UK needs a 30% increase in consultant WTE, from 62.3 WTE to 81.1 WTE, to meet estimated current demand.

This is supported by BNS data on the number of WTE consultants required to deliver the current and ideal volume of DCC from 2020 to 2023.[v]

Figure 6: BNS reported shortfall in WTE consultants required to deliver the current and ideal volume of DCC across regions.



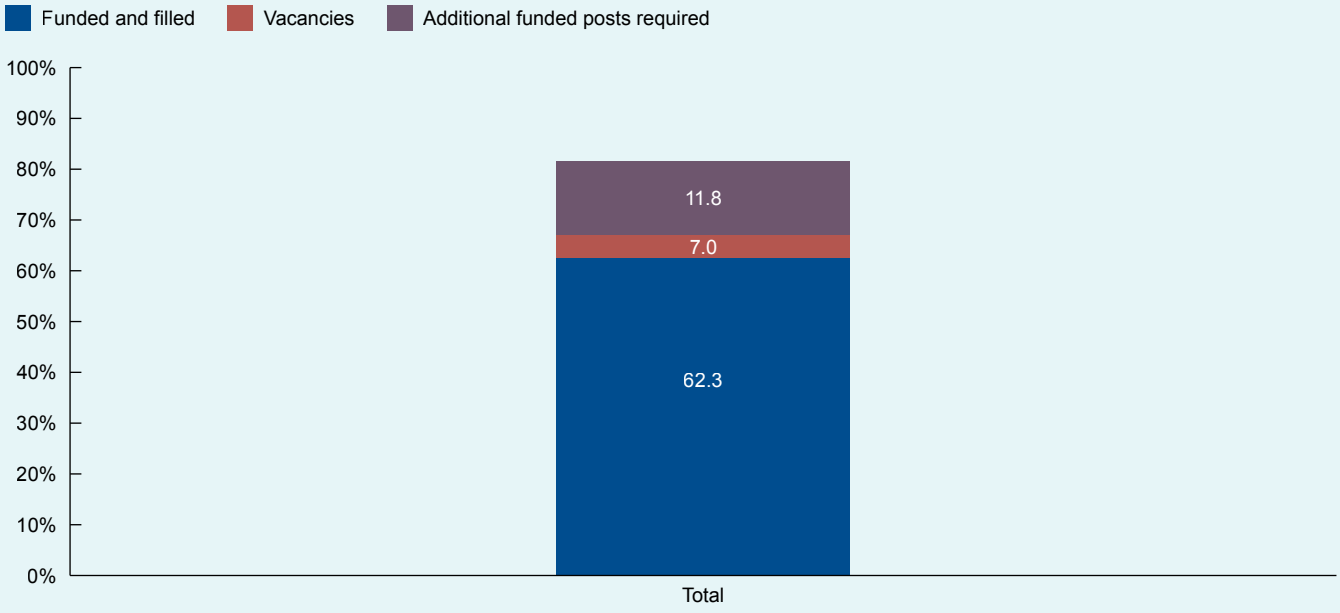
[v] *This is based on data reported to the BNS of current and ideal volume of DCCs across regions using an estimated scenario (8 DCCs = 1 WTE). This has been combined for a UK total. It is noted that some of these data were incomplete and therefore the WTE does not represent a full complement of consultants. Further, data is not available for Northern Ireland.*



Required workforce number

It is estimated that a total of 81.1 WTE (85 headcount) of consultant neuropathologists are needed.[vi] Based on this, we estimate that at least 1 WTE neuropathology consultant is required per 854,000 total approximate population to meet current needs.[vii] This is a crude national average and will vary for individual services.

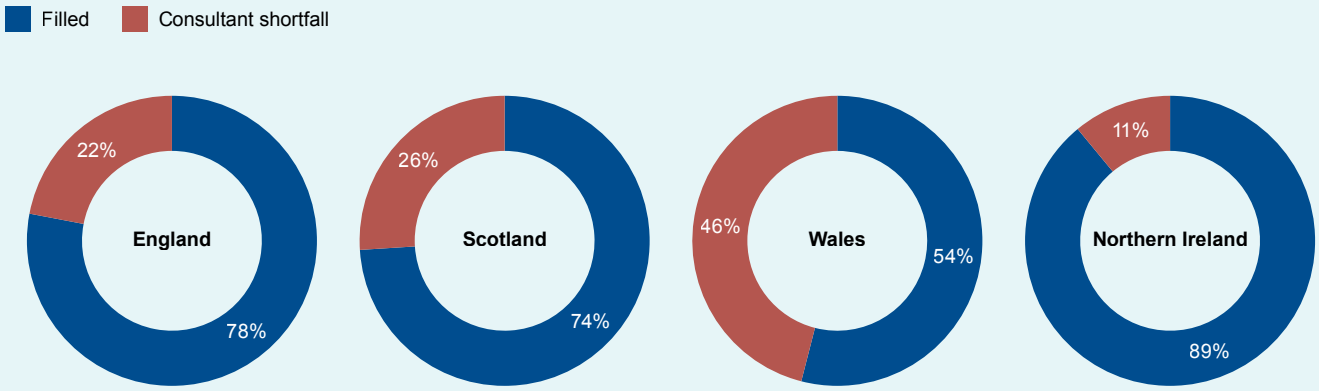
Figure 7: Number of neuropathology consultant posts filled, vacant and required to meet service demand across the UK at 1 WTE neuropathology consultant per 854,000 population.



[vi] *In our direct-to-service survey, services were asked if there are enough neuropathologists in their service to meet demand. If respondents stated they did not have enough, they were asked 'If all current posts were filled, or are filled, how many additional consultant posts would be required to meet clinical demand to maintain a resilient service?' Collectively across the UK, services answered that an additional 11.8 WTE consultant posts were required. With reported vacancies of 7.0 WTE, this represents a total 30% increase required on top of the reported current number of filled posts (62.3 WTE).*

[vii] *This figure is calculated by dividing the estimated UK total population at time of writing (as defined by the Office for National Statistics) by the total required workforce of 81.1. It is acknowledged that variation in demographics and service provision, including the type of work that consultants are doing (for example, some services may be more automated or less labour intensive, and some may be providing support for other services in different areas of the UK or may) means that this is a crude UK average. When applied against regions of the UK, the figures vary (e.g. London has more consultants than its population size owing to the large amount of work undertaken on behalf of the rest of the UK).*

Figure 8: Consultant neuropathologist shortfalls across the UK.



Applying these figures by nation illustrates the consultant shortfall by country.

- England currently has 53.5 WTE consultants in post and requires at least 68.6 WTE.
- Wales has 2 WTE consultants in post and requires at least 3.7 WTE.
- Scotland has 4.8 WTE consultants in post and requires at least 6.5 WTE.
- Northern Ireland has 2 WTE consultants in post and requires at least 2.3 WTE.

These figures should be used with caution owing to the small and fragile nature of the neuropathology workforce. This includes consideration of:

- headcount being higher than WTE to account for less-than-full-time (LTFT) working trends. Furthermore, only a proportion of each consultant's time will be available to provide DCC – for example, a neuropathologist employed by an academic institution is likely to have a reduced number of DCCs.
- the context of how services are arranged locally. For example, smaller services with lower workforce numbers – particularly in single-handed departments – may need more support via networks or mutual aid, liaison with colleagues for case discussion and maintenance of standards, and provision for periods of leave.
- the workload of each service. As an example, those performing post mortems have time-intensive work and would need more consultants per population than those undertaking mostly biopsy work. Larger departments may also benefit from efficiencies in workforce organisation. For example, consultants can rotate responsibilities so that, for a defined period, some consultants focus intensively on surgical biopsy reporting while colleagues cover other duties, allowing increased throughput. These efficiencies would need to be reflected in job planning.
- as a priority, services that are already struggling with service provision will need to have numbers increased to allow for these needs to be met, in addition to allowing time for increased focus on research in some areas.



Increasing demand

Neuropathology services across the UK are experiencing sustained increases in workload, particularly with the integration of molecular techniques. There has been no commensurate growth in filled consultant posts.

Workload data covering 2020–2023 was supplied by the BNS. More recent data was unavailable at the point of data collection.[viii] Data collected included:

- diagnostic workload (slides, cases, procedures)
- post-mortem activity
- molecular neuropathology workload
- MDT commitments.

Diagnostic case mix and complexity

Neuropathology cases encompass a wide range of diagnostics including brain tumour classification, non-neoplastic disorders (e.g. cerebral vasculitis and neuromuscular disease) and pathology involving meninges, skull and related structures.

This diversity, combined with newer international diagnostic requirements, has increased minimum diagnostic work per case, even where total case numbers appear stable.

> “Management feel caseloads are stable. However, the complexity of these cases now and the minimal diagnostic requirements for each area has exponentially risen. The new WHO diagnostics require molecular tests. As we wait for molecular testing, our clinical colleagues are frustrated that a diagnosis hasn’t been reached – when 10 years ago a tumour would have been named the same day and report released. Clinical colleagues hate the waiting and communicating uncertainty.”

[viii] *The impact of COVID-19 has not been specifically considered, but it is recognised that this may have affected the data collection period.*

UK and national trends

Based on total cases, the UK-wide diagnostic workload shows an average 4% increase in cases per year between 2020 and 2023.[ix] Even though there may be limitations to this data, services inform us anecdotally that sustained workforce pressures are increasing workload.

Historically, more time was spent on reporting histology, which was labour intensive. More recently, histopathological workload has reduced significantly owing to molecular reporting. Although less time is spent on histology, the increased complexity and range of data collected means that more time is spent on analysing and reporting on data for each case. An overall increase in the slide counts per case is reported, however, only 1 year of data is available. It is acknowledged that ratios will vary due to differences in case mix, local practice, availability of specialist services and how data is recorded.

To illustrate overall UK diagnostic activity and highlight the variability in growth across different case types, the tables below summarise reported UK-wide case totals and category between 2020 and 2023.

Table 1: Reported total diagnostic cases (2020–2023).

Country	2020	2021	2022	2023	Growth per annum
England	16,887	17,661	17,283	18,398	2.9%
Scotland	2,594	3,283	3,890	3,522	10.7%
Wales	585	451	722	690	5.7%
UK	**20,066**	**21,395**	**21,895**	**22,610**	**4.1%**

Table 2: Reported UK diagnostic neuropathology cases by category (2020–2023).

Type of case	2020	2021	2022	2023
Neurosurgical cases	14,019	14,899	13,995	14,436
Muscle biopsy cases	987	1,126	1,170	1,202
Nerve biopsy cases	255	342	475	348
Electron microscopy cases	334	414	581	608

[ix] *Data was collected on cases for: neurosurgical, muscle biopsy, nerve biopsy, electron microscopy, intraoperative smear/frozen section cases and cytology cases. The average annual increase across all case types is 4%. There are limitations to the data. No data was provided for Northern Ireland. Figures exclude centres where data was not supplied so data reflects trends but not total numbers. As data was not collected on cases (only slides) in 2020 and 2021, some data from these years is estimated based on average UK slide-to-case ratios. There may be errors due to complex and often inconsistent data collection methodologies across departments. COVID-19 may have also impacted data as cases may have increased as services returned to normal.*

Multidisciplinary time

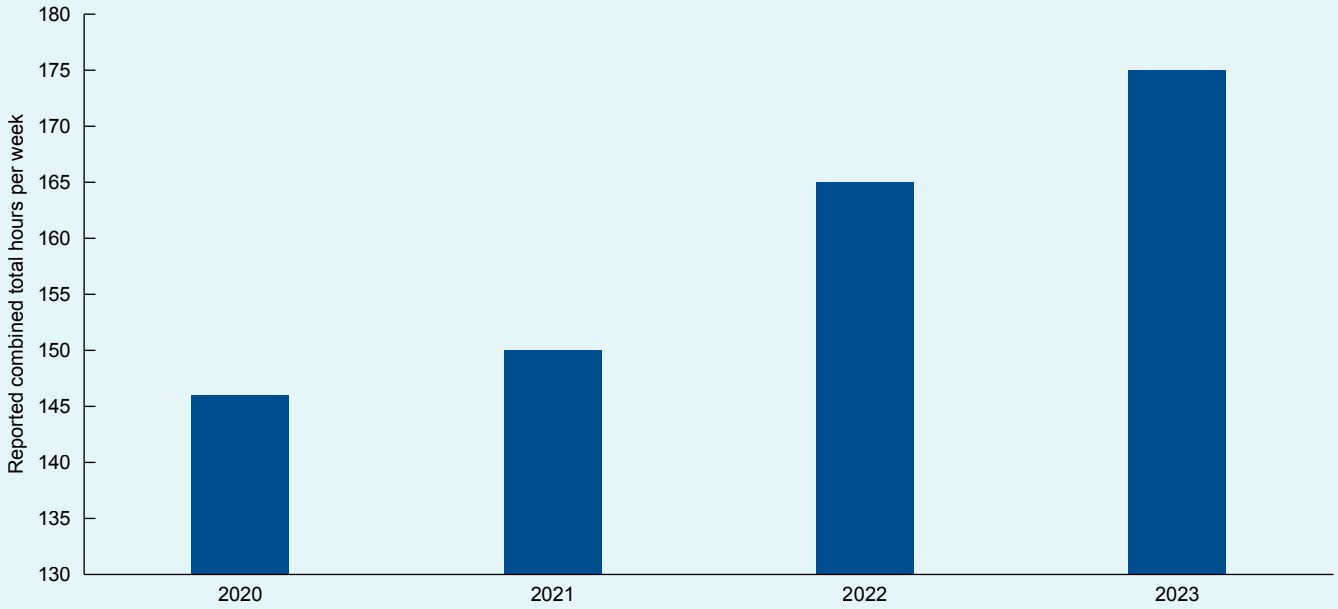
Neuropathologists are core members of formal MDTs and work closely with clinical colleagues including, but not limited to, neurology, neurosurgery, neuroradiology, oncology, radiotherapy, and other specialty areas such as rheumatology, ophthalmology, endocrinology and haematology.

Neuropathologists provide key diagnoses and prognostic oncological information that are central to treatment planning and to the timeliness of treatment. They also attend informal meetings for non-oncological disorders such as neuromuscular disease. Some neuropathologists also provide networked services.

From 2020 to 2023, MDT workload increased by an estimated 6% per annum, reflecting both rising case complexity and expanding clinical pathways.[x]

The College is engaged in work to reform MDTs in cancer care, recognising the need to streamline this vital work to make efficient use of clinician time, reduce delays and improve equity of access and patient outcomes.[4]

Figure 9: Reported combined total hours spent per week on MDT by all consultants (UK).



[x] *Limitations are noted in that there may be variation in how services account for MDT time, e.g. some may only count how long consultants attend for, while others may count the full length of the meeting.*

Molecular neuropathology

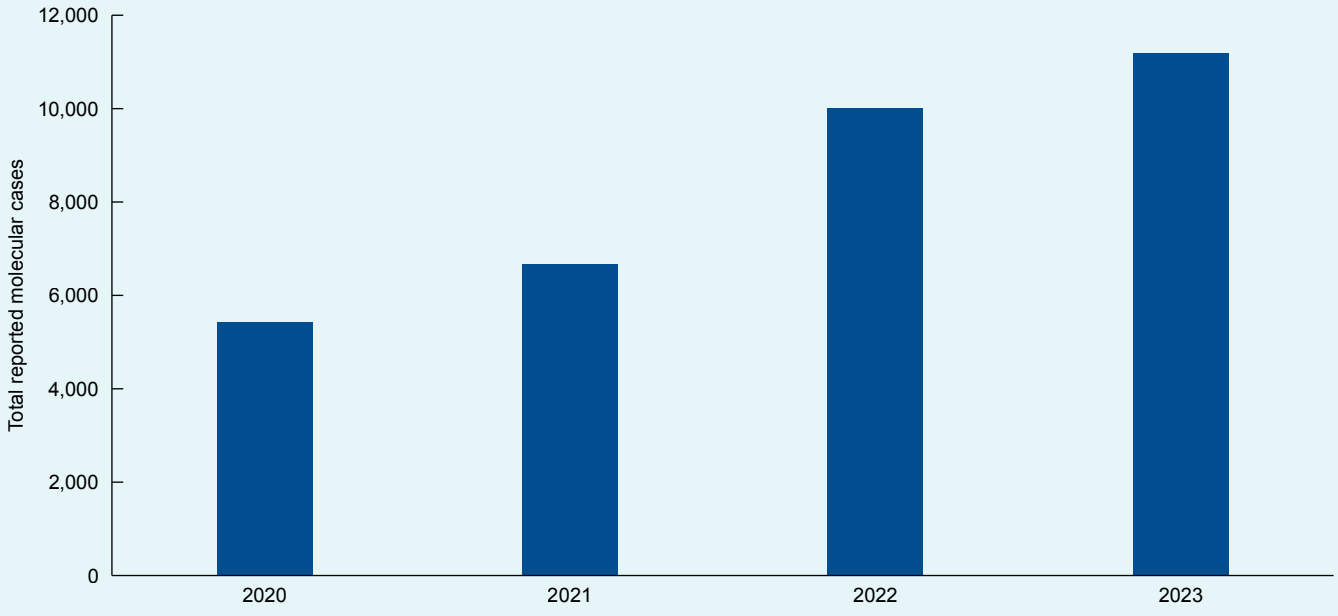
Microscopy in neuropathology is often supplemented by molecular investigation, which is increasingly important for diagnosis, prognosis and the prediction required for personalised medicine. In recent years, neuropathologists have developed a knowledge of molecular pathology in addition to morphology and the understanding to be able to combine molecular, morphological and clinical information to reach an integrated diagnosis.

Across the UK, the number of molecular neuropathology cases has increased sharply, increasing by an average of 29% per annum between 2020 and 2023.

This is supported by a publication on transforming molecular neuropathology for adult brain tumour patients in the UK, which highlighted that the total number of samples submitted for genomic testing increased by 128% between 2021 and 2024. The study confirmed that national investment has substantially expanded molecular diagnostic capacity but highlighted the need for parallel workforce and pathway redesign to translate capacity into faster turnaround.[5]

It is acknowledged that not every molecular development necessarily increases consultant workload. Complexity, external testing, internal testing, automation and service configuration affect centres differently.

Figure 10: Total reported neuropathology molecular cases (UK) 2020–2023.



Shift in molecular case complexity

Complexity data was provided for 2022 and 2023 only. Although we only have data for 2 years, this demonstrated an increase in complex cases and a higher proportion of complex cases compared with basic.[xi]

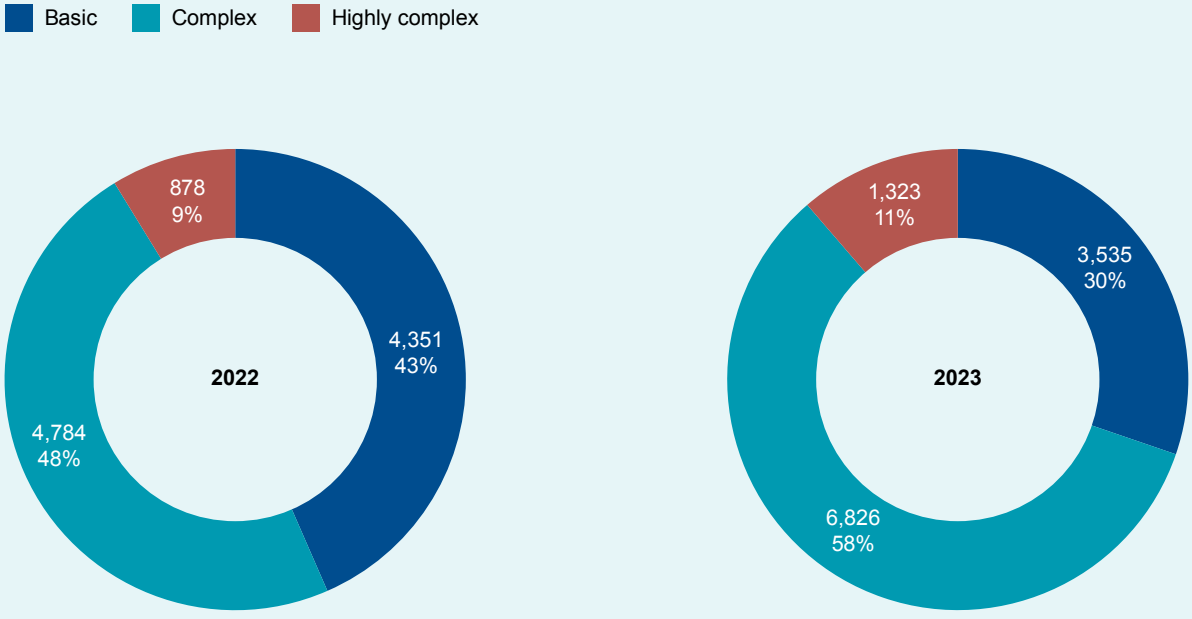
Increased complexity is driven by more neurosurgical interventions, and referrals for rare conditions – including brain tumours – requiring full molecular workups. This is alongside growing demand for methylation profiling – an advanced molecular (e.g. DNA) test used to classify brain tumours and guide treatment decisions more accurately. Advances such as nanopore-based sequencing, which promise ultra-rapid, near-patient tumour classification, will further impact workload.

These advances are welcome and investment is needed in both neuropathology and more broadly across cellular pathology to deliver these. Workforce issues need to be resolved to allow development of these technologies as well as ease key service pressures.

Between 2022 and 2023:

- basic molecular cases decreased by 19%
- complex cases increased by 43%
- highly complex cases increased by 51%.

Figure 11: UK reported molecular cases by complexity.



[xi] *This data is based on how services categorised data. Typically, basic molecular testing refers to routine, targeted assays (e.g. single-gene or limited marker tests) used in standard neuropathological diagnosis, typically deliverable in local or regional laboratories. Complex testing involves large panels or methylation array requiring specialist infrastructure and interpretation. Highly complex typically includes whole genome sequencing (WGS). Percentages are rounded and may not add up to 100%.*

Neuropathology post-mortem (autopsy) workload

Neuropathologists play a critical role in post-mortem services, providing specialist expertise to determine causes of death and clarify complex circumstances.

Their work spans a wide range of cases, including head injuries, road traffic accidents, sudden unexplained deaths (such as epilepsy) and public health concerns like meningitis. They often collaborate with forensic pathologists and require dedicated facilities for high-risk cases.

Neuropathology is essential for confirming diagnoses in neurodegenerative conditions, such as dementia, which can only be definitively assessed post mortem, and neuropathologists frequently provide vital information for clinicians and families.

Neuropathologists may carry out full post mortems, or brain only post mortems focusing solely on the brain (and sometimes spinal cord).

Post-mortem services for neuropathological diseases are provided for both hospital-consented cases and for coronial cases (procurator fiscal cases in Scotland). Currently, there is only a small pool of individuals who have time allocated to perform this complex type of work.

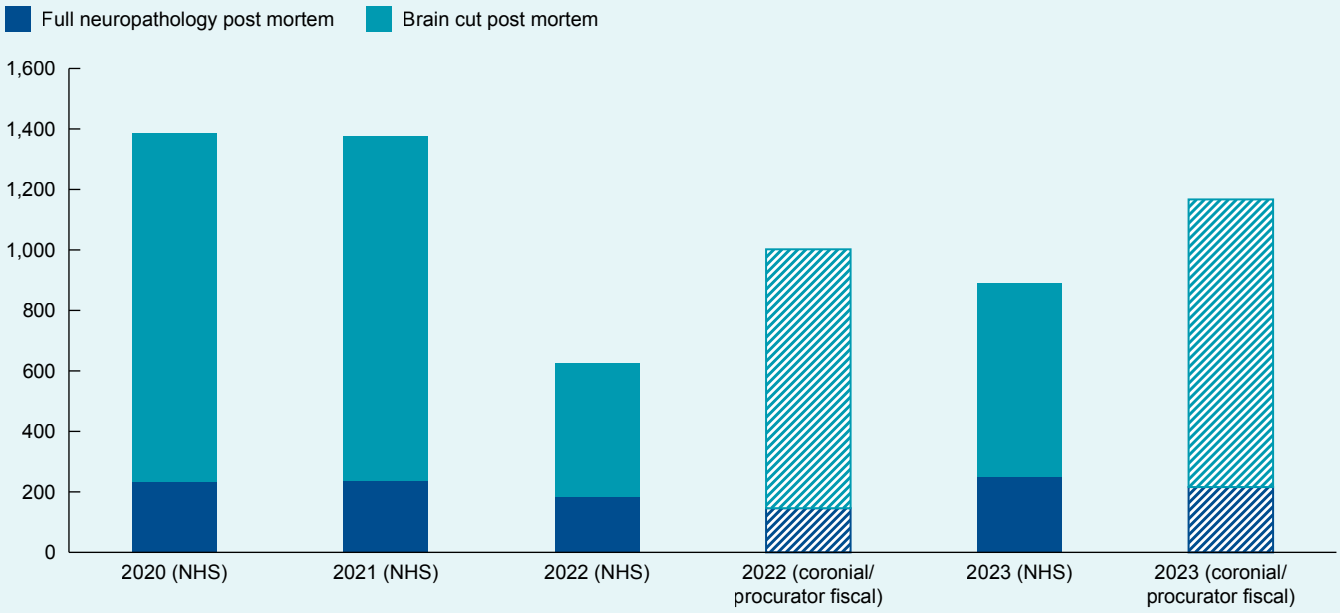
The figures below show diverging trends in post-mortem workload across NHS and coronial settings. Overall, trends indicate that NHS post mortems fell substantially between 2020 and 2023, while coronial post mortems rose between 2022 and 2023. There are multiple reasons why the number of NHS post mortems may be decreasing, which may include the introduction of the medical examiner system in England and Wales.[xii] This suggests that demand for post mortems is changing in terms of origin, rather than there simply being less need for the service overall. It is noted that this is estimated data and not all centres keep an accurate recording of post mortems.

The neuropathology curriculum is currently being reviewed. For neuropathologists, it is important to retain a dedicated workforce to undertake post mortems to be able to correlate imaging data with post-mortem tissue data in the context of capacity issues and declining interest across pathology.[xiii] Key to this will be ensuring that those interested in undertaking post mortems continue to have focused exposure and professional development opportunities to do so.

[xii] *The 2025 report of the Chief Coroner to the Lord Chancellor noted that the year 2025 marked the first full year of operation of the statutory medical examiner system across England and Wales. Early feedback suggests improved consistency in the scrutiny of natural deaths and greater clarity around referrals to coroners.*

[xiii] *Data from the Workforce Census 2025 found that a quarter of consultants who currently undertake autopsy work intend to give it up in the next 5 years, and that 56% of histopathology residents do not intend to take the Certificate in Higher Autopsy Training (CHAT). Among those intending to stop performing autopsies, the most selected reasons for giving it up include increased overall workload/time constraints (48%), lack of interest/preference (40%) and lack of adequate remuneration/incentives (38%). Pathologists cite that they frequently do not have the time to train and trainees report variable training experiences which affects their interest in taking on this work in future.*

Figure 12: Total reported neuropathology post mortems (2020–2023) in the UK.



Why are workload and demand increasing in neuropathology?

Demand is rising due to greater diagnostic complexity and the expansion of testing requirements.

Modern practice mandates integrated diagnoses that combine histology, immunohistochemistry and increasingly complex molecular tests, with WHO brain tumour classifications requiring molecular data for many tumour types. Only a proportion of the current consultant workforce has the skills and training to undertake this more complex testing. These multi-step processes are time-consuming and often involve offsite testing in Genomic Laboratory Hubs, adding coordination delays.

Neuropathologists must interpret and integrate these results into detailed reports, while time-sensitive conditions such as brain tumours and cerebral vasculitis require rapid turnaround to prevent clinical deterioration. MDTs often need preliminary reports before molecular results are available, leading to multiple reporting stages. The entire process dictates the turnaround time rather than the neuropathologist review. This can take several weeks. Optimal service models need to be considered to make the most efficient use of the workforce.

An ageing population adds to demand through increased prevalence of dementia and neurodegenerative diseases, while complex disorders like cerebral vasculitis and neuromuscular diseases require specialist tissue-based diagnosis using non-standard methods such as enzyme histochemistry, resin embedding, teased fibres and electron microscopy. Electron microscopy is a specific area for workforce concern with the number of pathologists trained in this procedure diminishing, putting pressure on those remaining.



> “Additional funding to support digital pathology set up to work as it’s expected to would be fantastic.”

How is excess demand managed?

Neuropathology services employ a range of strategies to manage excess demand and maintain patient safety.

- Automation of key laboratory processes can save time. Digital pathology is increasingly used to share cases between centres, but its adoption for primary diagnosis remains limited owing to inequitable investment, so efficiency gains are limited in some areas.
- Departments often prioritise urgent cases – such as neurosurgical, muscle and nerve biopsies – over post-mortem work, outsourcing where necessary. Clear prioritisation systems ensure that time-sensitive cases, including brain tumours and inflammatory lesions, are reported promptly. Routine cases are managed through monitored backlog systems. Escalation protocols, including waiting list initiatives, are triggered during staff absences. However, these measures are temporary solutions; long-term sustainability requires systemic investment in workforce, infrastructure and technology.
- Networked services can distribute workload, while support from general histopathology teams can provide resilience. Formal agreements with external neuropathology laboratories provide short-term cover during periods of adversity, and some departments have extended service-level agreements with other pathology providers to maintain continuity. Efficient service models are needed between neuropathology, histopathology and molecular pathology to reflect integrated diagnostic practice and encourage collaborative approaches to reduce unnecessary workload drivers (e.g. excess blocks, immunohistochemistry).
- Professional bodies continue to develop and follow clear national guidance for managing workload during periods of adversity, such as RCPath Best practice recommendations: Staffing and workload for neuropathology departments.[6] Workload modelling tools, for example the Diagnostic Neuropathology Workload Toolkit, help ensure fair case distribution and prevent overload.[7]

Effect on patients

Workforce shortages – combined with challenges in referral logistics, genomic laboratory capacity, batching and informatics – are reported to be affecting patients who are waiting for diagnosis and treatment. Families of people who have died are waiting longer for answers about their death.

NHS targets for cancer treatment turnaround times are harder to meet because integrated diagnoses now require multiple steps and molecular results. Inadequate staffing and increasing demand are causing families to wait longer for post-mortem results. Samples can take time to reach the right laboratory and there may not be enough capacity to process tests – or samples may sit waiting for a full sequencing run (batching). Analysis and interpretation of genomic data can be slow due to shortages in informatics systems or expertise.

Data on turnaround times across all of neuropathology is difficult to capture. There is potential to use Laboratory Information Management Systems (LIMS) or supplementary reports, or even genome laboratory data, but this has limits. The increased complex testing landscape and increased processes – particularly around molecular testing – makes it challenging to separate out the time for the neuropathology reporting specifically. However, anecdotally many neuropathologists report delays that effect patients.

This is supported by a recent report from the Tessa Jowell Brain Cancer Mission which found that NHS pathology pathways face challenges in keeping up with growing demand. This found that molecular diagnosis turnaround times rose between 2021 and 2026 from 17 to 21 days and centres meeting a 14-day turnaround time dropped from 50% to 25%.[8]

Many conditions (e.g. brain tumours, cerebral vasculitis) are time-sensitive. Delays in diagnosis can lead to clinical deterioration and increased anxiety for patients and families. Molecular testing is essential for accurate classification and prognosis. If turnaround times are slow, treatment decisions may be delayed or based on incomplete information.

Patients may experience longer waits because cases often need to be discussed multiple times at MDT meetings – first with preliminary findings, then again after molecular results.

There is major impact on paediatric patients – paediatric brain tumours require full molecular workups, which are complex and time-consuming. This can delay treatment for children with aggressive cancers. This is compounded by the effect of the crisis in the paediatric and perinatal pathology workforce.[9]

There is a risk of inequity as centres with fewer resources or slower molecular turnaround may provide less timely care, creating regional disparities in patient outcomes. Geographic disparities in genomic testing including brain tumour sampling and test availability across the UK also exist.

Many consultants also report that excess workload is limiting their time and ability to participate in service development and research. This has a negative impact in terms of overall service provision and innovation and reduces access to clinical trials for people with brain tumours.

> The most significant impact on patients has been delayed diagnoses due to extended turnaround times, particularly where molecular testing is outsourced. In many cases, treatment is initiated based on interim results to prevent delay, but this approach carries the risk of errors. Given the aggressive nature of many brain tumours, neuropathology requires faster turnaround times than are currently supported. Unfortunately, there is often limited understanding, even among laboratory staff, about the urgency of these cases and the clinical rationale for prioritisation. This disconnect directly affects the timeliness and quality of patient care.



Case studies

Brain Tumour Research Centres of Excellence

Brain Tumour Research provides long-term funding to dedicated Brain Tumour Research Centres of Excellence at key academic institutions. The Centre located at the Queen Mary University of London is led by Professor Silvia Marino, Professor of Neuropathology. Work is focused on developing personalised treatments for glioblastoma in adults and discovering gentler, more specific and effective therapies for childhood brain tumours, including medulloblastoma, diffuse intrinsic pontine glioma (DIPG) and ependymoma.

This innovative approach is paving the way for personalised treatments for glioblastoma patients, offering hope for more effective and tailored therapies. This can only be achieved with investment in the workforce with time for research.

BRAIN UK and the importance of research funding

BRAIN UK at the University of Southampton is the first national virtual brain tissue bank, a unique and hugely important resource for researchers working across the UK, funded by Brain Tumour Research. It maintains a unique database of more than 120,000 tumour tissue samples from NHS and academic pathology centres across the UK, enabling researchers to access rare and valuable specimens for studies into brain tumours and other neurological diseases. To date, more than 3,200 tissue samples have been supplied to research projects, helping to advance understanding of tumour biology and improve opportunities for developing new treatments.

The initiative demonstrates the critical contribution of neuropathologists to research infrastructure, as its success relies on the long-term collection, classification and preservation of tissue samples across the UK. Research funding has been essential in establishing and expanding the resource, supporting innovative services such as rapid ethical approval processes and facilitating access to rare tumour samples that would otherwise be difficult to study. Continued investment in research infrastructure – including the neuropathology workforce – is vital to accelerate discoveries in brain tumour diagnosis and treatment, strengthen the evidence base for patient care and support future advances across neuroscience more broadly.

How the workforce feels

Increasing workload and persistent challenges with recruitment and vacant resident posts are leaving the workforce feeling stressed and overworked.

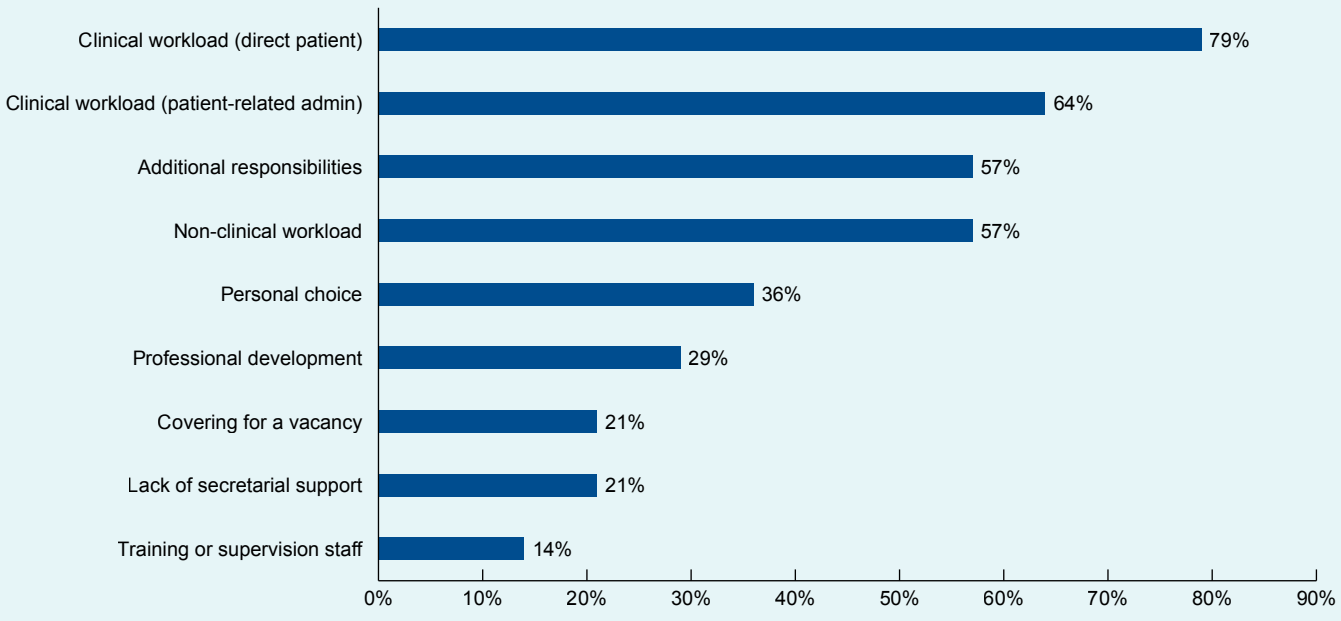
Increasingly complex workloads are leaving the neuropathology workforce stretched, with little time for professional development and research in line with findings from the broader pathology workforce in the 2025 Workforce Census.[10]

Consistent with the broader pathology workforce, of those neuropathologists who responded to the census, 60% reported that in a typical week they work beyond the number of hours or PAs than in their contract. Of those working more hours or PAs their contract, 86% were always or often working these additional hours without pay, indicating the system is critically reliant on goodwill.

The main reasons for working more than their contract per week were excessive workload (both clinical and non-clinical) and additional responsibilities (e.g. leadership roles, working for specialist societies).

> “Poor estate, lack of or unsuitable pathologist offices/workstations, micro-management, irrational administrative burden are main detractors for work satisfaction.”

Figure 13: Reported reasons by neuropathologists for working beyond contracted hours.



- The 3 biggest factors adversely affecting wellbeing at work were reported to be administrative burden (67%), poor functioning IT (54%) and interference by senior management in departmental matters (42%).
- The average number of supporting professional activities (SPAs) for a neuropathologist is 1.75, broadly aligning with the pathology average of 1.8, but less than the 2.5 recommended by the Academy of Medical Royal Colleges.
- 20% of neuropathologists did not agree that they had time to participate in the development of the profession (e.g. volunteer roles, NHS oversight groups and research activities) compared with 38% of the wider pathology workforce. This may reflect the more academic nature of some neuropathology roles.
- Neuropathologists report higher levels of stress than the overall pathology workforce with 57% reporting that they are always or often stressed at work compared with 47% for the overall pathology workforce.
- Consistent with the broader pathology workforce, neuropathologists highlight challenges in relation to the resources provided to them, including poor infrastructure and lack of administrative support.
- Respondents noted that retaining experienced consultants in practice requires investment in attractive workplaces. This includes upgrading IT systems, estates and access to digital resources (e.g. WHO Blue Book, remote access), as well as promoting flexible rotas, part-time options, remote working, sabbaticals and work-life balance initiatives to reduce burnout and create attractive workplaces. Research opportunities where desired were also seen as key.
- Improved understanding among management of neuropathology's distinct needs, especially when integrated into larger pathology departments, was also noted as a way to improve morale and wellbeing.

> "Lab staffing levels are a serious issue and morale is very low. This doesn't seem to be being addressed or taken seriously."



Leaving the profession

We predict that 29% of the consultant workforce will retire in the next 5 years. This is a very high expected retirement rate that would destabilise the profession in future years. Aside from retirement, more may leave in response to unsustainable workloads and service pressures.

Our data shows that half of the current consultant workforce is over the age of 55 and the average intended age for retirement of a neuropathologist is 65 – older than the pathology average of 63. Based on a retirement age of 65 we predict that:

- 15% of the neuropathology consultant workforce will retire in 2 years (10 consultants)
- 29% of the neuropathology consultant workforce will retire in the next 5 years (19 consultants)
- 47% of the neuropathology consultant workforce will retire in the next 10 years (31 consultants).

The methodology used to make these calculations has some limitations that may underestimate or overestimate intended retirements.[xiv]

The number of neuropathologists nearing retirement may reflect natural demographics. It is further acknowledged that the flexible retirement age in the UK provides scope for neuropathologists to work beyond the expected retirement age.

Additional losses to the workforce may also materialise from other personal circumstances. Currently, data specific to consultant neuropathology leavers for reasons other than retirement is limited. However, this is still an important factor to consider in workforce planning.

> “At the senior level, the biggest headache is the ever-expanding encroachment of compliance and governance departments that make life for academic and NHS consultants alike difficult but don’t enhance life for patients. I think this is driving early retirement for many of my colleagues or at least they are stepping back from additional work. Clearly pension restrictions loom large in senior consultant consideration.”

[xiv] *The expected retirement age is based on our 2025 Workforce Census. Members are asked at what age they intend to retire, which is mapped back to their current age to get an estimate of the year they intend to retire. Those who have not responded to the census are given the average intended age of retirement from the census (65 for neuropathologists). There are limitations to this method as there are also some unknowns (e.g. neuropathologists who are not members of the College) and some non-responders may retire earlier or later than 65. Furthermore, it does not account for any members who may reduce hours closer to retirement.*

Joining the profession

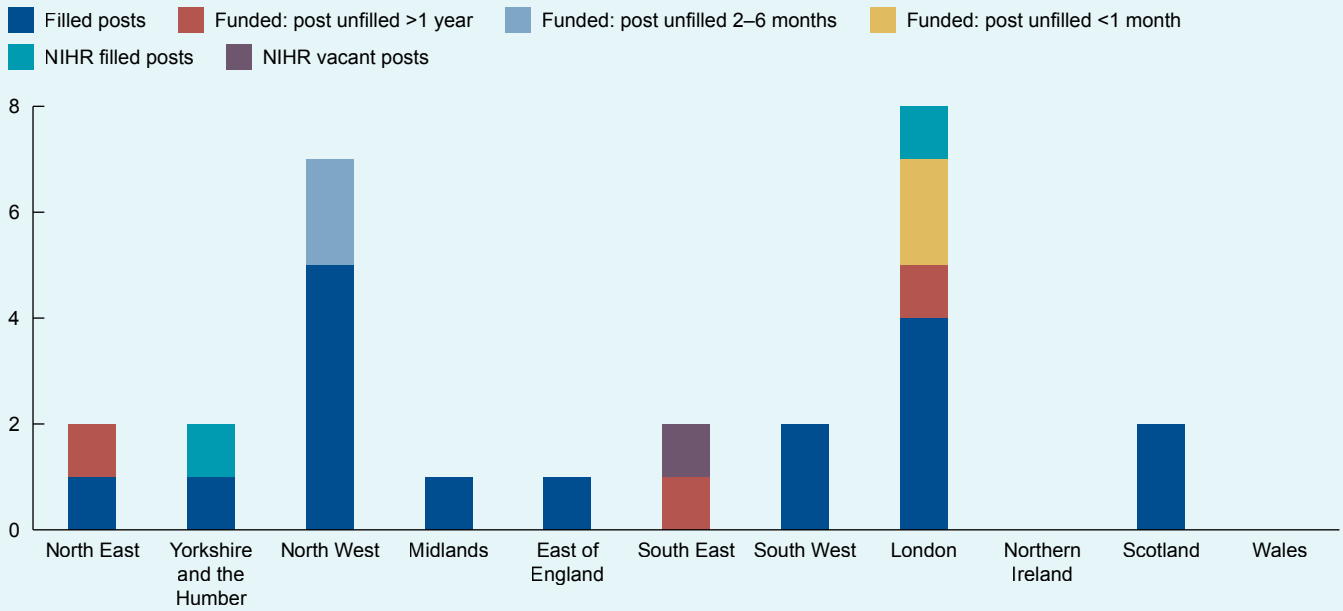
There are not enough doctors currently in approved specialist training posts for neuropathology and many posts remain vacant. Decreasing fill rates in recent years is particularly concerning in the context of rising expected retirements. This creates issues with recruitment to consultant posts and is a very real threat to ensuring a sustainable service for the future.

Resident doctors and educators

There are 19 residents currently in an approved specialist training programme for diagnostic neuropathology. Of these, 17 are in England – 3 of which are National Institute for Health and Care Research (NIHR) funded posts – and 2 are in Scotland. There are currently no residents located in Wales or Northern Ireland. In 2021, there were 17 trainees reported to be in post, which represents a minimal increase.

30% of all trainee posts are reported to be vacant (8 vacant posts out of 27 currently funded posts). Vacancies are not evenly spread across the UK, and there is variation between length of the vacancy.

Figure 14: Funded neuropathology training posts (2025).



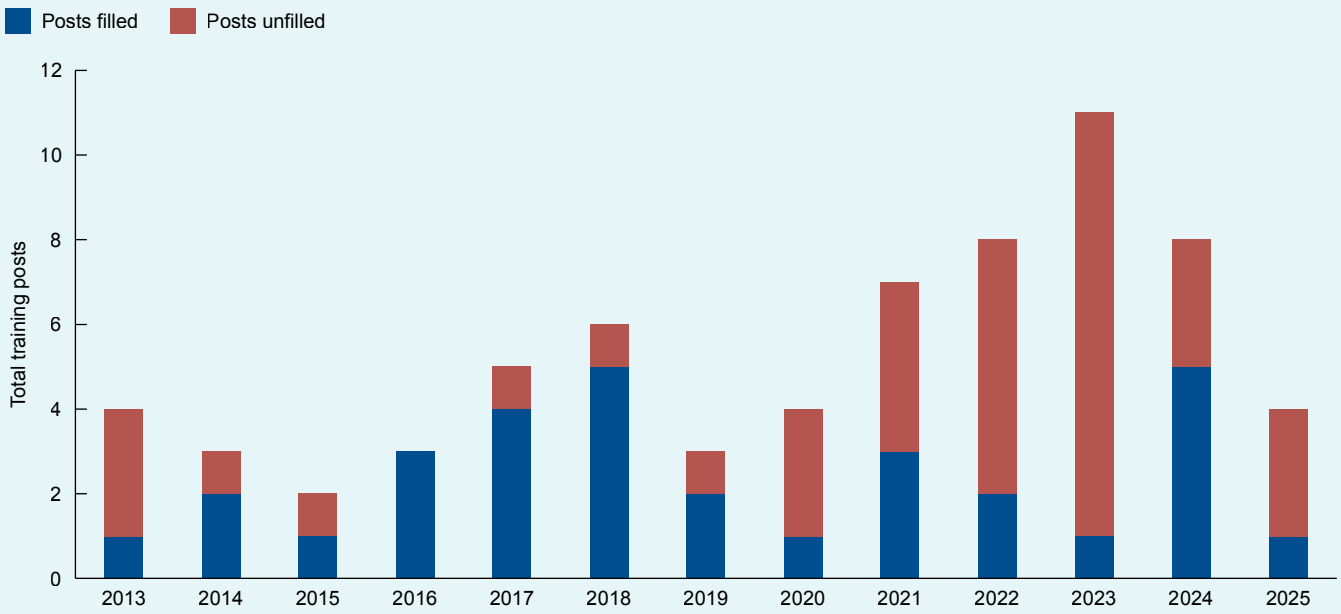
Applications to neuropathology training continue to be low, with large volumes of posts remaining unfilled around the UK since 2015.[11] Competition ratios are also historically low with frequently fewer applicants than posts, as illustrated in 2023 where there were only 2 applications for 11 posts.[12]

Even with a recent increase in the number of applications in 2025 where there were 8 applications for 4 training posts, only 1 of the 4 posts was filled. The reasons for this are unknown but are likely to reflect applicants accepting other specialty posts as higher preference.

Low competition and uptake rates are concerning when there is fierce competition across other medical specialties. Attractiveness of posts such as location, work type, workload or working environment – and/or a lack of awareness or understanding about neuropathology as a specialty training option – could be issues. This needs to be investigated and addressed, particularly as with the introduction of the Medical Training (Prioritisation) Act 2026,[xv] filling posts may become even more challenging.

> “Service is on the brink of collapse with no trainees in pipeline, unsupported service development and excess workload in already short-staffed service.”

Figure 15: Neuropathology fill rates (UK) 2013–2025.[xvi]



Data source: NHS England Fill Rates.

[xv] This was enacted to address the increasing competition for postgraduate medical training posts in the UK. The act prioritises UK-trained medical graduates and those with significant NHS experience over international medical graduates.

[xvi] Figure 15 outlines the total number of existing training posts available each year since 2013, and whether they were filled. It does not represent a specific vacancy rate and it is acknowledged that there could be discrepancies in the data, as posts may have been filled after the August recruitment round.

In 2021, it was recommended that the specialty needed to increase the pool of consultants required to meet the workload requirements.[2] Difficulties in attracting candidates to apply for trainee vacancies was also noted. Unfortunately, since then, although the number of available training posts has increased, the number of trainees taking up these posts has not increased.

As a small specialty, filling training places is critical to ensuring an adequate supply of new consultants. This situation cannot be ignored, as it raises similar patterns with the situation in paediatric and perinatal pathology 10 years ago – and those services are now in crisis owing to a failure to act early enough to avoid service collapse. Lack of succession planning will result in too few – or no – residents to replace retiring or departing consultants, ultimately leading to a breakdown in service provision.

It is important to fill these training posts while there are enough consultants to train the new workforce.

Barriers to recruitment in neuropathology training

Resident doctors enter the neuropathology training programme at ST3 after completion of integrated cellular pathology training (ICPT). Of those who responded to the 2025 Census, 7% of histopathology and integrated cellular pathology residents indicated an interest in pursuing ST3+ training options in neuropathology. This level of interest is likely to be insufficient to fill all available and vacant training posts. Lack of interest from those in training is also reported by some consultants as a barrier.

By 2028, 10 neuropathologists are expected to retire but only 8 residents are expected to have completed their training.



Funding for specialty training posts in England relies on deaneries funding 50% of residents' wages and the employing NHS trust funding the other half. This has led to a decrease in the number of neuropathology resident posts being offered due to difficulties with NHS trusts funding their component of salaries. Financial position or management resistance that fails to recognise the value of neuropathology posts in their service are also barriers.

Potential barriers to entering neuropathology – as highlighted in the 2023 workforce report – may include a lack of understanding of the role of neuropathologists, timing of neuropathology placements and having to do post mortems as a compulsory component of training. Further barriers may include not wishing to relocate for training – and then likely having to relocate again for a consultant post in a small specialty.

Current residents indicated that factors in their choice of neuropathology as a career included prior exposure to neuropathology and an existing interest in neurosciences. This provides useful information; however, it is limited in that it only reflects experiences of those who have already successfully entered training. Increasing exposure within medical training and foundation years is difficult to achieve — encouraging existing neuropathologists to undertake their own outreach to improve awareness could be an effective alternative.

Training programme challenges

At the time of data collection there were no training posts located in Wales or Northern Ireland. More recent GMC data indicates that training posts funded by Health Education and Improvement Wales exist but residents are typically placed in trusts outside of Wales. Small populations make it difficult to develop a comprehensive training programme, thereby making it unsustainable to meet GMC requirements, particularly when outsourcing molecular work limits opportunities for local training. This is different from London where services cover large regional areas that allows for a comprehensive training model by sharing resources.

There is need for sufficient consultant staffing and dedicated time for teaching and mentoring, and this is not always available. Supporting collaborative training models between centres could mitigate local resource constraints and provide flexible training opportunities for smaller departments – for example, by allowing residents to attend other centres for specific areas of training. This could also assist services in appointing their own consultants after completion of training.

Training quality is reported to be inconsistent across the UK, with some centres overemphasising molecular techniques at the expense of core histopathology and immunohistochemistry skills. The growing importance of molecular diagnostics is recognised and the lack of emphasis in the current curriculum is being addressed through curriculum updates that are underway. Supporting trainees to participate in day-to-day service delivery, which is balanced with focusing on exams, may leave them better prepared for independent diagnostic practice. Clearer national standards, consistent training and greater emphasis on hands-on, service-based learning are essential to ensure future consultants are competent and confident.

Required training numbers

Given the current significant training post vacancies, the priority should be on maintaining and filling existing established neuropathology training posts. Filling existing training places is critical to ensuring an adequate supply of new consultants to offset anticipated workforce losses, including through retirement. Consultant posts should be protected so that funding for these is not lost and trainees can secure consultant employment once they have completed training.

Once existing vacant training posts have been filled, an increase in training posts will be required to ensure a sustainable workforce long-term. This will allow for filling of existing consultant vacancies and service capacity expansion. RCPath has modelled the additional number of training posts required to meet this need.[xvii]

An additional 8.1 WTE (10 headcount) neuropathology training posts are needed within the next 5 years (by 2031) to replace consultant vacancies. There is need for an additional 13.6 WTE (16 headcount) training posts within the next 10 years (by 2036) to meet estimated demand for services. In total, there is need for an additional 21.7 WTE training posts (26 headcount) over the next 10 years to provide a safe and effective service.

Neuropathology residents are drawn from the pool of histopathology residents who have completed ICPT at ST1 and ST2 level. Any neuropathology-specific recruitment efforts must therefore be supported, in advance, by an equivalent increase in the number of histopathology residents at ST1.

Increasing LTFT training is a consideration for workforce planning. Flexible and capability-based training models currently in operation can support this.

[xvii] *RCPath has modelled the number of additional WTE trainees needed based on existing consultant vacancy rates, and the required workforce number to meet our estimate of current demand (see figure 7). This model assumes that all currently vacant training posts will be filled and, alongside existing trainees, this will be sufficient to replace expected retirements. The model also assumes that demand remains consistent over the next 10 years, and does not account for any potential changes to demand (e.g. through service reconfiguration or population changes). Figures have been adjusted to account for trainee attrition rates (including those who enter training who do not complete training, and those who, on completion of training, do not take up a substantive post). Trainee attrition rate for neuropathology is estimated as 15% based on internal College data and responses to the 2025 Workforce Census. Headcount has been uplifted by 20% to allow for LTFT working. These are working numbers based on the best available data we have. This methodology will develop over time as our data becomes more accurate and available and will be revisited periodically to ensure it remains fit for purpose.*

Additional opportunities to grow and support the workforce

The challenges in recruiting and retaining neuropathologists highlight the need to review the long-term sustainability of the specialty. As part of this there is need to consider whether changes to training and workforce development pathways are required to meet future demand.

It is recognised that even if more training posts are created, owing to the challenges in recruitment, these may not be filled. Additional opportunities exist to grow and support the workforce. Supporting international medical graduates to join the profession via the increased use of the Portfolio Pathway to help fill existing consultant vacancies, and upskilling histopathologists to support post-mortem work, present opportunities. Roles for non-medical scientists in consultant-led services – such as biomedical scientist reporting programmes – are other options for investigation.

Upskilling histopathologists could assist, although feedback from other specialties where conversion fellowships have been piloted – such as paediatric and perinatal pathology – suggests low uptake. This also has the impact of drawing consultants away from the cellular pathology workforce, which is struggling itself with workforce shortages.

Re-instating entry routes from neurology and related specialties is an option, although uptake from residents was also previously low, partly owing to challenges in asking trainees to leave run-through programmes. Further consideration of evidence of the benefits of introducing these is warranted before these are recommended for implementation.



College recommendations

The neuropathology workforce requires longer term commitment to train more consultants to meet the required level across the UK to avoid service collapse. Investment is also needed in academic components of consultant roles to ensure the future of high-quality and sustainable neuropathology services, research and innovation for patients across the UK.

Train



- Services should prioritise maintaining and filling existing training posts and protect all currently funded consultant posts so that trainees can fill these vacancies once they have completed training.
- Services should consider collaborative training models between centres to support smaller departments in training and subsequently appointing their own consultants. Where local opportunities are limited, flexible approaches should be considered.
- Once the established training posts are filled, training posts across the UK should be expanded by 21.7 additional WTE training posts (26 headcount) over the next 10 years (by 2036) to provide a safe and effective service. 8.1 WTE (10 headcount) of these should be delivered by 2031 to ensure that there is adequate succession planning in place for neuropathology. This should be supported by an equivalent increase in the number of histopathology residents at ST1.
- Services should support consultants by including adequate dedicated time for teaching and mentoring in their contract – ideally 2.5 SPAs. This should include time to strengthen academic mentorship and ensure trainees gain exposure to the full breadth of neuropathology (non-neoplastic pathology, post-mortem work and clinicopathological correlation).
- The College should continue the curriculum review process to ensure consistent, high-quality training across the UK, including alignment with current practice and future demands, such as molecular diagnostics and interpretation of AI-generated data.
- The College and other professional bodies to consider opportunities to upskill histopathologists to support post-mortem work, increase use of the Portfolio Pathway and consider how non-medical scientists can be best utilised to support consultant-led services.
- Neuropathologists should promote the specialty through engagement with general pathology trainees and targeted outreach to medical students and resident doctors and emphasise that neuropathology offers diverse career opportunities beyond academia.

Retain



- NHS bodies should provide dedicated administrative support to reduce non-clinical burden.
- NHS bodies should include research time as part of protected time in neuropathology roles.
- Neuropathologists, services and the College should work together to improve understanding among management of neuropathology's distinct needs, especially when integrated into larger pathology departments.
- NHS bodies should implement retention incentives for experienced consultants to remain in practice. This includes upgrading IT systems, estates and access to digital resources (e.g. WHO Blue Book, remote access), as well as promoting flexible rotas, part-time options, remote working, sabbaticals and work-life balance initiatives to reduce burnout and create attractive workplaces.

Reform



- Governments in all 4 countries must invest in IT infrastructure and LIMS to support digital pathology adoption and pan-digital reporting across the 24 services. This will enable cross-cover and collaborative working across regions and support better workload capture to understand the true extent of demand increases.
- Networked services should be created linking smaller hospitals with neuroscience centres via digital pathology to share expertise and reduce geographic disparities. Services with low workforce numbers should be supported to enable their own recruitment initiatives as required.
- Governments to invest in clinical academic posts that enable joint opportunities to combine clinical and research roles. This should be done by encouraging innovative partnership models with academic and research bodies.

Contingency



- Professional bodies to continue to develop and follow clear national guidance for managing workload during periods of adversity, such as RCPath Best practice recommendations on staffing and workload for neuropathology departments.[6] Consider ways to standardise reporting protocols to streamline diagnostic processes and integrate molecular data efficiently.
- Services to document robust prioritisation systems for urgent cases (e.g. brain tumours, inflammatory lesions) and monitor backlog size with escalation protocols (e.g. waiting list initiatives) during staff absences. Support prioritisation through collaboration with cellular pathology teams for urgent immunohistochemistry and molecular testing.
- Services to continue to refine service specifications for networked neuropathology services and strengthen mutual aid agreements between centres to provide short-term cover during consultant absences.
- Continue advocacy and best practice development by professional bodies such as the Royal College of Pathologists and the British Neuropathological Society to support systemic improvements.

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The Royal College of Pathologists, 6 Alie Street, London E1 8QT

Tel: +44 (0) 20 7451 6700 | Email: info@rcpath.org

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