Review of the NHS (Wales) Workforce – Call for Evidence Questions

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Integration of health and social care

The identification of new models of service delivery which are at the forefront of the integration of health and social care along with an analysis of the barriers experienced by such models and associated ways of working. We would welcome you views in this regard and in particular we would welcome your views concerning:

How have other countries/health systems adapted to meet exponential increases in demand for health and social care provision?

Not known

What factors have led to the increases in demand for provision within these countries/systems?

The discipline of cellular pathology serves all areas of practice where it is required to establish a diagnosis and provide clinical advice on management based upon examination of tissue taken from a patient.

- Several national cancer screening programmes are reliant upon services delivered by cellular pathology, especially cytopathology.
- Patients and the public expect a pathology service that provides reliable and timely results that meet the clinical requirement for information that guides patient management. Indirectly, tax payers require a service that is cost effective i.e. the community as a whole wants more activity at lower cost.
- The NHS cancer initiatives emphasise the need for early diagnosis as well as access to new therapies. Histopathology is central to delivery of this strategy linked to:
  - increasing the uptake of cancer screening
  - increasing early diagnosis of cancer
  - ensuring that all patients have access to the best possible treatment
- There is constant pressure to reduce turnaround times to meet service expectations. A shorter turnaround time can only be achieved 100% of the time if staffing levels are sufficient to accommodate fluctuations in workload i.e. staff level to cope with maximum workload rather than minimum or average workload.
- Workload in terms of crude sample numbers or requests is increasing by 1-3% each year (Keele benchmarking datasets) and varies between different services (no. requests and no. specimens). This crude increase belies the greater real increase in actual workload as scientific advances in our understanding of disease and the wider range of therapeutic options, mean that more detailed work is required on more specimens. This crude increase is not distributed evenly within all areas of cellular pathology and there are no reliable data to inform workforce planning. The latest information available to us for Keele datasets suggest around 50% year-on year increase in sections and stains being performed 2010/11-11/12.
- This increasing complexity of reports, for example as evidenced in cancer dataset publications, is an indirect measure of quality and clinical need.
- There is only limited scope for demand management in cellular pathology, although the use of agreed datasets for reporting is valuable in containing clinical expectations.
- Demand is driven by the increasing complexity of medical investigation requiring more accurate

diagnosis before treatment, and the increasing range of options for targeted drug therapies (molecular genetic characterisation of disease) linked to personalised medicine agenda. There are some illustrative examples later in this response document.

- Increasing numbers of cases now require consensus reporting and/or tertiary referral for specialist cellular pathology opinion – reflects increasing sophistication of diagnostic process and a risk-averse culture. There are emerging audits that suggest a possible 10% change in diagnosis, affecting immediate management decisions. This creates problems with availability and capacity of trained specialists. This is seen as a risk area and is likely to cause a rapid shift in the locus of activity for reporting cases. The demand for this type of review is likely to increase.
- More objective assessment is now required for some types of specimen to give reproducible assessments to determine patient treatment e.g. image analysis for ***Immunohistochemistry*** (IHC) results that act as the threshold for giving a therapy.
- While it is clear that next generation gene sequencing will refine approaches to diagnostic and prognostic information, it still requires the right tissue to be put into the right pathway to provide prognostic and predictive information. This new technology does not replace diagnostic cell pathology which will still be needed to triage material into this route. It is expected that cellular pathologists will be the main deliverers of integrated reporting that combine traditional and molecular genetic information; this requires both training in the new modalities and working time to provide the integrated reports (potentially doubling the time required to report diagnostic and prognostic information on some cases).

What criteria have been used to assess degree to which integration of services has contributed to effective management of demand?

Not known

To what extent can these models be replicated in Welsh system of health and social care?

Not known

What barriers have been identified in inhibiting successful implementation of such models?

Not known

How might such barriers be overcome within Welsh context?

Not known

Future workforce skill and skills mix

The workforce of the future; the staff and skill mix the NHS needs to ensure patients continue to receive high-quality care as close to their homes as possible. We would welcome you views in this regard and in particular we would welcome your views concerning:

To what extent has service provision changed within NHS Wales and across social care in Wales over past 10 years?

- Attendance at multidisciplinary meetings - the number of meetings per week is increasing, with different clinical groups now asking for pathology support (e.g. in relation to inflammatory bowel disease, interstitial lung disease and mesothelioma).
- There has been development of sub-specialist cellular pathology to meet the needs of service users as follows: Breast Pathology, Cytopathology. Cardiac Pathology. Cytopathology, Dermatopathology, Endocrine Pathology, Head and Neck Pathology. Forensic Pathology. Gastrointestinal Pathology, Gynaecological Pathology, Haematopathology, Liver Pathology, Neuropathology, Non-Forensic Autopsy Pathology, Ophthalmic Pathology, Oral and Maxillofacial Pathology, Osteoarticular Pathology, Pulmonary and Thoracic Pathology, Renal Pathology, Urological Pathology.

How has the composition of workforce changed within the same time period – numbers, type, location, etc?

In 2005:

- There were 66 medically qualified consultants in post in Wales in Cellular Pathology. 13 of these were aged 55 or over. 55 were male and 11 were female.

- There were 12 trainees in post, one of whom was holding a VTN.

In 2015:

- There are 78 medically qualified consultants in post in Wales in Cellular Pathology. 36 of these are aged 55 or over. (see Table 1) 56 are male and 22 are female.
- There are 20 trainees in post in histopathology. 8 trainees are male and 12 are female. 2 of the females are training part time.
- The trainees are provisionally due to obtain their CCT in the following years: 2 in 2015; 1 in 2016; 2 in 2017; 4 in 2018; 2 in 2019; 6 in 2020; 3 in 2021.

There is a significant proportion of consultants who are nearing retirement age.

What are the key strategic drivers that will influence trends in service provision over next 10 years?

- Increasing collaboration and partnership between organisations is an inevitable consequence of the requirement to ensure high quality (robust quality management systems and availability of specialist opinions, where appropriate). Specialist expertise (expensive) needs to be shared for best effect.
- Adjacency to clinical teams is important to minimise risks to patients and there is a need to understand better the options for remote working arising from videoconferencing and telepathology so that the right balance is achieved.
- Adjacency to molecular diagnostic services is important to ensure that the full benefits of genomic and proteomic data are realised through interdisciplinary working.
- Adjacency to academic centres is important for education (undergraduate and postgraduate), training and research within pathology and for other clinical and academic areas.
- Digital pathology is a disruptive technology with great potential to drive laboratory reorganisation within and between hospitals. It has the potential to make pathologists working lives more efficient (according to the suppliers), facilitates intra- and inter-departmental consultations, education and training. The business models can incorporate the centralisation of some technical services with digital distribution to wherever the pathologist happens to be, and there is also the opportunity to use central digital diagnostic expertise to provide (and charge for) specialist advice for other hospitals in the UK and internationally.
- As 7 day working becomes more normal for laboratory services, increasing numbers of staff (clinical, scientific and support staff) will be required to support the current weekday level of intensity of working over all 7 days.
- Review and rationalisation of cellular pathology services will only partially address workforce needs. While such rationalisation will help with service resilience (cover for leave, illness), and efficiency (optimal use of equipment), increasing demand is unlikely to be met.
- The 2015 Cancer Strategy sets out to reduce mortality from cancer. Aspects of the strategy will place increased demand on Cellular Pathology services.
- Earlier diagnosis is emphasised, “including a step-change in capacity and a shift in culture around investigative testing”. All cancers require a tissue diagnosis, not only to confirm the presence and the type of cancer, but increasingly to predict which treatments are likely to be effective and to give a prognosis. The proposed “step-change” will inevitably lead to a lowering of the threshold for requesting biopsies and an increased number of specimens for cellular pathology departments.
- The Cancer Taskforce proposes efforts to increase the uptake of screening programs. There are currently programmes for cervical, bowel and breast cancers. Improved uptake and expansion of the programmes will generate more biopsies.
- New NICE guidelines will reduce the threshold of suspicion to trigger a referral with cancer symptoms from General Practice.

What structural/organisational changes may be required to address such changes?

Not known

What are the likely workforce requirements to meet such demands on service provision over next 10 years?

- NICE guidance on early cancer diagnosis and GP direct access to rapid cancer diagnostics will increase the numbers of cancer and non-cancer biopsies coming from patients undergoing imaging and endoscopic assessments. As a result, there is a need for more trained Cellular Pathologists to meet demands of service provision over the next 10 years.
- The service will suffer unless training numbers (medical and scientific) increase. Such an increase

needs to be managed alongside a funded strategy to develop clinical scientist roles in the discipline of cellular and molecular pathology.

- As the skilled workforce approaches retirement, there is currently a tendency to retire at the earliest opportunity. There need to be strategies in place to retain expertise and engagement, possibly on a part time basis, to ensure capacity is sustained.

What are the likely deficits in workforce supply over next decade?

- The impact of recent changes in provision of NHS pensions are forecast by many organisations to have a significant effect on the retirement age of many consultant Cellular Pathologists, with the likelihood of earlier retirement. In addition, those consultants in receipt of ACCEA merit awards are also likely to retire early before the risk of these pensionable additions to salary are challenged.
- Geographical inequalities, trainees not commencing consultant posts within 1 year of obtaining their CCT, and a small attrition rate will contribute to a potential reduction in the number of consultants available.
- Trends suggest that there is a developing inability to recruit to consultant posts, following the ending of a period of uncertainty around laboratory configuration. The contribution of cellular pathology to a timely patient pathway, often providing the clinical information that directs a patient to a specific pathway, is now evident as a service constraint and consultant expansion has been required to meet needs.

<u>Autopsy services</u>

- NHS pathology services provide the capacity to deliver the majority of investigations for HM Coroner and modelling suggests that the number of autopsy-active pathologists will decline to such an extent that a national service will be compromised by 2020.
- There are serious concerns for provision of expertise in niche areas to support investigations in the criminal justice system, notably paediatric pathology, musculo-skeletal pathology, forensic ophthalmic pathology, forensic neuropathology.

How can such workforce supply deficits be addressed?

Not known

What policies are in place to address such deficits?

Not known

What new professional groupings and roles will be required? e.g physician assistants, advanced practitioners.

- Traditionally cellular pathology has been a consultant based service with very little direct service provision from other clinical staff or scientists. This is perceived as minimising risk to patients. The current situation by growth of consultant numbers is unsustainable. There is need for agreement on which work needs to be done by consultants and which can be done with minimal risk by other pathologists or by clinical scientists.
- As a result, there is a significant opportunity to develop clinical scientist roles for reporting cellular pathology cases under clinical supervision as part of a multidisciplinary team. This will need a coordinated training route together with a clear career structure for qualified clinical scientists in cellular pathology.

What is the evidence for the effectiveness of such groups and roles in meeting supply deficits?

Not known

Efficiency and prudent principles

Areas of potential efficiency, taking into account the principles of prudent healthcare, in order to address the long-term financial challenge between 2016-17 and 2025-26 set out by the Nuffield Trust. We would welcome you views in this regard and in particular we would welcome your views concerning:

How can the 'only do what only you can do' principle be translated into an estimate of workforce configuration in the future?

Not known

How can the 'only do what only you can do' principle be factored into workforce planning mechanisms?

Not known

What is the scope for professional substitution?

- Biomedical scientists now provide cut-up with minimal pathologist supervision with consultants making contributions in order to maintain their own competency. There is a need to develop formal qualification frameworks, models for clinical supervision and career pathways for clinical scientists in cellular pathology who would report a proportion of cell pathology work under consultant clinical supervision as part of a multiprofessional team. Consultants are needed:
  - as clinical diagnosticians providing a clinical opinion in conjunction with other clinical and scientific service areas
  - to make decisions in the face of uncertainty
  - to ensure overall clinical quality assurance of the diagnostic process
  - to prioritise need and manage workflows
- Advanced roles for biomedical scientists in specimen cutup are now well established. RCPath and IBMS are carrying out a pilot of BMS reporting in histopathology in which the first cohort of scientist will complete the initial programme in 2015/16. Additional healthcare scientist training posts will be required to provide sufficient additional scientists to carry out this role. The impact on the medical workforce is not clear yet and it is highly unlikely that there will be any impact in the next 2-3 years. In the 5-10 year window, BMS reporting practitioners may mitigate some of the need for consultant expansion related to year-on-year increase in workload.
- There is a particular need to develop ultrastructural pathology (electron microscopy) which retains a central place in the diagnosis of certain pathological processes. However, the current state of electron microscopy services in the UK is parlous, as many electron microscopes are reaching the end of their usable lifespan and many electron microscopists are similarly approaching the end of careers. Some rationalisation of service has happened, but at present electron microscopy is not an attractive career option. The College is developing a formal curriculum for ultrastructural pathology that should provide a career structure for appropriate scientists. The required investment is in healthcare scientist training positions that are not currently in the system to support additional posts.
- Molecular testing and integrated reporting is an important priority area that requires service redesign. There is a possibility that some molecular testing could replace established immunohistochemistry but will likely be part of a triage of diagnostic material, not a full replacement. It is uncertain how far or how quickly this will develop – or in which circumstances it will be cost effective.
- Service reconfiguration provides an opportunity to refine/redefine workforce models but there is little evidence for an effect on cellular pathology given the dominance of the current Consultant-based model of service delivery. Consolidation of services is likely to provide greater opportunities for BMS cut-up and clinical scientist reporting (there needs to be a critical number of people engaged in any such activity to ensure continuity of service). Purely specialist-based reporting creates difficulties during periods of leave or when someone retires; it is likely that a mixed economy of specialist specialists and specialist generalists will be most efficient. There is a need to consider in detail the training and assessment requirements for different groups of career-grade staff as well as the possibilities for movement between groups.
- Molecular training and expertise is vital to the new generation of cellular pathologists. Such training can only be delivered in major centres. It follows that most if not all cellular pathology will (and should) be delivered from major regional centres in the not-so-distant future.
- It is predicted that centralisation of pathology services will be linked to an increase in overall workload (linked to sophistication of investigation); this centralisation has started and is still in progress, and this trend will increase further with anticipated trends for personalised medicine depending on results of diagnostic testing. This requires sub-specialist pathologists in centres, and a support network of less specialised pathologists.

What are the financial implications of professional substitution?

Not known

What is the role of technology in compensating for time and distance?

- Increased automation within laboratories (processing, embedding, sectioning, digitisation, molecular) requires investment in equipment that is only cost effective when used on large scale. Although there are major advantages from pathologists and scientific staff being co-located, particularly for more complex activities e.g. molecular work, the full implications of automation in cellular pathology have yet to be understood so that the right people meet in the right places to do appropriate tasks.
- Intelligence around how technology/investigations impacts on workforce numbers is limited. Cellular pathology typically introduces new investigations as an addition to current work rather than to replace current work. Hence overall workload increases.
- Investment in IT systems is essential to make best use of pathologists' time; there are some efficiencies within departments from changing workflows, changing skill mix and implementation of digital pathology. The move to paperless systems of working will require time and investment to ensure that quality control is maintained.
- The 100,000 genomes project has dramatically reinforced the view that genomic medicine has arrived and that investment is required in information technology and staff to support the analysis and interpretation of the vast amount of new information that is becoming available for clinical management.
- The use of genomics is increasing the work per cancer case in cellular pathology. The recognition that the individual genetic make-up of tumours should guide the specifics of treatment means greatly increased use of immunohistochemistry. The prototype of this approach was the use of immunohistochemistry to determine hormonal receptor status and over-expression of Her2 in breast cancer to predict response to various therapeutic options. Since then, this approach has become important in other common cancers, such as lung and bowel, as well as less common cancers such as soft tissue and bone. In addition, the use of time-consuming in situ hybridisation techniques (ISH) to enable visualisation of the genes themselves has become common place (such as determining Her2 gene amplification in breast cancer).
- Molecular diagnostic testing techniques are burgeoning. Even when the test is carried out in a molecular pathology department, the result must be integrated into a complete interpretive cellular pathology report.

What are the financial implications of technological developments in this area?

Not known

Pay and reward

The long-term strategic direction for pay and reward for those currently covered by the UK Agenda for Change (and Executive and Senior Posts) contract terms and conditions. This will include the affordability of future pay and reward, set in the context of the Nuffield Trust's report; and the approach to considering, determining and setting future pay and reward. We would welcome you views in this regard and in particular we would welcome your views concerning:

What are your expectations for the long term strategic direction for pay and rewards within the NHS and in relation to pay and rewards within the wider economy?

Not known

What are your expectations with regard to the continuation of, or changes to, current pay and reward differentials?

Not known

What are the existing arrangements for A4C staff, executives and senior posts and how have these operated in each of the past five years?

Not known

To what extent does Wales have autonomy, authority and powers to be able to determine pay and reward mechanisms and to what extent does this vary as between A4C staff, executives and senior posts?

Not known

To what extent can the long-term strategic direction for pay and reward for people currently covered by the UK Agenda for Change contract terms and conditions be considered separately from a similar consideration of pay and reward for staff covered by the Doctors and Dentists Review Body? Not known
To what extent can pay and rewards be considered in isolation from all the other terms and conditions of employment? Not known

Additional information

Some examples of demand issues as they pertain to selected sub-specialist areas are provided below. Other sub-specialties have similar pressures on increasing numbers of cases of increasing complexity.

Diagnostic Neuropathology
The study of diseases of the brain and nerves, Diagnostic Neuropathology (previously a sub-specialty of Histopathology) was granted a separate CCT from Histopathology by the GMC in 2013. Entry is at ST3 following general Histopathology training in ST1 and ST2.

There is currently one consultant in Neuropathology working at the University Hospital of Wales, Cardiff; a full time male, funded by the university. There is currently no approved training programme in Wales for Neuropathology.

Service demand is expected to increase, reflecting increased diagnostic work on Central Nervous System (CNS) tumour cases, for example with layered reporting and more aggressive treatment of older patients. More in depth analysis of neurodegenerative brain specimens occurs, but this is not always within NHS job plans.

The niche delivered by Neuropathologists in terms of clinical research and education cannot be overlooked. Although these are hard to define in current DCC estimates, the contributions made to future treatment development should not be underestimated. The research-active service is well placed to begin to define issues of people living longer with multiple and complex conditions**.** For example, risk stratification by neuropathologists in what was previously considered one form of common paediatric CNS tumour (medulloblastoma). This balances adjuvant therapy to increase survival in children with higher-risk medulloblastomas with the potential neurodisability caused by unnecessary adjuvant therapy in children with lower-risk medulloblastomas, through the multidisciplinary team, with detailed neuropathology input. Reducing the number of children who potentially have 80 years of neurodisability, without increasing mortality, is an important priority.

As a relatively small specialty, Neuropathology is susceptible to problems arising if and when pathologists move within the devolved nations of the UK.

Training in Neuropathology is exceedingly limited, even in England, when diagnostic capacity needs to increase to reflect evolving paediatric oncology practices, and molecular capacity that impacts directly on patient survival and quality of life.

Paediatric Pathology
This is the study of disease in foetuses, babies and children e.g. stillbirths and childhood cancers. Paediatric Pathology (previously a sub-specialty of Histopathology) was granted a separate CCT from Histopathology by the GMC in 2013. Entry is at ST3 following general Histopathology training in ST1 and ST2.

There is currently one consultant in Paediatric Pathology working at the University Hospital of Wales, Cardiff; a full time male, funded by the NHS. There is a part time Specialty Doctor in post and a Specialty Registrar who commenced training in August 2015.

The workload is likely to increase gradually due to:

- increasingly specialised paediatric oncology / surgery;
- NHS focus on reducing perinatal and infant mortality, which may increase the role of autopsy investigation;
- NHS focus on patient experience in conjunction with new developments (e.g. post-mortem MRI and less invasive autopsy), likely to increase overall autopsy workload since increased acceptability.

Skill mix has potential to change in the next 5 years with increasing expectations for involvement in molecular pathology and support for projects such as the 100,000 genome project, and inclusion of new skills to allow interpretation of post mortem imaging and performance of less invasive autopsy approaches.

Productivity increases will need changes to service delivery, such as real time digital pathology and virtual slides etc, which are not yet part of standard widespread NHS practice, and for which many of the benefits to productivity remains unproven.

Forensic pathology

There are special considerations that need to apply to service provision for forensic pathology in the United Kingdom which is currently almost completely out with the Health Service planning process, although there is a possibility (see below) that this may change in the future. Forensic Histopathology (previously a sub-specialty of Histopathology) was granted a separate CCT from Histopathology by the GMC in 2013. Entry is at ST3 following general Histopathology training in ST1 and ST2.

The position in England and Wales is unclear for a number of reasons, not least because of the variable employment status. The large majority of the 35 consultant forensic pathologists on the Home Office Register are now independent and self employed. 2.5 pathologists are employed by the NHS and 8 by the Universities of Cardiff, Leicester and Newcastle (all posts now filled). The consultants are directly, indirectly, or partially funded by the Police. Specialty training occurs in 4 centres (Newcastle, Liverpool, Leicester and Cardiff) and currently there are 2 STRs in post in Liverpool, 2 in Leicester and 2 in Newcastle. All of the posts are fully funded by the Home Office who also provide additional funding to the centres to support the training. The trainee numbers are considered sufficient to meet likely consultant openings based on current workload demands (but see below).

Retaining trained forensic pathologists is difficult due to the lack of NHS and University employed posts in England and Wales, a national drop in forensic autopsy numbers (at least partly due to funding cuts) and recruitment to well paid posts in Australasia and Canada. A significant shift in national non-forensic autopsy arrangements (with or without scanning) may mean a necessary and rapid increase in numbers of forensic pathologists if the specialty is envisaged to be more involved in non-suspicious death investigation. The recently published Hutton Review of forensic pathology services proposes the development of a national forensic pathology led death investigation service, which if adopted by government, would require the training of a large number of additional forensic and autopsy pathologists. This could not be met easily by the existing training centres without considerable central support. Forensic pathology training will need to be considered further once the government's response to the review becomes known.

Trainees in Forensic Pathology are drawn from run-through training in Cellular Pathology, either part of the way through, or at the end of, their cellular pathology training. In some areas, the transfer of trainees from cellular to forensic pathology curricula has impacted on planned progression in cellular pathology but given the small numbers of forensic pathology trainees this is not considered a significant issue. The future needs of Forensic pathology should be integrated into the general workforce planning for cellular pathology.

Gastrointestinal disease

An increase in cancer incidence will occur in an ageing population (as identified in DOH documents). This will impact particularly heavily on gastrointestinal (GI) pathology which encompasses several of the commonest cancers, including many resectable cases: colorectal (2nd commonest cause of cancer death), pancreatic (5th), oesophageal (6th) and gastric (7th) (CRUK data). In combination, GI cancers are the largest cancer burden of all.

Also, there has been a consistent and significant increase in the incidence of pancreatic cancer, oesophageal adenocarcinoma, and oesophagogastric junction tumours in the UK - both in absolute terms and relative to other cancer types. This will probably continue.

The bowel cancer screening programme (BCSP) is operational; age extension is almost complete. Additional one-time flexible sigmoidoscopy for 50-60 year olds is now being piloted. A major future impact on GI pathology is well recognised, affecting medical, technical and administrative work. The impact will probably be about 1200 additional specimens (i.e., 50% of a consultant) per million population per annum (NE Thames data).

Incidental lesions discovered as a result of the BCSP, e.g., inflammatory bowel disease, will also impact on histopathology in the medium term.

The patient awareness campaign associated with the BCSP has also had an impact and will continue to do so: patients who are not eligible for screening nevertheless recognise symptoms of bowel cancer, and may then undergo endoscopic examination and biopsy.

Eosinophilic oesophagitis has been recognised increasingly in the past few years. International consensus guidelines recommend biopsies of proximal, middle and lower oesophagus in all patients who could have this diagnosis. If this advice is followed, which it should be, the number of oesophageal biopsies will increase very significantly. Histopathology is the only reliable way to diagnose this entity.

The number of biopsies recommended for diagnosing coeliac disease has also increased, and this advice is steadily being adopted (RCPath GI tissue pathway). Newer recommendations suggest additional biopsies from multiple small bowel sites.

Liver disease

Liver pathology has important epidemiological and public health changes due to increase fatty liver disease and related effects on transplantation and liver cancer. Medical liver biopsy interpretation is very dependent on integration of many facets of medical and pathology knowledge, and requires integrated working with clinicians. So not an area which would be impacted by workforce reconfiguration.

Clarification of the role and indications for biopsy (RCR/clinical/RCPath guidance) and NICE clinical guidelines will improve the appropriateness of biopsy; most think it unlikely that it will have an effect on number of biopsies performed (more case finding, smaller proportion need biopsy).

Primary liver cancer incidence is increasing rapidly, with future role for typing of molecular pathology

Complex medical (requiring biopsy), transplant and oncology cases are likely to be increasingly localised in main centres - succession planning for the hepatopathologists is important, in small specialty with limited exposure during training.

Gynaecological pathology

There are increasing numbers of prophylactic specimens in gynaecological pathology, for example prophylactic bilateral salpingo-oophorectomy in patients with BRCA1/2 mutation or a family history of breast or ovarian carcinoma, and prophylactic hysterectomy and bilateral salpingo-oophorectomy in patients with Lynch syndrome. These specimens require extensive pathological sampling, often with embedding of the entire specimen.

Endometrial carcinomas are common in patients with Lynch syndrome. There is an exponential increase in the number of cases of endometrial carcinoma where immunohistochemistry for mismatch repair proteins (MMR IHC) is requested by clinicians or performed at the initiative of the pathologist. There are no national recommended guidelines but MMR IHC is often performed in young patients, those with a positive family history or in tumours with morphology suggestive of MMR abnormalities. It is possible that in the future, MMR IHC will be performed in all newly diagnosed endometrial carcinomas.

Immunohistochemistry is increasingly used in the classification of gynaecological malignancies. New markers continue to be developed. There will be a requirement for these to be available in laboratories dealing with such specimens.

Ophthalmic pathology
Cases are getting more complex; with a 60% increase in number of large/complex specimens and a 40% drop in number of small/simple specimens in past year. Consolidation of the national service is important, together with establishing training routes into this small specialty area.

Breast pathology
There still exists a relative shortage nationally at Consultant level to support clinical services

Breast cancer has been and will continue for the foreseeable future to be a focus for molecularly targeted therapy. It is likely that multiplex/ comprehensive molecular methods based on deep sequencing will play an increasing role in breast (and other) cancers. Pathologists are likely to play a lead role in integration of cancer related data for therapeutic use.

Going forward, there is likely to increased demands due to age extension of the breast cancer screening programme, increased detection of cancers, and changing demographics with an ageing population.

Complex oncoplastic surgical procedures and increased use of neoadjuvant therapy make it more time consuming to deal with increasing the burden on pathologists.

CRUK and other research organisations have raised concerns that there are fewer pathologists available or interested in supporting research and clinical trials.

Thoracic pathololgy
Although the incidences of thoracic diseases are slowly changing over time, information suggests that the number of specimens per year remains relatively constant. However practitioners state that they are increasingly struggling due to the increased complexity of managing these samples, especially for lung cancer cases.
This complexity is due to:

- Increased immunohistochemistry - Whilst most cases of lung cancer a decade ago were simply divided into non-small cell lung carcinoma (NSCLC) and small cell carcinoma (NSCLC), there is now a need in most specimens to undertake immunohistochemistry in order to identify the phenotype, as the type of chemotherapy is dependent on accurate subtyping, particularly in NSCLC which is the majority of specimens (evidence for this is within the recent HQIP audit of UK thoracic pathology practice). On average, a pathologist would be looking at 5-6 slides rather than just 1-2 slides.
- Molecular testing - NICE guidelines in 2010 have meant that the majority of NSCLCs (i.e. those with advanced disease) should be assessed for EGFR mutations, the administration of which falls to the pathologist as we are the guardians of the samples. Furthermore, international guidelines now recommend screening for EML4-ALK translocations, with several other treatment-related genetic tests e.g. PLA, are already being requested sporadically in addition to other tests. This approach to personalised medicine will increase substantially in the next few years.
- More labour intensive specimens - the advent of new techniques, such as transbronchial needle aspiration (TBNA) reduces the cost and patient discomfort in relation to obtaining tumour samples. However these require much more detailed assessment (screening cytology) that those used previously (mediastinoscopy specimens). Furthermore, the number of samples per specimen has increased, with the requirement for more thorough staging and, with a need for immunohistochemistry and molecular testing, there is typically a doubling of the number of samples as additional preparation of cellblocks is required.

Table 1

Consultant Cellular Pathologists in Wales in 2015 (medically qualified)