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

The Royal College of Pathologists' response to the Shaping the National Cancer Plan call for evidence

29 April 2025

Prevention and awareness

Question

Which cancer risk factors should the government and the NHS focus on to improve prevention? (Select the 3 most important risk factors)

- Alcohol
- Tobacco
- Obesity
- Physical inactivity
- UV radiation
- Air pollution
- I don't know
- Other (please specify)

Please explain your answer.

The UK has an ageing population and rising levels of obesity, increasing the number of people living with complex health conditions. These drive the demand for clinical pathology services – both in the number and the complexity of tests performed. The UK has a higher rate of cancer cases than Continental Europe, on average, but proportionally fewer cancer healthcare staff and less equipment to treat patients, with widespread shortages across

cancer professions. The pathology workforce needs sustained investment to effectively meet the current and growing demand for its services.

Lifestyle choices such as alcohol consumption, tobacco use, and obesity are major, yet preventable, contributors to disease. Obesity plays a key role in several preventable conditions, including cancers of the oesophagus, colorectum, breast (in postmenopausal women), endometrium, and kidney. Therefore, tackling obesity must be a central focus of public health policy in the UK and devolved nations. Improving access to effective weight-loss treatments could greatly benefit public health outcomes.

Our members believe the government must take a stronger stance against large, processed food manufacturers, enforcing regulations that ensure healthier, less addictive, and higher-quality food products are available. The NHS is heavily burdened by the consequences of alcohol, tobacco, and obesity, with increased hospital admissions, extended stays, and lost productivity due to sickness. Reducing risks associated with these factors would positively impact a wide range of health conditions, including chronic respiratory illnesses and some infections, by alleviating the overall disease burden.

Greater support for obesity management and efforts to reduce alcohol and tobacco use are essential. This must be accompanied by a cultural shift and increased availability of support groups for individuals at various stages of recovery or lifestyle change. Broader access to weight management services should be made available—not just to the morbidly obese, but to anyone seeking to reduce obesity-related health risks. Early intervention can significantly reduce long-term healthcare costs and complications from preventable diseases.

Advertising restrictions on alcohol and tobacco, along with public education about their dangers, would help reduce misuse. The same should apply to recreational drugs and anabolic steroids, which are linked to several health issues, including cancer. Alcohol is a known risk factor for cancers of the oral cavity, pharynx, larynx, oesophagus, liver, colorectum, and breast. The risk increases with consumption, and heavy drinking combined with smoking amplifies this risk further. The burden of alcohol-related cancers also differs by gender, with men experiencing higher rates, particularly for mouth and oropharyngeal cancers.

Tobacco remains the leading cause of cancer deaths worldwide, including in the UK. It is associated with cancers of the lung, oesophagus, larynx, oral cavity, bladder, kidney, stomach, cervix, and colorectum. Harm from tobacco is not limited to smokers; second-hand smoke also poses serious health risks, especially to non-smokers.

To reduce the burden of cancer and other preventable diseases, the UK government must take stronger action to address the root causes—focusing on prevention, education, regulation, and broader access to treatment.

Early diagnosis

Question

What actions should the government and the NHS take to help diagnose cancer at an earlier stage? (Select the 3 actions that would have the most impact)

- Improve symptom awareness, address barriers to seeking help and encourage a timely response to symptoms
- Support timely and effective referrals from primary care (for example, GPs)
- Make improvements to existing cancer screening programmes, including increasing uptake
- Increase diagnostic test access and capacity
- Develop and expand interventions targeted at people most at risk of developing certain cancers
- Increase support for research and innovation
- I don't know
- Other (please specify)

Please explain your answer.

Pathology plays a vital role in NHS clinical care, with Cellular Pathology being central to diagnosing and managing both cancer and non-cancerous diseases. Cellular Pathology is often seen as the "gold standard" test for establishing a diagnosis of cancer. It helps determine patient prognosis, guides treatment decisions, and enables monitoring. However, significant improvements are needed in the organisation and funding of these services, particularly in the areas of genomics, digital pathology, and Artificial Intelligence (AI).

Despite their importance, Cellular Pathology services are underfunded, understaffed, and face challenges due to an ageing workforce, with many professionals retiring early. The reasons for this include historical underfunding (while related clinical specialities receive extra resource e.g., funding for new consultant clinical staff without consideration of the potential effects on specialties such as Cellular Pathology).

While competition for training posts in Cellular Pathology remains high, there are insufficient training posts available to create the numbers of fully trained pathologists that are required now and in the future.

Screening for cancer and early diagnosis are key to preventative healthcare, largely supported by pathology services. However, a shortage of pathologists and other essential diagnostic professionals is a barrier to expanding cancer screening programs. Effective cancer screening programs must ensure timely diagnosis and access to treatment, but each screening test has limitations, highlighting the need for improved methods.

Current research and innovation in early cancer detection, including multi-cancer detection blood tests and AI tools, offer hope for better patient outcomes. These tests can identify signals from over 50 types of cancer by detecting tumour DNA in the blood, though much more work is needed to refine these technologies.

A “one-stop shop” approach for quicker and easier access to diagnostic services can lead to earlier diagnoses and better outcomes, ultimately saving lives. However, with increasing cancer diagnoses and a projected shortage of 4.1 million healthcare workers by 2030 in Europe and the UK, the pressure on oncology care is expected to rise, leading to delayed diagnoses, worsening health outcomes, and increased strain on healthcare professionals. This situation is exacerbated by the growing and aging population, which increases demand for services, and the lack of sufficient healthcare workforce expansion.

Many cancers are diagnosed late due to low public awareness of symptoms, limited access to GP appointments, and delays in diagnostic referrals. General Practice plays a crucial role by offering expert guidance, appropriate testing, and efficient use of NHS resources—helping avoid unfocused or inefficient approaches. Early detection efforts should focus on identifying high-risk individuals using evidence-based tools, rather than guesswork.

Empowering patients to take an active role in their health through at-home diagnostic testing could improve early detection. However, this is complicated by the rapid growth of unregulated and low-quality devices and services, which may exacerbate health inequalities and place further strain on the NHS. Carefully regulating these services and ensuring quality control are essential to prevent additional burdens on healthcare systems.

Addressing the workforce shortage, enhancing screening, and investing in innovative technologies are essential to improving diagnosis and treatment.

Treatment

Question

What actions should the government and the NHS take to improve access to cancer services and the quality of cancer treatment that patients receive? (Select the 3 actions that would have the most impact)

- Increase treatment capacity (including workforce)
- Review and update treatment and management guidelines to improve pathways (processes of care) and efficiency
- Improve the flow and use of data to identify and address inconsistencies in care
- Improve treatment spaces and wards, including facilities available to carers
- Improve communication with patients, ensuring they have all the information they need
- Increase the availability of physical and mental health interventions before and during cancer treatment
- Increase the use of genomic (genetic) testing and other ways of supporting personalised treatment

- I don’t know
- Other (please specify)

Please explain your answer.

There are not enough pathologists and scientists to enable services to be delivered safely, effectively and equally to all regions of the UK. Over the next 5 years, we will lose 21% of experienced consultants to retirement. Nationally, there has been an increase in histopathology (part of Cellular Pathology) activity of 30% since 2018–2019, however the consultant workforce has grown by only 8% over the same period.

A focus on retaining experienced staff is vital. There is a rising risk of imminent retirement of many experienced consultants. These consultants are critical to delivering high-quality services, supervising, teaching and training the future workforce and shaping future services. Investment in the recruitment and training of pathologists and scientists must include fully funded training places.

Minimising diagnostic delays and making sure that pathology is sufficiently well-resourced to perform its role in directing patient care in a timely manner is essential. A haematologist told us that inconsistency of care is not down to lack of data, it is down to individual clinicians failing to use a Shared Decision Making approach. When patients understand why things are being done, they are more rational users of a service. The Scottish approach (Realistic Medicine) is a good example of this.

Targeted treatment for patients is important to reduce unnecessary side-effects including immunosuppression. This will mean fewer episodes of infection and exposure to antimicrobials so having a positive impact at the level of the microbiome, antimicrobial resistance and side-effects of additional treatment. Personalised treatment leads to fewer ‘unknowns’ around patient management to allow for more streamlined processes and better anticipated side effects.

The rise in diagnostic and treatment lists to manage backlogs does not account for the lack of expansion in the pathology workforce. More thorough clinical assessments at the first point of contact could help determine actual cancer risk and reduce unnecessary escalation. A histopathologist noted that many patients undergo cross-sectional imaging, including CT scans with radiation exposure, only to find no malignancy. This may indicate over-imaging without sufficient clinical assessment.

Genomic Medicine provides the ‘right treatment to the right patient’, improving outcomes and avoiding expensive therapies that are inappropriate. With precision diagnosis the NHS healthcare system will save money and improve patient care and outcomes.

Whilst there has been significant investment in genomics, there needs to be continued resource provision for the significantly increasing workload genomics creates for Cellular Pathology to process and analyse histological samples for genomic testing. Without this being addressed there will be issues in providing the quality and level of genomic service

desired. Standardisation of sample preparation and tumour assessment to optimise genomic testing is required. There needs to be a realistic view of cost-effective treatments with good benefit outcomes.

While attempts have been made to improve the funding streams for Cellular Pathology services involved in preparing samples for genomic testing, the number of tests requested affects the administrative, scientific and medical aspects of Cellular Pathology laboratories.

Living with and beyond cancer

Question

What can the government and the NHS do to improve the support that people diagnosed with cancer, treated for cancer, and living with and beyond cancer receive? (Select the 3 actions that would have the most impact) Please highlight three to indicate your choices.

- Provide more comprehensive, integrated and personalised support after an individual receives a cancer diagnosis and (if applicable) after treatment
- Improve the emotional, mental health and practical support for patients, as well as their partners, family members, children and carers
- Offer targeted support for specific groups, such as ethnic minority cancer patients, children and bereaved relatives
- Increase the number and availability of cancer co-ordinators, clinical nurse specialists and other staff who support patients
- Increase the support to hospice services and charities who provide care and support for patients
- Improve access to high-quality, supportive palliative and end-of-life care for patients with incurable cancer
- I don’t know
- Other (please specify)

Please explain your answer.

From an infection specialist perspective, we often see broad spectrum antibiotic use at the end of life, often used inappropriately. Higher quality palliative care and support to both patients and relatives often helps to provide realistic expectations on what will and won’t improve a patient’s quality of life – this in turn allows more appropriate antibiotic stewardship. Improvements in the availability of home and hospice care also improve the flow through the hospital, reducing the risk of hospital acquired infection for these patients.

The infrastructure supporting cancer care also requires improvement. Healthcare premises must meet high standards of infection prevention and control, particularly for patients who are immunocompromised. This includes adequate space, ventilation, and equipment to

prevent infection and ensure effective cleaning. Facilities for carers must also support their critical role in guiding patients through diagnosis and treatment.

Societal expectations with cancer have largely ignored co-ordinated support and palliative care / hospice care. It is not acceptable for someone who is dying from cancer (and other diseases) not to be able to have a dignified and pain-free death together with proper patient care and emotional support.

Research and innovation

Question

How can the government and the NHS maximise the impact of data, research and innovation regarding cancer and cancer services? (Select the 3 actions that would have the most impact) Please highlight three to indicate your choices.

- Improve the data available to conduct research
- Improve patient access to clinical trials
- Increase research into early diagnosis
- Increase research into innovative treatments
- Increase research on rarer and less common cancers
- Speed up the adoption of innovative diagnostics and treatments into the NHS
- I don't know
- Other (please specify)

Please explain your answer. (Do not include any personal information in your response. Maximum 500 words.)

Artificial intelligence (AI) techniques offer great potential for advancing diagnostics and genomic medicine, making systems more efficient, faster and more productive. AI algorithms can identify the right patients for specialist treatment, making patient pathways more efficient. Pathology needs to be supported to evaluate new algorithms and translate these into the clinic.

Scientific innovation to support early cancer diagnosis is needed, including the use of AI tools and multi-cancer detection blood tests. An example is the SONATA (tran**S**forming **O**varian ca**N**cer di**A**gnostic pa**T**hw**A**ys) study which will see 41,000 primary care samples sent to the Black Country Pathology Service and South Tyne and Wear laboratories to accurately establish whether using the ROMA blood test rather than CA125 will be cost effective for the NHS in diagnosing Ovarian Cancer. Research conducted in Birmingham found out that the ROMA test is significantly better than current tests (CA125 and ultrasound) used in both pre and postmenopausal women.

Most new cancer therapies and protocols come with an increased (but often unpredictable) risk for infections. It is important that cancer research becomes even more multidisciplinary and novel treatment trials have infection specialist input from early stages of trial design. To avoid unnecessary prophylactic and treatment use of broad-spectrum antibiotics, antifungals and antivirals, it is very important that any infection related adverse events are investigated properly with infection expert input.

Researchers have developed multi-cancer early detection (MCED) blood testing which currently can detect a common cancer signal from over 50 different types of cancer and predict where the signal has come from in the body. The signal arises from small sequences of circulating tumour DNA (ctDNA) in the blood which have some different methylation patterns from non-tumour DNA. Hope is on the horizon for detecting cancers that are currently unscreenable, but more work is needed, and, with experience and larger samples, these assays will improve. The tests need refining so they are better at distinguishing tumour DNA from all the other DNA that is circulating in the patient's blood. It is also critical to note that the purpose of cancer screening is not to decrease the incidence of cancer, but to decrease cancer mortality.

Legislation and the associated bureaucracy can be barriers to research and trials in the UK. There are extremely lengthy processes required before a research project can start. Local data governance, research governance in Trusts and Boards, ethics committees and GDPR all put barriers in the way of research. Clinicians often do not have time in their working week to be able to set aside for research as they are under extreme pressure to complete service commitments. Hospital departments are often not supportive of staff taking time for research activities as they are under extreme pressures. It is too easy to seek sponsorship for the rare rather than common issues.

Members recommend that the vast data available in our system is used to facilitate research and ideally a single NHS medical record that is viewable by all in case of patient transfer.

Inequalities

Question

In which of these areas could the government have the most impact in reducing inequalities in incidence (cases of cancer diagnosed in a specific population) and outcomes of cancer across England? (Select the 3 actions that would have the most impact) Please highlight three to indicate your choices.

- Improving prevention and reducing the risk of cancer
- Raising awareness of the signs and symptoms of cancer, reducing barriers and supporting timely response to symptoms
- Reducing inequalities in cancer screening uptake
- Improving earlier diagnosis of cancers across all groups

- Improving the access to and quality of cancer treatment
- Improving and achieving a more consistent experience across cancer referral, diagnosis, treatment and beyond
- Improving the aftercare support for cancer patients
- I don't know
- Other (please specify)

Please explain your answer.

Prevention would have the most impact in reducing incidence. However, in order to reduce inequalities, there has to be parity in terms of access to screening and reduction of waiting times for referrals; the 2 week wait is often longer in some parts of the country. Cancer screening uptake may be reduced in some populations because they are hard to reach e.g. rough sleepers, or because of cultural misconceptions. There should be a review of current screening programmes to see if they still meet the needs of the affected populations e.g. does the age limit for screening need to be reviewed or revised to take into account differences of risk in different populations?

According to Cancer Research UK, in England, among cases with a known stage, more than 8 in 10 cases of testicular, melanoma skin, breast and uterine cancers were diagnosed at stages 1 or 2, compared with fewer than 3 in 10 cases of non-Hodgkin lymphoma, lung, pancreatic, oesophageal and oropharyngeal cancers (this is based on 2018 data). For some cancer sites, later stage at diagnosis is associated with higher deprivation, being male, and having Caribbean, African or Asian ethnicity.

Overall, the proportion of cases diagnosed through screening is more than a third lower in the most versus the least deprived areas. Conversely, the proportion diagnosed through emergency presentation – associated with later stage at diagnosis – is almost 50% higher in the most versus the least deprived quintiles and up to 3-times higher in the oldest patients compared to the youngest.

Implementation of innovative diagnostics is needed to improve precision, speed and equity of access to personalised cancer care. Everyone who would benefit should have access to personalised cancer treatment. We must ensure that all patients across the UK have access to equitable cancer diagnostic testing to be able to deliver personalised care to everyone who will benefit.

It is essential that there is equity of access to genomic cancer tests and personalised treatment to truly benefit all patients. We must harness the potential of AI to improve efficiency and cost-benefit. Without continued investment in innovation and research fewer patients will benefit from genomic testing.

Genomic medicine provides an incredible opportunity for faster, accurate diagnosis for patients with cancer and with inherited diseases. To deliver the full potential of genomics for patients, there needs to be significant investment in staffing and equipment for

laboratories, otherwise patients will fail to benefit from earlier diagnosis, access to new drugs and improved chances of survival.

AI has the potential to transform healthcare. In pathology, there is opportunity to revolutionise the way we do our work to meet the significant challenges that our services face. However, we must maintain a critical eye on this promise in the hyperbole that surrounds AI. This critical eye is necessary to ensure that emerging diagnostic tools are safe, accessible to all patients and acceptable to wider society, and that they do not worsen health inequalities. These tools need to be usable and trusted by the workforce charged with their deployment in diagnostic workflows.

Priorities for the national cancer plan

Question

What are the most important priorities that the national cancer plan should address? (Select the 3 most important priorities) Please highlight three to indicate your choices.

- Prevention and reducing the risk of cancer
- Raising awareness of the signs and symptoms of cancer
- Earlier diagnosis of cancer
- Improving the access to and quality of cancer treatment, including meeting the cancer waiting time standards
- Improving patient experience across cancer referral, diagnosis, treatment and beyond
- Improving the aftercare support for cancer patients
- Reducing inequalities in cancer incidence, diagnosis and treatment
- Other (please specify)

Please explain your answer.

The most significant factors are those targeting cancer prevention, early awareness and early diagnosis. If cancer is detected early, the whole impact and costs of the disease is reduced significantly. Cancer pathways need pathology and we won't have capacity in the near future unless we see investment in training, digital, genomics and AI.

Prevention and reducing cancer risk is a very cost effective way to approach the burden of cancer on the NHS. Early cancers tend to be easier to treat and have better outcomes than advanced cancers and identifying cancer early should be a priority. Easy access to high quality cancer treatment should be available to all patients for the reasons set out in the cancer waiting time standards.

Data across many cancer types is overwhelming in terms of prevention and early diagnosis being the main factors associated with favourable outcomes and improved survival.

Cancer patients often receive highly immunosuppressive therapies, putting them at risk of infection and as a result contribute to relatively high broad spectrum antibiotic use in comparison to other patient groups. Earlier diagnosis and preventive strategies would impact on this through lowering the requirement for such therapies, reducing hospital stays thus reducing hospital acquired infection risk and requirements for antibiotic therapy.

Digital pathology – the collection, management, sharing and interpretation of pathology information in a digital environment – may improve patient care and supports the pathology workforce. It can make diagnosis more efficient, may allow faster access to a second opinion and may enable rapid referral of cases between health organisations.

It supports flexible working and enhances collaboration between pathologists. Embedding digital pathology lays the foundation for the collective readiness for Artificial Intelligence (AI) support tools that are in development. These have the potential to transform diagnostics, improve health outcomes, shorten waiting lists and increase efficiency.

There needs to be significant and sustained investment in digital pathology, AI and IT and laboratory infrastructure. Laboratory IT systems need to be updated as they are generally old and inflexible. There is often a lack of interoperability between NHS Trusts, which means results cannot be electronically shared, transferred or collected. Funding for skilled IT support staff for laboratories is key to implement and maintain new systems and software.

Digital pathology may increase the flexibility with which some Cellular Pathologists are able work but is no substitute for correct levels of staffing and sufficient investment in other aspects of laboratories e.g., equipment. Also, it is not yet clear to what degree digital pathology systems will be able to, or allowed to, interact with each other in terms of facilitating the acquisition of expert opinions on cases. While this is a theoretical advantage of digital pathology, there are practical considerations that are currently limiting the advantage that may be gained.

AI may provide further assistance to Cellular Pathology services in the future but, our members tell us, we are several years away from this technology having a significant impact on our specialty. Therefore, it is essential that AI is not seen as a “solution” to the difficulties faced by Cellular Pathology services now.

Contact details

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About the Royal College of Pathologists

The Royal College of Pathologists is a professional membership organisation with more than 11,000 fellows, affiliates and trainees, of which 23% are based outside of the UK. We are committed to setting and maintaining professional standards and promoting excellence in the teaching and practice of pathology, for the benefit of patients.

Our members include medically and veterinary qualified pathologists and clinical scientists in 17 different specialties, including cellular pathology, haematology, clinical biochemistry, medical microbiology and veterinary pathology.

The College works with pathologists at every stage of their career. We set curricula, organise training and run exams, publish clinical guidelines and best practice recommendations and provide continuing professional development. We engage a wide range of stakeholders to improve awareness and understanding of pathology and the vital role it plays in everybody's healthcare. Working with members, we run programmes to inspire the next generation to study science and join the profession.