inside medicine

At odds: BMA council chair Philip Banfield (centre) has asked health secretary Wes Streeting (right) to return to the negotiating table, while Danny Mortimer (left) of NHS Employers urges unions to wait before taking action

BMA dismisses “derisory” 4% offer

The announcement of a pay award of 4% for most doctors in England is “derisory” and could lead to strike action, the BMA has said. On 27 May the association launched a ballot of resident doctors, saying that the award failed to restore pay to levels of 16 years ago.

The government has accepted the DDRB’s recommendation of a rise of 4% for consultants, SAS doctors, and GPs. The pay rise will be backdated to April and will appear in pay packets from August.

The Department of Health and Social Care’s submission to the DDRB in December was for a pay rise of just 2.8% for doctors. Resident doctors will receive a consolidated payment of £750 on top of a 4% rise, giving them an average pay rise of 5.4%. NHS workers on Agenda for Change contracts, including nurses, health visitors, midwives, ambulance staff, porters, and cleaners, will see their pay rise by 3.6%.

The BMA said that the 4% rise failed to redress historical pay losses and that the health secretary, Wes Streeting, must come to the negotiating table if he wants to avoid strike action. BMA council chair Philip Banfield said, “The health secretary can avert strike action by negotiating with us and agreeing a route to full pay restoration.”

Banfield added that consultants and SAS doctors were “now left with no choice but to also re-enter dispute and, as a first step, to reinstate the BMA’s set rates of pay for extracontractual work.”

The BMA said the award was less than inflation, which averaged 4.5% over the past year and was below the average growth in earnings of 6%. Banfield said that doctors’ pay in real terms was still a quarter less than 16 years ago. Salaried GPs have experienced similar pay erosion, and this award “does nothing to address their pay issues,” he added.

Streeting urged resident doctors not to vote for industrial action, saying that it could hamper progress being made in the NHS. Announcing the award, he said, “This government was never going to be able to fully reverse a decade and a half of neglect in under a year, but this year’s pay increases—and last year’s—represent significant progress in making sure that NHS staff are properly recognised for the outstanding work they do.”

Danny Mortimer, chief executive of NHS Employers, said, “I would urge all unions to await the government’s longer term plans and to seek dialogue and engagement as ways to resolve any concerns they may have.”

Jacqui Wise, Kent

Cite this as: *BMJ* 2025;389:r1075

LATEST ONLINE

- Health of world’s teens is at “tipping point,” expert commission warns
- New NHS obesity service will provide access to weight loss injections in Northern Ireland
- BMA sounds alarm over medical students planning to leave UK

MEDICAL NEWS

Citations of retracted articles will no longer count towards impact factor

The bibliometric analytics company Clarivate has announced that citations to and from retracted articles will no longer contribute to a journal's impact factor. The company, which publishes its Journal Impact Factor (JIF) annually, said the change would come into effect in its 2025 result (which is based on 2024 data) and comes amid a rise in retractions.

In a statement on the company's website Nandita Quaderi, Clarivate's senior vice president, said that retracted content represented just 0.04% of indexed content last year (20 000 of 4.6 million citations) but noted that "retractions typically take years rather than months." Clarivate also highlighted an analysis by *Nature* in 2023 that found that journal article retractions had reached a record high number, with more than 10 000 that year. The analysis said publishers were struggling to deal with "sham papers and peer review fraud." It added that Saudi Arabia, Pakistan, Russia, and China had the highest retraction rates.

In light of this, Quaderi said the company's new policy would "pre-emptively guard against" retracted content distorting the JIF.

Elisabeth Mahase, *The BMJ* **Cite this as: *BMJ* 2025;389:r1047**

Blood scandal

GPs will help find infected patients in England

New patients registering at general practices in England will be asked whether they had a blood transfusion before 1996, as part of a drive to find undiagnosed cases from the contaminated blood scandal. The new questions will be introduced in the online GP registration service from 16 June and follow a recommendation of the Infected Blood Inquiry report, published in May 2024. Patients will be able to order self-testing hepatitis C kits to complete at home, or they can be tested at GP surgeries or sexual health clinics.

West Nile disease

Virus detected in mosquitoes in the UK

The UK Health Security Agency has for the first time identified fragments of West Nile virus genetic material in mosquitoes collected in the UK. No cases of locally acquired West Nile disease have yet been detected in humans or horses in the UK, although seven cases associated with travel have occurred since 2000. Meera Chand of the UKHSA said that the risk to the public was currently assessed as very low. Advice is being issued to healthcare professionals so that patients with encephalitis of unknown cause can be tested as a precaution.

Waiting times

Backlog grows despite extra 100 000 treatments

More than 100 000 more NHS treatments were delivered to patients in March than in the same month last year, monthly performance statistics showed. Official data showed that a quarter of a million fewer people waited longer than 18 weeks for care and that NHS staff carried out more than 1.5 million treatments in one month, with 3.6 million additional appointments since July 2024. However, high demand meant that the overall backlog grew by 18 751 to reach 7.42 million.

"Carrot and stick" system will determine bosses' pay

Senior NHS managers, including medical directors, will be able to earn bonuses or could face pay cuts, depending on how well their organisation performs, under a new pay framework announced by NHS England. Chief executives who manage to cut waiting times and deliver improvements for patients could be rewarded with bonuses as high as 10% of their salary. However, executives whose trusts are failing could see their pay docked by as much as £15 000 if they run into debt or fail to deliver improvements, under what the government described as a "carrot and stick" approach.

GP funding

Contract is imposed on Northern Ireland's GPs

Mike Nesbitt, Northern Ireland's health minister, imposed the General Medical Services contract on local GPs after they rejected the deal. Frances O'Hagan (below), chair of the BMA's Northern Ireland GP Committee, said, "To say we are shocked and angry at this decision would be an understatement." Speaking in the Northern Ireland assembly, Nesbitt said that negotiations had reached an endpoint and that there would be no further offer to GPs. Some 99.6% of GPs who took part in a referendum had voted to reject the offer. The BMA said it would consult its members on the next steps.

Safeguarding

Healthcare leaders call for smacking ban in England

Health organisations joined forces to call on the government to outlaw physical punishment of children in England. Thirteen organisations, led by the Royal College of Paediatrics and Child Health, sent an open letter to the government calling for removal of the "reasonable punishment" defence in England as part of the Children's Wellbeing and Schools Bill, which is progressing through parliament.

Mental health

Problems in childhood affect work later in life

Children with severe mental or behavioural conditions are almost twice as likely to have symptoms of depression in mid-life and are two thirds more likely to have limited ability to work, said the Institute for Public Policy Research. Its analysis, which followed people born in a single week in 1970 throughout their lives, found that mental health problems at age 10 had substantial implications 40 years on. The think tank said that preventive investment in children's mental health would be crucial to reducing long term barriers to working.

IN BRIEF

The international agreement on pandemic preparedness won't include the US

Global health

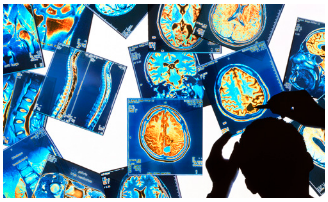
World leaders reach pandemic agreement

An agreement on how governments should work together to tackle future pandemics has been approved by the World Health Assembly after three years of negotiation. It aims to foster stronger collaboration among countries, international organisations such as WHO, civil society, the private sector, and others to help prevent pandemics and to respond better. The US will not be part of the agreement, having withdrawn from WHO.

Radiology

NHS gave private firms record £216m

The NHS gave a record £216m to private teleradiology companies to examine x rays and scans last year because hospitals had too few radiologists. An analysis by the Royal College of Radiologists found that 976 000 people breached the NHS target in 2024 and waited more than a month for their scan results, up 28% from 2023. College president Katharine Halliday said it was "a false economy" to be spending NHS funds on outsourcing radiology to private companies and was evidence of a failure to "train and retain the NHS radiologists we need."



NHS rationing

"Trade-offs are needed" to deliver reforms

NHS leaders are being forced to make tough decisions to balance their books and protect patient care, said the King's Fund. Its report, based on discussions with NHS leaders in England, found examples of local NHS leaders cutting services such as patient transport; freezing recruitment and reducing agency staffing; and reducing investments in public health services such as health visiting and school nurses. The authors called for realism about the trade-offs needed to deliver essential NHS reforms.

Maternity care

Services must be better funded, say NHS leaders

NHS Providers called on the government to adequately resource maternity services to help improve quality and safety. Its new report said that black women were as much as three times as likely to die in pregnancy or childbirth as white women and called for meaningful action to tackle racism in maternity services. The government's 10 year health plan must make maternity services a priority, said the report.

Sustainability

RCP publishes progress "report card"

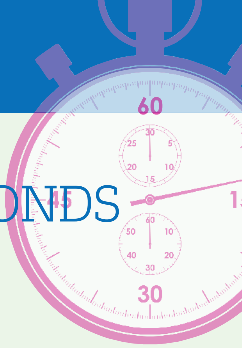
The Royal College of Physicians published its sustainability report card, detailing its progress in becoming a greener organisation. Steps include exploring "green" banking options and reducing energy consumption at the college's grade 1 listed London headquarters. Other measures include a toolkit for doctors to improve the sustainability of their practice, allowing domestic air travel only in exceptional circumstances, and working to improve waste management at the London site.

Cite this as: *BMJ* 2025;389:r1057

CONFLICT

In 2024 more than 3600 attacks on healthcare facilities in conflict zones were recorded, up by 15% from 2023 and by 62% from 2022

[Safeguarding Health in Conflict Coalition]



SIXTY SECONDS ON . . . **SPY SCALES**

A NEW GADGET FOR JAMES BOND?

Not quite. The term refers to digital "smart scale" technology currently being piloted by 15 specialist NHS clinics to help severely obese children lose weight.

WHAT'S SO SMART ABOUT IT?

The idea is that the young person is encouraged to stand on the scale at home every day. But instead of displaying numbers the scale connects to a mobile app to visually display whether weight is going up or down. The data are transferred to the patient's clinical team, who can send regular personalised feedback.

SO, BIG BROTHER IS WATCHING?

Media headlines have called them "spy scales." But Simon Kenny, NHS England's national clinical director for children, said the "game changing" tool helps specialists keep track of children's progress without them needing to leave home.

WEIGHT A MINUTE—NO NUMBERS?

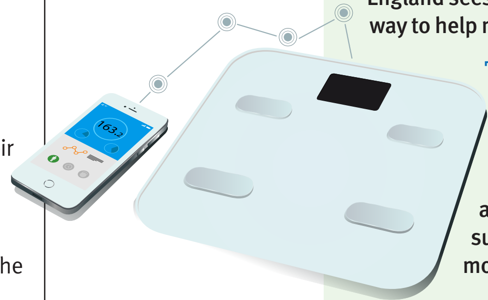
The technology is part of a holistic and behaviour change approach to obesity care. A high proportion of patients supported in these clinics have a neurodevelopmental disorder, such as autism or a learning disability, or health complications such as metabolic dysfunction associated steatotic liver disease, obstructive sleep apnoea, or hypertension. Over 40% of patients live in the most deprived neighbourhoods.

WEIGHTY MATTERS

Indeed. Catherine Homer, associate professor of obesity and public health at Sheffield Hallam University, part of the team that is collecting the data, said that there was an "urgent need to provide specialised, person centred support for the many young people currently living with severe and complex forms of obesity." Since 2021, 4784 children and adolescents with severe obesity in England have had care through these clinics, and NHS England sees the new technology as a way to help many more.

TIME TO SCALE IT UP?

Around 350 patients already use the new technology, and the plan is to extend the pilot to another four clinics this summer, which will help 150 more young people.



Jacqui Wise, Kent

Cite this as: *BMJ* 2025;389:r1022

MORTALITY: “Drug deaths causing UK to fall behind other rich countries”

A sharp rise in drug related deaths in recent years is largely responsible for the UK’s mortality worsening, an analysis has found. The UK’s rate of drug related deaths in 2019 was more than triple the average of its peer countries, a Health Foundation report said.

Mortality in the UK fell between 1990 and 2023, but between 2011 and 2019 the rate of improvement slowed and stagnated. Health Foundation chief executive Jennifer Dixon said, “The UK is becoming the sick person of the wealthy world. We need a bold, long term health strategy that tackles prevention, inequality, and underinvestment in public health . . . and in particular far more urgent action on drugs.”

The report compared the UK’s mortality trends with 21 other high income countries. Drawing on research commissioned from the London School of Hygiene and Tropical Medicine, it found that improvements in UK death rates slowed down greatly in the 2010s and more than in most of the comparison countries. Rates of death from cancers and circulatory diseases, among the most common causes of death in people aged 25-49, improved in the UK between 2001 and 2019.

Alcohol related mortality in the UK among people aged 25-49 fell from 2010 to 2019, from 8.1 to 7.5 deaths per 100 000 in women and from 16.8 to 13.2 in men. But in this period drug related mortality rose considerably, while falling in peer countries: from 5.4 to 10.4 deaths per 100 000 in UK women (peer countries 4.3 to 3.2) and from 16.3 to 25.8 in men (peer countries 8.9 to 7.9).

Rates differed across the UK nations. In 2019 drug related mortality in Scotland was around four times that in England. In England it was 3-4 times as high in the North East as in London.

A health department spokesperson said the government was committed to reducing drug related deaths and supporting more people to recover.

Adrian O’Dowd, London **Cite this as: *BMJ* 2025;389:r1046**

In 2023 mortality in UK women was almost **14%** higher than the median of peer countries (843 *v* 742 deaths per 100 000), while in men it was almost **9%** higher (1165 *v* 1070). The relative worsening of mortality in the UK was more marked in the working age population: **46%** higher than the peer country median in men and **31%** higher in women

Police criticised for advice to search for abortion pills after pregnancy loss

The Royal College of Obstetricians and Gynaecologists (RCOG) has criticised “truly shocking” police guidance detailing how to search women’s homes for abortifacient drugs and seize devices to look for period trackers in cases involving sudden unexpected pregnancy loss.

The *Practice Advice on Child Death Investigation* from the National Police Chiefs’ Council (NPCC) was published in January but has only just come to public attention. It replaces 2014 guidance that did not mention investigating stillbirths and had one mention of investigating women who may have had an illegal termination.

The new version has eight pages covering stillbirths and termination of pregnancy outside legally permitted circumstances.

Women’s reproductive rights are increasingly under the spotlight. Earlier this month Nicola Packer, 45, was cleared of illegally terminating a pregnancy after taking abortion pills during the covid lockdown. She is one of six women in the UK who have appeared in court over the past two years charged with ending their own pregnancy. Before this, only three convictions had been reported of an illegal abortion since the current law was introduced in 1861.

An amendment to the Crime and Policing Bill that is making its way through parliament would decriminalise abortion up to 24 weeks. It is supported by several medical colleges and organisations.

When “concerns are raised”

The new guidance says police should investigate if they are presented with

Up to 1000 new GPs face unemployment, BMA warns

The BMA has warned the government that as many as 1000 GP registrars could be left without a job when they qualify later this summer unless urgent mitigation is taken.

In a letter to Wes Streeting, the health and social care secretary, the chairs of the BMA’s General Practitioners Committee for England (GPCE) and its sessional and registrars committees warned that the unemployment crisis would deepen when GP registrars qualify in August. It urged ministers to provide ringfenced funding directly to general practices to allow them to hire newly qualified or unemployed GPs.

The BMA said GP unemployment had been steadily worsening over the past couple of years, with a lack of funding preventing practices from hiring GPs. The letter acknowledged extra funding provided for the additional roles reimbursement scheme (ARRS) for primary care networks to hire GPs, but it said this would “not generate additional jobs,” as the vast majority of existing ARRS budgets would be needed to continue to pay for GPs already employed under the scheme.

Cheska Ball and Vicki McKay, co-chairs of the GP Registrars Committee, said it was “devastating”

The best bang for an NHS buck is to provide ringfenced reimbursements Katie Bramall reports of unattended stillbirths in the community about which concerns have been raised, a live birth after an attempted termination of pregnancy, or an unattended live birth where the baby survived only a short period.

It says a "search of relevant premises should be considered where it is suspected an abortifacient has been taken to terminate a pregnancy outside of the legally permitted circumstances." This should include looking for the drugs mifepristone and misoprostol and any packaging or documentation relating to them.

Seizure of devices

The guidance states that "evidence of knowledge and intention in relation to the pregnancy may be demonstrated through digital evidence" and that seizure of digital devices used by the woman during her pregnancy should be considered. It suggests that "internet search history, digital communications with third parties, and health apps such as menstrual cycle and fertility tracker may provide information to help investigators establish a woman's knowledge and intention in relation to the pregnancy."

The guidance also includes advice on how police could obtain a woman's medical records if medical professionals were unwilling to disclose personal health information. It states that "there are alternative opportunities to seek the information," because the abortion regulations require any practitioner who terminates a pregnancy in England and Wales to provide the chief medical officer with details and that this can be disclosed to a high ranking police officer for the purposes of investigating if an offence has been committed.

MPs urged to decriminalise abortion

RCOG president Ranee Thakar said the guidance was "truly shocking to read," adding, "Women in these circumstances have a right to compassionate care and to have their dignity and privacy respected, not to have their homes, phones, computers, and health apps searched or be arrested and interrogated."

Thakar told *The BMJ*, "We are very alarmed by the increasing number of women being prosecuted for ending their own pregnancy, including women who have experienced the tragedy of an unexplained pregnancy loss being criminally investigated. This is not in the public's best interest."

Thakar urged MPs to seize the "unmissable opportunity to decriminalise abortion, to ensure women can access abortion safely, confidentially, and free from the threat of investigation and prosecution."

Katie Saxon, chief strategic communications officer at the British Pregnancy Advisory Service, said that the "harrowing" guidance was written at the same time as "unprecedented threats to global abortion rights" and that it showed "just how detached from reality" the NPCC was.

The Abortion Act of 1967 allows women to end their pregnancies under medical supervision up to 24 weeks—or beyond in certain circumstances such as if the life of the mother is at risk or the fetus has a serious abnormality.

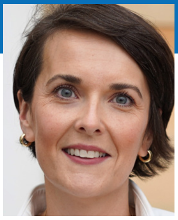
During the pandemic temporary arrangements were introduced in England, Wales, and Scotland that allowed for the medical consultation to take place over the telephone or by video call and for doctors to prescribe the abortion drugs, which could be collected or sent by post. In 2022 these arrangements were made permanent.

The NPCC said that since the law changed there had been a small rise in reports to police of suspected illegal terminations. It said it produced the guidance to bring consistency to how the police approached such cases.

A spokesperson said, "An investigation is only initiated where there is credible information to suggest criminal activity. We recognise how traumatic the experience of losing a child is, and any investigation of this nature will always be treated with the utmost sensitivity and compassion."

Jacqui Wise, Kent

Cite this as: *BMJ* 2025;389:r1036



The harrowing guidance shows just how detached from reality the police are
Katie Saxon

Women in these circumstances have a right to have their dignity respected
Ranee Thakar

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that new GPs might be unable to start their careers.

Mark Steggles, Sessional GP Committee chair, said the issue of unemployment had spread from locums to other parts of the GP profession.

Katie Bramall, GPCE chair, said,"We know public finances are tight, but the best bang for an NHS buck is to provide ringfenced reimbursements at a practice level to get as many GPs seeing patients as soon as possible."

A health department spokesperson said, "We have recruited more than 1500 GPs, and we are making it easier to hire GPs. We have also provided the biggest boost to funding in years—an extra £889m—and are investing £102m in surgery upgrades."

Gareth Iacobucci, *The BMJ*

Cite this as: *BMJ* 2025;389:r1051

Gonorrhoea vaccine scheme is "world first"

A vaccination programme to prevent gonorrhoea will be rolled out in August to the people at highest risk in England, making it the first country in the world to have such a programme.

Although the vaccine provides only around 30-40% protection, NHS England hopes it will reverse rising numbers of infections and help tackle antibiotic resistant strains. Gonorrhoea diagnoses in England reached a record high of 85 000 in 2023, three times the number in 2012.

The vaccine, 4CMenB (Bexsero), is currently used in the routine childhood programme given at ages 8 weeks, 16 weeks, and 12 months for the prevention of meningococcal B disease. It is a four component vaccine containing *Neisseria meningitidis* proteins. The vaccine has also been found to provide some protection against gonorrhoea, as *N meningitidis* and *N gonorrhoea* are closely genetically related.

JCVI recommendation

In November 2023 the Joint Committee on Vaccination and Immunisation (JCVI) recommended the 4CMenB vaccine should be offered to patients who would benefit most. The government has now accepted this recommendation.

The vaccine will be offered through local authority sexual health services and will mainly target gay and bisexual men who have a recent history of multiple sexual partners or a sexually transmitted infection.

However, the JCVI said vaccination should be considered for other groups, such as sex workers and people who are heterosexual but have a recent history of bacterial STIs.

An analysis by Imperial College London suggested the 4CMenB vaccine could avert 100 000 cases of gonorrhoea and save more than £7.9m over the next 10 years if high uptake is achieved.

EDITORIAL, p 271

Jacqui Wise, Kent

Cite this as: *BMJ* 2025;389:r1064

Could personalised CRISPR therapy transform genetic disease care?

An infant with a rare genetic condition made headlines this month after receiving the treatment. **Jacqui Wise** summarises what we know about the breakthrough

What has happened?

US doctors have developed and safely delivered a customised gene editing therapy to treat a baby boy with carbamoyl phosphate synthetase 1 (CPS1) deficiency, diagnosed soon after birth.

The condition, which affects one in 1.3 million people, is characterised by an inability to fully break down byproducts from protein metabolism in the liver. This causes a build up of ammonia to toxic levels that can cause severe damage to the liver and brain.

Treatment includes a low protein diet until the child is old enough to receive a liver transplant. However, during the waiting period there is a risk of rapid organ failure. The disorder is estimated to kill about half of those children affected in early infancy.

What is CRISPR?

CRISPR (clustered regularly interspaced short palindromic repeats) is a technology that allows precise changes to DNA inside living cells. A team at the Children's Hospital of Philadelphia and the Perelman School of Medicine at the University of Pennsylvania raced to develop a bespoke therapy, using the CRISPR platform, to correct one of the infant's two copies of the CPS1 gene.

The researchers developed the therapy and got it approved by the US Food and Drug Administration within six months of the baby's birth. They said ideally babies would be treated even earlier, to prevent any long term damage the CPS1 deficiency causes.

What was the result?

The infant, known as baby KJ (below), received a very low dose of the therapy at 6 months, then a higher dose at 7 and 8 months. The initial results were reported in the *New England Journal of Medicine* and at a meeting of the American Society of Gene and Cell Therapy on 15 May.

The research team saw signs that the therapy was effective almost from the start. KJ began taking in more protein, and doctors could halve the drugs needed to reduce ammonia concentrations. He also recovered well after catching a cold and later a gastrointestinal illness, which normally would have been dangerous for a child with his condition. No serious adverse events occurred, and the researchers said they were cautiously optimistic about KJ's progress but he would need continual monitoring.

What further research is needed?

It's still very early days, as KJ received his first dose in February. Much longer follow up is needed to assess the treatment's efficacy and safety. Direct molecular confirmation of gene editing by a liver biopsy has also not yet occurred as it posed an unacceptable risk to the infant. There has also not been evaluation of possible unwanted edits from the therapy (known as off-target effects). And the treatment will need to be repeated on other patients.

How has CRISPR based therapy been used so far?

CRISPR based therapies are in development for several genetic conditions, including Duchenne muscular dystrophy, cystic fibrosis, Huntington's disease, and cancer. In January NICE approved a one-off CRISPR therapy to treat severe sickle cell disease in people aged 12 years or over. However, such treatment is designed to be used in many people with the same disorder, regardless of the underlying mutations.

What makes this latest breakthrough different is that it is the first case of a personalised CRISPR based medicine designed to correct a specific genetic sequence in an individual's genome.

What might the breakthrough mean for the future?

The US National Institutes of Health (NIH), which supported the research, said the gene editing platform used could be tweaked to treat a wide range of genetic disorders and opened the possibility of creating personalised treatments in other parts of the body.

CHOP PENNSYLVANIA

GENE THERAPY for sickle cell disease costs £1.65m per course of treatment in England, even though it is a one-size-fits-all therapy

As we get better at doing this, economies of scale will kick in
Kiran Musunuru

Gene editing promises a new era of precision medicine for hundreds of rare diseases
Joni Rutter

Joni Rutter, director of NIH's National Center for Advancing Translational Sciences, said, "As a platform, gene editing—built on reusable components and rapid customisation—promises a new era of precision medicine for hundreds of rare diseases, bringing lifechanging therapies to patients: early, fast, and tailored to the individual."

However, cost will be an issue. Gene therapies are often expensive to develop because of the time it takes to test them for safety and efficacy. For example, the gene therapy for sickle cell disease costs £1.65m per course of treatment in England, even though it is a one-size-fits-all therapy. Personalised treatments are likely to be even more expensive.

Study author Kiran Musunuru told a press briefing he couldn't put a number on KJ's treatment cost as the companies involved did much of the work for free. But he said, "As we get better at doing this, economies of scale will kick in, and you can expect the cost to come down orders of magnitude." He predicted that in a "couple of generations, gene editing will have become the standard of care for many diseases"—as routine as antibiotics or blood pressure drugs.

Jacqui Wise, Kent

Cite this as: ***BMJ*** **2025;389:r1028**

"GMC regulation reform will go ahead this parliament"

The government has committed itself to introducing long awaited reforms to modernise the regulation of doctors and other healthcare professionals in the current parliament.

Karin Smyth, minister for health and secondary care, made the announcement in the House of Commons when pledging to amend the criminal offence of misuse of professional titles to stop fake nurses using the title "nurse." Smyth said, "This amendment will be made as part of the government's professional regulation reform programme, which will modernise the legislative frameworks for the GMC, the Nursing and Midwifery Council, and the Health and Care Professional Council during this parliament."

Ministers accepted as far back as 2018 that the bureaucratic and outdated system, which is more than 40 years old, should be reformed and simplified, and the GMC had long been pressing for such a move.

As part of the reforms the GMC would lose its right to appeal against the decisions of medical practitioner tribunals. The GMC's chief executive, Charlie Massey, said, "Updating our antiquated legislation is a crucial step in enabling us to take a more responsive and flexible approach to regulation and will make our processes simpler, faster, and less adversarial."

The GMC said the reforms would allow the regulator to change its own rules without requiring extensive parliamentary time, as at present. The new processes would allow greater flexibility in conducting investigations and resolving cases more quickly.

It said its current process provided "limited opportunity" to resolve cases without going to a tribunal, even where a registrant would be prepared to accept the regulatory action proposed.

This will make our processes simpler, faster, and less adversarial Charlie Massey

"This prolongs resolution, increasing stress for both the registrant and witnesses," the GMC explained. "In future, senior decision makers will be able to propose what action we should take to protect the public at the end of an investigation. If a registrant accepts a finding that their fitness to practise is impaired and the action proposed to address this, the matter can be resolved without a hearing, leading to a quicker, less stressful conclusion, while continuing to protect the public."

Clare Dyer, *The BMJ* **Cite this as:** ***BMJ*** **2025;389:r996**

ASSISTED DYING BILL: **MPs clash over role of doctors**

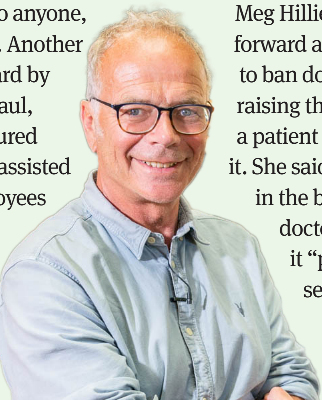
MPs considering a bill to introduce assisted dying laws in England and Wales are at odds over whether doctors should be allowed to raise the option with a terminally ill patient or should wait for the patient to raise it first.

The disagreement emerged as parliament debated the Terminally Ill Adults (End of Life) Bill, a private member's bill introduced by the Labour MP Kim Leadbeater, which MPs supported by 330 to 275 votes last November. The bill, which would allow patients expected to live for six months or less to opt for assisted dying, has since gone through six months of scrutiny by a parliamentary committee. Significant changes have been made, including removing the need for a High Court judge to sign off each request. Instead a panel, including a psychiatrist, would assess cases.

In a fractious debate on 16 May MPs railed against the limited time they had to raise amendments. As a private member's bill, debates are restricted to five hours on Fridays. This meant dozens of proposed amendments were not voted on or even discussed, and only two votes took place.

One new clause was added to the bill, extending the right for doctors to opt out of taking part in assisted dying to anyone, including pharmacists. Another amendment, put forward by the Tory MP Rebecca Paul, which would have ensured employers opposed to assisted dying could stop employees providing it, was defeated. The bill will come back for further debate and voting on 13 June.

Four MPs with medical backgrounds—former doctors the Conservative Neil Shastri-Hurst and Labour's Simon Opher (below) and Peter Prinsley, and the former nurse Kevin McKenna (Labour)—urged colleagues in a letter to support the bill, arguing that the current law "criminalises compassion and forces dying people into situations no civilised healthcare system should accept."



The current law forces dying people into situations no civilised system should accept Letter authors

Meg Hillier, Labour, put forward an amendment to ban doctors from raising the topic before a patient had broached it. She said the provision in the bill allowing doctors to suggest it "presents a serious risk that terminally ill patients, already highly vulnerable, will feel pressured to end their lives."

Shastri-Hurst said it represented a "fundamental misunderstanding of the doctor-patient relationship. We trust our clinicians every day to raise subjects of great complexity and moral weight."

The government has taken a neutral position on the bill. The Royal College of Psychiatrists said it was neutral on the principle, but ahead of the latest debate it had raised a number of concerns it had, including the demand it would put on psychiatrists. The Royal College of Physicians adopted a similar position, arguing that the bill as it stood was "not fit for purpose."

A bill to legalise assisted dying in Scotland has passed its first stage by 70 votes to 56.

Clare Dyer, *The BMJ*

Cite this as: ***BMJ*** **2025;389:r1026**

WHO to get extra $500m from China

China has pledged to give an additional $500m (£370m) to the World Health Organization over the next five years in a move that will help offset the loss of its top donor, the US, and increase Beijing's global influence. China's vice premier of the state council, Liu Guozhong, announced the pledge in a speech to the World Health Assembly on 20 May. He told the meeting, "China strongly believes that only with solidarity and mutual assistance can we create a healthy world together." (Full story doi:10.1136/bmj.r1066)

Bombing of IVF clinic kills four

A bombing outside a fertility clinic in Palm Springs, California, on 17 May injured four people and caused major damage to the clinic and nearby buildings. It also killed the perpetrator. The clinic provided treatments such as IVF, egg freezing, and surrogacy, especially for the city's large LGBTQ community. No patients were in the clinic at the time of the bombing, and eggs and embryos stored in the building weren't harmed. (Full story doi:10.1136/bmj.r1055)

Drug overdoses in US fall for first time in five years

The number of overdose deaths in the US has fallen for the first time in five years, in a sign the country may be finally turning the corner on deaths attributed to fentanyl. A report published by the CDC on 15 May showed that 107 543 drug related deaths were reported in 2023, down from 111 029 in 2022. The data also show that deaths began to flatten in 2022 and then fell steadily in 2024, indicating that the mounting health crisis may have peaked. (Full story doi:10.1136/bmj.r1014)

NEWS ANALYSIS

Why cardiovascular deaths in under 65s are rising again

After more than 20 years of steady decline, heart related deaths in working age adults are back up. **Sophie Borland** looks into the issue

> **We've been recognising more sudden deaths that may be related to obesity**
> Elijah Behr

Just a decade ago newspaper headlines and *The BMJ* were reporting a dramatic reduction in deaths from heart disease. Experts credited the fall to wider prescribing of statins and drugs for high blood pressure and also successful campaigns to bring down smoking rates. Fast forward to May 2025 and the story is very different. An analysis by the British Heart Foundation shows that cardiovascular disease mortality in working age adults (20 to 64 years) rose steadily from 49 deaths per 100 000 population in 2019 to 55 per 100 000 in 2023. The charity said that up to 2019 the overall death rate from heart disease had been declining since the organisation's founding in 1961.

Bryan Williams, a professor and the foundation's chief scientific and medical officer, told *The BMJ*, "Every decade over the past 60 years we've seen a progressive reduction in events due to heart disease, and then in the past five years we've started to see that flatten and now begin to increase. That's the thing that's a real concern to us, because we're losing a generation of progress here in reducing risk."

What is the role of obesity and of cuts to weight loss services?

Researchers estimated in 2021 that one in nine cardiovascular deaths in the UK, around 18 000 a year, were attributable to obesity or excess weight. A *Lancet* study in March 2024 estimated that 28.3% of women and 26.9% of men in the UK were obese, up from 13.8% and 10.7% three decades ago. This trend is being compounded by cuts to NHS weight loss services. Last September an investigation by *The BMJ* found that patients in nearly half of England cannot get appointments with specialist teams for weight loss support and care. Referring to a "rising tide of obesity," Williams added, "Many of the factors we're trying to correct are being made more difficult in patients who are obese and are more common. All of this to some extent contributes to the reversal of what we're trying to do."

Elijah Behr, consultant cardiologist and director of the Cardiovascular and Genomics Research Institute at City St George's, University of London, told *The BMJ* that the impact of obesity was a "concern, and it's something we've seen increasingly at our institution from a research perspective." He said the institute, which has a specific research interest in sudden deaths in young people, had been "recognising more sudden deaths that may be related to obesity."

Similarly, campaigners have warned about the effects of cuts to NHS smoking cessation services, with some areas of England seeing the first rise in smoking rates in nearly two decades.

Are lengthening waiting times a factor in the rise in deaths?

The number of people waiting for routine heart procedures has almost doubled since 2019. Latest NHS figures, up to March 2025 (published on 15 May), show that an estimated 425 372 people were awaiting procedures ranging from echocardiograms to stent fittings to coronary bypass surgery, including 8028 who have been waiting longer than a year. In March 2019 the number of patients on the waiting list was 216 188, of whom just 53 had been waiting more than a year.

Waits for ambulances have also increased. NHS figures up to April 2025 (published on 15 May), show that response times for category 1 patients—those needing an immediate response for a life threatening

SPL

condition such as cardiac or respiratory arrest—waited an average of 7 minutes and 43 seconds, up from 6 minutes and 59 seconds in the same period in 2019. For category 2 incidents—those that may require rapid assessment or urgent transport, which include heart attacks and strokes—the average response time was 27 minutes and 34 seconds, up from 21 minutes and 29 seconds in 2019.

"We always say time is muscle in a heart attack," said Williams. "Literally minutes matter. When you're faced with delays to ambulance response times, delays to get into the cath lab to get that artery opened up as an emergency procedure . . . that has huge impacts. These people waiting to have something done end up coming to emergency departments with chest pain, heart attacks, strokes that could have been prevented had we actually had the interventions done earlier."

What were the effects of the covid-19 pandemic?

The pandemic hugely disrupted cardiac preventive care, diagnosis, surgery and other treatment, and rehabilitation. Amitava Banerjee, professor of clinical data science and honorary consultant cardiologist at the Institute of Health Informatics at University College London, told *The BMJ*, "Even within cardiovascular disease we were focusing on providing emergency treatments and getting through the waiting lists for operations and for angioplasties and not focusing on whether we were making sure we were getting the right people on prevention . . . That's actually where we have a major impact to be made." There is also evidence that covid itself may increase the risk of heart attack and stroke.

Are changes in socioeconomic conditions making things worse?

Figures analysed by the British Heart Foundation show wide variation in mortality in working age people according to their level of social deprivation. In 2021-23 the average annual age standardised mortality from cardiovascular disease was 79 deaths per 100 000 working age adults in England's 10 most deprived local authorities and 29 per 100 000 in the 10 least deprived.

The foundation said that this disparity was principally due to socioeconomic factors that increase the risk of cardiovascular disease and to a lack of access to preventive treatment and other procedures in the poorest areas. It also pointed to evidence that this gap had widened in the past five years, particularly with respect to admissions to hospital for heart disease, stroke, and heart failure.

Furthermore, recent papers by the Institute of Health Equity at University College London and the health think tank the King's Fund have warned of growing health inequalities more generally.

RESEARCHERS estimated in 2021 that one in nine cardiovascular deaths in the UK, around 18000 a year, were attributable to obesity or excess weight

What can be done to reverse the current trend?

Behind the numbers are family tragedies of loved ones taken too soon. More widely, the NHS and the economy are also affected, particularly given the increasing number of deaths in people of working age.

Williams said, "We're seeing working age adults dying of heart disease. This is a tragedy—this shouldn't be happening." Behr agreed, saying, "I have children and I worry for their future. And if this is an environment of increasing health disparity and poor health in general, how is that going to impact on the future of our country?"

However, the British Heart Foundation is hopeful that new technology may help reverse the trend, including use of artificial intelligence to analyse CT scans to predict the risk of future heart attacks.

Other researchers are looking at how gene editing techniques can correct the DNA mutations that cause inherited heart muscle disease. The foundation also wants to make more use of behavioural science and data to identify an individual's risk of heart disease. "There are improvements coming through now that you couldn't have imagined just 10 years ago," Williams said.

He added, "Many of the issues we're facing are incredibly difficult challenges, but the solution will come from innovation and new ways of doing things. We can't just keep doing more of the same thing: there needs to be a radical reset."

Sophie Borland, Hertfordshire

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We're losing a generation of progress in reducing risk of heart disease events
Bryan Williams

We weren't focusing on making sure we were getting the right people on prevention
Amitava Banerjee

THE BIG PICTURE

Artists join campaign to demand action to cut snakebite deaths

A striking installation of 10 venomous snakes has taken over Geneva this month, during the World Health Assembly. The creations were created as an urgent "SOS" warning to international organisations and authorities that snakebite envenoming can no longer be ignored.

The "snakeover" installation is hiding in plain sight in Parc Mon Repos, representing the daily danger that people face from snakebite, one of the world's deadliest yet most overlooked neglected tropical diseases. Around 138 000 people die each year—one every five minutes—and 400 000 are permanently injured.

The installation also marks the launch of the Strike Out Snakebite (SOS) initiative, which has established a Global Snakebite Taskforce comprising experts, policy makers, funders, researchers, health professionals, community advocates, and global leaders.

The taskforce's report *Time To Bite Back: Catalyzing a Global Response to Snakebite Envenoming* tracks progress towards the World Health Organization's target of halving deaths and disabilities from snakebite envenoming by 2030. It warns the world's leaders that action has to be accelerated if the target is to be reached.

Alison Shepherd, *The BMJ*

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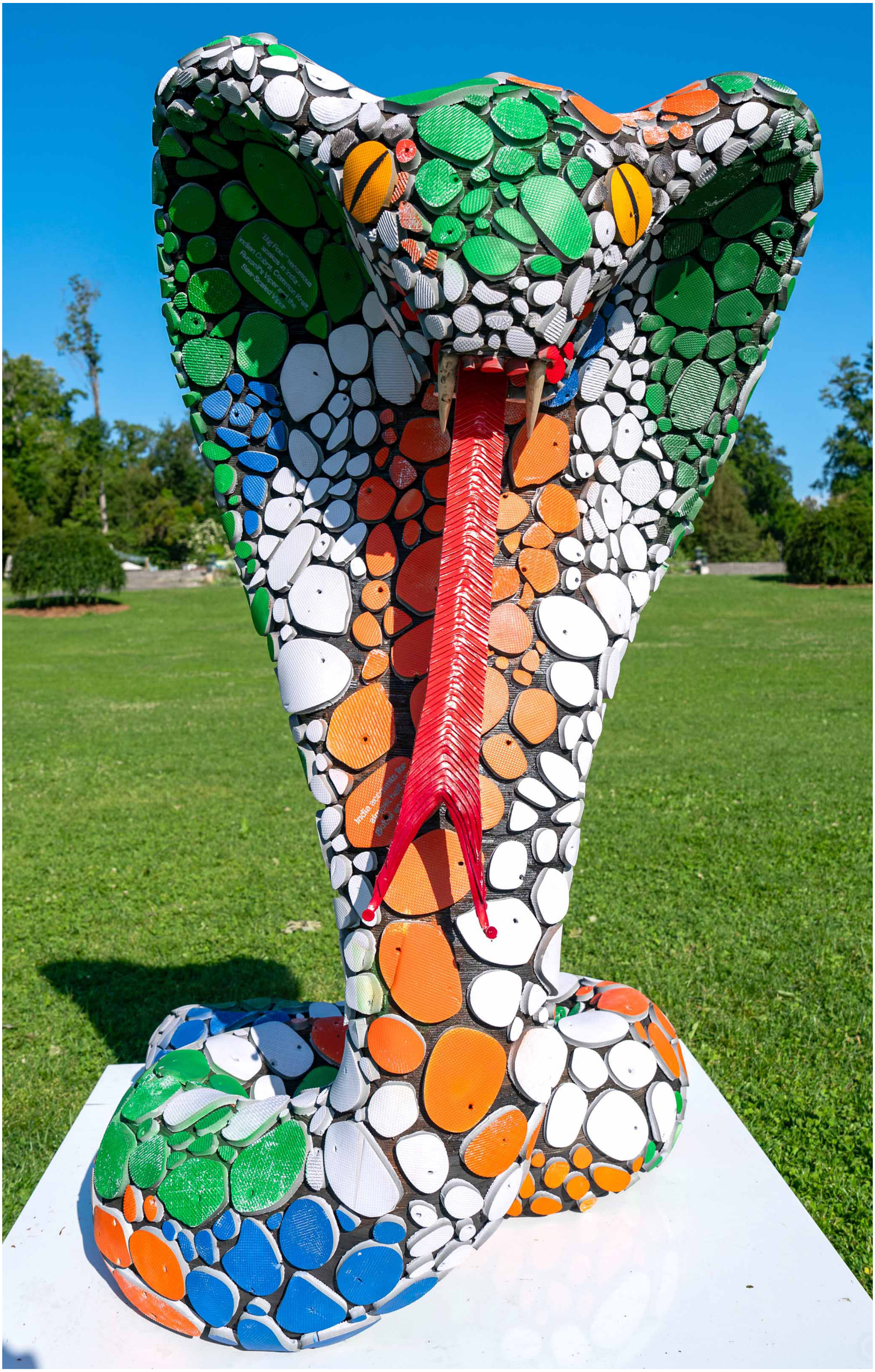

OWEN DAVIES/GETTY

Three of the 10 installations:

"The Last Coil," in the colours of the Indian flag (left), and "Bitten Twice," in the colours of the Nigerian flag (far left), by Lazerian, a UK studio led by the artist Liam Hopkins

"The Russell's Viper" (top left), by Lisa Lloyd, a UK based paper artist

EDITORIAL

Competition for medical specialty training posts

The UK needs joined up medical workforce planning

Discontent is simmering in the UK about the increase in competition for postgraduate medical specialty training posts.[1-5] This has arisen partly because of the rapid increase in the number of new international medical graduates (IMGs)—doctors with non-UK primary medical qualifications.[6,7] IMGs comprised 68% of new General Medical Council (GMC) registrants in 2023,[8] and they now form 46% of all doctors on the register.[9] IMGs are seen as a major contributor to the increasing difficulty of UK medical graduates to secure training posts, which is reportedly jeopardising specialty training aspirations and risking unemployment, and the BMA's resident doctors committee is demanding urgent action.[4-10]

The background to the current situation is complex and punctuated by short term solutions to fix medical workforce crises. In 2019, the UK doctor shortage resulted in the medical profession being added to the now defunct shortage occupation list.[11] This meant that IMGs could apply from their home countries for any medical post in the UK, including training posts. As a result, fill rates for training posts improved in some specialties. The increasing number of IMGs who required extra sittings of the Professional and Linguistic Assessments Board (PLAB) test for registration, generated around £25m in extra revenue for the GMC in 2024.[13,14]

Another reason for rising competition for training posts is the growth of locally employed doctor (LED) posts.[8,15] These posts multiplied in the early 2000s,[16] and from 2014 have grown more than any other category of post, reaching 35 000 in 2023.[8] They were created by trusts and health boards to address healthcare service gaps which had resulted from reducing residents' training hours and expanding healthcare delivery in the absence of a meaningful increase in training posts[16] (12 179 posts in 2019 to 12 743 in 2024).[10] Two thirds of LED posts are currently filled by IMGs.[8] At the end of their contracts, LEDs apply for another LED post, leave the GMC register, or apply for training posts, increasing competition ratios.[8,15]

MALCOLM WILLETT

There is a risk of oscillating between periods of intense competition and ongoing shortages of UK doctors

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Despite competition for training posts, the UK shortage of doctors continues (eg, 8330 vacancies in secondary care in England in 2024),[17] with just 3.2 doctors per 1000 population compared with the average 3.7 for countries in the Organisation for Economic Cooperation and Development (OECD).[18] England alone requires 40 000 more doctors to bring it up to the OECD average in Europe.[17] In the absence of a massive increase in medical student intake at UK universities,[8] IMGs are still required.

Coordinated approach

There is a risk of alternating between high competition for training posts to low fill rates, and perpetuating UK doctor shortages. These risks could be mitigated through the formation of a UK-wide medical workforce committee (similar to the Australian model)[20] to make coherent and joined-up recommendations across the whole medical career pathway. Its work should be driven by accurate data and with contributions from the GMC, national Departments of Health, the Home Office, NHS Employers, medical schools, postgraduate training bodies, doctor representatives, and patient groups.

Short term priorities must be to immediately suspend PLAB sittings—with exceptions for groups such as UK nationals with non-UK medical degrees[7]—and adjust future sittings in line with needs. Training posts must be increased as recommended in the 2023 Long term Workforce Plan for England[21] and replicated across the UK. Furthermore, transparent guidelines on training post appointments and prioritisation must be developed. This could involve an early application round for UK and international medical graduates in the UK before filling vacancies from outside the UK, or higher points in applications for current NHS employees or UK graduates.

Medium term priorities should include developing a national system that enables accurate collection of data, including migration status. There must also be an increase in medical student intake in line with long term plans,[21] and the development of a national strategy in relation to LED posts.[16] A national registry should be established for LED posts, detailing their specialties and contract duration. It must be a legal requirement to notify the registry when an LED post is created and filled.

Long term priorities must be set UK-wide and adjusted to developments in healthcare services, including new technologies, and incorporating an appropriate proportion of IMGs to maintain the UK's international reputation as a leading destination for medical education. Solving the postgraduate training problem requires a clear headed, fair, and compassionate debate and proper planning and implementation.

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EDITORIAL

Screening for prostate cancer

Inclusion of polygenic risk scores could improve outcomes

Prostate cancer is the most common cancer in men and is highly heritable. Despite its prevalence, there is no agreed international population based screening programme because of the lack of an appropriate screening test and the wide spectrum of disease—from slow growing tumours that do not require treatment to highly aggressive and incurable. Prostate specific antigen (PSA) screening alone is not recommended in most countries as it cannot distinguish accurately between potentially lethal disease and disease that will not affect an individual's quality of life and has unclear effect on overall survival.

Large, randomised trials of PSA screening have produced disappointing results. The US based Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial showed no mortality benefit from annual PSA screening after 15 years. The European Randomised Study of Screening for Prostate Cancer showed a 20% reduction in the risk of death from prostate cancer.[2] However, this was at a cost of overdiagnosis and overtreatment, with a number needed to screen (NNS) of 1410 and number needed to treat (NNT) of 48. Published data on breast and bowel cancer screening show a NNS of 113-720 and 281, respectively.[4 5]

Although a small proportion of inherited prostate cancer risk is attributed to rare pathogenic genetic variants (eg, *BRCA1* and *BRCA2*), the largest share comes from numerous low risk variants known as single nucleotide polymorphisms (SNPs) identified from genome-wide association studies. A study published in the *New England Journal of Medicine* in April 2025 evaluated use of a polygenic risk score, calculated from 130 inherited European ancestry SNPs, to guide prostate cancer screening in 6393 UK men of European ancestry.[6]

Optimal screening minimises overdiagnosis and ensures early detection of lethal cancers

Among the 745 men with a risk score in the top 10%, 468 had magnetic resonance imaging (MRI) and biopsy, and 187 had prostate cancer diagnosed. Notably, 103 cases (55%) were classified as "clinically significant," and the authors claim that 74 (72%) of these would have been missed using age specific PSA thresholds and positive findings on MRI, which is the most common approach to PSA testing in the UK. However, lack of consensus on PSA thresholds for investigation and regional differences in MRI quality lead to variability.

The study is limited by the predominance of men from European ancestry and professional backgrounds, reflecting limited socioeconomic diversity among those willing to be tested. Understanding inherited risk in men from non-European ancestries, particularly African and Caribbean, whose lifetime risk of prostate cancer is 1 in 4 compared with 1 in 8 for men of European ancestry,[7 8] will be essential to ensure broad applicability of polygenic risk scores. Additionally, it had relatively low recruitment rate (22% of those invited expressed interest in participating) and suboptimal adherence (withdrawal rate of 37%), probably influenced by the covid-19 pandemic as initial recruitment was in March to July 2019.

The primary reason for participant withdrawal, both before and after MRI, was reluctance to undergo biopsy (40%). Another unusual detail is the markedly lower cancer detection rates (10-20%) in MRI visible lesions (not considered low risk cancers) compared with the 50-80% reported in earlier studies, without an obvious explanation for this discrepancy.[9] Finally, a thorough evaluation of health economic benefits is required.

Potential of genetic screening

The ongoing debate surrounding the results of the landmark trials described has led to multiple further initiatives to investigate innovative approaches to early detection. The UK Transform trial, set to be the largest randomised prostate cancer screening study, will enrol 300 000 men and test PSA, MRI, and polygenic risk scores.[10] Alongside this, the European Praise-U initiative is coordinating five population based screening pilots.[11]

The introduction of a genetic risk component to prostate cancer screening is a welcome addition to PSA testing and MRI. Polygenic risk scores could enable risk stratification of individuals based on inherited characteristics, especially in assessing baseline risk and guiding repeated screening strategies. Alongside inherited genetic risk, non-invasive tests incorporating acquired somatic genetics (non-inherited spontaneous DNA alterations) are likely to be critical for differentiating potentially lethal cancers from indolent disease, as many aggressive cancers arise from somatic events not detected by germline (inherited) risk scores.[12] A screening strategy that minimises overdiagnosis and ensures early recognition of lethal prostate cancer is key, and polygenic risk scores could form part of a multimodal approach.

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TREATMENT INNOVATION

Who will pay for these new life altering medical therapies?

Many high risk, high reward advanced medical therapies that use cutting edge science are proving themselves in clinical trials. But are health services ready to pay for them—and how will they? **Marianne Guenot** reports

Gene editing therapies have transformative potential
Uta Griesenbach

On 16 September 2024 Jimi Olaghere (below, right) became the first person with sickle cell disease to reach the summit of Mount Kilimanjaro. The 39 year old could hardly believe it as he contemplated his achievement from nearly 6000 m above sea level.

"I was in shock. Five years ago I couldn't get out of bed," Olaghere tells *The BMJ*. People with sickle cell disease are discouraged from venturing to altitudes above 3000 m, let alone to the top of the highest peak in Africa.

Jimi Olaghere was the first person with sickle cell disease to reach the summit of Mount Kilimanjaro

Olaghere was a participant in Vertex Pharmaceuticals' trial of exagamglogene autotemcel (exa-cel, brand name Casgevy), which works by editing a patient's blood stem cells before they're re-injected. In the phase 3 trial 29 of 30 participants with repeated vaso-occlusive crises—episodes when "sickled" red blood cells get stuck in blood vessels and cause pain—reported no crises and no related hospital admissions for at least a year.

Exa-cel isn't the only success story. BlueBio's lovotibeglogene autotemcel (lovo-cel, brand name Lyfgenia) is also used to treat patients with sickle cell disease. Vertex and BlueBio are the first companies to produce therapies that use the much hyped CRISPR-Cas 9 gene editing technology (box).

Exa-cel was approved by the European Medicines Agency (EMA) and the US Food and Drug Administration (FDA) for sickle cell disease and thalassaemia and by the UK National Institute of Health and Care Excellence (NICE) for sickle cell disease. These approvals are "really exciting developments in the field," says Uta Griesenbach, professor of molecular medicine at Imperial College London, adding that gene editing therapies have a "very strong potential to be transformative."

Exa-cel and lovo-cel are just two examples of advanced therapy medicinal products (ATMPs) that have emerged in recent years. ATMPs use manipulated human genes, tissue, and cells to treat diseases and disorders. A typical example is chimeric antigen receptor T cell (CAR T cell) therapy, in which a patient's immune cells are removed from the body and genetically engineered to express molecules that target cancerous cells after re-injection.

Olaghere, who has had no vaso-occlusive crises since his treatment, says that exa-cel gave him the "superhuman" ability to carry out everyday tasks he didn't think were possible with his disease.

These therapies have the potential to be life altering—that is, if they can be afforded. With some ATMPs costing hundreds of thousands—even millions—of dollars per patient, experts warn that healthcare systems aren't ready to absorb the costs. On the other hand, this may be the jolt that ageing healthcare structures need to meet the demands of 21st century medicine.

Million dollar, single shot interventions

Matthew Durdy, chief executive of the biotechnology company Cell and Gene Therapy Catapult, says we're at a point where the volume of ATMPs available to patients may rise dramatically. That "could be seen as a threat, because it might overpower the system. Or it could be the most amazing opportunity," he says.

Many new ATMPs are now reaching the market. CSL Behring's etranacogene dezaparvovec (Hemgenix) and Pfizer's fidanacogene elaparvovec (Beqvez), two gene therapies for haemophilia B, were recently approved in the US and EU.

CAR T cell treatments also continue to grow. The FDA and the EMA have now approved six CAR T cell therapies to fight blood cancers, and others are in development for autoimmune diseases.

These approvals are good news for emerging therapies—which include gene therapy medicines, somatic cell therapy medicines, tissue engineered medicines, and other ATMPs—some of which come close to "cure" for some conditions.

For Sarah Emond, president and chief executive of the Institute for Clinical and Economic Review (ICER), years of investment in research and development are finally


Vertex Pharmaceuticals is among the first companies to use CRISPR-Cas 9 gene editing technology

BILL SIKES/PA/ALAMY


LYFGENIA/BLUEBIRDBIO LAB

paying off. “Yet we’re met with a payment system that has not evolved to meet this new science.”

Casgevy has a list price of $2.2m (£1.78m) per intervention and Lyfgenia $3.1m. Pfizer and CSL charge $3.5m for Beqvez and Hemgenix. Orchard Therapeutics’ Lenmeldy, which targets metachromatic leucodystrophy, a rare neurological disease affecting children, had a US list price of $4.25m in 2024. In 2022 the same drug, marketed in Europe and the UK as Libmeldy, was listed in the UK at £2.8m per intervention.

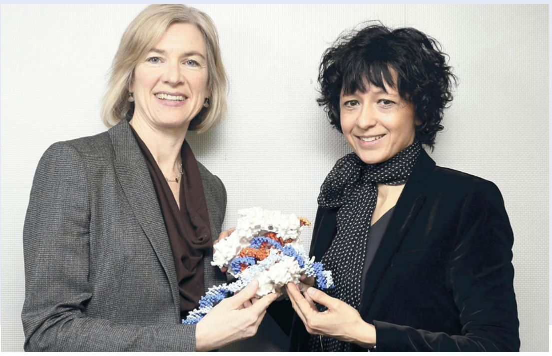
Increasing volumes may be seen as a threat—or an opportunity
Matthew Durdy

What is CRISPR-Cas9 and why is it so exciting?

CRISPR-Cas9 is a revolutionary gene editing technique. (CRISPR stands for clustered regularly interspaced short palindromic repeats, and cas-9 for CRISPR associated protein 9.) The invention of CRISPR-Cas9 won biochemists Jennifer Doudna and Emmanuelle Charpentier (below left and right, respectively) the 2020 Nobel prize for chemistry.

Often described as molecular “scissors,” the metaphor is apt: guided by a small piece of mRNA, it’s easily programmable and customisable, allowing scientists to precisely incapacitate, insert, or swap genes from cells’ DNA.

The approval of CRISPR based therapies was a milestone, as it is a signal that the technology is safe to roll out. Other CRISPR based treatments are in the clinical pipeline, including some targeting diabetes, muscular dystrophy, atherosclerotic cardiovascular disease, and even infectious diseases such as HIV and hepatitis B.


YOMIURI SHIMBUN/AP/ALAMY

The prices make more sense in context. ATMPs are usually meant to be curative, and their prices align with the cost of caring for the patient without the intervention. This “value based” pricing encourages manufacturers to develop niche treatments that will save money in the long term. In the short term, however, these treatments threaten to create shocks to already overstretched healthcare budgets. This unsteady situation has meant that treatments can fall by the wayside, while others take years to reach patients.

Pivot point

Although healthcare systems have been able to find funds to cover ATMPs so far, the industry is reaching a “pivot point,” says Paul Catchpole, director of value and access policy at the Association of the British Pharmaceutical Industry (ABPI).

“The ATMP pipeline is getting much bigger,” he tells *The BMJ*. There are over 4000 ATMPs currently in development.

Italy’s medicines agency expects as many as 60 ATMP launches between 2024 and 2030. In the UK the ABPI predicts that the Medicines and Healthcare Products Regulatory Agency (MHRA), which currently handles one to two approvals a year, will field 10 to 15 ATMP requests each year by 2030. The ABPI says that by 2028 as many as 10 000 people a year will receive the therapies, a fourfold increase from 2500 in 2021.

Similarly, the ICER reports that the FDA will approve 85 new gene therapies across more than 12 therapeutic areas by 2032, up from 17 over the past seven years. These therapies are touted to fetch $35-40bn over the next decade.

“The nature of those treatments is also changing,” Catchpole added, highlighting that ATMPs are now “moving into larger patient populations.” Treatments for haemophilia, he says, are a good “poster child” for this effect. “There are obviously many more patients with haemophilia than patients with rare diseases,” he says.

The ABPI reported that a 2021 survey of clinicaltrials.gov, the online database of clinical research studies, found that 54% of ATMP trials were targeting non-rare diseases. Some researchers are also looking to apply gene therapy to neurodegenerative diseases such as Alzheimer’s and Parkinson’s disease, the burden of which is expected to grow as populations age.

Improving access

To improve access to ATMPs some countries have been experimenting with innovative pricing structures, including “outcome based” pricing, where manufacturers share the risk of investing in the treatment by agreeing to pay back some of the cost if it doesn’t deliver on its promise.

Outcome based contracts can be an “important tool for protecting against clinical uncertainty,” says the ICER’s Emond.

She says, “In a lot of cases, even if you’re not assuming a lifetime of benefit, many of these therapies are bringing tremendous value to patients that command prices in the millions of dollars.

“But not everything that’s a gene therapy comes with that robust and evidence base that can justify a million dollar price.”

Clinical trials that support the regulatory approval of new cell and gene therapies are typically only a couple of years long, Emond says, “so there exists a tension between the evidence that we have in front of us and what is a reasonable expectation for how long it will last.”

Italy and Spain are two countries pushing these models forward, tracking patient outcomes through their national centralised patient data registries, infrastructure that often doesn’t exist in other countries.

Other countries are attempting a similar approach. NHS England says it will “explore” outcome based agreements under its renewed voluntary scheme for branded medicines pricing access and growth agreement, which began in January 2024 and lasts for five years. It has also committed to delivering two innovative payment model pilots for ATMPs.

The US Centers for Medicare and Medicaid Services is experimenting with the cell and gene therapy access model, a pilot programme that began in January 2025 to allow states to develop and administer outcome based agreements, which will use sickle cell as a template for this approach.

The approach has already seen many states and manufacturers express interest, Emond says, although she adds that it is not clear how the programme, introduced under Joe Biden’s administration, would pan out under that of Donald Trump.

Pricing disagreements

Emond cautions that outcome based pricing has some limits. One is that the strength of the contracts is only as good as the data that are collected after the intervention. “It requires an investment in infrastructure to track outcomes over time, and that isn’t something that payers typically do now.”

CSL Behring’s etranacogene dezaparvovec (Hemgenix) is one of two gene therapy products to treat haemophilia B recently approved in the US and EU

The industry is reaching a pivot point
Paul Catchpole

There’s no silver bullet in terms of a payment system
Sarah Emond

Evidence shows that healthcare systems are not ready
Rifat Atun

She warns that the ICER has heard of disagreements arising between payers and manufacturers on the outcome of the intervention. This can lead to cumbersome and lengthy resolutions. “There are examples where outcome based contracts might not make sense for a particular payer because of the administrative burden that can come with them,” she adds.

Other pricing structures have shown promise. France’s authorisation for temporary use allows manufacturers to set the price of therapies before marketing authorisation, provided that they sign up to a payback clause determined during negotiations with the French medicine pricing committee. The ABPI says this is one reason France is attractive to developers, as it enables early collection of real world evidence and accelerates patients’ access to the therapies.

Spain has also been leveraging Europe’s hospital exemption clause to support treatments from non-commercial actors. This clause allows products to sidestep Europe’s centralised marketing authorisation and be approved, instead, by the Spanish Agency of Medicines and Medical Devices. In September 2021 this led to the approval in Spain of ARI-0001, a CD19 CAR T cell treatment for treatment resistant lymphoblastic leukaemia.

“We’re starting to recognise, including those running healthcare systems, that there is a need not just to talk about innovative pricing models but to try and understand what that means in practice,” ABPI’s Catchpole says.

21st century systems

Headlines concerning new medical therapies highlight breakthroughs and curative hopes. But we’re still far from most of the public being able to access them, Emond warns.

“Some of these pricing models haven’t had as much uptake as we would expect,” she says, adding that some healthcare systems still prefer to “roll the dice” and take the risk of having to absorb the “lightning strike” of a one-off intervention, if it arises.

She says, “As we see more approvals, some of these payment options are going to seem like a much better deal.

“For the US, there’s no silver bullet from a payment and access perspective. We have hundreds of different payers, and they have different resources and constraints when it comes to changing and adapting their payment system for these very expensive, but potentially high value, therapies.”

Rifat Atun, director of the Health Systems Innovation Laboratory at Harvard University, warns that even if these systems can work for some payers “it is very difficult to know whether these approaches can be replicated and scaled up in a systematic fashion.”

“The evidence overwhelmingly shows that healthcare systems are not ready,” he tells *The BMJ*.

Jimi Olaghere still marvels at the miracle he feels he’s received. But he can’t shake off a trace of guilt over the fact that many other patients with sickle cell disease won’t be able to access the therapy because of its hefty price tag.

“It’s going to take a while” until sustainable solutions are offered, he says. “A lot of lives that need to be saved will unfortunately not be saved.”

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TREATMENT INNOVATION

Life-changing drugs but still no cure—challenges as cystic fibrosis patients age

Sixty years ago cystic fibrosis was practically a death sentence, but the remarkable progress of science and medicine has meant that people with the condition can live into their 60s. **Mun-Keat Looi** considers what new health challenges these patients face and whether talk of a cure is premature

Cystic fibrosis has long been considered a life limiting condition, as patients have historically struggled with significant morbidity and early mortality. The past few decades have brought remarkable progress, transforming the prognosis for many.

"In the 1960s, CF was an almost exclusively paediatric condition," says David Ramsden, chief executive of the Cystic Fibrosis Trust. "Many people with the condition would have actually not made it through even very early childhood." Today, the median predicted survival for a baby born with CF has increased to over 60 years, in stark contrast with previous decades.

Yet CF was also often cited as a condition that might be "cured" by gene therapy. Where do we currently stand in the search for a cure? And as people with CF live longer and longer lives, how do we continue to tackle the challenges they face?

Changing treatment landscape

Much of the progress in longevity is credited to the introduction of highly effective modulator therapies (HEMTs)—oral drugs that improve the function of the CFTR protein responsible for CF, either by increasing the time the channel pore is open or by facilitating its trafficking through the cell to where it's needed on the cell membrane.

For many people, these drugs have been life changing. "We know that these drugs aren't a cure: not everybody can benefit from them, not everybody can tolerate them," says Lucy Allen, director of research and health data at the Cystic Fibrosis Trust.

CF is caused by mutations in the *CFTR* gene, with over 2000 mutations identified to date. While modulator therapies work for many people with the most common mutations, they are ineffective for those whose mutations prevent any CFTR protein from being produced. Sadly, this group of people have a genetic type that leaves the modulators with "nothing to work on," says Jane Davies, consultant in paediatric respiratory medicine at the Royal Brompton Hospital in London.

The median predicted survival of a baby with CF is now over 60 years

For this group, gene therapy—the idea of replacing the malfunctioning *CTFR* gene with a working one in the patient's cells—holds promise. "In an ideal world, gene therapy would be the way to cure everybody," says Davies. However, this remains a long term goal. Current gene therapy approaches in trials focus primarily on delivering treatment to the lungs, whereas modulator drugs taken orally affect multiple organs.

Growing old with CF

With increasing life expectancy come a new set of health concerns. "We don't yet know the longer term effects of potential lifetime exposure to modulator therapies," says Allen. Additionally, people with CF are beginning to experience conditions largely associated with ageing, such as cardiovascular disease and cancer.

Then there are emerging risks. People with CF have as much as 10 times the risk of bowel cancer as the general population, says Frederick Frost, senior lecturer at the University of Liverpool. This increased risk is thought to be due to a combination of genetic factors, chronic gut inflammation, and the effects of long term antibiotic use. Similarly, CF related diabetes and hypertension are becoming more prevalent, necessitating a shift in management of adult CF care.

And, despite advances in treatment, lung infections remain a significant challenge for people with CF. The polymicrobial nature of lung infections in CF makes treatment complex, as multiple pathogens interact in ways that are not yet fully understood.

To tackle this, the UK's CF community has launched initiatives such as the Cystic Fibrosis Antimicrobial Resistance Syndicate, which facilitates the development of better diagnostics and treatments. The challenge of antimicrobial resistance is particularly pressing, as repeated antibiotic exposure increases the risk of drug resistant infections.

While the advancements in CF treatment have been revolutionary, experts urge caution in how progress is communicated. News headlines about gene therapy might lead us to wonder why we haven't yet cured the condition completely.

Allen emphasises that improving quality of life remains a major focus, rather than exclusively pursuing an elusive cure. Ramsden says that, while a cure remains the ultimate ambition, "the risk of using the word 'cure' glibly is that you start to create expectations that you can't fulfil."

Davies adds, "It is possible to continue to push [CF progress] without hope of a cure. We need to be realistic and not oversell. The important thing is to take the community with us on this."

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TOO MUCH MEDICINE

Overdiagnosis and the harm to patients

Early detection and proactive medicine are often equated with better care—but **Suzanne O'Sullivan** begs to differ

***The Age of Diagnosis*, a new book by the award winning author Suzanne O'Sullivan—a neurologist and clinical neurophysiologist at the National Hospital for Neurology—explores how diagnostic enthusiasm can sometimes do more harm than good. O'Sullivan sat for an interview with *The BMJ*'s Helen Macdonald.**

What brought you to the topic of overdiagnosis?

Over the past 10 to 15 years I've noticed more and more young patients coming in with extensive lists of diagnoses. These labels often explain symptoms but don't seem to lead to meaningful treatment or improvement. It can feel like diagnosis for its own sake.

You start the book with a powerful story about a mother and daughter

Yes, a patient I call Stephanie. She has epilepsy, which I'd never managed to get under control. Then, one day, we noticed she was walking strangely. A casual comment from her husband revealed that their daughter, Abigail, walked the same way. That set off alarm bells: maybe it was genetic. So, I tested them both. Years later, we confirmed that they had a rare mutation.

But then came the regret. Abigail was only 15. She didn't see her gait as a problem—she was good at yoga, not great at running. She was teased a bit but otherwise lived a normal life. My diagnosis was correct, but was it helpful? Did Abigail need to know that at 15? That's the crux of overdiagnosis: doing the right thing medically but potentially harming the person.

How do you define overdiagnosis, especially in contrast with public misconceptions?

People often hear "overdiagnosis" and assume it means that the diagnosis is wrong or that the patient isn't really ill.

ISABEL B PERMUY/ARCHIVO ASBC/ALBUM/ALAMY

That's not what I mean at all. A diagnosis can be entirely correct, but if it's made too early, or if it offers no benefit—or worse, causes harm—then it becomes a problem. It changes a person's relationship with their health and body.

Your book coincided with public debate on the cost of benefits and disability diagnosis. How do you respond to concerns that your work might be used to justify cutting support?

That's absolutely not my agenda. Overdiagnosis doesn't mean that someone isn't struggling. It means that perhaps we're over-medicalising that struggle. I still want those people to receive support—be it psychological, educational, or social. But maybe we can do it without medical labels, which can sometimes be limiting or harmful.

Recently, the health secretary, Wes Streeting, referred publicly to overdiagnosis

I agreed with the sentiment, but I feared that it would be misunderstood. It's a nuanced topic. When someone says there's an overdiagnosis problem, the public might hear, "There's nothing wrong with you." That's not it at all. It's not about denying illness: it's about asking when medicine starts to become too much medicine.

This idea has been explored in journals such as *The BMJ* and through campaigns such as Choosing Wisely. How can the wider public conversation be improved?

I hope *The Age of Diagnosis* contributes to that. Doctors are already talking about this—"too much medicine" has been a longstanding thread in *The BMJ*. But it's hard to talk about publicly. People fear that it's about rationing care. But really we're asking: what care is genuinely helpful?

There's a study from the *New England Journal of Medicine* in 2017 showing similar cancer mortality rates between high and low income countries, despite much higher diagnosis rates in wealthier nations. That's a red flag: we may be doing unnecessary care.

How do you communicate this clearly to patients and the public?

I focus on real stories. There's one woman in my book who believed she had Huntington's disease for 20 years—she never tested, but she lived as if she had it. Eventually she did the test, and it was negative. But that belief had shaped her life. It shows that diagnosis isn't inert: it can be powerful and even harmful.

Did any patients you spoke to for the book express regret at getting a diagnosis?

Yes. One of the biggest challenges is that people often feel lucky to have a diagnosis, even if it's ultimately unhelpful. In cancer, people relate to the saved life more than to the people overtreated. That's why storytelling is vital. We need to understand what it feels like to live under a label that might never have been necessary.

How did the patients in your book react to sharing their stories?

They were incredibly generous. People want their experiences to help others. Whether it was about autism, ADHD, Lyme disease, or genetic testing—they wanted to be heard. And I think readers will see that these aren't abstract concepts. They're deeply personal.

Helen Macdonald, publication ethics and content integrity editor

Mun-Keat Looi, international features editor, *The BMJ*

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ROLE MODEL

Mary Doherty

The consultant anaesthetist talks to **Kathy Oxtoby** about being autistic and being a doctor

When Mary Doherty was diagnosed as autistic in 2013, in her mid-40s, "looking back it explained so much of my life."

"But the question then was, 'Can you be autistic and be a doctor?'" says Doherty, a clinical associate professor at University College Dublin School of Medicine, and a consultant anaesthetist at Our Lady's Hospital, in Navan, Ireland.

She connected with the autistic community, both online and in person, but couldn't find any other doctors. "I recognised we needed a community space for doctors who are autistic."

Doherty started Autistic Doctors International (ADI) as a Facebook group in 2019 (https://autisticdoctorsinternational.com). It now has around 1200 members worldwide and hosts WhatsApp groups, as well as online and in-person meet ups. "We're not just a peer support group—we are a vibrant community of colleagues and friends," Doherty says.

ADI is involved in advocacy, training, and research, "spreading knowledge and awareness among our medical peers, because there is such a poor understanding of autism, and neurodivergence more widely," she says.

ADI also has a linked group for autistic medical students and a website (https://linktr.ee/autisticdoctors) dedicated to its research, which is focused on improving healthcare for autistic people as well as the needs of autistic doctors and medical students.

The group has been "career saving for some, and life saving for others," Doherty says. "And it's somewhere we can be safely ourselves among accepting friends, peers, and colleagues, where we don't have to mask and don't have to be other than who we are."

She says there is "an erroneous association between being autistic or neurodivergent in medicine and being in difficulty, when the reality is that, while some members do have career challenges, the vast majority do not."

"We have published research which shows that most of our members are thriving in their careers without any difficulty at all, but are flying under the radar because the disclosure that they are autistic is not safe."

Many doctors do not realise they are autistic, she says. "And living in a world designed for non-autistic people without realising that you're autistic is incredibly difficult. That's why raising awareness is so important."

From a young age, Doherty wanted to help people. As a child she had recurrent abdominal pain "and was not believed by doctors."

"At the age of 5 I decided I was going to be a doctor when I grew up and I would always believe my patients," she says.

After attending medical school at University College Dublin, she chose to specialise in anaesthesia, training in Dublin with a fellowship in France in regional anaesthesia. She took up her current post in 2008.

"What I love about anaesthesia is the people—and this flies in the face of stereotypes about autistic people. I particularly love building a rapport with patients in often really stressful situations in a short period of time, and gaining their trust, where they're comfortable to put their life in your hands." she says.

Doherty's late aunt, who was a nurse in the US, influenced the doctor Doherty is today. "She recognised I was different and inspired me to embrace that difference," she says.

She says that autism academic and advocate Dinah Murray "inspired me to share my autistic identity and to use it for the benefit of autistic people." And consultant anaesthetist Nancy Redfern "is an incredible role model," who has spent her career supporting doctors and is involved with anaesthetists' wellbeing.

Outside of work, skiing and climbing are her passions, and she is a qualified skiing instructor. Apart from her children, she sees founding ADI as being the greatest achievement of her life. "I'm really proud of it, and of its leadership team. From the beginning, I knew we had so much knowledge around autism and neurodivergence that we needed to bring to the medical profession. I hoped that by founding the organisation we would do that. Now I'm seeing this come to fruition."

She believes "it's never too late to understand yourself in a way that can be life changing." She says, "Here I am, coming towards the end of my career, and finally finding my purpose. It's never too late to follow your dreams."

Kathy Oxtoby, London

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NOMINATED BY JAMES HENDERSON

"Mary provides inspiration and guidance for doctors, and has literally saved lives, both directly for doctors having workplace or legal difficulties and indirectly, by supporting those who would have quit medicine. Following a difficult time at work, she was there for me.

"Mary also researches the needs of autistic patients, culminating in a doctorate and affiliations with University College Dublin and the University of Exeter. She has presented widely to academic and statutory bodies, and the media. Mary is also a qualified ski instructor.

"Many autistic doctors conceal their traits, fearing discrimination. We must highlight the benefits of autism in medicine, and Mary is leading the world with this."

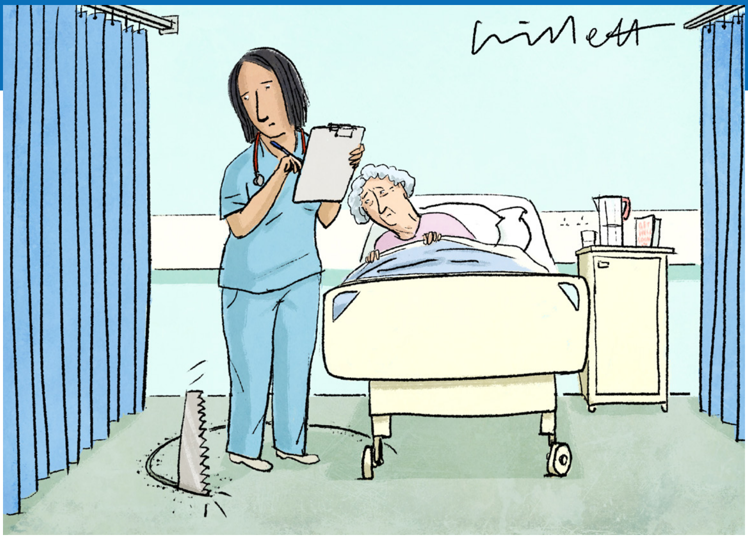
James Henderson is a consultant plastic, reconstructive, and hand surgeon and deputy lead of Autistic Doctors International.

NOMINATE A ROLE MODEL

To nominate someone who has been a role model during your medical career, send their name, job title, and the reason for your nomination to emahase@bmj.com

I am being undermined at work—what can I do?

Doctors are often criticised by colleagues. **Tom Moberly** hears advice on what to do when this happens



Seek support early

Sara Sreih, medicolegal consultant at the Medical Protection Society

"According to the 2024 NHS staff survey, more than 15% of staff experienced harassment, bullying, or abuse from colleagues in the previous 12 months. Unfortunately, it's not uncommon for us at MPS to see cases that have deep rooted disputes between colleagues at the centre.

"Such behaviours not only affect those on the receiving end but can have a profound impact on patient care. If inappropriate interactions are allowed to play out in the context of handovers or referrals, for example, patients can be put at risk.

"If you're being undermined by a colleague, pause and take a deep metaphorical breath. Bearing in mind your obligations to work collaboratively and to treat colleagues with respect, you should be wary about being drawn in to responding in an unprofessional manner.

"If another clinician questions a clinical decision you've made, consider that they have a duty to raise a concern where they perceive risk to patient safety. This may, however, be a matter that requires more serious attention if the behaviour is persistent or carried out without courtesy and respect. Try objectively to identify and document these instances.

"If these situations arise because of poor communication, a direct conversation may be the first step. If you feel the behaviour might amount to bullying or harassment, then support should be sought. Seek advice from your manager or a trusted mentor and consider involving your union or medical defence organisation. The impact on confidence and wellbeing can be considerable and long lasting, so seek support early."

Maintain professionalism

Clare Gerada, former president of the Royal College of General Practitioners

"Dealing with a colleague who undermines you can be challenging, especially where teamwork is essential. It has happened to me during my career, and it's very painful.

"Start by reflecting on the specific behaviours that are making you feel undermined. Consider whether these actions are intentional or if misunderstandings are at play.

"Recording incidents that demonstrate this undermining behaviour can be helpful. Documenting the context, what was said or done, and how it impacted your work might provide clarity and support if you need to escalate the matter later. If you feel comfortable, open up to your colleague about how their actions affect you. Seeking support from a trusted mentor or colleague can also be beneficial.

"Throughout this process, it's essential to maintain professionalism. Respond calmly to undermining behaviours and uphold high standards in your work. Setting clear boundaries may also be necessary, such as keeping all conversations to those needed for clinical work only. Politely communicate that specific actions are unacceptable and explain their impact on your work dynamics.

"Building relationships with other colleagues can help create a support network.

"If the situation doesn't improve despite your attempts to tackle it, consider exploring formal conflict resolution avenues in your organisation, such as mediation or a grievance procedure. Resolving this matter may take time, but your efforts are essential."

Record examples

Martin Bond, general secretary of HCSA—the hospital doctors' union

"Undermining behaviour can emerge in all workplaces, but the pressurised environment in the NHS makes it particularly prone to the problem. In an ideal world, dealing with this would be straightforward. Employers should have clear standards of conduct and policies should be in place to deal with conflicts that emerge between staff.

"The best case scenario is that by raising the matter informally it can be tackled. Sometimes this kind of behaviour is completely unintentional and tackling it directly could be enough to get an apology and nip the problem in the bud.

"In the real world, however, things are often far more complex, perhaps because of power dynamics—between resident doctors and senior medical staff, for example—or because of wider toxic cultures which allow bad behaviour to go unchallenged. People who undermine colleagues may simply be hardwired to behave that way.

"It's important to record examples of the behaviour that is affecting you. Where an informal approach doesn't work there should be an escalation and conciliation process available through your employer.

"This can feel like a huge step. As well as being daunting, raising concerns about colleagues sometimes leads to the complainant being labelled a troublemaker and this creates more problems—particularly when those power dynamics come into play.

"If an informal approach doesn't work, or you don't feel able to raise the concern directly, a union such as HCSA can support and advise you on the way forward. You don't have to face this kind of problem alone."

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