this week

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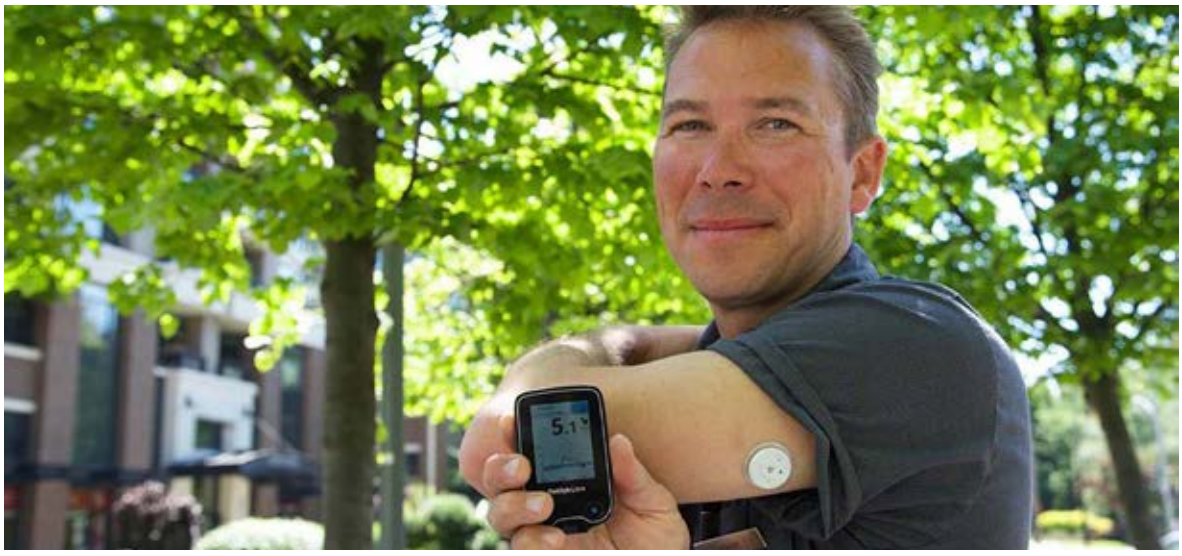


NHS to end diabetes device lottery

All clinical commissioning groups in England should make "flash" glucose monitoring devices available to patients with type 1 diabetes who meet the current clinical guidelines, NHS England has said.

The announcement means that more patients will be able to get the devices on prescription from their GP or a specialist diabetes team from April 2019, regardless of where they live.

The decision comes just a week after a *BMJ* investigation lifted the lid on a postcode lottery that is denying tens of thousands of UK patients access to the devices, which work from a small sensor attached to the skin. Campaigners and clinicians such as Partha Kar, the NHS's associate national clinical director for diabetes, have been lobbying CCGs to adopt NHS England's guidance since the sensors were made available on prescription on 1 November 2017.

Simon Stevens, chief executive of NHS England, said he had made the decision on world diabetes day (14 November) to improve the health outcomes and quality of life among people with type 1 diabetes.

He said, "As the NHS prepares to put digital health and technology at the heart of our long term plan, NHS England is taking important action so that, regardless of where you live, if you're a patient with type 1 diabetes you can reap the benefits of this life improving technology."

Kar hailed the decision. He said, "This is an exciting and welcome step forward as the aim is to have uniform prescribing policy across the NHS, irrespective of where someone with type 1 diabetes lives. This will be based on previous national guidance issued—with the provision of updating it as further evidence accrues."

Currently, 144 of 195 CCGs recommend the device, but some have imposed stricter criteria than NHS England set through its Regional Medicines Optimisation Committee for the north of England.

It is estimated that between 3% and 5% of patients with type 1 diabetes in England have access to Freestyle Libre, currently the only device available, but if all CCGs followed the guidance correctly this figure would rise to around 25%.

Chris Askew, chief executive of Diabetes UK, said, "This is a huge step forward and will be welcome news to the many thousands of people with type 1 diabetes whose lives will be changed for the better."

Gareth Iacobucci, *The BMJ*

Cite this as: *BMJ* 2018;363:k4812

The Freestyle Libre being made available across England will change the lives of patients with type 1 diabetes, say campaigners

LATEST ONLINE

- Vitamin D does not reduce cancer or cardiovascular events in healthy adults, trial finds
- GMC should apologise for its handling of the Bawa-Garba case, says RCP president
- Baby care: RCOG finds average of seven factors in each stillbirth, neonatal death, and brain injury

SEVEN DAYS IN

Facebook ad claiming that vaccines can kill is banned by UK regulator

The UK's Advertising Standards Authority (ASA) has ruled that a Facebook advertisement paid for by a US based antivaccination campaign group should not appear again.

A woman complained that the claims in the ad (left) were misleading and could not be substantiated and that the baby's image was likely to cause distress. The authority upheld the claim on both grounds and told Larry Cook, who runs Stop Mandatory Vaccination, that the ad must not be run again in its current form.

The authority had asked Cook to produce evidence that all vaccines carry the risk of death. He sent a US federal document showing the number of claims and the money awarded under the vaccine compensation programme. This showed that 6122 claims for vaccine injury and death were allowed and 11 214 were dismissed in the 20 years to 2018. But the ASA said, "While we acknowledged that those figures showed that a large number of claims had been compensated, we noted the report stated that settlement did not determine whether the vaccine had conclusively caused the injury or death." It added that the data in the UK could be different.

After the ruling Cook posted, "I will continue to promote my message to parents of the United Kingdom. The ASA does not have jurisdiction over Facebook or me."

Clare Dyer, *The BMJ* **Cite this as: *BMJ* 2018;363:k4720**

International news

Anti-gay activities in Tanzania are condemned

AIDS activists called on the Tanzanian government to end an initiative aimed at identifying and arresting people suspected of being gay. Regional representatives of the International AIDS Society's governing council said that HIV clinics in the country have been accused of promoting homosexuality and have been closed as part of actions promoting state sponsored harassment of LGBT Tanzanians. After the latest announcement 10 people said that they were arrested in Zanzibar on spurious charges, adding that the actions were contrary to Tanzania's stated commitment to end the AIDS epidemic by 2030.

US Medicaid expands, drug prices are targeted

Voters in three of America's most conservative states—Utah, Nebraska, and Idaho—passed ballot measures to implement provisions of "Obamacare" and extend Medicaid to 300 000 working citizens who earn too much to qualify under the old rules but not enough to afford private insurance. Healthcare was the most important issue to 41% of voters in the midterm election exit polls, compared with immigration (23%) and the economy (21%). Within hours of the vote the house minority leader, Nancy Pelosi (below), and President Trump both said that they aim to work together to tackle excessive drug prices.

Antibiotics

Resistant bacteria cause fifth of infections

Nearly a fifth of infections in Europe, North America, and Australia are due to antibiotic resistant bacteria, the Organisation for Economic Cooperation and Development warned. The average proportion of bacteria found to be resistant to antibiotics in Greece and Turkey was twice the average at 35%—seven times higher than in Iceland, the Netherlands, and Norway, which had the lowest rates (5%). Around 2.4 million people in OECD countries will die from 2015 to 2050 because of multi-resistant bacterial infections unless preventive measures are taken, the report predicted.

Patient safety

Dialysis patients get help to spot bleeding

Patients who have kidney dialysis through an arteriovenous fistula or arteriovenous grafts were asked to look out for signs of life threatening bleeding, after seven patients died from May 2015 to April 2018. Warning signs include non-healing scabs, signs of infection, and shiny skin around the connection to the dialysis machine. Patients at home should use a rigid object such as a large bottle top, hollow side down, to apply pressure to the area while waiting for an ambulance, said NHS Improvement.

Shropshire trust enters special measures

A hospital trust at the centre of an independent review over the deaths of more than 100 babies was put into special measures over its management, workforce issues, problems in urgent and maternity care, and whistleblowing. Shrewsbury and Telford Hospital NHS Trust is already reporting weekly to the Care Quality Commission over its maternity and emergency services, but NHS Improvement said the trust needs extra support to ensure that patients get safe, high quality, compassionate care.

Migrant health

End to immigration status checks through NHS

The government agreed to drop an agreement allowing NHS Digital to share patients' information with the Home Office to track down illegal immigrants. The decision followed legal action by the Migrants' Rights Network and Liberty, which was supported by the BMA and the Royal College of General Practitioners. The arrangement—set up in 2014—was suspended in May this year. A new Home Office request is being considered, said NHS England.

Suicide

People intervene more in attempted suicide

Members of the public acted 136 times in the first nine months of this year to stop people attempting suicide, up 20% on 2017. The data showed 127 suicides on railways from January to August, the lowest number for five years.

MEDICINE

Rabies

UK death follows a bite from a cat in Morocco

Public Health England issued a notice reminding people of the risk of rabies, after a UK resident died after becoming infected from a cat bite during a visit to Morocco. Five cases of human rabies associated with animal exposures abroad occurred from 2000 to 2017. Mary Ramsay, head of immunisations at Public Health England, said anyone scratched or licked by an animal in a country where rabies is present should wash the wound or site with soap and water and seek prompt medical advice.

A British person died from rabies after being bitten by a cat in Morocco

Trainees

BMA surveys junior doctors on contract

Junior doctors are being urged to report on their workplace conditions by responding to a BMA survey on the 2016 contract terms. The survey, part of the contract review, includes exception reporting, leave arrangements, and work patterns. The BMA has been in dispute with the government since the contract was imposed, and the review is an opportunity to secure improvements and pursue revisions, said Jeeves Wijesuriya (above), chair of the BMA's Junior Doctors Committee. The survey closes at 5 pm on 29 November.

Outpatients

NHS model is no longer fit for purpose—RCP

The current model of outpatient care in the NHS needs to change to meet demand and need, the Royal College of Physicians has argued. The college called for a new approach to account for all costs related to an intervention, including patients' loss of income and the impact of transport on public health. Solutions could involve better use of telephone and video consultations and remote monitoring to promote self care, it said.

Emergency care

England faces "year round crisis," warns BMA

A BMA analysis of NHS England data showed that services fared worse in summer 2018 than in five of the past eight winters against three key indicators: emergency admissions, trolley waits of over four hours, and the percentage of emergency attendances completed within four hours. Taj Hassan, president of the Royal College of Emergency Medicine, called for the 10% decline in beds in the past seven years to be reversed and for better planning in the NHS's 10 year plan to help avoid the need for "winter bailouts."

Emergency bowel surgery mortality rates fall

The 30 day mortality rate from emergency bowel surgery fell from 11.8% to 9.5% in 2013-17 in England and Wales, the Royal College of Anaesthetists found. This represents around 700 more patients' lives saved. The National Emergency Laparotomy Audit analysed care received by around 24 000 emergency bowel surgery patients from December 2016 to November 2017.

Cite this as: *BMJ* 2018;363:k4788

BREXIT

A "no deal" Brexit could impose around **£2.3bn** in extra annual costs on the English NHS—equivalent to the annual budgets of around six NHS trusts—through driving up the cost of purchasing supplies

[Nuffield Trust]

SIXTY SECONDS ON . . . MEAT TAX

ANOTHER DAY, ANOTHER TAX, RIGHT?
Well, not exactly. While the media may be calling this a "meat tax," there's no government policy on taxing meat . . . yet.

SO THE STORY'S BEING HAMMED UP?
The stories relate to a paper in *PLOS One* that reported the optimal level of taxation needed, in 149 world regions, to offset the theoretical healthcare costs of eating red meat and processed meat.

AN IDEA PLUCKED FROM THIN AIR?
No. In 2015 the World Health Organization classified processed meat as "carcinogenic to humans," with bacon, sausages, ham, and corned beef in the same risk group for cancer (group 1) as asbestos, cigarettes, and alcohol. Governments tend to apply taxes to anything deemed carcinogenic or with public health concerns—see tobacco and alcohol.

CAN YOU PUT ANY FAT ON THE STORY?
In 2020 the global health costs related to red and processed meats would be $285bn (£219bn), which is 0.3% of the global gross domestic product. There would be 860 000 deaths related to red meat, and 1.5 million related to processed meats (4.4% globally). To compensate for these costs, the price of red meat would need to increase on average by 4%, and 25% for processed meat.

THAT'LL CHOP INTO GROCERY BUDGETS
For the UK, this would equate to a 227 g Tesco sirloin steak increasing in price from £3.80 to £4.33 (14%), and eight Sainsbury's pork sausages from £1.50 to £2.69 (79%).

ANYTHING ELSE TO CHEW ON?
Yes, global deaths from meat consumption would fall by 222 000 in 2020 if a tax were introduced, the healthcare related costs would fall by $41bn, and the tax revenues would reach a delicious $172bn.

BRILLIANT—IT'S MATHS, SO IT MUST BE ACCURATE?
It's a mathematical model, so caution is advised. Limitations included assuming the risks of eating red and processed meat were causal, and they couldn't account for all the factors that might affect health costs.

ANY OTHER NUGGETS?
It's win, win. The study also showed that less meat consumption would help greenhouse emission gases fall by 1.2% globally.

Greta McLachlan, *The BMJ*

Cite this as: *BMJ* 2018;363:k4769

Robot assisted surgery is blamed for patient's death

A coroner overseeing an inquest into the death of a 69 year old man after a pioneering robotic heart operation went wrong has concluded a risk of further deaths will remain unless additional safeguards are introduced.

The coroner, Karen Dilks, said the death of retired music teacher Stephen Pettitt came as a "direct consequence of the operation and its complications . . . in part, because [it] was undertaken with robotic assistance."

The inquest heard that the operation in February 2015 at the Freeman Hospital in Newcastle was the first of its kind in the UK. The surgeon, Sukumaran Nair, had observed others using the da Vinci robot and practised alone on a simulator but had not had any one-to-one training. Nair admitted that he had not told Pettitt that he ran a higher risk as the first patient to undergo robotic mitral valve surgery than if he had had conventional open heart surgery, which carried a 1-2% risk of death for him.

Premature step

An expert report concluded that Nair's cross clamp times in conventional operations were slow and that moving to robotic procedures was "a premature step, running before you could walk."

Thasee Pillay, the surgeon assisting in the operation, told the inquest that he and Nair struggled to concentrate and to talk to each other because of a "tinny" noise from the robot. He had to raise his voice when he realised that the stitches were not being placed in an "organised fashion" after the robot knocked a theatre assistant's arm.

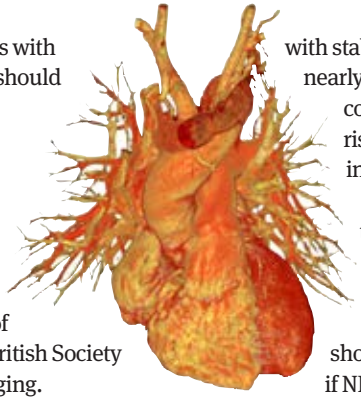
Near the end of the operation, when it was discovered that the sutures needed to be repaired, the aorta had been cross clamped for a considerable time and the patient developed a bleed that blinded the robot camera.

The surgeons moved to open heart surgery, but Pettitt's heart tissue had deteriorated too much, and he died from multiple organ failure in the next days.

Clare Dyer, *The BMJ*

Cite this as: *BMJ* 2018;363:k4791

Angina patients put at risk from lack of scans, say radiologists



At least 56 000 patients with angina in the UK who should have had a computed tomography coronary angiography (CTCA) scan last year missed out because of a shortage of scanners and radiologists, say the Royal College of Radiologists and the British Society of Cardiovascular Imaging.

They warn that underlying heart conditions may be missed if patients presenting with chest pain have their heart function assessed by exercise tests rather than CTCA scans. NICE updated its guideline in 2016 to recommend that all patients with chest pain should be investigated with CTCA.

A 2018 study in the *New England Journal of Medicine* found that investigating patients with stable chest pain by using CTCA nearly halved their risk of death from coronary heart disease or their risk of non-fatal myocardial infarction over five years.

Figures from NHS Digital show that 75 791 CTCA scans were performed in the UK last year. However, the royal college and the society estimate that there should have been at least 132 080 if NICE guidelines had been followed, indicating a shortfall of 43%.

Provision of CTCA scans was best in England, followed by Northern Ireland (58% shortfall), Scotland (73% shortfall), and Wales (78% shortfall).

Excellent accuracy

Andy Beale, of the Royal College of Radiologists, told *The BMJ*, "In the past

At least 132080 scans should have been performed if NICE guidelines had been followed, indicating a shortfall of 43%

Bullying at NHS Highland scrutinised

The Scottish government has ordered an independent inquiry into alleged bullying at NHS Highland after doctors blew the whistle on what they described as a "culture of fear and intimidation" at the health board for the past decade.

Scotland's health secretary, Jeane Freeman, said the inquiry would take place following the allegations that surfaced in September 2018, when a group of clinicians, including the Inverness GP Iain Kennedy (below), wrote to the *Herald* newspaper warning that "bullying" and "intimidation" of whistleblowers was rife at NHS Highland and was harming patients.

Around 120 staff, including managers, GPs, consultants, and support staff, have come forward with accounts of being bullied. Kennedy told *The BMJ* that he had spoken to 60 to 70 staff, including some who had experienced severe mental health problems as a result of bullying.

"We think it's been kept quiet over the years because each victim has felt isolated and terrified of speaking up," he said. "We believed that we had an ethical and moral duty to whistleblow."

Constructive talks

Kennedy said that a meeting on 5 November between whistleblowing clinicians, the GMB union, chief executive of NHS Scotland Paul Gray, and other officials had been constructive. "Now that it's been announced that there will be an inquiry we are very confident that this will be tackled. The genie is out of the bottle," he said.

The Scottish government agreed in September to support NHS Highland to manage the fallout from the allegations and has now committed to an independent investigation.

A Scottish government spokesperson said, "The welfare of NHS staff is paramount, and any claims of bullying in

10 years it has become possible to take a CT scan of the heart in between beats when it is stationary. You can now get excellent pictures of the coronary arteries and look for plaque, calcification, atherosclerosis, and narrowing."

He added, "Exercise tests are not particularly accurate and result in a lot of patients being either wrongly labelled or wrongly treated. Cardiac CT scans are more than 95% accurate at diagnosing, and even better at ruling out, coronary artery disease.

"There used to be worries about the radiation dose with CT scans, but it is roughly 10% of what it used to be. The dose is now not that dissimilar to a number of chest x rays and is significantly less than an angiogram."

For every million people the UK has only nine CT scanners, while France has 17 and Germany has 35. In addition, many of the UK's existing CT scanners are not modern enough to perform CTCAs.

Giles Roditi, president of the British Society of Cardiovascular Imaging, said, "Deadly cases of heart disease are being missed because we can't deliver these scans properly across the UK."

Jacqui Wise, London

Cite this as: *BMJ* 2018;363:k4719

"We think it's been kept quiet because each victim has felt terrified of speaking up" Iain Kennedy

the workplace must be treated with the utmost seriousness. This meeting (on 5 November) was helpful and provided useful input to the final form and scope that the independent external investigation will take."

David Alston, chair of NHS Highland, said, "Since the allegations were brought to the attention of the board, despite significant effort we have been unable to fully understand the nature, extent, and causes of the concerns being raised. What is clear, however, is that a growing number of staff are feeling distressed and concerned about their working environment.

"The board has said all along that we have nothing to hide and, therefore, in order to understand and tackle the underlying problems we would welcome external input."

Gareth Iacobucci, *The BMJ*

Cite this as: *BMJ* 2018;363:k4778

Visa system for conference delegates harms UK science

Medical conferences may have to be moved abroad unless the Home Office changes its visa issuing policy, the head of the London School of Hygiene and Tropical Medicine has warned.

Peter Piot said that 17 would-be delegates were prevented from attending the Women Leaders in Global Health conference, held at the school on 8-9 November, because they were denied visas. He called for an urgent review of the rejected applications and wrote to the home secretary, Sajid Javid, warning that UK competitiveness was being affected.

His complaints have been backed by the president of the Royal Society, Venti Ramakrishnan, and the director of the Wellcome Trust, Jeremy Farrar. Writing in the *Times*, Farrar said that Britain's place in world science could not be maintained without a proper immigration system.

Disappointment

Among those denied a visa to attend the women's health conference was Abrar Alalim, a medical student from a university in Sudan. She told the *Times*, "I was so disappointed. I worked hard on a speech to deliver there. The organisers of the conference paid for our tickets, hotel, meals, transportation. This is a lot of money spent on nothing."

Another conference, the Global Symposium on Health Systems Research in Liverpool, held in October 2018, was short of at least 10 of its 2000 registered delegates as a result of visa denials. One of them was Sabu Kochupurackal Ulahannan, who works in tribal communities in Kerala, southwest India. In a blog post he described the process of applying for a UK visa as discriminatory.

The Home Office said that in considering visa applications it took into account the financial circumstances of the applicant independent of any support provided by the host organisation, and their professional background.

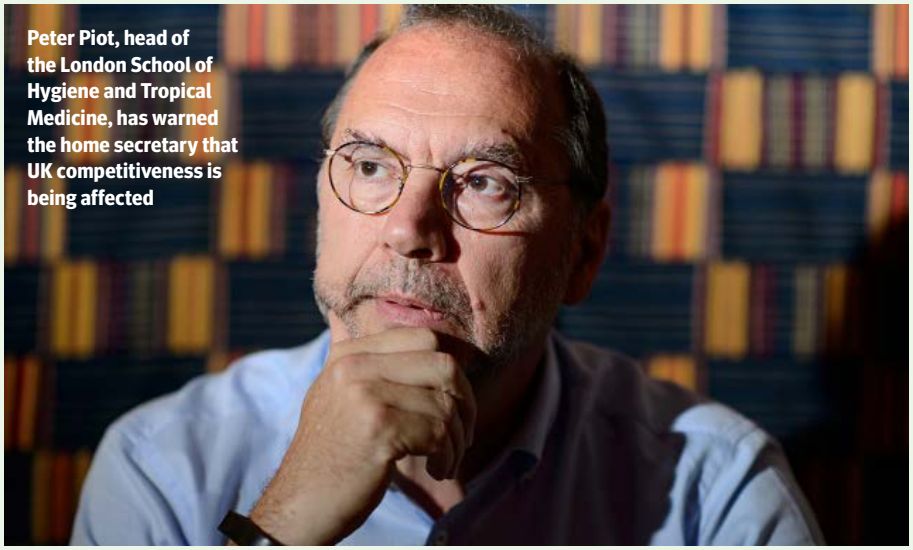
It is charged with controlling immigration into the UK, and visitors overstaying their visas is the largest channel of irregular immigration. While those migrants who are discovered in the back of a lorry at UK ports make the headlines, they are outnumbered by those who overstay and whose disappearance is seldom reported.

No official statistics exist, but the Migration Observatory at the University of Oxford quotes a figure of between 417 000 and 863 000 (central estimate 618 000) of those with irregular immigration status in the UK in 2007, compared with 178 000 to 400 000 in France and 196 000 to 457 000 in Germany.

Any conference in the EU would require an international delegate to get a Schengen visa, which requires them to produce an employment contract, a bank statement, and an income tax return.

Nigel Hawkes, London

Cite this as: *BMJ* 2018;363:k4779



Peter Piot, head of the London School of Hygiene and Tropical Medicine, has warned the home secretary that UK competitiveness is being affected

US doctors react to criticism from National Rifle Association

People at a candelight vigil in honour of the Borderline Bar shootings

KENT NISHIMURA/ LOS ANGELES TIMES/GETTY IMAGES

"My lane is a pregnant woman shot by her partner. Have you ever had to deliver a shattered baby?"
Stephanie Bonne, Newark surgeon

Kristen Gee, a doctor in Los Angles, tweeted images of her blood soaked boots and scrubs after treating a gunshot victim

Doctors across the US reacted sharply when a tweet from the National Rifle Association suggested that they should "stay in their lane" rather than join the debate on gun control.

The tweet, which came in response to a position paper from the American College of Physicians (ACP), was written just hours before a gunman killed 12 people at the Borderline Bar in Los Angeles.

NRA editorial

The ACP paper was published in the *Annals of Internal Medicine*. The NRA reacted with an editorial on its website, then with a tweet linking to the editorial. The tweet said, "Someone should tell self-important anti-gun doctors to stay in their lane. Half of the articles in Annals of Internal Medicine are pushing for gun control. Most upsetting, however, the medical community seems to have consulted NO ONE but themselves."

The tweet triggered an online backlash, much of it from emergency department physicians and others who treat the consequences of gun violence, under the hashtags #ThisisMyLane and #ThisisOurLane.

Kristin Gee, from Los Angeles, was one of several physicians who posted photographs of their own blood soaked scrubs and shoes, writing, "To the @NRA, this is what it looks like to stay in #mylane . . . I speak for this patient, for their parents who will never be the same, for every person who came after this one and didn't have to."

Joseph Sakran, director of emergency general surgery at Johns Hopkins Medicine in Baltimore, a city notoriously troubled by gun violence, asked the NRA, "Where are you when I'm having to tell all those families their loved one has died?"

"Do you have any idea how many bullets I pull out of corpses weekly?" asked Judy Melinek, a forensic pathologist in San Francisco. "This isn't just my lane. It's my fucking highway."

"My lane is a pregnant woman shot in a moment of rage by her partner," wrote Stephanie Bonne, a trauma surgeon in Newark, New Jersey. "She survived because the baby stopped the bullet. Have you ever had to deliver a shattered baby?"

Bonne also wrote of "asking families to identify their child by their tattoos, because their faces are unrecognizable."

The *Annals of Internal Medicine* also responded, tweeting, "We pledge to talk to our patients about gun violence whenever risk factors are present."

Guns in the home

The NRA has sponsored proposed legislation in several states that would stop paediatricians and family doctors asking patients about guns in the home. Such a law was passed in Florida in 2011 but was struck down in a federal court.

Data published this summer by the Centers for Disease Control and Prevention showed that the US death toll from firearms rose in the past two years, after decades of steady decline, with most of the increase in urban areas.

Data recently published in *JAMA Pediatrics* show that about 8300 children are admitted to US hospitals each year with firearm injuries, of which roughly 40% are accidental.

Owen Dyer, Montreal

Cite this as: *BMJ* 2018;363:k4795

National plan is needed to tackle childhood trauma

The government should create a national strategy to tackle adversity and trauma in childhood at an earlier stage to reduce the risk of ill health and social problems later, a group of MPs has urged.

The current provision of early intervention in England was "highly variable"

Former prime minister Gordon Brown at the opening of a Sure Start centre in 2009

and often undermined by inadequate funding, poor quality data collection, and insufficient focus on evidence, said the report from the Commons Science and Technology Committee.

The report identified early intervention schemes that worked effectively but said the lack of a national strategy or an effective means of monitoring schemes was hampering progress. A clear national plan would improve the lives of those who suffer in childhood and deliver long term savings by shifting resources away from late stage intervention, the MPs argued.

Norman Lamb, the committee chair, said, "A national strategy with coordinated support for local authorities could see the transformative benefits of

Fears of NHS's future sparks Brexit shift

Concern about the NHS is a major factor in driving "leavers" to want to back "remain" in any new Brexit referendum, results of a YouGov poll indicate.

The survey of about 8000 UK citizens was carried out on behalf of the People's Vote Campaign in early September. It found that, although only a small proportion of people had changed their views since the 2016 referendum, views about the NHS were closely linked to voting intentions in any new referendum.

Negative effect

The poll found that people who voted remain were more likely than those who voted leave to think that Brexit would have a negative effect on the NHS (65% *v* 12%).

Among leave voters who would switch, 48% thought the NHS would get worse

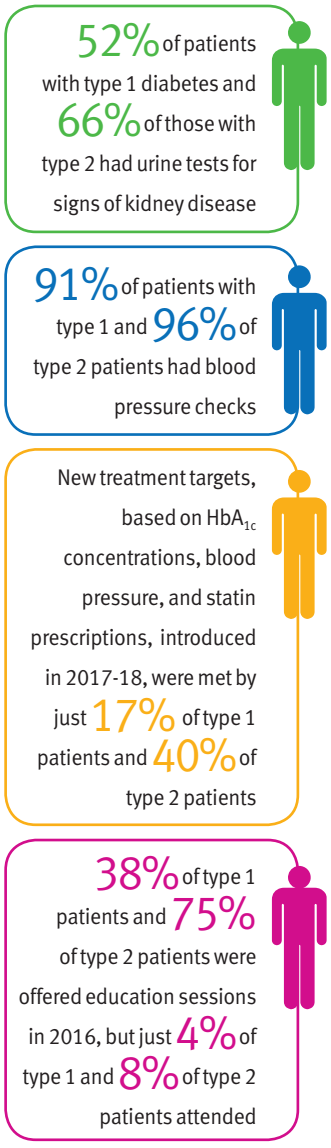
Christina Pagel, professor of operational research at University College London, who analysed the survey, found that a belief that Brexit would have a negative effect on the NHS was associated with a 60% increase in the likelihood of people wanting to vote remain in a second referendum. This was the case even after accounting for factors such as age and how people voted in 2016.

Among those who voted to leave in 2016 but would vote to remain in a second referendum, 48% thought that the NHS would get worse after Brexit. By comparison, among those who voted to leave and would vote that way again, only 8% thought that the NHS would suffer.

Ingrid Torjesen, London

Cite this as: *BMJ* 2018;363:k4799

Audit paints "bleak picture" of diabetes care in England and Wales



Around 1.5 million people with diabetes are not getting the care they need, in what health campaigners describe as a "bleak picture" of treatment.

Although more people with diabetes in England and Wales are being properly cared for, four in 10 do not get the care recommended by NICE, the latest diabetes audit has found. Patients ought to receive at least eight forms of care, including blood and urine tests, blood pressure and foot ulcer checks, and BMI and smoking history monitoring.

But figures for 2017-18 show that just 43% of people with type 1 diabetes and 59% of those with type 2 received care in line with NICE's recommendations. The number of patients getting all forms of care rose from the previous year, when they stood at 34% for type 1 and 48% for type 2 diabetes, but remain significantly lower than in 2013-14, when 45% of type 1 and 68% of type 2 diabetes patients received all forms.

Karen Addington, the Juvenile Diabetes Research Foundation's chief executive, said, "This report paints a bleak picture of care and treatment broadly, but people with type 1 are being particularly let down."

The audit came as figures from NHS Digital showed the sums being spent on antidiabetes prescriptions have risen to record levels, with 53.4 million items prescribed in 2017-18, costing over £1bn.

Concerns over access to NHS treatment were highlighted in a *BMJ* investigation on 8 November, which showed a postcode lottery in availability of "flash" glucose monitoring devices.

Jonathan Owen, London

Cite this as: *BMJ* 2018;353:k478

early intervention offered to all children who need it, irrespective of where they live."

The report added that extra funding was needed to establish, among other things, a team within an expanded Early Intervention Foundation to help local authorities plan. The foundation, an independent charity and a member of the government's What Works Network, aims to ensure that effective early intervention is used to improve the lives of children at risk of poor outcomes. The strategy should also define and train a designated "early years workforce," including healthcare workers, teachers, and social workers, it said.

The government should promote the importance of data collection and analysis, provide examples of good practice, and set and monitor targets for improvement, it added.

Michael Marmot, director at University College London's Institute of Health Equity, said that he would have liked the report to focus more on the effects of poverty and deprivation on children. He told *The BMJ*, "The reductions in funding for Sure Start centres and early child services have been significant. People say that we've got to make good use of the money we have, and that's absolutely right. But you need the money to implement the interventions that work."

Gareth Iacobucci, *The BMJ*

Cite this as: *BMJ* 2018;363:k4809

OTHER KEY RECOMMENDATIONS

- Tackle the shortfall in health visitors to ensure that all children receive all five mandatory visits
- Ensure that academics can access data on childhood adversity, outcomes, and the effects of early intervention
- Clarifying the future of Sure Start Children's Centres, and
- Make use of "implementation science" to explore how proven interventions can best be promoted and delivered

THE BIG PICTURE

Congolese fight against Ebola

Health workers embrace while putting on their personal protective equipment before heading into the red zone at a newly built Ebola centre supported by the charity Médecins Sans Frontières in Bunia, in the Democratic Republic of the Congo.

The death toll from the most recent outbreak of Ebola virus disease has risen to more than 200, with more than 330 probable cases reported, the health ministry said last week. The outbreak, the second this year, has been declared by local officials as the worst in the country's history.

The UK has sent two teams to DRC to help deal with the outbreak. Daniel Bausch, director of UK Public Health's Rapid Support Team for Ebola, told Sky News, "We sent a senior epidemiologist for a rapid assessment mission a few months ago, when things started. We've just sent him back.

"We are gearing up to send two teams after that. One is a laboratory team to help with sequencing the virus to better understand where the cases are coming from. The other is a team to work on some of the therapeutic trials that are being set up to test whether new drugs are efficacious for Ebola."

Efforts to contain the virus are complicated by the conflict raging in the east of the country and by rebel attacks on health workers and facilities. The World Health Organization has said that 27 000 people have been vaccinated against Ebola virus disease in the country but noted that its workers often faced resistance from some communities to allow them to vaccinate and bury the dead, because of issues of trust and misinformation.

Alison Shepherd, *The BMJ*

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JOHN WESSELS / AFP

As MPs prepare to vote on the European Union (Withdrawal) Bill, doctors, academics, and healthcare campaigners warn in the following nine pages that leaving the EU will risk patients' lives, disrupt medicine supplies, and dismantle research networks. And a "no deal" Brexit will be even worse

EDITORIAL

Brexit will damage health

You can help ensure a people's vote on the final deal

Within the next few weeks, the House of Commons is expected to vote on the withdrawal agreement to exit the EU. The prime minister has said that the choice for MPs will be between the "Chequers deal"[1] if and in what guise it still exists, and, by default if this is not approved, a "no deal" Brexit.

We are concerned that either outcome has the potential to cause serious and lasting damage to the nation's health.[2] You may think there is nothing you can do to influence these events. This editorial, jointly from the BMA, the Royal College of Nursing, and *The BMJ*, seeks to persuade you otherwise.

Concern about the damaging effects of a no deal Brexit has intensified as the consequences have become clearer and the date of departure approaches. It is now widely accepted that the UK's economy will be badly hit, with inevitable cuts to funding for health and social care. But a "no deal" Brexit also poses serious immediate and long term threats to the supply of medicines and devices, to staffing for health and social care, to research funding and collaboration, and to public health.[3 4]

Real risks

Suppliers, civil servants, and ministers agree that a no deal Brexit would severely disrupt complex supply chains. No matter what the government is asking health professionals to tell their patients,[5 6] the result would be dangerous shortages of medicines and devices.[7]

As for the workforce, the vote to leave the EU has already exacerbated severe existing staff shortages. Nursing numbers are falling—the latest figures from the Nursing and Midwifery Council show that more EU nurses are now leaving than joining the UK register[9]; and doctors from Europe are being driven by the uncertainty to seek jobs outside the UK.[10 11] Recruiting staff to fill these gaps will be costly.

Given the complex supply networks, each hospital trust is expected to make its own

COMMENTARY

No deal is not a happy prospect for life after March 2019

Disruption to healthcare from a bad Brexit would risk lives, warns **Niall Dickson**, chief executive of the NHS Confederation and co-chair of the Brexit Health Alliance

For too long the government was not prepared to consider the prospect of a "no-deal" exit from the EU. And it adhered to an unfortunate fiction that the implications could be managed relatively easily if it did happen.

The government may have had good tactical reasons for such a negotiating stance, but reality has now dawned: whatever your views on Brexit, crashing out is bad news on many fronts—not least the welfare of patients in the UK and, indeed, throughout Europe.

Like a patient before an operation, the British people must now be allowed to make a fully informed decision in a second referendum

preparations, including assessing the risks and identifying vulnerabilities in their supply chains. This is a massive task for services that are already stretched.

If the prime minister can get her Chequers deal or something like it through parliament, will this be less damaging for health? It would keep the UK in the single market for medicines and devices and would retain reciprocal healthcare schemes at least until 2020.[13] But it offers no solution for the predicted staffing or funding crises, and key aspects of the deal are still to be hammered out.[14]

Need for informed consent

Politicians on both sides now acknowledge that, deal or no deal, Brexit will leave the UK worse off. Like a patient before an operation, the British people must now be allowed to make a fully informed decision in a second referendum.

This is a view supported by Conservative MP and chair of the Health and Social Care Select Committee, Sarah Wollaston. She and three fellow medically qualified MPs from all main parties have proposed an amendment to the forthcoming House of Commons vote. If passed, this would make withdrawal from the EU conditional on a second referendum, allowing the British people to properly weigh up the choice between the proposed deal and remaining in the EU.[16] Whatever the outcome, the UK could then move forward knowing that the decision had been made on the basis of informed consent and the best available evidence. If the Wollaston amendment is allowed, the BMA and the RCN will write to all MPs asking them to support it. If cabinet or parliament reject the prime minister's deal, a compelling case remains for a second referendum if the UK is then faced with an even more harmful no deal Brexit.

Whatever your views on Brexit, we ask you to consider adding your voice to this call for a people's vote by telling your MP that you want an informed choice based on what you now know. You could also share this information with your colleagues and patients. Data from a recent YouGov poll show that those who believe that Brexit will have a detrimental effect on the NHS are more likely to vote remain in a people's vote.[17] We believe the evidence of a detrimental effect on the nation's health is clear. Please join our call for a people's vote on the final Brexit deal.

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This is real, not scaremongering. And, if we get it wrong, lives could be at risk. It's fair to say that anxiety levels at the Department of Health and Social Care (DHSC) have risen. Our impression at the Brexit Health Alliance is that the DHSC is one of the better prepared departments in Whitehall, having always had a degree of realism in its official ranks.

Warnings are not fanciful

But, as the detailed implications of what a no-deal scenario might entail become apparent, there's an understandable and justified push to fortify preparations. The prospect of medicines and other lifesaving supplies being held up at European ports for days, or even weeks, is not fanciful. Nor is the warning that the M20 motorway could become a giant lorry park, dwarfing the scale of previous versions of Operation Stack, the contingency plan used for previous problems with Channel ports.

This, then, is about protecting lives—making sure that patients have access to the medicines and other treatments they need. As of 29 March 2019 they will continue to turn up at GP surgeries, outpatient clinics, and emergency departments. They will expect operations to go ahead and for community nurses to have the materials they need to deliver high quality care.

We all take for granted the complex supply chains that make modern healthcare work. And much of healthcare operates on a just-in-time basis, and is therefore susceptible to disruption, with potentially serious consequences.

Understanding all of this—and accepting it—is a first step. The challenge then is how to prepare with detailed operational guidance for every stage in the supply chain, including those endpoints where care is delivered.

Striking a balance

Of course, a balance must be struck: it is in no one's interest to encourage a rush to unplanned stockpiling or, indeed, anything that makes matters worse or causes unnecessary anxiety.

The DHSC is working with devices and pharmaceutical industries as part of a contingency planning programme, which should provide some assurance. The NHS has a great record in responding to emergencies. It is in many ways the service at its best, bringing managers and clinicians together in a common cause and demonstrating the value in careful planning. The service will surely rise to this challenge.

The situation is uncertain, and will be complex and difficult to navigate

But we should be under no illusion: all signs are that the scale of what will be required in a no-deal scenario is very considerable. As it is, at the Brexit Health Alliance we've suggested that every NHS board should assess the risks and at the very least undertake an inventory to identify vulnerabilities in the supply chain.

It would be an unusual, and in some respects unprecedented, situation: unlike the EPRR (emergency preparedness, resilience, and response), the impact of a no-deal outcome extends across the country and could persist for an unspecified time.

Last month Chris Wormald, permanent secretary at DHSC, told MPs on the Exiting the European Union Committee that he could not be confident that essential medicines would be available in a no-deal Brexit, describing the challenge as "extremely difficult."

When the mandarins look rattled we need to take it seriously.

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LEAVING THE EU

Braced for Brexit

Doctors, patients, and suppliers are increasingly worried about access to drugs and medical expertise

Blood and insulin: a cold storage catastrophe?

If the UK leaves the European Union without a deal in place, supplies of drugs could face "a catastrophic time," according to Martin Sawer, executive director of the Healthcare Distribution Association.

Two types at particular risk are insulin and biological medicines, including those derived from blood plasma—because the UK relies on imported supplies. The six week buffer stock that health secretary Matt Hancock has asked drug companies to set up in case of short term border disruption is straightforward (if costly) for drugs with a long shelf life. It is trickier for those that need to be kept at a controlled, low temperature during transport and storage.

Mike Thompson, chief executive of the Association of the British Pharmaceutical Industry, told MPs on the Health Select Committee no deal Brexit inquiry on 23 October that the government's contingency plans were insufficient. There were no cold chain storage facilities at the ports in the event of delays and not enough medical cold stores generally in the UK, he said. "I think we've got to the stage of recognising that stockpiling won't be enough and we need to put in the next phase of plans."

In a last minute effort to close the gap, the Department of Health has issued tenders for additional cold storage—either newly built or, more likely, converted from facilities designed to store food. "I am confident this can be delivered by March next year when the UK leaves the EU," Hancock told the committee. Others, including Thompson and Sawer, are not so sure. Sawer doubts there is now time to build new cold storage, which typically takes a year, but renting capacity from the food industry might suffice.

He is worried that some of the UK's 2000 companies that hold a wholesaler's licence might exploit the situation by buying up stock and not releasing it to the market, creating shortages and raising prices. He wants the government to take emergency powers to control the market, but Hancock told the committee he was not considering emergency powers and insisted that supplies should be maintained even with no deal.

Hancock has written to NHS trusts, pharmacies, and GPs warning them not to stockpile drugs or write longer prescriptions for patients in the weeks leading up to Brexit. However, Sawer told the committee that patients might need to ensure they had their own stocks. "We're not suggesting anyone needs to stockpile outside of the supply chain yet, but come January that might be a different picture" he said.

Necessary for survival

People with diabetes are among those who have expressed worry on social media, including talking about stockpiling their own supplies. Nikki Joule, policy manager at the charity Diabetes UK, tells *The BMJ*: "We are concerned that government hasn't communicated its plans regarding the continued supply of insulin in the event of a no deal Brexit, which is causing unnecessary concern for people with diabetes."

Her colleague Libby Dowling, the charity's senior clinical adviser, adds: "For people with type 1 diabetes, and for some with type 2 diabetes, insulin isn't a luxury; it's necessary for survival.

Diabetes UK estimates that 1.14 million people in the UK rely on insulin. Only one company makes insulin in the UK: Wockhardt UK. But this produces porcine and bovine insulin, which only about 1500 to 2000 patients use. Most people with diabetes use analogues or synthetic human insulin. All of this is imported, mainly from three main manufacturers—Lilly, Sanofi, and Novo Nordisk.

"We're not suggesting anyone needs to stockpile outside of the supply chain yet, but come January that might be a different picture"
Martin Sawer

"For people with type 1 diabetes, and for some with type 2 diabetes, insulin isn't a luxury; it's necessary for survival"
Libby Dowling

Sawer told the select committee that the government's basis for stockpiling an additional six weeks' supply of medicines to prepare for no deal has not been explained to companies. Insulin suppliers are already building up stocks further than this. Novo Nordisk confirmed to *The BMJ* that it is increasing UK stocks to about 16 weeks from the final quarter of this year—double its current stock level.

Sanofi says it will hold a 14 week stockpile. Lilly will not release any figures but a spokesperson says the company "is working to plan for a worst case 'hard Brexit' in March 2019 and we have undertaken comprehensive analysis of the risks that would pose to our business and, critically, our ability to supply medicines in the UK." The spokesperson adds: "We continue to urge government to maintain regulatory cooperation with the EU to prevent the burden of duplicative regulation and testing that could slow the complex supply chain."

WHO essential medicines

Also at risk are a range of products derived from blood plasma, including albumin and immunoglobulins. (Blood for transfusion is not a problem since the UK is close to self sufficient, and clotting factors for haemophilia and von Willebrand disease are now made by genetic engineering using recombinant DNA methods.)

Plasma products are the outcome of a complex supply chain beginning, more often than not, in the US. Blood donations there are paid for, generating a surplus. The resulting plasma is then shipped around the world to factories where it is "fractionated" into a range of

"We need a fast track route. Airlifting is a possibility but there's a question of capacity"
Mike Thompson, Association of the British Pharmaceutical Industry

products. Globally, the business is worth about $20bn (£15bn) a year.

The UK has one such fractionating plant, run by the BPL Group in Elstree, Hertfordshire. David Lewis of BPL says that the company supplies about 40% of the UK's albumin needs and is "a small player" in immunoglobulins. All other plasma products are supplied by companies outside the UK, including CSL Behring (US), Shire l (Ireland), Grifols (Spain), Biotest (Germany), and Octapharma (Switzerland).

Susan Walsh, director of the patient organisation Primary Immunodeficiency UK, says she has "grave concerns" about post-Brexit supplies of immunoglobulins. "The supply is necessarily heavily regulated and therefore at risk of disruption during the transfer to a new regulatory system," she says.

"There has been increasing difficulty in sourcing immunoglobulins, and supplies are limited with little opportunity or available facility to stockpile. Human immunoglobulin is the only treatment option available for some patients to prevent life threatening infection and is a WHO listed essential medicine for patients affected by PID.

Acute delays

The immediate danger for people with diabetes and primary immunodeficiency is that imports will be delayed at the ports in the transition period after a no-deal Brexit; hence Hancock's call for a six week stockpile and more refrigerated warehouses in which to store it.

Thompson says that 90% of medicines imported from Europe pass through Dover or Folkestone, where delays are likely to be acute. The government is considering using other ports and possibly airfreight. Hancock told the select committee that this option was more likely for short half life radioisotopes (see right) than for medicines.

Thompson says: "We need a fast track route. Airlifting is a possibility as we already use that for drugs for clinical trials, but in a no deal scenario lots of people will want airlifting so there's a question of capacity. Another alternative might be sourcing products from the US or India."

Access to new treatments

There are potential longer term concerns for patients depending on the type of Brexit. The BMA, the drug industry, and the Brexit Health Alliance have all warned that if the UK develops a divergent approach to licensing from the European Medicines Agency it could lead to delayed access to new medicines.

Niall Dickson, co-chair of the Brexit Health Alliance, says: "We know that countries outside the European Medicines Agency can experience delays. Switzerland, despite a bilateral trade agreement with the EU, experiences delays in accessing new medicines. We have to find a way of exiting the EU without disrupting access to innovative and safe medicines for patients in the UK and in Europe."

The BMA warns that a separate regulatory system for medicines could lead to delays of 12 to 24 months in accessing life saving drugs; weaker post-approval regulation and pharmacovigilance because of reduced capacity to manage and detect adverse drug reactions; and loss of expertise in regulatory processes and pharmacovigilance. It is calling on the government to work closely with the EMA through a formal agreement to continue to support and participate in their assessments for approving medicines and to agree mutual recognition of and ongoing participation in the CE mark scheme.

Nigel Hawkes, journalist, London

Jacqui Wise, journalist, London

Nuclear medicine: time waits for no radioactive drug

When, in August, the UK government told drug companies to stockpile medicines to prepare for a no deal Brexit, the press had a field day. Yet little attention was given to a stark challenge faced by patients with cancer and their clinicians: some key diagnostic tools and cancer treatments rely on radioactive isotopes that will have decayed and become effectively useless if delayed for six weeks.

Roughly one million diagnostic nuclear medicine tests are done in the UK every year, according to the British Nuclear Medicine Society. About 150 000 of these use a radiopharmaceutical called F-18 fluorodeoxy glucose (FDG), which has a two hour half life so is normally made within 60 miles of the hospital where it is used. The remaining 850 000 tests need technetium-99m (^{99m}Tc), which is used in bone, cardiac, lung, and kidney scanning as well as during surgery for breast cancer.

Tc-99 is produced by the radioactive decay of molybdenum-99 (^{99}Mo), which in turn is produced in nuclear reactors. Neither isotope can be stockpiled because both decay rapidly: the amount of useful radiation emitted by ^{99m}Tc halves every six hours, and the yield of ^{99m}Tc from ^{99}Mo halves every 66 hours, with unstable atoms releasing radiation to become more stable.

The UK also imports iodine-131(^{131}I) to treat thyroid cancer, radium-223 to treat bone tumours, and lutetium-177 to treat neuroendocrine tumours, because it has no reactors capable of producing them.[8] Since the isotopes decay rapidly, UK hospitals rely on a continuous supply by lorry from reactors in France, Belgium, and the Netherlands.

The longer half life of ^{99}Mo means it can be delivered weekly, but ^{131}I has a half life of 12 hours so has to be delivered on the day, and any delays or queues at ports could result in it being unusable.

Continued overleaf

Cancer treatment

Radioisotopes used for cancer treatment are also at risk. The main one used is iridium-192: roughly 1500 women and 2000 men each year receive treatment with implants containing iridium for cervical and prostate cancer.

Iridium's 74 day half life means that half of the radioisotope has decayed after three months.[9] "That means you're getting half of the activity you prescribe which—in the case of cervical cancer—means the treatment takes much longer," says Jeanette Dickson, vice president for clinical oncology at the Royal College of Radiologists.

"Decay means you're getting half of the activity you prescribe which—in the case of cervical cancer—means the treatment takes much longer"
Jeanette Dickson

At the moment, the use and transport of radioactive material is governed by the EU's Euratom programme,[10] which the government's EU withdrawal notification said the UK intends to leave.[11] The reasons for leaving are not specified, but researchers at the Institute of Government believe that staying in Euratom would require the UK to compromise on the negotiating positions set out by the prime minister regarding the European Court of Justice, which has jurisdiction over the body.

"Leaving Euratom risks breaking a series of time sensitive supply chains," says John Buscombe, president of the British Nuclear Medicine Society. "If we don't have the isotopes, the tests can't get done—because delivery is timed for the morning of an appointment patients may arrive at hospital, find we have nothing to give them and then go home and wait for another slot. A lymphoma positron emission tomography scan is timed to be just before the treatment. If you delay the scan, you affect treatment outcomes and patients may die."

Warnings from Northern Ireland

It is possible to fly radioisotopes into the UK. Currently, radioisotopes bound for Northern Ireland are flown to Coventry airport, but even under the existing Euratom regime Northern Ireland faced shortages of radioisotopes in 2009 and 2013 because of supply chain problems.

"Our supply chains are built around lorries crossing the Channel," explains Dickson. "It would take a substantial, expensive, and time consuming process to reorganise all those supply chains but we can't consider the process until we have a clear picture on the post-Brexit deal."

Whatever the solution, restoring a regular supply will take time and money—but until the terms of the deal are agreed no planning can take place. The NHS, clinicians, and the British Nuclear Medicine Society have been asking the government for information and solutions but the outcome is still unclear. "The civil servants we've spoken to take it seriously but they don't know what to do," Buscombe says.

Stephen Armstrong, journalist, London

Rare diseases: collaboration at risk

Some conditions are so rare that they affect just a handful of people in any one country. To grow expertise, clinicians have developed ways of working with colleagues in other countries to share learning and knowledge, and to collaborate on research into new treatments.

For patients in the UK, these ways of working are centred around the European Reference Networks (ERNs). These were set up under the EU's crossborder healthcare directives and receive funding from the EU.

Genetic Alliance UK, a charity that works with families and patients with genetic conditions, warns that the care of UK patients will be undermined if the UK is no longer able to work in these networks. "Losing our ability to collaborate, participate, and indeed lead those networks as a consequence of Brexit would be a really big disbenefit for patients with rare diseases and their families in the UK and across the EU," says chief executive Jayne Spink.

"We have a structure within the EU that's been working well in terms of promoting and supporting research and clinical research for rare diseases for a number of years. The majority of touch points for that infrastructure are at risk or affected by Brexit."

A rare disease is defined as one that affects no more than one in 2000 people. There are thousands of known rare diseases, and many more conditions that do not represent any known disease. Every year in the UK 6000 babies are born with a syndrome without a name. In fact, around 6% of the UK population will be affected by a rare disease at some point in their life.

These diseases tend to require a high level of expertise to be recognised, diagnosed, and treated appropriately, Spink explains. "It's difficult for any one country to provide sufficient numbers of patients, sufficient expertise, and sufficient capacity to carry out a clinical trial or to gather sufficient information about the natural course and the cause of that condition to develop effective care and treatment," she says.

To get around this problem, clinicians have relied on learning and research communities and collaborations. The European networks currently link around 20 000 healthcare professionals in 300 centres of excellence across 26 countries. "The ERNs have virtual advisory panels and they have a dedicated IT platform and telemedicine tools," Spink says. "It's not that patients are being shipped around—knowledge and information and things that can help with diagnosis and care are being shared."

At the moment, the UK has a central role in the ERNs. The NHS leads a quarter of the 24 networks and is involved in all but one of them. This includes 40 centres of excellence and 114 specialist units providing care for 150 000 patients.

"There's no guarantee, and we're not aware of solid commitments"
Jayne Spink

No post-Brexit certainty

How the collaborations that underpin care for these patients will continue after Brexit is not clear. "There's no guarantee, and we're not aware of solid commitments," Spink says. "You could imagine several scenarios. But the most desirable would be for the UK to be able to continue to be a cornerstone of the ERNs. That benefits patients here, but it also benefits patients across Europe. "

Genetic Alliance UK is asking people to sign up to a campaign that calls on all parties to work towards a positive outcome and for continuing involvement of the UK in the ERNs.

Warning about the effect of Brexit on patients with rare diseases earlier this year, Niall Dickson, from the Brexit Health Alliance (BHA), said the UK and its EU neighbours had come to depend on each other to advance medical research. "We want to see preserved levels of cooperation which have built up over the past 15 or 20 years, on a whole range of areas,

Every year in the UK **6000** babies are born with a syndrome without a name. In fact, around **6%** of the UK population will be affected by a rare disease at some point in their lifetime

particularly on rare diseases where some fantastic cooperation has developed," he said.

BHA also submitted written evidence to the Commons Health and Social Care Committee's inquiry into the effect of a no-deal Brexit. The alliance said that, in the event of a no-deal Brexit, NHS trusts would no longer be full members of ERNs. "The six UK coordinators have already been asked to identify and hand over their responsibilities to another member centre," it said. "The process of applying for funding to support ERNs beyond March 2019 has been suspended. ERNs are seeing a loss of leadership and jobs, as well as less access to funding even before Brexit occurs. This presents a risk to patients with rare diseases."

Brexit could also lead to fewer treatments for rare diseases being available to UK patients, Genetic Alliance UK says. "Research and care are so intimately entwined—and that's intimately entwined in decisions about developing medicines and providing access to them. It's an ecosystem," Spink says.

"If trials are not carried out here, that might have a negative impact. It could be that the UK loses out because we're a late choice for launch or because companies choose not to launch at all, given we're only 3% of the global market."

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BMJ OPINION

Sarah Wollaston and Paul Williams

There is no version of Brexit that will benefit the NHS—only varying degrees of harm

The message from the majority of clinicians and scientists is clear; Brexit is bad for our health. It will be harmful for people who rely on the NHS, research, social care, and public health, as well as for the workforce on which these depend. We have listened to the evidence presented to the Health and Social Care Committee in parliament, and we cannot remain silent about the impact that this will have on the people we were elected to represent, especially in the event of a chaotic exit with no deal and no transition.

The reality of Brexit is vastly different from the fantasy that was mis-sold to the public during the referendum campaign. The committee heard evidence that pharmaceutical companies are already spending hundreds of millions of pounds on contingency planning. Ultimately these costs will be passed on to the NHS and taxpayers, money that would be better spent investing in patient care. The costs will only increase as the clock ticks down to 29 March 2019. Stockpiling and refrigerated warehousing do not come cheap, let alone chartering special air freights for medical radioisotopes and other essential supplies with short shelf lives.

A new report, Brexit and the Health and Social Care Workforce in the UK, by the National Institute of Economic and Social Research (NIESR), also highlights the vital role of European Economic Area nationals across social care as well as the NHS.

The NIESR report forecasts an additional potential shortfall of 5000 to 10 000 nurses in the NHS in England by 2021 on top of existing vacancies, which stood at 41 722 (11.8% of all positions) at the end of June 2018. EEA nationals also play an increasingly important role in social care, where the numbers employed grew by 68%, or 30 600 people, between 2011 and 2016.

Brexit is major constitutional, economic, and social surgery, and we are all being wheeled into the operating theatre on the basis of a vague consent form signed over two years ago. It is time to insist that our politicians apply the principle of informed consent. Once the government has stopped negotiating with itself and agreed with our EU partners which of the many versions of Brexit to take forward, it must set out what that means and in full. Only at that point can the public properly weigh up the risks and benefits of the proposed surgery. It is essential that they have the opportunity to do so, followed by a referendum on the final deal, which includes the choice to remain in the EU. We all have the right to make risky decisions and it is possible that the public would come to the same conclusion to leave the EU. To proceed without informed consent, however, would not only be grossly unethical, it would also place the blame for the unintended consequences squarely at the feet of all those politicians who allowed it to happen.

A group of current and former clinicians in parliament plan to bring forward an "informed consent" amendment to the "meaningful vote" approval motion on the final deal. It is not acceptable for MPs to sit on the sidelines claiming that the people have already delivered their verdict. Without informed consent there is no valid consent.

The best way to give legal weight for a referendum on the final deal would be through amending the approval motion to make this conditional on a referendum. The reality of the parliamentary arithmetic is that there can be no referendum unless Labour supports one. Most Labour members do, but unequivocal front bench support for the "informed consent" amendment will be needed for it to pass.

With less than 140 days to go until we could chaotically crash out of the EU without a deal, it is time for all MPs to take responsibility for avoiding the consequences.

Sarah Wollaston is the Conservative MP for Totnes and chair of the Health and Social Care Select Committee

Paul Williams is a GP, Labour MP for Stockton South, and a member of the Health Select Committee

DATA BRIEFING

Concerns for the NHS after Brexit

Peering into the black hole, the Nuffield Trust's **John Appleby** and **Mark Dayan** find evidence for effects on funding, staffing, and pharmaceutical and related trade, as well as research and regulation

Junaid Masood (left) shared this picture of his team at Homerton University Hospital on social media the day after the EU referendum

Barring some extraordinary event over the next few months, the UK will officially leave the European Union at 11 pm (midnight for the rest of Europe) on 29 March next year. On what terms this will be remains uncertain. After 43 years of increasing economic, legal, and regulatory entanglement, unravelling the past and setting out a path for future relations with the EU was never going to be completed in two years from invoking Article 50.

Although the UK government has its plans, the fraught process of negotiation in both London and Brussels means that exactly what the world will look like for the UK after this process is beyond the event horizon. The future may be hard to predict accurately but, as the favourite analogue of macroeconomic forecasters goes: "If you binge on pizzas for a year, your doctor may not be able to predict your weight to the nearest kilogram but they'll have a pretty good idea that you'll be heavier and less healthy."

Widespread effects

Brexit's effects on healthcare will be widespread—touching NHS funding, staffing, pharmaceutical and related trade, clinical and other research, and regulation in unclear ways. But we already know of some of the effects as a result of decisions by individuals and organisations.

We know that from March the Medicines and Healthcare Products Regulatory Agency will lose its role in evaluating medicines for the European Medicines Agency; slower economic growth has already meant a tighter rein on public spending. And it is hard not to be astonished that as a result of the 2016 referendum and the political decisions that have ensued, the UK government is planning to stockpile drugs to prepare for a no deal exit from the EU.

Medicinal products are important commodities for the UK in both import and export terms, ranking in the top five traded goods in 2017. And of the £27.7bn of imported medicinal products in 2017, nearly 80% came from EU countries (mainly the Netherlands, Germany, Ireland, Belgium, Spain, and France, fig 1).

In 2017, of the £27.7bn of imported medicinal products, nearly 80% came from EU countries

We also know that the weight of economic opinion is pretty gloomy about future economic growth. This will affect the growth in taxation revenues and hence public spending on things such as the NHS. Nine major analyses of the size of the UK's gross domestic product (GDP) suggest a loss of national

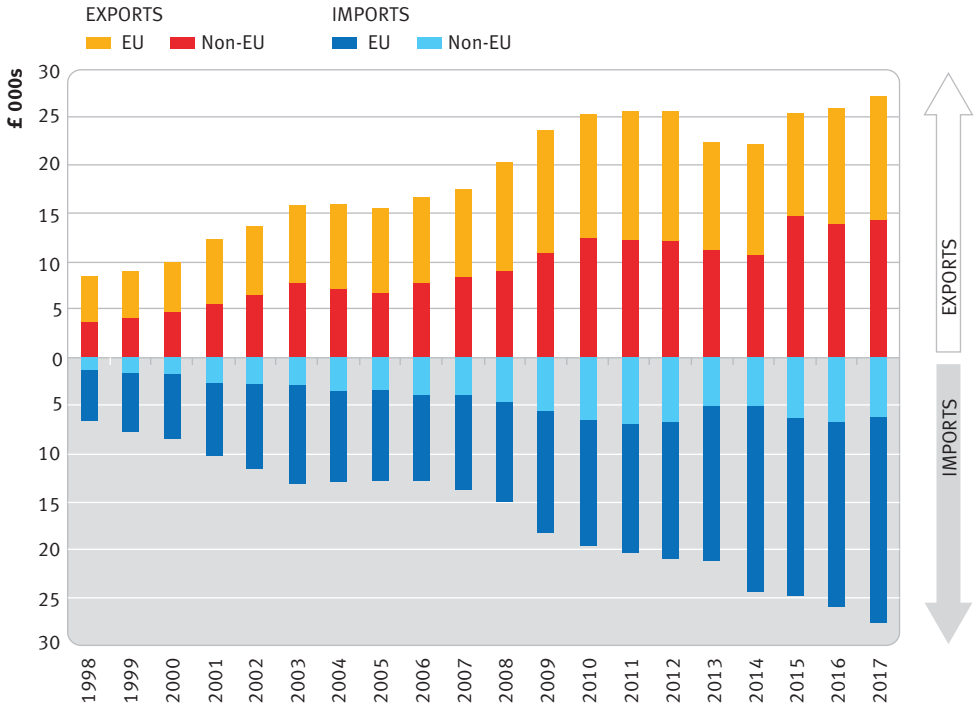

Fig 1 | Value of UK imported and exported medicinal products from EU and non-EU countries (2017 prices)

output by 2030 compared with where the economy would have been without Brexit (fig 2).

Generally, no deal is seen as the worst scenario and the single market the best, with various options related to free trade deals in between. Forecast losses range from between £23bn to £62bn to between £282bn and £500bn, depending on the forecaster and the assumptions they make in their models.

Staffing uncertainties

Only one prediction, from the pro-Brexit group Economists for Free Trade, suggests a positive outcome. The government's forecast suggests losses between £33bn and £172bn (fig 2). All these forecasts come with a health warning: the future will be uncertain. But the broad conclusion is that we shouldn't expect a positive economic outcome from Brexit.

The percentage increase (compared with the previous year) in the number of NHS staff from the EU has also slowed substantially in the past few years. Professional groups show different trends, with nursing numbers having fallen particularly sharply in 2018, probably because of the added effect of new language requirements (fig 3).

Given uncertainties about the rights of EU nationals, it is difficult to know how the 63 000 such people who work within the English NHS (5.3% of all staff) will react after Brexit. The proportion of EU doctors is even higher—9.2%. For some trusts—particularly in the south east (such as the Royal Brompton and Harefield, where 28% of doctors are from the EU)—this uncertainty will be concerning (fig 4).

The level of brinksmanship, posturing, and manoeuvring that has marked negotiations in London and Brussels means uncertainty about the outcome will continue over the next few months. What we can be sure of is that for many core areas of the NHS— staff, money, and supplies—there are turbulent times ahead.

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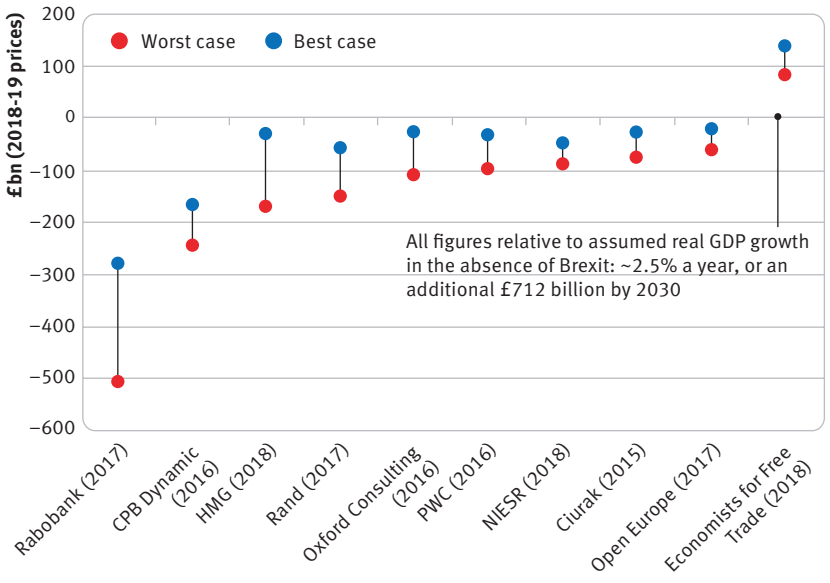

Fig 2 | Selected forecasts of UK gross domestic product (GDP) by 2030 after Brexit (2018-19 prices)

"Worst case" usually a no deal Brexit
"Best case" usually a free trade deal or remaining in the single market
Forecasts vary depending on other assumptions made by different models

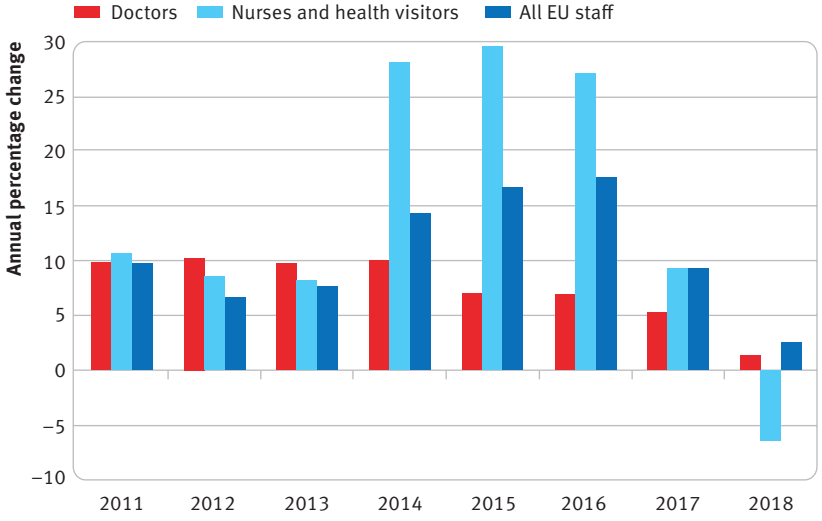

Fig 3 | Annual percentage changes in number of EU staff in the English NHS

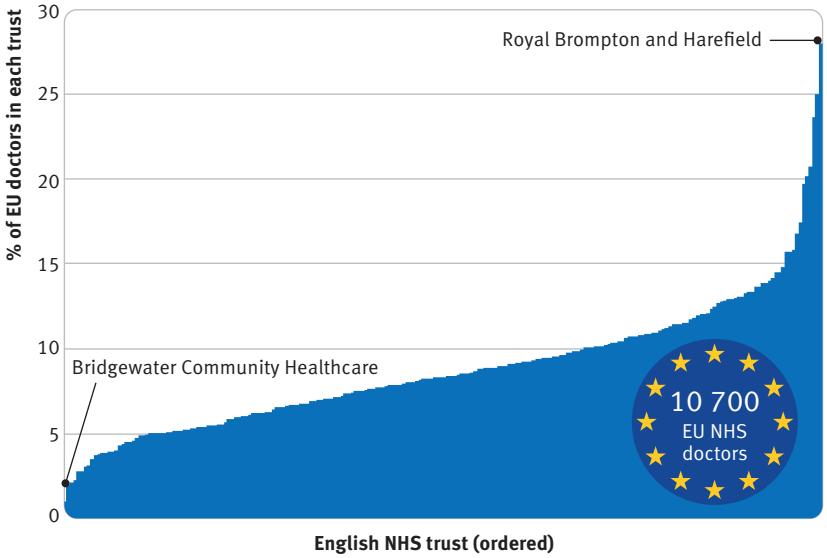

Fig 4 | EU doctors as a proportion of all doctors in each English NHS trust (June 2018). Excludes 10 trusts (nine ambulance and one community trust) with no EU doctors)

EDITORIAL

Reciprocal healthcare arrangements after Brexit

People need clear guidance, to avert harm in the event of no deal

The EU 27 nationals who reside in or visit the UK, and vice versa, are currently entitled to healthcare under EU law. The law covers entitlements for people who are settled in a different country and includes, for visitors, the European Health Insurance Card (EHIC) system.

The underlying ideas are reciprocity and that the "home country" (where the patient has paid tax or national insurance) pays. The European Commission operates as a clearing house for payments and gives information to people on their rights.

On leaving the EU, the UK will no longer be part of this system. But the implications depend critically on whether the UK government secures a Brexit deal based on the current Withdrawal Agreement.[1]

Deal…

The agreement, if signed, will give rights to EU 27 nationals and their families legally residing in the UK on 29 March 2019 until the end of the transition period (December 2020). Those rights include healthcare entitlements. So, for instance, EU 27 nationals resident and working in UK health and social care,[2] will continue to have access to NHS care. The same will be true for UK nationals resident in EU 27 countries.

Under the same agreement, some rights—including EHIC based treatment, planned cross border healthcare, and healthcare for pensioners—will continue after December 2020 for as long as the person continues to be "in a situation involving both a member state and the UK at the same time," which could be for the rest of their life.[3]

After December 2020, UK law will apply to EU residents in the UK, and either EU law (for some long term residents),[4] or the law of each member state will apply to UK residents there.[5] On 26 October, the government published a bill[6] empowering the health secretary to make payments under international agreements for reciprocal healthcare, leading to speculation that "back channel" discussions have taken place.

So the Withdrawal Agreement would legally secure substantial continuity with the current position, at least until 2020.

…Or no deal

In this situation, access to healthcare after March 2019 would rely solely on existing EU laws (for UK nationals in the EU) and those in the UK (for EU nationals in the UK). The EU (Withdrawal) Act[7] promises legal continuity, including to access to the NHS. But if there is no deal, the rules are likely to be altered, so EU 27 nationals are treated like people from the rest of the world.

Under current English law, primary and emergency care, and a small number of other treatments are free for anyone coming into England unless they have travelled specifically for treatment.[8] Access to other NHS services and to hospital care depends on residence, not nationality. Short term visitors to England have to pay for NHS hospital care. Non-resident visitors staying for more than six months have to pay a health surcharge and 150% of the NHS national tariff for hospital treatment.[8] Different rules apply in Scotland, Wales, and Northern Ireland.[9]

The position for UK nationals in the EU will be covered mainly by the host country's laws. These grant free emergency care, but define emergency differently. EU law gives rights to long term residents only. It will be difficult for UK nationals to find out their rights, and there will be no mechanism for countries to recoup treatment costs. Countries such as Spain may have to revise their provision, potentially leaving UK pensioners with no access to free care.

A no deal Brexit will be difficult to navigate. This will cause anxiety for most and more serious harm for those who, for instance, can no longer afford non-emergency treatment where they live.

All forms of Brexit are bad for health: a no deal Brexit particularly so.

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BMJ OPINION Anna Schumann

Withdrawal won't build a physical wall, but it will create significant boundaries

While talking to my French consultant last week, it turned out neither of us slept well the previous night. Why? We were worried about Brexit. Specialty training applications are open, and it's a time for young doctors to reflect on what to do next. The plans that I made when I came to the UK 10 years ago are now redundant.

If I do leave, even with the intention to return, I may not be allowed to come back for my training. I may have two UK degrees, but if I leave now to gain more experience elsewhere, I may not be eligible to apply to "settle."

If I continue my training in the UK, I may get a qualification that is no longer recognised in my own country, when I want to go back home to be close to my family. If I want certainty, what choice do I have but to pack my bags?

I was born shortly after the fall of the Berlin wall, just months before German reunification. I was brought up learning the significance of borders and to appreciate the privilege of their absence. This year, Germany marks 20 years as a reunified nation, yet certain borders still remain. While the obvious ones may be socioeconomic and financial, the subtle but significant effects of separation continue to exist in many people's minds. Brexit won't build a physical wall, but the boundaries it will create will be of huge significance and won't be undone easily. Why don't we learn?

While sharing my thoughts, I look around the room at my French consultant, two Portuguese operating department practitioners, a Polish surgeon, a Bulgarian registrar, and an Italian scrub nurse. Of course not everyone present is from the EU: my Nigerian theatre coordinator and three Filipino scrub nurses had joined us. There are no Brits in the room.

Some 37% of UK doctors gained their qualification outside the UK. Around 10% of all hospital doctors and 7% of nurses are EU nationals and every one has their own Brexit story. Two years after the referendum, none of us have answers and are left with the right to remain anxious and uncertain about our future.

With a German passport and a UK medical degree I did not expect that I may be facing employment restrictions across Europe. But why would I stay in rainy Britain when I could train in Germany, close to loved ones and real bread?

Anna Schumann is an F2 in anaesthetics at Darent Valley Hospital