

## **Developing the long-term plan for the NHS. Consultation input submitted by the Clinical Pharmacology Skills Alliance, 28 September 2018.**

The consultation document can be accessed here:

<https://www.engage.england.nhs.uk/consultation/developing-the-long-term-plan-for-the-nhs/>

*Please note, we have not answered all the consultation questions. Question numbering is therefore not continuous but is mapped to the consultation document. Our response will be uploaded via the online consultation portal.*

### **The Clinical Pharmacology Skills Alliance**

The Clinical Pharmacology Skills Alliance (CPSA) is a partnership formed by the Association of the British Pharmaceutical Industry (ABPI), the British Pharmacological Society (BPS), the Faculty of Pharmaceutical Medicine (FPM) and Health Education England (HEE). The purpose of the CPSA is to develop and support a long-term, cross-sector action plan for clinical pharmacology. We aim to improve the clinical pharmacology skills pipeline to support both healthcare and life sciences sectors for the benefit of patients and the UK economy alike. The CPSA is led by an Executive Board representing the partner organisations: Andrew Foxley (ABPI), Professor Sir Munir Pirmohamed (BPS), Professor Alan Boyd (FPM) and Professor Geeta Menon (HEE).

Clinical pharmacology is a discipline focussed on the development and use of medicines through education, research, policy and practice. Clinical pharmacologists may be medically qualified and/or scientists. They often have portfolio careers and leadership roles working in the NHS, the life sciences, academia and regulation.

The Alliance represents over 6000 people, based on individual and organisational membership.

### **Overarching questions**

- **What are the core values that should underpin a long-term plan for the NHS?**

We support the core values as set out by the current NHS constitution<sup>1</sup>. We suggest amending Value 5 from 'The NHS works across organisational boundaries' to 'The NHS works across organisational, professional and sector boundaries' to underline a commitment to multi-professional working and to meet ambitions in research and innovation.

- **What do you think are the barriers to improving care and health outcomes for NHS patients?**

The safe and appropriate use of medicines is central to the work of the NHS in benefitting patients. However, the current workforce does not have the full skills base it needs to respond to the increasing challenges in the use of medicines.

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<sup>1</sup> Department of Health and Social Care. (2015) The NHS Constitution for England. Available at: <https://www.gov.uk/government/publications/the-nhs-constitution-for-england/the-nhs-constitution-for-england#nhs-values>

Over 1.1 billion prescription items are dispensed in the UK community setting every year<sup>2</sup>. Although medicines have many proven benefits, 6.5% of all hospital admissions are caused by adverse drug reactions, and 237 million medication errors are made in the NHS every year<sup>3,4</sup>. The costs relating to these adverse reactions and medication errors is a significant burden on the healthcare budget. Further, as the population ages, people increasingly have multiple co-existing chronic diseases (i.e. multimorbidity), necessitating the use of multiple medicines - over 1 million people take 8 or more medicines per day. Clinical pharmacologists are experts in the safe, effective and cost-effective use of medicines. In 2014, there were only 78 Clinical Pharmacology and Therapeutics (CPT) consultants in the UK<sup>5</sup>. This compares to a Royal Colleges of Physicians (London) recommendation of a workforce of 440<sup>6</sup>. We would like to double the number of UK clinical pharmacologists by 2025 and achieve greater flexibility in training pathways to support a wider range of dual training options. However, to have the greatest impact across the NHS, the whole workforce must be skilled in the use of medicines. We envisage a workforce across which clinical pharmacology skills are embedded. To achieve this, we must address the current shortage of clinical pharmacologists in the NHS, who can lead upskilling of all healthcare professionals in the system in partnership with pharmacy. We recommend investing in 'Regional Medicines Specialist Centres' (led by experienced pharmacists and clinical pharmacologists) at the primary-secondary care interface to help respond to these challenges. Please see our answer to question 1.5 in the main consultation for more detail about this idea.

While the development of new medicines is essential for addressing unmet clinical need, bringing benefit for both society and the UK economy, the NHS workforce needs to be better supported to respond to this challenge. Supporting innovation that addresses public needs, such as drugs and therapies for elderly patients and those that promote healthier ageing, is part of NHS England's Research Plan<sup>7</sup> and an NIHR Research Priority<sup>8</sup>. The field of drug development and clinical trials is an important part of the UK's success in health-related innovations, both in industry and in the NHS. To facilitate this, the workforce must be 'research ready', meaning healthcare professionals must be familiar with and have some exposure to the disciplines and ethics of clinical research and structured data gathering. We recommend investing in clinical pharmacology and therapeutics (as one of the few specialities that embeds research into its curriculum) to better position this specialty in supporting research readiness across the workforce.

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<sup>2</sup> NHS Digital. (2017) Prescriptions Dispensed in the Community, Statistics for England – 2006-2016 [PAS]. Available at: <https://digital.nhs.uk/catalogue/PUB30014>

<sup>3</sup> British Pharmacological Society. (2016) Clinical Pharmacology and Therapeutics: The case for savings in the NHS. Available at: <https://www.bps.ac.uk/BPSMemberPortal/media/BPSWebsite/Assets/CPT-case-for-savings-in-the-NHS.pdf>

<sup>4</sup> Policy Research Unit in Economic Evaluation of Health & Care Interventions. (2018) Prevalence and Economic Burden of Medication Errors in the NHS in England. Available at: [www.eepru.org.uk/wp-content/uploads/2018/02/medication-error-report-revised-final.2-22022018.pdf](http://www.eepru.org.uk/wp-content/uploads/2018/02/medication-error-report-revised-final.2-22022018.pdf)

<sup>5</sup> The British Pharmacological Society. (2014) A Prescription for the NHS. Available from: [https://www.bps.ac.uk/BPSMemberPortal/media/BPSWebsite/BPS A prescription for the NHS FINAL SP\(1\).pdf](https://www.bps.ac.uk/BPSMemberPortal/media/BPSWebsite/BPS_A_prescription_for_the_NHS_FINAL_SP(1).pdf)

<sup>6</sup> The Royal Colleges of Physicians. (2013, update). Available from: <https://www.rcplondon.ac.uk/file/1578/download?token=TH8kJh7r>

<sup>7</sup> NHS England. (2017) NHS England Research Plan. Available at: <https://www.england.nhs.uk/wp-content/uploads/2017/04/nhse-research-plan.pdf>

<sup>8</sup> National Institute for Health Research. (2015) Statement on Areas of Research Interests. Available at: <https://www.nihr.ac.uk/research-and-impact/research-priorities/areas-of-research-interests.htm>

Investing in clinical pharmacology will also save the NHS money. Findings of cost-modelling studies show that every £1 invested in clinical pharmacologists could save nearly £6 through more efficient use of medicines with fewer adverse drug reactions and a reduction in medication errors<sup>9</sup>. Savings would be felt across the NHS, benefiting patients and the wider workforce. Once fully implemented, the cost savings delivered by employing 78 additional clinical pharmacologists could pay for around 1,600 extra nurses or 600 extra doctors.

## **Main Consultation questions: developing the NHS long-term plan**

### **1. Life stage programmes**

#### **Early life**

##### **1.1 What must the NHS do to meet its ambition to reduce still-births and infant mortality?**

Currently little is known about the impact that medicines have during pregnancy and their effects on the unborn baby. A recent report<sup>10</sup> from the Commission of Human Medicines Expert Working Group on Hormone Pregnancy Tests concluded that despite many improvements, there is a need to strengthen the systems for “detecting, evaluating, managing and communicating risk with exposure to medicines in early pregnancy”. We support the Working Group’s recommendations to improve safety, pharmacovigilance and pharmacoepidemiology in the field of obstetrics. We also support the recommendation that obstetricians should have the opportunity to train in pharmacology. Clinical pharmacologists would be well-placed to support this training. Greater flexibility in specialty training pathways would allow for more dual training in obstetrics and clinical pharmacology and therapeutics.

##### **1.2 How can we improve how we tackle conditions that affect children and young people?**

The Royal College of Paediatrics and Child Health have raised concerns about the low numbers of paediatric clinical pharmacologists with the Alliance. Avoidance of adverse drug reactions in children<sup>11</sup> (and other consequences of poor prescribing) is one area of clinical priority, and one that clinical pharmacology is particularly well-placed to support. Identical to adults, the issues around adverse drug reactions and poor prescribing in paediatrics are also a significant cost burden to healthcare budgets. We would therefore recommend a focus on ensuring that paediatricians have access to appropriate prescribing support together with investment in dual specialty training pathways for paediatrics and clinical pharmacology and therapeutics.

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<sup>9</sup> British Pharmacological Society. (2016) Clinical Pharmacology and Therapeutics: the case for savings in the NHS. Available from: <https://www.bps.ac.uk/BPSMemberPortal/media/BPSWebsite/Assets/CPT-case-for-savings-in-the-NHS.pdf>

<sup>10</sup> Gov.uk. (2017) Report of the Commission on Human Medicines’ Expert Working Group on Hormone Pregnancy Tests. Available at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/659115/Report-CHM-EWG-HPTs\\_FINAL.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/659115/Report-CHM-EWG-HPTs_FINAL.pdf)

<sup>11</sup> Smyth et al. (2012) Adverse Drug Reactions in Children—A Systematic Review. PLoS One 7(3): e24061

#### **1.4 How can we ensure children living with complex needs aren't disadvantaged or excluded?**

Children with complex needs are often prescribed multiple medicines, usually chronically, to control rather than cure their symptoms. Investing in paediatric clinical pharmacology has an important role to play in identifying the best doses (poorly done in paediatric clinical practice at present), avoiding harmful drug–drug interactions and preventing adverse drug reactions. With respect to the latter, it is extremely important that prescribers are aware of long-term consequences of drugs in children that can have long-term adverse effects lasting into adulthood. Please see our response to question 1.2.

#### **Staying healthy**

#### **1.5 What is the top prevention activity that should be prioritised for further support over the next five and ten years?**

We support a focus on investments and public health initiatives that aim to protect people from harm and reduce demand on the NHS. Clinical pharmacologists have expertise in prescribing and in drug–drug interactions, both of which are key to understanding patients taking multiple medicines and the problems that can occur. Further, current estimates suggest that approximately 65% of individuals aged 65 or older will have two or more chronic long-term conditions (LTC) and this figure rises sharply with age<sup>12</sup>. The skills of clinical pharmacologists can support a holistic overview of a patient's drug list and can provide advice to all prescribers when it comes to interpreting multiple guidelines. In addition, clinical pharmacologists are cost saving, with nearly £6 saved for every £1 invested<sup>13</sup>—e.g. through decreasing adverse drug reactions, prescribing errors and improved management of poisoning.

We recommend investing in partnerships between clinical pharmacology and pharmacy at the primary-secondary care interface to support complex polypharmacy. The General Practice Forward View<sup>14</sup> is committed to supporting an extra 1500 clinical pharmacists to work in general practice by 2020/21. We believe there is a need for "medicines specialists" (i.e., experienced pharmacists and clinical pharmacologists) to provide support at the primary–secondary care interface as part of the NHS prevention approach. For example, reviewing patients with the most complex polypharmacy at the request of GP/GP pharmacist teams, conducting multidisciplinary reviews with GPs/GP pharmacists of patients identified with polypharmacy using the ePACT2 polypharmacy indicators, and providing advice, training, and networking could help reduce and avoid issues with polypharmacy. This could be delivered through investment in new 'medicines specialist hubs' jointly led by experienced pharmacists and clinical pharmacologists.

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<sup>12</sup> Barnett K et al. (2012). Epidemiology of multimorbidity and implications for health care, research, and medical education: a cross sectional study. *Lancet* 380(9836):37-43.

<sup>13</sup> British Pharmacological Society. (2016) Clinical Pharmacology and Therapeutics: the case for savings in the NHS. Available from: <https://www.bps.ac.uk/BPSMemberPortal/media/BPSWebsite/Assets/CPT-case-for-savings-in-the-NHS.pdf>

<sup>14</sup> General Practice Forward View. (2016) Available at: <https://www.england.nhs.uk/wp-content/uploads/2016/04/gpfv.pdf>.

We would also support other prevention activities that help ensure efficient resource use by the NHS. For example, we recommend targets on a minimum standard in relation to reducing medicines wastage in the NHS.

The long-term plan should also prioritise addressing antimicrobial resistance through improved prescribing of these medicines. Antimicrobial prescribing is just one example of why the use of medicines is the responsibility of the whole NHS workforce. Appropriate antimicrobial use is essential for the effective treatment of infectious diseases (e.g. sepsis), to save lives and prevent disability. However, restriction of the inappropriate use of antimicrobials is equally important to prevent antimicrobial resistance, which is a major threat to modern healthcare. Good prescribing and antimicrobial stewardship are everyone's responsibility. Clinical pharmacologists have the expertise to lead development and delivery of appropriate training in the use of medicines such as antimicrobials for the whole workforce; this would be done in collaboration with both pharmacists and microbiologists.

**1.6 What are the main actions that the NHS and other bodies could take to: a) Reduce the burden of preventable disease in England? b) Reduce preventable deaths? c) Improve healthy life expectancy? d) Put prevention at the heart of the National Health Service?**

Given the rapid increase in the use of medicines and new treatments, we recommend targets on minimum standards in relation to the following areas:

- Improving prescribing skills across the healthcare system to ensure more effective, efficient and safer prescribing
- Reducing the burden of adverse outcomes from prescribing
- Increasing the participation of the NHS and public in research and innovation in relation to new therapies aimed at disease prevention

Please also see our answer to question 1.5

**1.7 What should be the top priority for addressing inequalities in health over the next five and ten years?**

There are increasing numbers of patients with multimorbidity, yet typically no trials are undertaken in these patients. This leads to the use of drugs doses and combinations that may at times be harmful. Additionally, the medical model focuses on one disease at a time - and that is subsequently how NHS services are configured. This creates inequalities in how those with multimorbidity (who may or may not be elderly) are treated. System change is required to tackle some of this. The NHS must invest in measures to address the challenges of multimorbidity and complex polypharmacy (in elderly and other populations) to ensure that these patients receive equal quality of care. Please also see our answers to question 1.12.

## **1.8 Are there examples of innovative/excellent practice that you think could be scaled up nationally to improve outcomes, experience or mortality?**

Case study: a study at St George's, University of London is investigating the potential contribution of clinical pharmacologists to the management of patients with complex polypharmacy. Clinical pharmacologists used a diagnosis-based structured assessment and reviewed anonymised data for 43 patients (mean age 74 years [SD 6]) taking an average of 9.4  $\pm$ 2.4 regular medicines. Despite 30 (70%) patients having undergone primary care medicines review in the previous 12 months, the CP structured assessment recommended potential medication changes in 38 (88%) patients including: in 32 (74%) patients at least one medication should be stopped (73 drugs, mean 1.7 per patient); in 22 (51%) patients at least one medication should be started (30 drugs, mean 0.7 per patient); in 11 (26%) patients the dose should be reduced for at least one medication (18 drugs, mean 0.4 per patient); and in eight (19%) patients the dose should be increased for at least one medication (10 drugs, mean 0.2 per patient). The outcomes were that 45 (34%) of 131 recommended changes were to optimise benefit, 45 (34%) were to reduce the risk of harm, and 41 (32%) to reduce treatment burden. Further changes were considered for 104 drugs (2.4 drugs per patient), but further information (e.g., monitoring and specialist input) was required. A pilot of this model in primary care in Merton, southwest London is now planned to test its efficacy and acceptability as specialist service to support GPs and GP clinical pharmacists in managing patients with the most complex polypharmacy.

Case study: The Central Adelaide Local Health Network in Australia has used a Multi-disciplinary Ambulatory Consulting Service (the 'MACS' model of care) to provide holistic, individualised management of care for patients with multiple comorbidities. A case control evaluation<sup>15</sup> of patients referred to the MACS service compared to inpatients not referred showed 30% reduced mortality and an 18% reduced overall length of stay in the MACS group. This was despite the MACS patients having slightly more comorbidities and a significantly higher total length of stay in the preceding 12 months compared to the usual care arm. A separate study<sup>16</sup> compared the MACS model of care in outpatients with heart failure compared with those managed through usual care showed reduction in time to death or non-cardiovascular readmission and trends showing reductions in presentation and cumulative length of stay overall and other types of readmissions. Clinician adherence to treatment guidelines was also greater in this study, and likely contributed to the observed benefits. Therefore, there is potential to improve patient outcomes and reduce the burden on the NHS by investing in piloting such models in the UK.

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<sup>15</sup> Shakib S et al. Effect of a Multidisciplinary Outpatient Model of Care on Health Outcomes in Older Patients with Multimorbidity: A Retrospective Case Control Study. PLoS ONE 2016; 11 (8)

<sup>16</sup> Ho TH et al. Guideline Compliance in Chronic Heart Failure Patients with Multiple Comorbid Diseases: Evaluation of an Individualised Multidisciplinary Model of Care. PLoS ONE 2014; 9 (4): 1-7.

## Ageing well

### **1.11 What more could be done to encourage and enable patients with long-term health issues to play a fuller role in managing their health?**

Increasing clinical pharmacology skills in primary care (as described in our response to question 1.5) is essential to ensure that patients are given appropriate understanding of the medicines they are taking and reduce the risk of them coming to harm. For example, ensuring that patients fully understand their medication and sick day guidance in relation to relevant medications can only occur if all healthcare professionals have the awareness, skills and confidence to engage in these discussions and support patients in their decision-making.

Further, greater patient engagement with digital technologies can improve participation of patients in their own care. For example, a clinical pharmacologist commented that “in my hypertension work, I deliberately ask whether they have a smartphone, and if they do I ask them to download a blood pressure app on which they record their blood pressure and bring the readings back to me. This makes them more aware of their condition, and thereby participate in their care.” Not all innovations need to be expensive – some common-sense applications may also have important benefits.

### **1.12 How can we build proactive, multi-disciplinary teams to support people with complex needs to keep well and to prevent progression from moderate to severe frailty for older people?**

As the population ages, people increasingly have multiple co-existing chronic diseases (multimorbidity), necessitating the use of multiple medicines: over 1 million people take 8 or more medicines per day. The Shape of Training Review<sup>17</sup> states the need for more doctors capable of providing general care in broad specialties for such patients and clinical pharmacologists are ideally suited to meet this need and support the development of these skills across the NHS, contributing to proactive multi-disciplinary teams. The King’s Fund has already recognised the extent of polypharmacy across the NHS and the importance of clinical pharmacologists in meeting this challenge<sup>18</sup>.

We are pleased to see that the long-term plan recognises the current and future challenges relating to the use of medicines (e.g. caring for an ageing population, pharmacogenomics) but it must be ensured that the NHS workforce is equipped to respond to them. A major challenge for the NHS is that of increasing numbers of older people with multiple long-term conditions, requiring prescription of multiple medicines. Further, the NHS will be utilising pharmacogenomics in the next few years, to personalise the use of medicines. It is vital that healthcare professionals are appropriately trained to manage the complex problems that emerge in clinical practice. This issue is not restricted to ageing. The use of medicines is central to the work of the NHS for the benefit of all patients.

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<sup>17</sup> Greenaway D. (2013) Shape of Training Review. Available from: <https://www.shapeoftraining.co.uk/>

<sup>18</sup> Duerden M, Avery T, Payne R. (2013) Polypharmacy and medicines optimisation. Available from: <https://www.kingsfund.org.uk/publications/polypharmacy-and-medicines-optimisation>

People with long-term conditions spend <1% of their time with healthcare professionals and >99% of their time managing their own conditions, often with the support of carers<sup>19</sup>. It is essential that patients and carers are supported and empowered to do this well.

Case study: The Prescribing Safety Assessment (PSA)<sup>20</sup> is a joint venture between the British Pharmacological Society and Medical Schools Council Assessment, used by all 33 UK medical schools and the UK Foundation programme. By passing the PSA, students and the recently qualified junior doctors are demonstrating prescribing competency before they begin work as an independent prescriber. It is set at an appropriate standard to minimise real life errors and ensure patient safety and is now a vital component in UK medical training. There is a need to increase the levels of post-qualification training and continuing professional development in prescribing across all grades of doctors and specialties. The PSA may be a helpful model to work from to set standards in prescribing post-qualification and for the wider workforce.

Case study: The CPSA is currently working with partners to develop a modern Clinical Pharmacology and Therapeutics (CPT) specialty training curriculum and has developed a shared training charter. This charter is being piloted in London, and could be taken nationwide. The aim of the CPSA is to provide a supportive training pathway, with clear career outputs that are of value to and valued by the NHS. The initiative would also strongly support a more flexible specialty training pathway. For example, at present the limited opportunities to dual train with CPT is significantly restricting the ability of doctors to develop specialist skills in the use of medicines, in addition to their organ-based specialty training. The charter should improve the training experience and help clinical pharmacologists in the NHS use their specific skills to support service provision.

## **2. Clinical priorities**

### **Cancer**

#### **2.1** What should the top priority for improving cancer outcomes and care over the next five and ten years be?

The UK is generally revealed to still have some of the lowest uptake of new cancer medicines compared with the five largest European economies<sup>21</sup>, although there are exceptions where better progress has been made.

Developing new drugs, and new drug combinations, is going to be critical and will require close partnership with the pharmaceutical industry. As part of this, the top priority for improving cancer outcomes should be investment in personalised medicine including pharmacogenomics and immunogenomics. Undertaking early

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<sup>19</sup> NHS England. (2014) NHS Five Year Forward View. Available at: <https://www.england.nhs.uk/publication/nhs-five-year-forward-view/>

<sup>20</sup> British Pharmacological Society, the Prescribing safety assessment, more information available: <https://www.bps.ac.uk/education-engagement/prescribing-and-patient-safety/championing-prescribing-competency-worldwide/about-the-prescribing-skills-assessment>

<sup>21</sup> Bengt Jönsson et al., Comparator Report on Patient Access to Cancer Medicines in Europe Revisited, 2016: page 114-149)



phase trials for these new medicines in UK clinical research facilities will be important for both health and wealth, and clinical pharmacology can play an important leadership role here. This will also enable patients to get early access to medicines, particularly for cancers where there is an unmet need.

In the NHS, a top priority for improving cancer care should be the avoidance of serious drug–drug interactions and improving drug safety to reduce survivor issues. There has been a lot of focus on efficacy of anti-cancer medicines (quite rightly, and this should of course continue), but it should not be at the expense of forgetting about drug safety and ignoring long-term survivor issues.

Investing in clinical pharmacology (both across the whole workforce and specifically regarding flexible dual training between clinical pharmacology and therapeutics and oncology) could help address both these priorities. As part of this, the CPSA are working with Genomics England to determine the workforce implications for implementation of pharmacogenomics across the NHS.

## **2.2 What more can be done to ensure that: a) More cancers are prevented? b) More cancers are diagnosed early and quickly? c) People can maintain a good quality of life during and after treatment? d) People with cancer have a good experience of care?**

Please see our answer to question 2.1.

### **Cardiovascular and respiratory**

## **2.4 What actions could be taken to further reduce the incidence of cardiovascular and respiratory disease?**

Cardiovascular disease now predominantly occurs in the setting of multiple long-term conditions, such as diabetes and obesity. Better management of these conditions (which rarely occur in isolation) is vital to reduce the burden of cardiovascular disease. A system change that allows the healthcare workforce to deal with multimorbidity, rather than looking at diseases individually, will be important to improve care of patients. Clinical pharmacology skills are important here, because this specialty is not constrained by focusing on individual organs, and can provide more holistic care in partnership with the organ-based specialists. Furthermore, it is essential to upskill the workforce to ensure best practice in relation to how medicines management is implemented. For example, despite clear guidelines, patients with diabetes experience protracted periods with excess hyperglycaemia<sup>22</sup>. Better medicines management, championed by clinical pharmacologists as part of multi-disciplinary teams, has the potential of significantly reducing cardiovascular disease burden in these patients by approximately 60%<sup>23</sup>. More broadly, the NHS should lend support and contribute to initiatives aimed at strengthening accountability with regards to action on Non-Communicable Diseases (NCDs); for example, NCD Countdown 2030<sup>24</sup>, a collaborative effort by The Lancet, public health scientists, civil

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<sup>22</sup> Khunti K et al. Clinical inertia in people with type 2 diabetes: a retrospective cohort study of more than 80,000 people. *Diabetes Care* 2013; 6: 3411–3417

<sup>23</sup> Paul S et al. Delay in treatment intensification increases the risks of cardiovascular events in patients with type 2 diabetes. *Cardiovasc Diabetol* 2015; 14:100–10

<sup>24</sup> The Lancet. NCD Countdown 2030. <https://www.thelancet.com/ncd-countdown-2030?code=lancet-site>

society leaders, and WHO, which aims to monitor and review progress towards preventing, treating, and controlling NCDs.

## **2.5 What actions should the NHS take as a priority over the next five to ten years to improve outcomes for those with cardiovascular or respiratory disease?**

These diseases are treated by multiple therapies, and better guidance on treatment regimens and possible ADRs/interactions would be valuable. Investing in medicines specialists at the primary-secondary care interface (outlined in our response to question 1.5) would be a practical means of supporting healthcare professionals with the skills and the advice they need to manage the complexities of multi-morbidity and polypharmacy. This will help in preventing admissions to hospital, in keeping with the 5-year forward view, allowing these patients to be managed in the community with an improvement in their quality of life and reduced costs.

## **Mental health**

### **2.7 What gaps in service provision currently exist and how do you think we can fill them?**

There is a need for better guidance for healthcare professionals around the use of medicines for psychiatric disorders, for integration with other treatment options and better information for patients to support their decision making. We would recommend a focus on ensuring that psychiatrists have access to sufficient prescribing support – and investing in dual specialty training pathways for psychiatry and clinical pharmacology and therapeutics. Achieving this latter ambition for psychiatry (and other areas of pressing need such as paediatrics and oncology) will depend upon agreeing more flexibility in training pathways across the Royal Colleges, working in partnership with the GMC. We would also recommend better support for prescribing these medicines in primary care (please see our answer to question 1.5). Finally, we would support ambitions to reach parity between mental and physical health – including research and investment into strategies that protect good mental health.

### **2.9 What are the major challenges to improving support for people with mental health problems and what do you think the NHS and other public bodies can do to overcome them?**

Medicine adherence is a major challenge for those patients with psychiatric disorders. Technical support and distance monitoring (for example, the Proteus product<sup>25</sup> that has recently been approved by the FDA) could be of value. Regarding supporting good mental health, continued public health campaigns that promote awareness of lifestyle factors, options for support and those that tackle stigma would be welcome.

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<sup>25</sup> Proteus. <https://www.proteus.com/>

## **2.10 How can we better personalise mental health services, involving people in decisions about their care and providing more choice and control over their support?**

More research is needed in this area, including the use of pharmacogenomics to choose the right drug and the right dose. Better patient information about the efficacy/risks of medication would support informed patient choice.

## **3. Enablers of improvement**

### **Workforce**

#### **3.1 What is the size and shape of the workforce that we need over the next ten years to help deliver the improvements in services that we would like to see?**

There needs to be an explicit reference within the long-term plan to the development of the important cross-cutting skills required by the workforce. We believe that both effective medicines management and supporting the life sciences strategic agenda are examples of such very important generic skills that require such reference. For clinical pharmacology, collaborative workforce planning and funding (e.g. within sustainability and transformation partnerships [STPs]) should create posts that support medicines use in both primary and secondary care by diverse professionals including clinical pharmacists and general practitioners. Most important is the support across the primary and secondary care interface, which needs to be developed across the whole country. This would also support other important initiatives such e-prescribing, the creation of joint formularies, reducing variation in prescribing practice, improving patient safety and reducing prescribing costs.

As outlined previously<sup>26</sup> by the Clinical Pharmacology Skills Alliance (CPSA):

- The whole NHS workforce must be skilled in the use of medicines, including personalised medicines
- The NHS must be equipped to respond to current and future challenges regarding the use of medicines (e.g. multimorbidity, polypharmacy and pharmacogenomics)
- The NHS workforce must be 'research ready' (meaning healthcare professionals must be familiar with and have some exposure to the disciplines and ethics of clinical research and structured data gathering) so that it can support innovation that delivers to public needs

Clinical pharmacology can play a key role in supporting these recommendations. Clinical pharmacologists are experts in the safe, effective and cost-effective use of medicines. They also work across the sector supporting the development of new therapeutics and driving research. Moreover, cost-modelling demonstrates that for every £1 invested in Clinical pharmacologists the NHS saves nearly £6<sup>27</sup> through

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<sup>26</sup> British Pharmacological Society (2018). Facing the facts, shaping the future: draft workforce strategy consultation response. Available at: <https://www.bps.ac.uk/about/policy-positions-and-statements/consultation-responses/articles/2018/facing-the-facts,-shaping-the-future-draft-workfo>

<sup>27</sup> British Pharmacological Society. (2016) Clinical Pharmacology and Therapeutics: the case for savings in the NHS. Available from: <https://www.bps.ac.uk/BPSMemberPortal/media/BPSWebsite/Assets/CPT-case-for-savings-in-the-NHS.pdf>

decreasing adverse drug reactions, prescribing errors and improved management of poisoning. However, the UK has critical skills shortages in clinical pharmacology that need urgent action.

#### UK shortfall in clinical pharmacology

- The UK has a shortfall in skilled clinical pharmacologists.
- The British Pharmacological Society has identified clinical pharmacology within the NHS as an area of critical skills shortages. In 2014 there were only 78 Clinical Pharmacology and Therapeutics (CPT) consultants in the UK<sup>28</sup>. This compares to a Royal Colleges of Physicians (London) recommendation of a workforce of 440<sup>29</sup>: one in each large district general hospital and one per 180 training medical students. The same report shows that there is about one consultant in clinical pharmacology to 500 undergraduates, compared to one cardiology consultant to only 40 undergraduates<sup>30,31,32</sup>. Further, in 2012 the overall UK consultant workforce had increased by 62% (representing 4,636 extra consultants), but with only a 4% increase for clinical pharmacology (equivalent to only 3 extra consultants)<sup>30</sup>.
- These findings were echoed in ABPI's 2008<sup>33</sup> and 2015<sup>34</sup> reports, and in the 2014 vulnerable skills and capabilities survey from the BBSRC and MRC<sup>35</sup>.
- Failure to address this shortfall carries a significant threat to effective clinical service in the NHS, the attractiveness of the UK as a place to conduct national and international clinical research, and the development of new medicinal products. Failing to invest in clinical pharmacology can be detrimental to patients both in the short and long-term.

The CPSA is currently working on an action plan for UK Clinical Pharmacology – we would like to double the number of UK clinical pharmacologists working across the sector by 2025 and enhance clinical pharmacology capability across the workforce. Our work seeks to address urgent and long-standing skills gaps in UK clinical pharmacology and makes a variety of recommendations, many of which relate directly to the NHS.

We envisage a network of clinical pharmacologists, healthcare professionals and scientists, working together to meet the needs of the sector. There is scope for

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<sup>28</sup> The British Pharmacological Society. (2014) A Prescription for the NHS. Available from: <https://www.bps.ac.uk/getmedia/230bae72-8faa-4793-8937-89a941404f29/A-prescription-for-the-NHS.pdf.aspx>

<sup>29</sup> The Royal Colleges of Physicians. (2013, update). Available from: <https://www.rcplondon.ac.uk/file/1578/download?token=TH8kJh7r>

<sup>30</sup> British Pharmacological Society, A prescription for the NHS: Recognising the value of clinical pharmacology and therapeutics, 2014. Available at: [http://www.bps.ac.uk/BPSMemberPortal/media/BPSWebsite/BPS\\_A\\_prescription\\_for\\_the\\_NHS\\_FINAL\\_SP%281%29.pdf](http://www.bps.ac.uk/BPSMemberPortal/media/BPSWebsite/BPS_A_prescription_for_the_NHS_FINAL_SP%281%29.pdf)

<sup>31</sup> Royal College of Physicians of London, Consultant physicians working with patients: The duties, responsibilities, and practice of physicians in medicine, 2013. Available at: [http://www.rcplondon.ac.uk/sites/default/files/consultant\\_physicians\\_revised\\_5th\\_ed\\_full\\_text\\_final.pdf](http://www.rcplondon.ac.uk/sites/default/files/consultant_physicians_revised_5th_ed_full_text_final.pdf).

<sup>32</sup> Royal College of Physicians, Census of consultant physicians in the UK 2013-14, 2014. Available at: [https://www.rcplondon.ac.uk/sites/default/files/clinical\\_pharmacology\\_2013-14\\_census\\_spec\\_report.pdf](https://www.rcplondon.ac.uk/sites/default/files/clinical_pharmacology_2013-14_census_spec_report.pdf)

<sup>33</sup> The Association of the British Pharmaceutical Industry. (2008) Skills needs for biomedical research. Creating the pools of talent to win the Innovation Race. Available from: <http://www.abpi.org.uk/our-work/library/industry/Documents/skills-biomedical-research.pdf>

<sup>34</sup> The Association of the British Pharmaceutical Industry. Bridging the skills gap in the biopharmaceutical industry. Maintaining the UK's leading position in life sciences. (2015) Available from: [http://www.abpi.org.uk/our-work/library/industry/Documents/Skills\\_Gap\\_Industry.pdf](http://www.abpi.org.uk/our-work/library/industry/Documents/Skills_Gap_Industry.pdf)

<sup>35</sup> BBSRC and MRC. (2014) Review of Vulnerable Skills and Capabilities. Available from: <http://www.mrc.ac.uk/documents/pdf/review-of-vulnerable-skills-and-capabilities/>

sharing responsibilities across the workforce. In partnership with pharmacy and healthcare science, the CPSA will support the development of an 'Integrated Medicines Pathway' to map skills for the use of medicines, how these are currently deployed and who by—and where there are innovative solutions through interprofessional working and new career routes. For example, we are collecting current examples of collaborations between pharmacists and clinical pharmacologists with a view to formalising good practice and are reviewing scientific training pathways, in particular apprenticeships, to investigate the potential for expanding these careers to support the NHS.

Clinical pharmacology is a great example of a specialty that has adapted and evolved to meet the needs of different times as well as the ways of working and differing expectations of generations. Clinical pharmacology started as mainly a research specialty, discovering and developing new medicines. As the harms of medicines started to become apparent, a regulatory subspecialty developed, for example working with the MHRA. As evidence of an epidemic of prescribing errors emerged, clinical pharmacologists took responsibility for prescribing education and assessment, developing the national Prescribing Safety Assessment. With the emergence of multi-morbidity and polypharmacy and the advent of pharmacogenomics, a new generation of clinical pharmacologists have evolved to realise the value of clinical pharmacology to the NHS. A key feature of this evolution has been a 'change-ready' workforce with a portfolio of adaptable skills.

### **3.2 How should we support staff to deliver the changes and ensure the NHS can attract and retain the staff we need?**

**Securing the supply of staff.** Securing the supply of staff more generally is also a key challenge for the NHS. Indeed, staff leaving the NHS could be due to a number of factors including pay, workload and career development, which are the main areas the 'solutions' must focus on.<sup>36</sup> We are also aware of the impact Brexit may have on the NHS and as part of the Life Sciences sector have called for the need to secure access to the best talent for the Life Sciences sector and the NHS.

We have recognised lack of awareness of clinical pharmacology as a potential career amongst medical students and junior doctors as a major threat to our specialty and have started to address this. In 2017 we held the first 'clinical pharmacology month', during which we ran a national medical student competition and events such as grand rounds to showcase clinical pharmacology. We have targeted careers fairs and general medical conferences and are developing 'taster experiences' to encourage junior doctors to consider the specialty.

**Education and training to support flexibility and adaptability.** We recognise the scope for blending clinical responsibilities between professions for the benefit of both staff and the service. There is considerable opportunity for clinical pharmacologists and pharmacists to blend responsibilities, with clinical pharmacologists supporting prescribing training and role development for pharmacists, and working with pharmacists on strategic planning for the use of medicines e.g. through formulary and medicines optimisation committees.

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<sup>36</sup> Campaign For Science and Engineering, Tier 2 Cap. Information available at: <http://www.sciencecampaign.org.uk/our-work/campaigns/tier-2-cap.html>

**Providing broad pathways for careers in the NHS.** Clinical pharmacology offers a wide range of opportunities, such as clinical practice, precision medicine, prescribing education, drug development, clinical trials and medicines policy. Clinical pharmacologists thus develop throughout the whole of their career, and retention in the NHS is high. Encouraging the wider workforce to develop expertise in these areas could broaden career paths, enhancing retention, and increasing productivity. It will also bring direct benefits to patients. To facilitate this, it is essential that training time is included in job plans to allow time away from acute care for personal development.

**Inclusive modern model employers.** With increasing demands for acute care, diminishing resources and fragmented rotas, staff must work at a fast pace at the expense of time for reflection and learning and also at the expense of team work. In the modern NHS, more attention should be paid to ensure that all staff have protected time in their job plans to allow for development (e.g. of cross-cutting skills such as medicines management and clinical research). This could reduce 'burn out' and increase retention and job satisfaction.

### **3.3 What more could the NHS do to boost staff health and well-being and demonstrate how employers can help create a healthier country?**

The CPSA has consulted on this issue with its members at different career stages. A common theme is the importance of treating all employees with value and respect. A newly-appointed consultant in clinical pharmacology emphasised the importance of *'being treated as a person, rather than a name that fills a rota slot'*.

Protected time for training is also very important. A clinical pharmacology registrar commented that *'there should be proper time for training and development in your job plan, not just continuous service provision'*. The CPSA has led the way in addressing these issues through development of a training charter, which identifies the important components necessary for provision of training in the specialty.

For trainees considering a career in clinical pharmacology, it is vital that they see *'a realistic prospect of getting a job that has value and reflects their training'*. A senior trainee commented: *'I am keen to become an NHS consultant in Clinical Pharmacology & Therapeutics. We have a responsibility to our patients to ensure medicines are safe, effective and prescribed appropriately. Our unique expertise needs to be championed by healthcare leaders.'* This needs support through central workforce and financial planning.

#### **Primary care**

### **3.4 How can the NHS help and support patients to stay healthy and manage their own minor, short-term illnesses and long-term health conditions?**

Please see our answers to questions 1.5 and 1.12.

### **3.5 How could services like general practice and pharmacy, work with other services like hospital services to better identify and meet the urgent and long-term needs of patients?**

The General Practice Forward View<sup>37</sup> is committed to supporting an extra 1500 clinical pharmacists to work in general practice by 2020/21. We believe there is a need for “medicines specialists” (i.e., experienced pharmacists and clinical pharmacologists) to provide support at the primary–secondary care interface. For example, reviewing patients with the most complex polypharmacy at the request of GP/GP pharmacist teams, conducting multidisciplinary reviews with GPs/GP pharmacists of patients identified with polypharmacy using the ePACT2 polypharmacy indicators, and providing advice, training, and networking. This could be delivered through investment in new ‘Regional Medicines Specialist Centres’ jointly led by experienced pharmacists and clinical pharmacologists.

### **3.6 What other kinds of professionals could play a role in primary care, what services might they be able to deliver which are currently delivered elsewhere and how might they be supported to do so?**

Investing in medicines specialists (experienced pharmacists and clinical pharmacologists) at the primary–secondary care interface would support onward referral for complex prescribing and medicines management. Please see our answer to question 3.5 for further detail.

### **3.7 How could prevention and pro-active strategies of population health management be built more strongly into primary care?**

Please see our answer to question 1.5. Investing in medicines specialists at the primary–secondary care interface would provide a foundation for integrating strategies for care and prevention.

## **Digital innovation and technology**

### **3.8 How can digital technology help the NHS to:**

- a) Improve patient care and experience?**
- b) Enable people and patients to manage their own health and care?**
- c) Improve the efficiency of delivering care?**

It would be helpful for all clinical settings to aim to have systems in place to ensure people taking multiple medicines can be identified. This will be difficult to fulfil for organisations that lack electronic prescribing or discharge summaries. This barrier will lessen as more organisations adopt electronic systems.

One major barrier is the potential for poor communication between those carrying out the medication review and other healthcare professionals involved in the care of the patient. This is especially important at the primary–secondary care interface, where prescribing errors through miscommunication are most likely to arise.

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<sup>37</sup> General Practice Forward View. (2016) Available at: <https://www.england.nhs.uk/wp-content/uploads/2016/04/gpfv.pdf>.

Implementation of the summary care record so that medication lists from all patients can be seen in any healthcare setting should be an ambition. It would also be helpful for advice for all prescriptions to have a stop or review date. Further, advice for prescribers to review existing prescriptions to check if any can be stopped before new medications are prescribed would be valuable.

### **3.10 How do we encourage people to use digital tools and services? (What are the issues and considerations that people may have?)**

As described in our answer to question 1.11, patients are more likely to use digital tools when this is integrated as part of the care they are receiving. This requires all healthcare professionals to feel that they have the skills and confidence to use such tools and address any concerns that patients may have. Improving patient confidence about how their data is used will also remove barriers to uptake.

There is an increasing drive to introduce innovations, including digital innovations, into the NHS, which we support. However, we also want to add a note of caution. It is extremely important that digital innovations are tested and demonstrated to show clinical utility. Otherwise, the NHS could end up spending billions of pounds on digital innovations, which are later found to be useless<sup>38</sup>.

## **Research and innovation**

### **3.14 How can we encourage more people to participate in research in the NHS and do so in a way that reflects the diversity of our population and differing health and care needs?**

The development of new medicines and treatments is essential to address unmet clinical need, bringing benefit for both society and the UK economy. Supporting innovation that delivers to public needs, such as drugs and therapies for elderly patients and healthier ageing, is part of NHS England's Research Plan<sup>39</sup> and an NIHR Research Priority<sup>40</sup>. The field of drug development and clinical trials is an important part of the UK's success in health-related innovations, both in industry and in the NHS. To facilitate this, the workforce must be 'research ready', meaning healthcare professionals must be familiar with and have some exposure to the disciplines and ethics of clinical research and structured data gathering. Clinical Pharmacology and Therapeutics is one of the few specialties where research is embedded as part of the curriculum, so it is well-placed to help realise this.

### **3.16 What should our priorities be to ensure that we continue to lead the world in genomic medicine?**

Our priorities should be:

- Ensuring that genomic testing is available to the whole population
- Investing in a better-trained workforce with knowledge of genomics

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<sup>38</sup> The Lancet (2018). Is digital medicine different?

[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(18\)31562-9/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(18)31562-9/fulltext)

<sup>39</sup> NHS England. (2017) NHS England Research Plan. Available at: <https://www.england.nhs.uk/wp-content/uploads/2017/04/nhse-research-plan.pdf>

<sup>40</sup> National Institute for Health Research. (2015) Statement on Areas of Research Interests. Available at: <https://www.nihr.ac.uk/research-and-impact/research-priorities/areas-of-research-interests.htm>



- Integration of genomics into undergraduate curricula
- Continued efforts in rare disease and cancer genomics
- Implementation of pharmacogenomics across the NHS
- Investing in decision-support systems that are integrated within electronic health records to allow for the interpretation of genomic test results
- Facilitating the use of liquid biopsies for early cancer and disease diagnosis
- Exploration of the utility of polygenic risk scores in identifying at risk patients.

## Engagement

### 3.18 How can the NHS improve the way it feeds back to people about how their input is shaping decisions and demonstrate that the NHS is the world's largest learning organisation?

The NHS should prioritise engaging patients and the workforce regarding the use of personal data. A move to personalised medicine, digital tools and digital services rests on patient confidence in the use of data—and the workforce needs the skills to engage directly with patients as these conversations arise. Of note, the NHS should follow the work of Understanding Patient Data,<sup>41</sup> a 2-year initiative set up in 2017 to support discussions with the UK public, patients and healthcare professionals about uses of health and care data.

Overall, the NHS together with partners and stakeholders across the healthcare ecosystem can collaborate to show how the public's input is shaping its future. Learnings and insights from how the NHS has celebrated its 70<sup>th</sup> anniversary across the UK and beyond is a demonstrable source of ideas.

## Appendix

Due to potential word count limits on submission, we provided summaries for the following sections at the beginning of the section in addition to the full responses:

### Overarching questions

#### 3. What do you think are the barriers to improving care and health outcomes for NHS patients?

##### Summary

Given the challenges of medication errors and increasing burden of multimorbidity and polypharmacy, we recommend establishing a skills base to support the safe and appropriate use of medicines, by:

- Doubling the number of UK clinical pharmacologists by 2025
- Increasing clinical pharmacology capacity across the workforce, in partnership with pharmacy
- Ensuring workforce is 'research ready' to support innovation that delivers to public needs
- 

This will also save the NHS money. Cost-modelling demonstrates that every £1 invested in clinical pharmacology saves the NHS nearly £6 [2].

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<sup>41</sup> Understanding Patient Data. Available at: <http://understandingpatientdata.org.uk/>

## **Staying Healthy**

### **4. Are there examples of innovative/excellent practice that you think could be scaled up nationally to improve outcomes, experience or mortality?**

#### Summary

- Case study 1 demonstrates the potential contribution of clinical pharmacologists to the management of patients with complex polypharmacy
- Case study 2 demonstrates how a multi-disciplinary ambulatory consulting service can provide holistic, individualised management of care for patients with multiple comorbidities

There is potential to improve patient outcomes and reduce the burden on the NHS by investing in piloting such models in the UK.

## **Life stage - Aging well**

### **2. How can we build proactive, multi-disciplinary teams to support people with complex needs to keep well and to prevent progression from moderate to severe frailty for older people**

#### Summary

As the population ages, so too does the incidence of multimorbidity, necessitating the use of multiple medicines. Clinical pharmacologists are key to addressing this issue of polypharmacy. More broadly, the NHS workforce should be well-equipped to meet current and future challenges relating to the use of medicines.

- Case Study 1: the Prescribing Safety Assessment, a vital component in UK medical training that sets an appropriate standard to minimise real life errors and ensure patient safety [4]
- Case Study 2: CPSA shared training charter, improving the training experience and helping clinical pharmacologists in the NHS use their specific skills to support service provision

## **Enabling improvement – Workforce**

### **1. What is the size and shape of the workforce that we need over the next ten years to help deliver the improvements in services we would like to see?**

#### Summary

There needs to be an explicit reference within the long-term plan to the development of the important cross-cutting skills required by the workforce. We recommend that:

- The whole NHS workforce must be skilled in the use of medicines, including personalised medicines
- The NHS must be equipped to respond to current and future challenges regarding the use of medicines (e.g. multimorbidity, polypharmacy and pharmacogenomics)
- The NHS workforce must be 'research ready' (meaning healthcare professionals must be familiar with and have some exposure to the disciplines and ethics of clinical research and structured data gathering) so that it can support innovation that delivers to public needs
- The NHS addresses urgent and long-standing skills gaps in UK clinical pharmacology by doubling the number of UK clinical pharmacologists working across the sector by 2025
- The NHS should invest in partnerships between clinical pharmacology and pharmacy to upskill the wider workforce in the use of medicines, for example at the primary-secondary care interface to support complex polypharmacy

## **2. How should we support staff to deliver the changes, and ensure the NHS can attract and retain the staff we need?**

### Summary

We propose four approaches:

- Securing the supply of staff (specifically clinical pharmacologists)
- Education and training to support flexibility and adaptability (eg, blending responsibilities of clinical pharmacologists and pharmacists and achieving greater flexibility in training pathways to support a wider range of dual training options)
- Providing broad pathways for careers in the NHS (eg, encouraging the wider workforce to develop expertise in clinical pharmacology)
- Inclusive modern model employers (protecting time in job plans to allow for development)