

South East

Clinical
senate

**Physician Associates and
Anaesthesia Associates in the NHS**

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Contents

1. Introduction	3
2. Development of Physician and Anaesthesia Associates in Other Healthcare Systems	4
3. Timeline Detailing Physician Associates and Anaesthesia Associates in the UK	10
4. A review of the evidence underpinning the proposed expansion of the Physician and Anaesthesia Associate workforce in the NHS	13
Physician Associates (primary care)	13
Physician Associates (Secondary Care)	21
Physician Associates Primary and Secondary Care HEE Case Studies	33
Anaesthesia Associates HEE Case Study	35
5. Additional Published Evidence Relating to the Role of Physician and Anaesthesia Associates Focussing on Impact, Outcomes and Cost	38
Primary Care	38
Secondary Care	40
6. Where are we now?	45
7. Concluding Remarks	47
8. References	49

1. Introduction

The NHS is now 76 years from its post war inception and building a workforce capable of delivering the volume and breadth of health and social care to meet population needs continues to be a priority focus for national bodies. This national workforce challenge and its effects on the various professional groups and patient care is well documented [1].

The NHS Long Term Plan (LTP) highlights the need to expand capacity and grow the workforce [2]. Importantly the LTP emphasises the need to do this in some very specific ways, such as to expand capacity and capability in primary and community care and to support integration and cross sectoral working between primary, secondary and community health, health and social care and physical and mental health. Importantly it references credentialling, the trusted assessment of health care professionals to enable them to work at the top of their licence. The NHS People Plan aims to increase the workforce and have people working differently within a compassionate and inclusive NHS [3]. The NHS Long Term Workforce Plan (LTWP) describes the extent of a predicted workforce shortfall in the face of demographic change [4]. The plan aims to build on existing ambitions to expand the workforce, such as increasing medical school places and the number of nurses working in the NHS, improving monitoring of staff morale, ensuring the right skill mix to deliver patient care and supporting return to practice, ensuring a workforce fit to meet the needs of the future. The plan sets out a strategic direction for the long term, and includes action to be taken locally, regionally, and nationally in the short and medium term to address current workforce challenges. Those actions fall into three priority areas:

Train: significantly increasing education and training, together with increasing apprenticeships and alternative routes into health care professional roles, to meet the changing needs of patients and support the ongoing transformation of care.

Retain: ensuring the NHS keeps more of their staff by better supporting people throughout their careers and working to improve the culture and leadership across NHS organisations.

Reform: improving productivity by working and training in different ways, building broader teams with flexible skills, changing education and training to deliver more staff in roles and services where they are needed most; this means primary, community and mental health care in the main, and ensuring staff have the right skills to take advantage of new technology that helps provide the care patients need more effectively and efficiently.

To facilitate these three areas, routes into NHS professional careers will need to change. Working differently means enabling the development of new roles. The ambition for new roles to assist and free up professional time for medically trained doctors in acute, community and primary care has received particular attention both within the NHS and in partner organisations such as social care and the independent and voluntary sectors.

Two of these proposed new roles are Physician Associates (PAs) and Anaesthesia Associates (AAs). PAs are medically trained generalist healthcare professionals who work alongside doctors and provide medical care as an integral part of the multidisciplinary team. PAs are practitioners working with a dedicated medical supervisor but are able to work autonomously with appropriate support. Training programme entry requirements are an undergraduate degree in a bioscience and/or a significant background in healthcare [5]. AAs are trained practitioners that work within an anaesthetic team under the direction and supervision of a consultant anaesthetist. Training programme entry requirements are an undergraduate degree in a bioscience and/or a significant background in healthcare. For example, a nurse or operating department practitioner with at least three years full-time post-qualification experience and evidence of recent academic study [6]. Both PA and AA entrants undertake a training programme which includes 2 years of academic study and clinical training followed by a period of supervised practice.

The LTWP ambitions were to increase PA training places to over 1,500 by 2031/32 with the aim of establishing a workforce of 10,000 PAs by 2036/37 [4]. Similarly, AA training places were to be increased to 250 a year by 2028/29 with an ambition to increase places to 280 a year by 2031/32. The aim of these roles is to add to the multi-disciplinary team (MDT) skill mix and provide a stable generalist addition to the current NHS workforce. However, since publication of the LTWP these roles have received considerable and increasing professional and public scrutiny.

The purpose of this report is twofold:

- to describe how the roles of PAs and AAs have developed to date in both the NHS and other healthcare systems
- to review the published evidence relating to patient safety, patient outcomes, patient experience and cost effectiveness of PAs and AAs.

2. Development of Physician and Anaesthesia Associates in Other Healthcare Systems

The terminology used to describe PAs and AAs differs depending where in the world they are trained and practise. Other descriptors used include Physician Assistants, Medical Assistants, Clinical Associates, Assistant Physicians and Clinical Officers.

The earliest records of introduction of these roles are from sub-Saharan Africa. Clinical Officers in Kenya and Uganda were introduced as non-physician clinicians with the goal of filling gaps in provision of healthcare for the local population. In Kenya a formal training programme was established at the Kenyatta National Hospital in 1928 which initially admitted experienced nurses who were prepared for advanced practice through a one-year certificate course. This evolved into a three-year course covering basic medical sciences, medicine, surgery, paediatrics, obstetrics and gynaecology, community health, rural health and health service management. The course included final qualifying examinations followed by admission into a compulsory one-year hospital internship programme and completion of a further three-year period of clinical supervision. Every Clinical Officer practising in Kenya is required to be registered and licensed with the Clinical Officers Council in accordance with the Clinical Officers (Training, Registration and Licensing) Act, 2017, Laws of Kenya [8]. Clinical Officers are central to medical care in Kenya with 29,802 clinical officers currently registered with the Clinical Officers Council which regulates their training and practice and accredits the 67 training institutions [9]. Their training programme is now a four or five-year professional diploma or degree program involving one year of pre-clinical training in medical sciences followed by three or four years of training in clinical medicine, surgery, and community health, including a mandatory one-year internship. Clinical Officers work as general practitioners and specialists managing patients in a variety of ways and are able to both prescribe and request ionising radiation investigations.

Primary healthcare is also a national priority for Kenya with under 4 family physicians per million population and thus requiring innovative solutions for provision of care. Clinical Officers provide much of that care and are now trained as Family Health practitioners, a Higher Diploma in Family Health for Clinical Officers (FHCO) having been launched in 2018 [10]. A model of care that could lend itself to other countries if appropriately regulated. A similar training program for Clinical Officers working in Emergency Medicine and Critical Care has also been implemented which trains mid-level providers in an 18-month course to be the primary caregivers in emergency departments and critical care units [11]. Graduates of the course are enabled to carry out the following key roles and functions:

- Work in an emergency department as the primary caregiver for undifferentiated presenting patients
- Work as part of a multidisciplinary team as the primary caregiver in critical care areas of the hospital including intensive care units
- Teach and supervise other clinicians in the area of advanced life support
- Lead and participate in 'rapid response' teams aimed at quick assessment and stabilisation of critically unwell patients, including resuscitation.

They are also trained in the key skills commensurate with those roles and functions which many high-income countries would be justly proud of (Table 1).

Table1: Clinical Officers key skills in Kenya

Key Skills Expected of Emergency Medicine and Critical Care Clinical Officers
Cardiac ultrasound (Bedside echocardiography)
Extended Focused Assessment of Sonography in Trauma (E-FAST)
Assessment of intravascular volume by ultrasound
Arterial blood gas sampling and analysis
Rapid sequence induction and intubation of adults and children
Conscious sedation
Difficult airway management with a bougie and laryngeal mask
Mechanical ventilation set up and continuous management
Non-invasive ventilation set-up and continuous management
Stabilisation of open and closed fractures
Needle decompression for tension pneumothorax
Basics of ECG Interpretation
Utilization of IV vasopressors and anti-hypertensives
Basic Life Support and Advanced Cardiac Life Support
Advanced Paediatric Life Support
Advanced Trauma Training
Emergency vascular access with an intra-osseous needle or ultrasound guidance

Early audit data after one year of this programme showed positive improvement in clinical care and staff satisfaction in the emergency department. The Emergency Department had a mortality rate that was a quarter of that published in other tertiary hospitals in Kenya and the mortality in the ICU fell from 39% in 2014 to 30% in 2018 after the introduction of the critical care trained Clinical Officers [11].

The main driver for establishment and development of these roles was undoubtedly the lack of trained medical staff but since the early adoption of this addition to the health care workforce the contemporary physician assistant/associate or clinical officer movement has spread to North America and other countries around the world. There are differences in training, regulation, scope of practice and supervision depending where in the world PAs and AAs practice, how mature each country's program is, and what other health care staff resources are available. Table 2 below details some of this variation in countries other than the United Kingdom for comparison.

Table 2: Physician Assistants, Physician Associates and Clinical Officers Training and Regulation Across Different Countries

Country	Training	Regulation	Medication Prescribing	Ionising radiation
Malawi	3 years training + 1 year internship	Medical Council of Malawi (Act No. 9 of 2019, Malawi Government.	✓	✓
Tanzania	3 years training ± advanced diploma in clinical medicine (2 years)	Tanzania Medicines and Medical Devices Authority; Tanzania Commission for Science and Technology; Medical Council of Tanganyika.	✓	✓
Uganda	3 years training + 2 year internship	Regulated, registered, and licensed by the Allied Health Professionals' Council, in accordance with the Allied Health Professionals Act, Cap 268 of 1996.	✓	✓
Zambia	3 year Diploma in Clinical Medicine Sciences-Psychiatry + 10 months clinical experience	Health Professions Council of Zambia.	✓	✓
Ghana	4 year training program leading bachelor of science degree (or 2 years for registered nurses with 3 years work experience	Medical and Dental Council of Ghana regulates the practice and training of physician assistants (PAs) and is a statutory agency under the Ministry of Health.	✓	✓
South Africa	3 year degree course, Bachelor of Clinical Medical Practice	Registered with the Health Professions Council of South Africa and regulated by the Medical and Dental Board.	✓	✓
United States	Accredited programs with typically 2 years of basic and behavioural science training then 3 years of academic and professional training including a master's level degree	Regulated by State laws and medical boards supported by the American Medical Association. Recertification every 10 years.	✓	✓

	and Physician Assistant National Certifying Exam			
Canada	Undergraduate degree in a science related field then 3 academic years in an accredited Physician Assistant program and a master's degree	Regulated in some Canadian provinces and territories, while others are still integrating them into their healthcare systems. Certification is administered by the Physician Assistant Certification Council of Canada.	✓ (but no narcotics or controlled drugs)	✓
Netherlands	Undergraduate degree in a medical field then 2½ year master's program + 2 years direct patient care	Regulated by Netherlands and Vlamisch Accreditation Organization; Netherlands Association of Physician Assistants and recognised by Ministry of Health; Medical councils; and Health care insurance agencies.	✓	✓
Germany	PA programs in Germany are offered through universities of applied science and offer a 3 year bachelor's degree	No formal regulatory arrangements.	×	×
Liberia	3 year training program in theoretical and clinical medicine accredited by the regulators	Regulated by the Physician Assistant Board of the Liberia National Physician Assistants Association, JFK Medical Board, and by the Liberian Medical and Dental Council.	✓	✓
India	2-4 year programs varying from baccalaureate to postgraduate diploma with final year internship	No accrediting or regulatory bodies but the Indian government has included physician assistants as one of the seven health care professionals in the formation of the National Allied and Health care Professionals Council.	✓	✓
Australia	3-year bachelor of health science (PA) degree	Self-regulated and operate under the guidance of the Australasian Society of Physician Assistants.	×	×

The World Health Organisation's Global Strategy on Human Resources for Health: Workforce 2030 acknowledges that PAs and AAs have a critical role to play across all service delivery priorities [12]. The objectives and milestones in that document are as applicable to high income countries as they are to low- and middle-income countries. Especially Objective 2 which states “Align investment in human resources for health with the current and future needs of the population and health systems, taking account of labour market dynamics and education policies, to address shortages and improve distribution of health workers, so as to enable maximum improvements in health outcomes, social welfare, employment creation and economic growth”. All countries need a sustainable, affordable and scalable approach to addressing the Human Resources for Health shortage. Areas of medicine and surgery where PA and AA programmes are already established include primary care, emergency medicine and surgery, elective surgery, orthopaedics, obstetrics, anaesthetics and critical care. Where these programmes are well established and regulated PAs and AAs request and interpret investigations (e.g. electrocardiograms, laboratory tests, X-rays), diagnose and treat common conditions, perform procedures, assist in and perform surgery and anaesthesia, provide patient education and counselling, make appropriate admissions, discharges and referrals and prescribe medicines for common and important conditions.

The successful introduction and expansion of the PA and AA concept into a health system depends on more than a shortage or ageing of the physician workforce. It requires the support and lack of opposition of the countries' medical, nursing, pharmacists and Allied Health Professionals (AHPs) professional organisations, government support, funding, accredited training programs, support and acceptance by patients, and critically a legal and regulatory framework.

Good quality improvement in healthcare requires initiatives to be patient-centred, safe, effective and efficient, timely, equitable, collaborative, systematic and shared.

3. Timeline Detailing Physician Associates and Anaesthesia Associates in the UK

The table below details a timeline of events and influences relating to the introduction of PAs and AAs to the UK from 2003 to date.

Table 3: Timeline of events

	Date
Physician associates (PAs) introduced into the English National Health Service (NHS).	2003
Anaesthesia Associates (AAs) introduced into the NHS.	2004
Voluntary register of PAs created by the Faculty of Physician Associates (FPA).	2011
Royal College of Physicians (RCP) began hosting the FPA.	2015
NHS England GP Forward View announced investment in the training of 1,000 PAs to support general practice in addition to an extra 5,000 GPs.	2016
Royal College of General Practitioners (RCGP) position statement opined that PAs have a role as members of the multidisciplinary team, trained in the medical model, and can help broaden capacity and skill mix but require supervision and regulation.	2017
UK government consulted on proposals to regulate PAs and AAs.	2017
FPA census showed there were 3240 PAs in primary and secondary care in the NHS.	2022
UK Government began consultation on legislation to enable GMC regulation of AAs and Pas.	February 2023
NHS Long Term Workforce Plan published.	30 June 2023
Royal College of Anaesthetists (RCoA) position statement was supportive of AA regulation by the GMC and announced the RCoA would host the Faculty of AAs and produce a curriculum for AA training together with updated guidance.	June 2023
RCGP called for greater guidance, support and regulation of the integration of PAs into general practice.	October 2023
RCP council petitioned by a group of Fellows re: concerns over safety of PAs and their impact on postgraduate medical training.	October 2023
RCoA Extraordinary General Meeting (EGM) requisitioned to discuss proposed expansion and supervision of AAs, the communication of the AA role to patients and the impact of AAs on anaesthetists in training. EGM resolved to pause recruitment of AAs and supported additional resolutions related to impact on anaesthetic trainees, supervision of AAs and patient communication.	October 2023
British Medical Association (BMA) called for a halt to the recruitment of	November

PAs and AAs to allow time for patient safety claims to be investigated and the PA and AA roles to be reconsidered. BMA surveyed members between 10 November and 13 December 2023.	2023
Academy of Medical Royal Colleges (AoMRC) trainee doctors' group published their statement on PAs and AAs in healthcare.	December 2023
Anaesthesia Associates and Physician Associates Order 2024 no. 374 passed by Parliament – enabling statutory regulation of AAs and PAs by the GMC.	January 2024
RCP Council agreed to call an EGM to discuss Pas.	January 2024
RCP commissioned a survey of its members from Civica to inform their position on the role of PAs in the NHS.	February 2024
RCoA requested a pause in the recruitment of new student AAs to last until at least GMC regulation commences.	February 2024
BMA published an analysis of 18,182 responses to their member survey covering PAs and AAs scope of practice, patient safety and impact on doctors in training (10% response rate). Perceptions relating to the introduction and expansion of PA and AA numbers and their training and regulation were also sought in the survey questions.	February 2024
AoMRC published 12 high level principles concerning PAs in the NHS.	4 March 2024
RCGP council strengthened and updated its position on the role and regulation of PAs working in general practice and questioned whether the GMC should regulate doctors and Pas.	8 March 2024
RCP EGM was held to discuss the College position on the role of PAs in the NHS.	13 March 2024
BMA published a Safe Scope of Practice for Medical Associate Professionals (PAs and AAs) detailing the safety parameters to be followed. The scope described what PAs and AAs are and are not permitted to undertake, described their supervision and included 'traffic light' tables to guide what PAs and AAs are expected to do (green), what they may do with adequate training and supervision (amber) and what they must not do (red).	March 2024
Association of Anaesthetists published a position statement expressing significant concerns about the roll-out of the AA project and the misleading representations of equivalence of AA roles to doctor roles.	April 2024
RCoA published a survey of members' perceptions and experiences of AAs (35% response rate). Majority of respondents were opposed to NHSE's plan to expand AA numbers. Patient safety, quality of care and potential negative impact on anaesthetists in training were the major concerns.	10 April 2024
GMC's consultation on the detailed rules, standards and guidance for regulation of AAs and PAs ended.	May 2024
RCP request NHSE to review its projections for growth in the PA workforce until issues of regulation, standards and national scope of	June 2024

practice are addressed.	
RCGP published results of their member survey on the role of PAs in general practice (10% response rate) and called for a halt to recruitment of PAs in general practice citing patient safety and maintaining standards of practice as fundamental issues.	20 June 2024
RCP closed a 6-week consultation on draft guidance on safe and effective practice for PAs. The guidance set out high-level principles for employing PAs and stated that the scale and pace of the expansion of PA numbers in the UK should be limited and that NHS England should review the projected numbers for PAs in the Long Term Workforce Plan. The RCP stated they remain committed to a national scope of practice for PAs with consistent training standards linked to clinical competence. RCP further stated that PAs are not doctors and must not be used to replace doctors. They play no role in prescribing medications or ionising radiation and supervision of PAs should be by senior doctors only (a consultant, specialist, associate specialist or a GP).	13 September 2024
RCoA published for consultation the final draft of the AA Scope of Practice 2024 recommended by the College.	16 September 2024
RCGP council voted to oppose a role for PAs working in general practice.	20 September 2024
GMC propose to start regulating PAs and AAs.	December 2024

4. A review of the evidence underpinning the proposed expansion of the Physician and Anaesthesia Associate workforce in the NHS

Workforce Training and Education (WT&E) national team shared 10 documents used to underpin assumptions regarding the expansion of the PA and AA workforce [13-22].

Of the 10 documents, 7 are by Drennan and colleagues dating 2011-2020 and investigating various aspects of PAs in primary and secondary care [13-19]. Two of these are research award reports published by the National Institute of Health Research (NIHR) in 2014 and 2019 [14,17] and make reference to or are referenced in the 5 shorter journal articles.

The Yorkshire & Humber Academic Health Science Network was commissioned by Health Education England (HEE) to design, develop, and deliver research on the impact of PA and AA roles in the system. The findings were presented in the form of 3 case studies [20-22]. Data collection for this project consisted of semi-structured 1:1 research interview, designed to gather qualitative data on the perceived value of PA and AA roles, how the roles are utilised within organisations, and to identify what impacts these roles are having on teams, clinical services, PA/AA employers, the wider organisation, and patients. These case studies represent the first large-scale qualitative study of impact undertaken at a national level in England.

Below is a summary of this evidence, which includes the methodologies used and outlines the findings (tables 4 -7). The findings for all documents submitted generally fell within the following categories: clinical practice, continuity of care, cost, impacts on service provision, patient safety, perceptions about PAs (healthcare professionals, operational managers and patients), regulation, prescribing, training and supervision. The 2 NIHR research projects also included governance and organisational culture.

Physician Associates (primary care)

Drennan et al (2011): A qualitative study of employers' viewpoints using semi-structured telephone interviews which were thematically analysed [13].

Participants: 13 General Practitioners (GPs) and three practice managers from 15 general practices employing PAs in five areas of England. All practices were employing American (US) trained PAs.

Four main issues were addressed by participants.

1. Motivation for employing PAs (increasing the general practice capacity to manage patient demand, broadening skill-mix and financial considerations).
2. The work of the PAs in the practice team.
3. The benefits of employing PAs.
4. Challenges of employing PAs.

Halter et al (2017): a qualitative study, using semi-structured interviews, with thematic analysis and focussed on patient experience [15].

Participants: 30 volunteer patients of 430 who had consulted a PA for a same-day appointment and had returned a satisfaction survey, in six general practices employing PAs in England. Four interlinking themes were identified:

1. Variation in understanding of the role of PAs
2. Trust and confidence in the PA consultation
3. Comparison with a GP consultation
4. Patient willingness to see a PA again

The authors report participants had largely positive experiences and were generally positive about trust and confidence in the PA and patients saw PAs as an appropriate GP substitute. Most participants were not offered a choice of whether they saw a GP or PA. The authors conclude that patient experiences could inform delivery redesign of PA services in primary care.

Drennan et al 2014 National Institute of Health Research report: This study aimed to investigate the contribution of PAs to the delivery of patient care in primary care services in England [14].

The research questions addressed were:

1. How are PAs deployed in general practice and what is the impact of including PAs in general practice teams on the patients' experiences and outcomes?
2. What is the impact of including the PAs in general practice teams on the organisation of general practice, the working practices of other professionals, relationships with these professionals and the practice costs?
3. What factors support or inhibit the inclusion of PAs as part of English general practice teams at the local and macro level

Method: A mixed-methods study conducted at macro, meso and micro-organisational levels in two phases:

1. A rapid review and a documentary analysis of published commentaries and of UK workforce policy. A scoping survey of key national and regional informants, a policy review, and a survey of PAs.
2. Comparative case studies in 12 general practices (six employing PAs). The latter incorporated clinical record reviews, a patient satisfaction survey, video observations of consultations and interviews with patients and professionals

The rapid review found 49 studies, 46 were from the USA, and one each was from the UK, Australia, and the Netherlands. Overall, the quality of the studies was weak to moderate with few studies providing comparative data about other occupational groups.

A similar finding emerged from the analysis of published commentaries and opinions. The commentaries ranged in date from 1980 to 2012, with the greatest number published between 2004 and 2006. Fifty-one of the commentaries gave a positive view of PAs, 24 gave negative opinions and the remainder were neutral, often suggesting that more information was required to help inform opinion.

Review of UK workforce policy found that PAs were absent from English health workforce and education planning documents at national and regional levels. One mention of them was found in a Welsh policy document for rural primary care. By contrast, the NHS in Scotland had policy and plans to develop a PA workforce.

There were 539 respondents to the patient satisfaction survey (a response rate of 52.8%). The majority reported high levels of satisfaction with no significant difference between those consulting PAs or GPs [odds ratio (OR) 1.00, 95% confidence interval (CI) 0.42 to 2.36, $p = 0.99$]. Most respondents who had consulted a PA said that they would be very satisfied (62%) or satisfied (28.3%) to consult a PA again.

Thirty-four patients gave interviews. Most participants expressed a high degree of satisfaction with and confidence in PAs (often in relation to the supervision by a doctor or their trust in the practice), some expressed the need to fully understand this new-to-the-UK role, to have choice in whom to consult and to ensure continuity in their relationship with their clinician.

From an analysis of the 2086 anonymous patient records there were 932 consultations with PAs and 1154 with GPs. PAs were consulted by a wide range of patients but, in comparison with those of the GPs, the patients were younger, had fewer indicators of ongoing multiple chronic conditions and were presenting that day with less medically acute/complex problems. After adjustment for confounding there was no difference between PAs and GPs in the rate of procedures undertaken (rate ratio 0.85, 95% CI 0.34 to 2.15, $p = 0.734$), diagnostic tests ordered (rate ratio 1.08, 95% CI 0.89 to 1.30, $p = 0.439$), referrals to secondary care (rate ratio 0.95, 95% CI 0.63 to 1.43, $p = 0.797$) or prescriptions issued (rate ratio 0.87, 95% CI 0.87 to 1.53,

$p = 0.309$). PAs were significantly more likely to document general advice (OR 3.30, 95% CI 1.689 to 6.4532, $p = < 0.001$).

Thirty-two per cent of the patients attended the surgery again within 2 weeks. Of the primary outcome measure, there was no difference between those consulting PAs or GPs in the rate of repeat consultation with the same problem at the practice or an urgent care facility within 2 weeks (rate ratio 1.314, 95% CI 0.843 to 2.049, $p = 0.228$) or for the same or a linked problem (rate ratio 1.240, 95% CI 0.861 to 1.78, $p = 0.247$).

A panel of experienced GPs who were blinded to whether the clinician was a GP or a PA reviewed the records of the 475 patients who reconsulted for the same problem. They judged the documented activities in the initial consultation to be appropriate in 80% of PA records and 50% of GP records. The GP reviewers could not easily identify whether the clinician was a GP or PA from the records, correctly classifying 40% of PA consultations and 76% of GP consultations. Video observations of PA consultations were judged by the panel of GPs to be competent, with scores between 40% and 60% for the dimensions of interview/history taking, physical examination, patient management, problem solving, behaviour/relationship with patients and anticipatory care. Across all the dimensions of competence, PAs scored significantly lower than the GPs they were compared with [median overall percentage for GPs 58.6%, for PAs 47%, Mann–Whitney U-test (two-tailed), $p = 0.012$].

An economic analysis was conducted at two levels: practice team configurations and costs; and patient-level comparison of the contribution and costs of GP and PA consultations. The average cost per patient ranged from £146 to £176 in practices employing PAs and from £68 to £405 in those not employing PAs. The proportion of GPs who were salaried (as opposed to partners) was higher in practices employing PAs than in practices without PAs. After adjusting for covariates, the average patient consultation with a PA was 5.8 minutes longer than with a GP (95% CI -7.1 to -2.46 ; $p < 0.001$). Consultation costs were £34.36 for GPs and £28.14 for PAs. However, costs could not be apportioned to interruptions to GPs for conferring or signatures for prescriptions and did not take account of the time GPs spent on supervision and training of PAs.

Table 4 summarises the key findings from these 3 related publications.

Table 4: Combined Findings table Drennan et al 2011, Halter et al 2017, Drennan et al 2014

<p>Clinical Practice</p>	<ul style="list-style-type: none"> • Chronic disease management, home visits, cryotherapy, teaching, clinical audit and supervision of other staff such as health-care assistants. • Triage patients and/or see same-day appointments; minor illnesses to those requiring immediate hospital admission. • PAs were perceived to undertake a high volume of work and required low levels of supervision. • Scope of work limited by prescribing restriction • The majority of consultations were in same-day appointment surgeries, employing GPs expected the PAs to hold their own consultations and to assess, diagnose and treat the patients within competency limits agreed by their supervising doctor. • Other activities included arranging referrals or processing laboratory results, attending practice meetings or training days, carrying out clinical governance activities and condition/case-specific duties (such as child protection work). • PAs were consulted by a wide range of patients, but these patients tended to be younger, with less medically acute or complex problems than those consulting GPs.
<p>Continuity</p>	<ul style="list-style-type: none"> • Continuity of clinician was important to those with multiple and ongoing problems.
<p>Cost</p>	<ul style="list-style-type: none"> • Costs could not be apportioned to GPs for interruptions, supervision or training of PAs. • Participants reported that the advantages of employing a PA outweighed or at least balanced the costs and challenges. • PAs were costed as Band 7 nurses. The same costs were applied to GP partners and salaried GPs because evidence on this was contradictory. One study suggested that partners cost less than salaried GPs and others argued partners cost slightly more or the same. • Some practices deployed their PAs in ways which increased the practice income, for example Quality and Outcome Frameworks (QOF) activities and provision of clinical activities that were promoted and incentivised by local and national commissioners. • Although GPs see more patients per hour (three patients for every two seen by PAs), their salary and related costs are more than twice those of PAs. Using national figures GP and PA consultations cost £3.08 and £1.67 per minute (based on consultations of 11.7 minutes at £36 and 15 minutes at £25), giving

	consultation costs within this study (for the adjusted consultation lengths of 17.03 minutes and 11.23 minutes) of £34.36 and £28.14, respectively, a saving of £6.22.
Governance	<ul style="list-style-type: none"> • Not reported on
Impacts on service provision	<ul style="list-style-type: none"> • Perception that the nature and volume of work in primary care had changed; an increasing volume of minor illness consultations that required a different skill mix in general practice and lent themselves to PA employment • Alleviated recruitment difficulties experienced in recruiting doctors and nurse practitioners, particularly in practices in deprived urban areas and rural areas. • The average consultation with a physician assistant is significantly longer than that with a GP: 5.8 minutes for patients of average age for this sample (38 years). • PAs had an impact on the working practices of some of the GPs. In some practices, they were employed specifically to release GP time for attending to more complex patients or other aspects of the GP workload. • The extent to which PAs impacted on the work in each surgery of the supervising doctor varied depending on the experience of the PA and the systems in place to signal the PA's need for consultation about a patient and/or prescription signing. • PAs' lack of authority to sign a prescription was an issue in all the practices • PAs were reported to be flexible in their skills, and so were often able to cover nurse absences. • It was evident from the interviews with the practice managers and GPs that the priority was to deploy available staff most efficiently against the practice service delivery needs and the demands of each day. • PAs offer another labour pool, with a shorter training period than GPs or Nurse Practitioners, to consider in health service workforce and education planning at local, regional and national levels.
Perceptions of PAs (HCPs, managers and patients)	<p>HCP:</p> <ul style="list-style-type: none"> • The professional participants reported PAs were seen as acceptable to patients • The lack of ability to prescribe was reported to cause frustration and additional time to the PAs, the GPs and the patients. • Varying views concerning PA speed of consultation and ability to complete all associated tasks rather than

	<p>refer on to the GP. All views were also tempered by the availability or lack of GPs, experienced practice nurses and NPs in the local labour market.</p> <ul style="list-style-type: none"> • PAs could be perceived as a threat to others' roles leading to opposition to PA employment. • Many of the practice staff and nurses observed that the PA could be seen to be aligned with nursing staff, or alternatively as a bridge between nursing and medical staff. <p>Patients:</p> <ul style="list-style-type: none"> • Practices had developed different approaches to informing patients that they might be seen by a PA and getting their consent to this. However there remained some doubts as to patients' understanding of exactly what a PA was and that they were not a doctor. • Patients reported high levels of satisfaction with both PAs and GPs. The majority were willing or very willing to consult a PA again but wanted choice in which type of professional they consulted. • Patients expressed the need to fully understand this new-to-the-UK role, to have choice in whom to consult and to ensure continuity in their relationship with their clinician. • Understanding the role of the PA varied from 'certain and correct' to 'uncertain', to 'certain and incorrect', where the patient believed the PA to be a doctor.
Patient Safety	<ul style="list-style-type: none"> • There was no significant difference between PAs and GPs in the primary outcome of patient reconsultation for the same problem within 2 weeks, investigations/tests ordered, referrals to secondary care or prescriptions issued. • PAs were judged to be competent and safe from observed consultations and to be more likely than GPs to document appropriate clinical activities. • PAs recorded that advice was taken from a supervising doctor in 53 (35.3%) of their index consultations, whether this was at the time of the consultation or later routine quality assurance by the doctor. • Video observations of PA consultations were judged by the panel of GPs to be competent • PAs take and document advice from supervising doctors in just over one-third of consultations
Regulation and Prescribing	<ul style="list-style-type: none"> • The lack of current regulation and authority to prescribe was viewed as problematic by many stakeholders and practice employers. • Negative experiences were associated with the PA role limitations, requiring additional GP appointments or prescription delay

	<ul style="list-style-type: none"> • Interviewees highlighted the need for PAs to become a regulated profession in the UK and for enhanced public awareness of their role and scope of practice.
Training and Supervision	<ul style="list-style-type: none"> • The GPs, practice managers and PAs all described an induction process of establishing the PAs' competency in clinical work, confidence in working in the practice team and with practice systems through additional training and supervision sessions offered by the GP. • There was agreement from most participants, across all professional roles, as to the importance of ongoing supervision and mentorship. • The PAs tended to report a mixture of informal advice as and when needed in clinical sessions together with regular more formal supervision sessions.

Physician Associates (Secondary Care)

Halter et al 2018: a systematic review to appraise and synthesise research on the impact of PAs in secondary care, specifically acute internal medicine, care of the elderly, emergency medicine, trauma and orthopaedics, and mental health [16].

5472 references were identified and 161 read in full; 16 were included—emergency medicine (7), trauma and orthopaedics (6), acute internal medicine (2), mental health (1) and care of the elderly (0). All included studies were observational with variable methodological quality.

Outcome measures assessed included impact on patients' experiences and outcomes (length of stay, waiting times, pain control, operative complications, mortality), service organisation, working practices, other professional groups and costs.

In Trauma and Orthopaedics two prospective studies of the addition of PAs to surgical teams, preoperatively, intraoperatively and postoperatively reported both patient satisfaction and acceptability of PAs to other clinical staff from surveys of these groups. Nursing staff were more equivocal, expressing concern about the overlap of tasks traditionally considered to be the responsibility of nurses but staff appreciated the continuity provided by PAs and their skills in the operating room.

In emergency medicine and in trauma and orthopaedics, when PAs were added to teams there were reduced waiting and process times, readmission rates were reported to be at least equivalent. The difficulty of attributing cause and effect in complex systems where work is organised in teams was also highlighted.

In a large study the 72 hours' reattendance rate to the ED for children aged 6 and younger was used as a proxy measure of clinical safety [23]. The unadjusted rate was significantly lower for those patients treated only by a PA (6.8% vs emergency physician 8.0%, $p=0.03$) but analysis of the reattendance rates by Emergency Severity Index score found no statistically significant differences.

Pain control reported by the studies was variable but PA presence in teams had a positive effect on thromboprophylaxis and post-operative complications. Length of stay and mortality outcomes were variable but again were at least equivalent.

In internal medicine outcomes of care provided by PAs and doctors were equivalent when considering length of stay, readmission rates and mortality.

Evidence regarding cost was mixed but those studies attempting to address costs found either a reduction or equivalent costs where PAs were employed.

National Institute of Health Research Report, Drennan et al 2019: The aim of this study was to investigate the contribution of PAs to the delivery of patient care in

hospital services in England [17]. A proportion of the findings were also reported in Halter et al 2018 [16].

The research questions addressed were:

1. What is the extent of the adoption and deployment of PAs employed in acute hospital medical services?
2. What factors support or inhibit the inclusion of PAs as part of hospital medical teams at the macro, meso and micro levels of the English health-care system?
3. What is the impact of including PAs in hospital medical teams on patients' experiences and outcomes?
4. What is the impact of including PAs in hospital medical teams on the organisation of services, working practices and training of other professionals, relationships between professionals and service costs?

Method: This was a mixed-methods study using an evaluative framework with dimensions of effectiveness, appropriateness, equity, efficiency, safety, acceptability and cost. There were four interlinked workstreams:

1. Surveys: Two national, electronic, descriptive, self-report surveys – one to medical directors (MDs) of secondary care NHS trusts and one to PAs. At the time of the survey, there were 214 NHS acute and mental health trusts in England; MDs from 33% of trusts (n = 71) replied. Of these, 68% (n = 48) were acute trusts. Out of the 223 PAs on the UK voluntary register and practising in primary and secondary care in the UK at the time of the survey, 63 PAs working in secondary care in England completed the online survey. Of these, 49 provided responses to all 18 questions. The majority of respondents had trained in the UK and the mean length of time since qualification was 3.1 years [standard deviation (SD) 2.1 years]. Most worked in large acute hospital trusts. The respondents reported working in 33 medical or surgical specialties; the most frequently reported was acute medicine, followed by elderly care medicine and trauma and orthopaedic surgery.

The surveys addressed the first 2 research questions and in the absence of NHS workforce data on PAs complemented data gathered annually by the Faculty of Physician Associates. They were used to inform the methods and identify potential hospital trusts for workstream 3.

2. Reviews: A systematic review of published peer-reviewed evidence found 16 observational studies from North America in the specialties most frequently employing PAs in the UK

The policy review that had formed part of the earlier primary care study [15] was updated with a particular focus on secondary care. Internet searches of relevant English government, NHS and associated agencies' websites were conducted periodically throughout the study period to identify relevant policy documents and reports on health-care workforce planning, education, regulation and development. The time period was September 2013 to October 2017.

3. Investigation, in six hospital trust case study sites of the deployment, impact and contribution of PAs utilising semi-structured interviews with patients and relatives, senior and operational managers, senior consultants, medical and nursing team members and PAs.
 - **Doctor interviews:** Forty doctors working in a range of specialties were interviewed across the six study sites: 23 senior doctors (consultants), 10 middle-grade doctors (registrars and senior specialty doctors) and 7 early-career doctors (Foundation Years/core training doctors).
 - **Operational managers interviews:** Eleven non-clinical operational managers from five NHS trusts working in medical, surgical and emergency services and ranging from divisional managers to service business managers and assistant service managers participated. Ten spoke in interviews and one provided written information only. All had worked in their posts for ≥ 18 months
 - **Nurses interviews:** Twenty-eight nurses, working in roles including staff nurse, ward manager, clinical nurse specialist and matron, were interviewed about their experiences of working with PAs. They worked in a range of adult and paediatric medical and surgical specialties as well as emergency medicine.

A pragmatic comparison of PAs or Foundation Year 2 (FY2) junior doctors as the first clinician of patient outcomes and costs was made through retrospective anonymous record review in emergency departments (EDs) of patients attended (after triage). The primary outcome was re-attendance within 7 days. A subsample was also assessed for appropriateness by independent clinicians blinded to the attending staff. Comparison sites

included different-sized hospitals in inner-urban, urban and county environments in the West Midlands, London and the South East of England.

4. Synthesis of evidence from the three data-collection workstreams, presented and tested at an emerging-findings workshop with attendees from the research participants, patient and public voice representatives and other advisors to the study.

Drennan et al 2019: a mixed methods within a case study design, using interviews, observations, work diaries and documentary analysis [18].

Setting: Six acute care hospitals in three regions of England in 2016–2017.

Participants: 43 PAs, 77 other health professionals, 28 managers, 28 patients and relatives. This was the first study of the contribution of PAs across multiple secondary care specialties in the National Health Service in England. A key influencing factor supporting the employment of PAs in all settings was a shortage of doctors.

Drennan et al 2020: a mixed methods longitudinal, multi-site evaluation of a two-year programme employing 27 American PAs: interviews and documentary analysis [19].

Setting: Eight acute hospitals, England.

Participants: 36 medical directors, consultants, junior doctors, nurses and managers, 198 documents.

Interview analysis identified three overarching themes:

1. motivation to recruit experienced PAs
2. changing views about the PA contribution to the team
3. perceptions of PAs positive contributions.

Table 5: Findings table Halter et al 2017 [16], Drennan et al 2019 [17], Drennan et al 2019 [18] and Drennan et al 2020 [19]

<p>Clinical Practice</p>	<ul style="list-style-type: none"> • Employed within medical or surgical teams, core role for adults and paediatrics was ward-based work. <ul style="list-style-type: none"> ○ With the exception of those employed in emergency medicine, PAs were mainly deployed to undertake inpatient-ward-based activities of the medical/surgical team on weekdays during the core hours of 07.00 to 19.00. ○ participating in and following up ward rounds and patient reviews led by doctors ○ clerking and assessment of patients; preparing for, responding to requests and concerns about patients from nursing staff ○ communicating with patients and relatives ○ Only a small number of PAs spent a small amount of time in outpatient clinics and theatres. • In ED PAs worked in majors, and sometimes minors where they were described and observed to be assigned to undertake patient assessments following clinical triage. • Individual PA roles were described and observed to be moulded to the need of a service and that over time some PAs had been trained to undertake procedures common for that specialty such as lumbar punctures, echocardiograms, peripherally inserted central lines or nerve block. • Mostly inpatient work although a small number of PAs worked in outpatients and theatres. • PAs undertook significant amounts of non-patient facing clinical work for the medical/surgical teams (e.g. preparing discharge summaries).
<p>Continuity</p>	<ul style="list-style-type: none"> • A positive and frequently reported impact was that PAs provided continuity of staffing in the medical/surgical team, both personal and team continuity. <ul style="list-style-type: none"> ○ Continuity in presence on the inpatient wards which increased access and early escalation of problems to the medical/surgical team ○ Continuity in knowledge about current inpatient status, management plans and patients' progress, which facilitated updating patients and the medical/ surgical team ○ Knowledge of the preferred processes and procedures of consultant(s) and services ○ Continuity in relationships with patients and their families ○ Continuity in knowledge about the policies and practices (clinical and otherwise) of the department, the individual consultants and the hospital, reported to be of particular value for doctors on short training rotations new to that particular workplace.

<p>Cost</p>	<ul style="list-style-type: none"> • In some services, the PAs' duty times were arranged to cover for absences of doctors, for example, to attend training and reduce the use of locum doctors. • Locum doctors were considered less efficient, less safe and costlier than PAs by consultants and managers. • The unit cost per hour to trusts of hiring PAs was higher than that of FY2 doctors who spend a limited period in ED on a training rotation. • Operational managers feedback: PAs were not necessarily substitutes or funded from medical staffing budgets; some were in additional service posts that were funded differently.
<p>Governance</p>	<ul style="list-style-type: none"> • The lack of regulation raised concerns about governance, responsibilities and liabilities. • Typically, detailed work on PAs, including governance arrangements, was taken on by designated PA boards or committees, which sometimes had changes in leadership. MDs were commonly the link between the PA board and the trust board. The issues that PA boards or committees considered included: <ul style="list-style-type: none"> ○ setting up structures (e.g. deciding whether PAs come within medical or nursing administration) ○ the scope of PA roles (i.e. addressing what they could and could not do) ○ clinical supervision arrangements ○ reporting lines to management on non-clinical issues (e.g. leave and rotas) ○ engaging the organisation with using PAs ○ issues in relation to PAs not being able to prescribe or request ionising radiation investigations ○ the ways in which PAs could work with others e.g. advanced nurse practitioners (ANPs) and prescribing pharmacists ○ arrangements for PAs continuing education and study leave.
<p>Impacts on service provision</p>	<ul style="list-style-type: none"> • It was reported that developing roles, such as PAs, was a necessity in the face of the shortages of junior doctors to cover the medical rotas, the need to release junior doctors to undertake their training, workload created by increased patient demand, expansion of services and recognised quality issues in some service delivery. • PAs were described and observed to undertake large amounts of non-patient facing clinical work for the medical/surgical team and helped smooth and improve patient flow. PAs were considered to provide 'oil' to the system. • Although some specialties with high-dependency patients reported that PAs were less appropriate than doctors,

most specialties only reported issues in terms of inefficiencies and problems in the workflow created by the lack of PA authority to prescribe and request ionising radiation investigations.

- PAs released doctors' time to attend more complex patients and also to attend patients in outpatients and theatre.
- Reported a positive impact of including PAs in medical/surgical teams on achieving safe working hours for doctors in training and described as actively supporting junior doctors' induction and training.
- PAs trained to provide a central line insertion service, telephone clinic services for cancer patients, rapid access chest pain clinic and to assist in the placement of percutaneous endoscopic gastrostomies were all described reducing waiting times and enabling services to match demand.
- Most clinicians and senior managers described decisions concerning actual posts for PAs (or others) as being departmentally driven by local assessment of need rather than within an explicit strategic framework. The PAs were reported to contribute to service efficiency through supporting doctors and nurses. Specific examples included:
 - PAs working shift patterns to complement the junior doctors that enabled an outpatient clinic to extend its hours with greater patient throughput
 - Increased patient flow through the ED
 - Improved access for nurses to raise concerns about a patient to a member of the medical team (e.g. when all the doctors were in theatre).
 - In some areas of work, PAs were considered to free up consultants' time
 - PAs were also considered to contribute to the hospital meeting national quality targets (e.g. on discharge processes and ensuring policy).
- No quantitative data were offered and there was a commonly held view that it was difficult to disaggregate the impact of individual types of staff in team and department provision. Generally, positive answers drew on the PAs' apparent popularity with patients and the lack of complaints. In some hospitals, PAs were thought to be effective at nipping complaints in the bud. There had also been some positive feedback (e.g. on a hospital

	<p>website and from surveys of patient satisfaction).</p> <ul style="list-style-type: none"> • The lack of supply of PAs to recruit was an inhibiting factor and retention was also reported to be difficult in some areas owing to a lack of development opportunities and no obvious career trajectory.
<p>Perceptions of PAs (HCPs, managers and patients)</p>	<p>HCP and managers:</p> <ul style="list-style-type: none"> • The majority of doctors, nurses and managers described the contribution of PAs as positive and saw PAs as a positive asset. However, a few clinical leaders (medical and nursing) were reported to consider that PAs were not the right group to develop or employ, favouring nurses or others. • Opposition to PA employment from some senior doctors and nurses was reported to change over time as PAs became part of teams and demonstrated what they could contribute. • A small number of doctors and nurses in high dependency specialties considered that, having employed or worked with PAs, doctors were more suited to the work of the specialty. • PAs helped junior doctors (residents) manage the workload and were missed when they were absent. Nurses particularly commented on the stability the PAs brought to medical teams and their continual presence in ward settings. • The presence of PAs on the wards released early-career doctors to undertake training and meant that nurses had easy access to a member of the medical team. • Some early-career doctors were reported to be concerned that the presence of PAs would reduce their opportunities for training in certain procedures. Most doctors and PAs described the prioritising of training for doctors, but procedures were also, in some cases, a contested area of PA work, with trainee doctors described as ‘competing’ for procedures. Views on this varied from a sense that there was plenty work to go round to a feeling that rotating junior doctors should be allowed the opportunities, noting the limitations of allowing the junior doctors first refusal on the career development of PAs. All of the views suggested that the PA role was there to fill medical staffing gaps, whichever part of the medical work that entailed. • Some aspects of the PAs and their roles were described as particularly valuable and valued by doctors and other staff groups, for example:

- The fact that PAs were trained in the medical model
- PAs supported new junior doctors and freed up their time
- PA training promoted caring qualities as well as academic standards
- PAs offered enhanced skills and different skills to doctors and would be valuable additions
- PAs' adaptability and flexibility.

Managers:

- All senior managers and clinicians described the difficulty of attributing patient outcomes and cost to an individual professional when clinical provision was team based and affected by multiple other contextual factors.
- None of the managers or clinicians in any of the sites were able to provide any routine data or reports from which the impact of the involvement of PAs could be disaggregated.
- Some reported that the presence of the PAs enabled the senior doctors to be more efficient.
- Many managers and consultants reported that PAs reduced the use of expensive locum doctors, but although cost was important the primary consideration was patient safety and efficiency.

Patients:

- Patients and relatives reported very positive views of the PAs attending them, highlighting continuity and communication, especially relating to team decisions and management plans.
- Many of those interviewed and observed were uncertain about what a PA was or mistook them for a doctor. Even if introduced as a PA.
- High degree of patient satisfaction evidenced through compliments and presents the PAs received from patients. Patients and relatives reported PAs to be caring, approachable and good at communicating and were content with the physical examination and procedures undertaken.
- Patients were happy to have a PA involved in their care in the future with one important caveat, they thought that PAs were a good idea (to assist with staffing pressures) as long as they were properly supervised.

Patient Safety	<ul style="list-style-type: none"> • Consultants, registrars and managers reported the PAs to be safe with no serious incidents or patient complaints. Continuity provided was described as important for patient safety and experience. • A random sample of anonymised emergency department (ED) patient records (305 seen by PAs and 308 seen by FY2 doctors) was analysed. The re-attendance rate within 7 days was 8% (n = 48), with no difference in the rate of re-attendance between cases seen by the PAs and FY2 doctors after adjustment for patient age and acuity (odds ratio 1.33, 95% confidence interval 0.69 to 2.57; p = 0.40). Clinical review by four independent clinicians, blinded to the type of professional, of a subsample of 40 records found the documented consultation to have been appropriate in the majority of PA and FY2 doctor cases with no errors or omissions likely to have caused harm. Three records (two of FY2 doctors and one of a PA) were identified as having an error or omission that breached clinical guidelines. In one case, the reviewers agreed that a senior doctor had agreed the consultation and plan, but they disagreed in the other two cases
Regulation and Prescribing	<ul style="list-style-type: none"> • The chief inhibiting factors to PA employment were the lack of regulation and lack of authority to prescribe medicines and request ionising radiation investigations. Some registrars gave estimates that the PAs, without authority to prescribe could only cover about 70% of the work required.
Training and Supervision	<ul style="list-style-type: none"> • Early weeks in post required induction and orientation to the English language as used in the UK and to UK medical and surgical practice and the NHS. • The PAs told a consistent story about supervision, mentioning consultant- or senior-registrar-level support, which was usually directly available at the point of care or otherwise indirectly by telephone. This supervision was not tied to one particular person, but to whichever senior doctor was on cover for the ward or unit at that point in time. • Conducting more procedures appeared to be associated with time since qualification, or personal development over time within a particular specialty. Competence to carry out a procedure was clearly important, with a system and sign-off documents being mentioned by PAs at more than one case study site.

Physician Associates Primary and Secondary Care HEE Case Studies

The primary and secondary care impact case studies from the Yorkshire & Humber Academic Health Science Network [20, 21] describe similar outcomes and are therefore considered together. These case studies represent the first large-scale qualitative study of impact undertaken at a national level. Participants recruited for the project were:

3 PAs and 9 PA employers from 11 NHS primary care organisations across 4 NHS England regions (North West, North East, Midlands, South East)

4 PAs and 8 PA employers from 10 NHS secondary care organisations across 5 NHS England regions (North West, North East, Midlands, London, South East)

Verbatim narrative accounts are provided by members of the multidisciplinary team (MDT) from Ashford and St Peter's Hospitals, Epsom and St Helier University Hospitals, Chesterfield Royal Hospitals, Alder Hey Children's Hospital, University Hospital of Leicester, Humberstone Medical Centre, Greystone House

To increase the impact of the PA role in primary and secondary care the case studies suggest the following are required:

- More PAs (secondary care)
- Increased funding for employing PAs (secondary care)
- GMC regulation (primary and secondary care)
- Ability to prescribe (primary and secondary care)
- Ability to request ionising radiation investigations (primary and secondary care)
- Ability to sign fit for work notes (primary care and secondary care)
- Preceptorship/foundation year on a national scale (secondary care)
- More training in advanced skills (secondary care)
- Joined up approach to career development (secondary care)
- Increased awareness of the role (primary and secondary care)
- Clear pathway for career progression with a postgraduate training option and formal appraisal process (primary care)
- Culture shift to enable more acceptance of the role (primary care)

Table 6: Findings table primary and secondary care HEE case studies

<p>Clinical Practice</p>	<p>Primary Care:</p> <ul style="list-style-type: none"> • Mainly provide routine and acute appointments with some variation between practices in terms of whether these are triaged first. • Patients with chronic conditions e.g. chronic pain and type 2 diabetes. • Dependent on local policy some request and take bloods only, some interpret results. • PAs experienced in frailty undertook care home ward rounds. <p>Secondary Care:</p> <ul style="list-style-type: none"> • Run clinics, clerking, undertaking post take ward rounds and facilitating patient discharge. In some NHS trusts, PAs work with outpatients or are employed to work in the community providing care to specific patient groups (e.g., people with learning disabilities). • See patients with diabetes or gastric illnesses • Supporting ward rounds and recording inpatient notes
<p>Continuity</p>	<ul style="list-style-type: none"> • Good continuity of care, for example undertaking regular ward rounds in care homes saving GP time in primary care and continuity provided by PAs in secondary care leads to faster patient discharge.
<p>Cost</p>	<ul style="list-style-type: none"> • Not reported
<p>Impacts on service provision</p>	<ul style="list-style-type: none"> • Science background of PAs enables a more holistic approach to healthcare providing a good wrap-around level of care to patients. • Faster discharge from the acute setting • Ability to see new patients enables increased clinic provision and reduced waiting times and likelihood of cancellation. • Provision of follow-up appointments freeing up consultant appointments. • Used in innovative ways in new services e.g., virtual wards • PAs help increase workforce capacity. • Provide a level of stability as permanent members of staff with a routine working pattern. • PAs share generalist medical knowledge and learning and provide advice to the wider multidisciplinary team. E.g., they provide guidance to nursing staff and support receptionists to provide advice to patients on the phone.

Perceptions of PAs (HCPs, managers and patients)	HCP and managers: <ul style="list-style-type: none"> • Perceptions regarding the impact of the role are mixed across professions with some nervousness around the role from several professions. • Perception that PAs are taking away postgraduate doctors' training opportunities • Issues over pay comparison.
Patient Safety	<ul style="list-style-type: none"> • Not directly reported on in the case studies.
Regulation and Prescribing	<ul style="list-style-type: none"> • PAs are unable to prescribe and are not permitted to request ionising radiation investigations preventing them working out of hours, causing delays for patients and creating work for medical staff.
Training and Supervision	Primary Care: <ul style="list-style-type: none"> • Supervising newly qualified PAs can be time-consuming for GPs but after the PAs have gained enough experience, the number of additional patient appointments they can provide outweighs the amount of supervision time required. • There were hesitations to employing PAs because of the time commitments required in supervising them and a lack of clarity around their capabilities and level of training • Lack of supervisory capacity limits out of hours working Secondary Care: <ul style="list-style-type: none"> • Some trusts offer preceptorships or rotational posts enabling PAs to work between departments or across hospital sites. • PAs also free up consultants' time by providing training to PA students and postgraduate doctors.

Anaesthesia Associates HEE Case Study

The evidence submitted for anaesthesia associates (AAs) was the case study by Yorkshire & Humber Academic Health Science Network [22]. Participants recruited for the project were:

4 AAs and 8 AA employers from 8 NHS organisations across 5 NHS England regions (North West, North East, Midlands, London, South East).

Verbatim narrative accounts were provided by members of the MDT from Leeds Teaching Hospital Trust, University Hospitals Birmingham, Sheffield Teaching Hospitals, Hull University Teaching Hospitals.

To increase the impact of the AA role the case study suggests the following are required:

- More AAs
- GMC regulation
- Ability to prescribe
- Clear guidance on scope of practice with experience
- National guidance on appraisal & revalidation
- Sharing of protocols between hospitals employing AAs
- A clear career pathway
- Building awareness of the role
- Employing AAs involves a cultural change for many teams

Table 7: Findings table anaesthesia associates HEE case study

<p>Clinical Practice</p>	<ul style="list-style-type: none"> • AAs are utilised in 1:1 (AA & consultant anaesthetist) & 2:1 (2 AAs or 1AA/1 trainee anaesthetist & consultant anaesthetist) capacities. • Traditionally supported trauma and day surgery lists. • Some hospitals have expanded the role and include AAs being used in ophthalmology to administer eye blocks and work outside theatre undertaking preoperative assessments and providing sedation services for interventional radiology. • Some work out-of-hours or weekends to support the emergency and trauma services or more complex cases.
<p>Continuity</p>	<ul style="list-style-type: none"> • They can provide a layer of flexibility and continuity to anaesthesia departments, facilitating increased consultant availability and providing not only anaesthesia services efficiently but also services related to the speciality. • Because AAs do not typically rotate, they have an in-depth understanding of systems and processes, providing continuity to anaesthesia departments.
<p>Cost</p>	<ul style="list-style-type: none"> • Suggested to be cost-effective but no data included.
<p>Impacts on service provision</p>	<ul style="list-style-type: none"> • AAs provide flexibility to anaesthesia teams allowing consultants to manage their team more effectively, reducing theatre downtime and increasing patient flow, and in some cases, helps to increase the overall productivity of the department. • Utilisation of AAs across the whole perioperative pathway helps improve patient flow and productivity. • Patient access and discharge rates are improved when AAs provide vascular access. • AAs trained to support with conscious sedation allow more lists to be done and reduce patient waiting times. • Increase workforce capacity; they support the anaesthetist workforce when there are shortages and reduce the burden on consultants. • Take the pressure off medical staff without removing the higher tier of medical care. • Utilising AAs in a 2:1 model appears to be particularly impactful in terms of freeing up consultants' time. This model allows consultants to work on other lists where there is greater demand and to undertake training of other theatre staff.

<p>Perceptions of PAs (HCPs, managers and patients)</p>	<p>HCP and managers:</p> <ul style="list-style-type: none"> • There is a level of resistance against the AA role. • There are some concerns from consultants around their role changing to be less patient facing when supervising AAs. • There is a perception of increased risk related to safety and quality of service, although others believe that having an AA working under appropriate supervision can facilitate direct continuous quality control and increase safety. • Anaesthetic trainees worry that AAs will take away training and future job opportunities.
<p>Patient Safety</p>	<ul style="list-style-type: none"> • Conflicting views that there may be increased risk related to safety and quality of service balanced by views that having an AA working under appropriate supervision can facilitate direct continuous quality control and increase safety.
<p>Regulation and Prescribing</p>	<ul style="list-style-type: none"> • AA role is not currently regulated by the General Medical Council and AAs are unable to prescribe which limits their ability to be autonomous practitioners.
<p>Training and Supervision</p>	<ul style="list-style-type: none"> • Lack of supervisory availability means many AAs do not support emergency or trauma out of hours services. • There is no clear guidance on how the scope of practice should shift with increased experience and skill acquisition. • There is no national career development pathway in place for AAs.

5. Additional Published Evidence Relating to the Role of Physician and Anaesthesia Associates Focussing on Impact, Outcomes and Cost

A literature search using the search terms Physician Assistants, Physician Associates, Anaesthesia Associates and Clinical Officers in the title or abstract published between 1974 and September 2024 was undertaken. Results were filtered to retain publications that referred specifically to these defined roles and titles were reviewed for relevance in terms of safety, quality, impact, patient satisfaction, clinical outcomes and cost. These articles were retained for further review together with articles reporting trials, reviews, systematic reviews, randomised controlled trials or meta-analyses specifically concerning PAs and AAs. Those that had been reviewed in the evidence submitted to the South East Clinical Senate from the WT&E national team described above were not considered further. A selection of articles are described below [23-56] together with a Cochrane systematic review of the role of non-physician providers of anaesthesia commissioned and shared by the Royal College of Anaesthetists [47].

A recent review of factors influencing how PAs and AAs are developed, integrated and received in hospital health care teams indicate that these remain broadly unchanged from earlier evidence reviewed in the section above [23]. Workforce supply, working time directives and views of external collaborators weigh heavily; as do views and perceptions of professional societies, local organisational leaders and champions. There is the potential to reduce delays, improve continuity of care and patient satisfaction whilst providing similar clinical safety and patient outcomes through use of PAs and AAs [24-27]. Key to development of the roles is the development and retention of trust between all stakeholders. The propensity to trust indicates the willingness of an individual to be vulnerable to another. The capability, humanity, integrity and reliability of PAs and AAs are all aspects of development of trusting relationships between them and patients and between them and other healthcare providers. However, of equal importance is the predisposition of patients and other healthcare providers to trust PAs and AAs [28].

Primary Care

Challenges in primary care include insufficient primary care providers, an ageing multiply comorbid population and the drive to improve patient outcomes. Allied to this GPs are not consistently used in a way that maximises their skills and training, often spending time on tasks that could be safely and perhaps better performed by others. The first group of PAs to be introduced in UK primary care were trained in the US

and were chiefly introduced to address workforce shortages in underserved primary care practices in the West Midlands [29]. Since their first introduction PA educational programmes in the UK have expanded and now around 2000 PAs are working in UK primary care [30]. The Care Quality Commission has published guidance on the role of PAs in general practice to clarify staff competencies, delegation and oversight and supervision of PAs [31]. The guidance requires that PAs must work under the supervision of doctors and under the direction of a named senior doctor. They can supplement and complement but not replace GPs, nursing staff and other members of the practice team. The guidance follows the high level principles concerning PAs espoused by the Academy of Medical Royal Colleges in March 2024 [32] and the 'red lines' on PAs working in general practice from the Royal College of General Practitioners (RCGP) which further explicitly stated that "the training and retention of GPs must be prioritised and that the responsibilities and skills required by GPs to supervise PAs must be recognised and resourced" [33]. The RCGP's governing UK Council have since changed their position on PAs working in general practice and voted to oppose a role for PAs working in general practice [34]. In its statement the RCGP recognised the need for guidance to support GP practices that are already employing PAs and reiterated its position that the regulation of PAs must proceed as soon as possible.

Despite the position taken by the RCGP there are studies indicating that PAs provide added value in primary care. Equally there are concerns that PAs working in primary care may worsen health inequalities.

A 2-year cluster RCT in Germany compared medical assistant-delivered protocol-based care management, including structured assessment, action planning, and monitoring, compared with usual care [35]. 2076 patients with type 2 diabetes, chronic obstructive pulmonary disease, or chronic heart failure and a high likelihood of hospitalisation were included. Measurements included all-cause hospitalizations at 12 months (primary outcome) and quality-of-life scores. There were no differences in all-cause hospitalisations but there were positive effects on quality of life at reasonable costs in these high-risk multimorbid patients.

Systematic review of 15 studies examining PA contributions to cancer diagnosis in primary care suggested that the introduction of PAs into primary care may maintain the quality of referrals and diagnostic tests needed to support cancer diagnosis [36]. PAs performed similarly to primary care physicians on rates of diagnostic tests ordered, referrals and patient outcomes (satisfaction, malpractice, emergency visits). However, no studies reported on the timeliness of cancer diagnosis.

Wang and colleagues considered the role of PAs as part of a scoping review considering the career development, competencies, effectiveness, perceptions, and regulation of both PAs and ANPs [37]. Although data was limited, they found that PA

patient outcomes for less complex tasks were comparable to GPs. The cost data they cited was that quoted from the earlier study by Drennan and colleagues (Table 4) [14].

Systematic review of international evidence examining the cost effectiveness of PAs in 2021 included 39 studies meeting the inclusion criteria (34 from the US, 4 from Europe and 1 from Africa) [38]. The majority of studies were in an emergency department/acute setting or in different settings in hospitals (31 studies), only 8 studies in a primary care type setting. The authors indicated that overall, 26 of 39 studies had low risk of bias, 9 moderate, 3 high risk and 1 critical. The quality of care delivered by a PA was assessed as comparable to a physician's care in 15 studies, and exceeded that of a physician in 18 studies. In total, 29 studies showed that both labour and resource costs were lower when the PA delivered the care than when the physician delivered the care. The authors concluded that PAs are cost effective and safe in their delivery of patient care and believe that the findings from their consolidated analysis are generalisable as they transcend five countries and represent the broad span of PA employment: acute care settings, medical and surgical wards, proceduralists, and facilitators of patient throughput.

It is contended that PAs in primary care in the UK are often filling GPs' roles including seeing undifferentiated patients driven by general practice resource limitations and ring-fenced funding through the Additional Roles Reimbursement Scheme (ARRS) for medical associate professionals, including PAs, paramedics, and pharmacists. An analysis by the GP magazine Pulse found that the proportion of staff who were PAs in the least funded practices was more than double those in the highest funded [39]. A survey by the Royal College of General Practitioners aimed at understanding GPs' views on the role of PAs in primary care and open to all RCGP members between April 2023 and May 2024 received 5112 responses (10% response rate) [40]. Of the responders 31% were currently working with PAs and 24% had previously worked with PAs. Subjectively roughly half of all respondents reported specific instances of compromised safety, including misdiagnosis, inappropriate prescribing, and poor management. The results of this survey formed the basis for the RCGP's position statement in September 2024 [34].

Secondary Care

In surgery and anaesthetics PAs and AAs have been employed in several different areas, particularly in developing countries. A meta-analysis of studies comparing clinical officers with medical doctors on the outcomes of caesarean section examined six non-randomised controlled studies, a total of 16,018 women [41].

There were no significant differences for maternal death (odds ratio 1.46, 95% confidence interval 0.78 to 2.75; P=0.24) or for perinatal death (1.31, 0.87 to 1.95; P=0.19). However, clinical officers were associated with a higher incidence of wound infection (1.58, 1.01 to 2.47; P=0.05) and wound dehiscence (1.89, 1.21 to 2.95; P=0.005).

In Malawi both doctors and clinical officers undertake surgery, including paediatric surgery. Paediatric surgical cases where the operating surgeon was categorised as physician or clinical officer were examined over a 12-month period [42]. A total of 1186 operations were performed on 1004 paediatric patients. Mean age was 6 years (± 5) and 64% of patients were male. Clinical officers performed 40% of the cases. Most general surgery, urology and congenital cases were performed by physicians, while most ENT, neurosurgery, and burn surgery cases were performed by clinical officers. Reoperation rate was higher for patients treated by clinical officers (17%) compared to physicians (7.1%), although this was said to be attributable to multiple burn surgical procedures. Physician and clinical officer cohorts had similar complication rates (4.5% and 4.0%, respectively) and mortality rates (2.5% and 2.1%, respectively).

A study of task-shifting of orthopaedic surgery to non-physicians has also suggested that this can be safely achieved [43]. Major amputations and open reductions and plating were selected and reviewed for outcome. The patients compared were either operated on by clinical officers alone or by surgeons or clinical officers assisted by surgeons. Clinical officers performed 463/1010 major (45.8%) and 1600/1765 minor operations (90.7%) alone. There was no difference in perioperative outcome and the authors concluded that clinical officers carry out a large proportion of orthopaedic procedures with good clinical results indicating that shifting of clinical tasks to clinical officers including major orthopaedic surgery can be safe.

Systematic review of 31 studies of task shifting of surgical procedures to non-surgeon clinicians in sub-Saharan Africa reported on morbidity or mortality outcomes [44]. Non-surgeon clinicians performed 1999/3304 (61%) of the total surgical cases studied which encompassed acute abdominal surgery, hernia repair and orthopaedic surgery. Sixteen of the studies reported clinical outcomes and safety. Morbidity rates for non-surgeon clinicians were 16% compared with 17% for surgeons and mortality rates were 2.2% and 2.5% respectively. The authors commented that non-surgeon clinicians are increasingly performing surgical tasks in regions of sub-Saharan Africa deficient in trained surgeons and appear to have non-inferior safety outcomes in selected programs.

A further systematic review aimed to assess the impact of both anaesthetic and surgical task shifting globally [45]. The authors identified 35 studies focussing on task-shifting for surgical and obstetric procedures, 4 studies addressing anaesthetic

task-shifting and 1 study covering both. The majority were from sub-Saharan Africa and the USA. Seventy-five percent presented perioperative mortality outcomes and 85% analysed morbidity measures. The evidence from low- and middle-income countries primarily concentrated on caesarean sections, hernia repairs and surgical male circumcisions and pointed to the overall safety of non-surgeon clinicians. In high income countries studies were limited to nine studies analysing tube thoracostomies, neurosurgical procedures, caesarean sections, male circumcisions and basal cell carcinoma excisions. Only five studies examined anaesthetic task-shifting across all country settings, but results were conflicting and conclusions regarding safety of non-physician anaesthetic care could not be made. This was in accordance with an earlier Cochrane review assessing the safety and effectiveness of different anaesthetic providers for patients undergoing surgical procedures under general, regional or epidural anaesthesia [46]. That review found 1,563,820 patients in 6 non-randomised studies (5 studies from the US and the other from Haiti). The authors were not able to make a definitive statement about the possible superiority of one type of anaesthesia care over another. The complexity of perioperative care, the low intrinsic rate of complications relating directly to anaesthesia, and the potential confounding effects within the studies reviewed, all of which were non-randomized, made it impossible to provide a definitive answer to the review question. The Royal College of Anaesthetists recently commissioned a further Cochrane review of the current evidence pertaining to the role of non-physician providers of anaesthesia [47]. That review included 56 studies from the world literature. The scope of practice and supervision of non-physician anaesthetists varied and most of the literature focussed on nurse anaesthetists, few studies described models of working involving anaesthesia associates. For nurse anaesthetists compared with doctors there were no differences in mortality but there were contradictory findings relating to complications and there were no studies found in this review making comparisons between anaesthesia associates and doctors. All included studies were considered to be at least at serious risk of bias. There were 9 studies reporting on the views and experiences of anaesthetists, non-physician anaesthetists, patients and others regarding the role of non-physician anaesthetists. Views were both positive and negative and there were negative views about the impact that AAs may have on training opportunities. Further research is needed to understand and to better assess the performance of non-specialist anaesthesia providers and future studies must adopt randomised study designs and include long-term outcome measures to generate high-quality evidence.

The recently published 7th National Audit Project of the Royal College of Anaesthetists looked at the utilisation of AAs in the UK [48]. AAs worked predominantly in a small number of surgical specialties during weekdays and working daytime hours. Complication rates were low in cases managed by anaesthesia associates, likely reflecting case mix. However, activity and registry

case mix data showed that AAs were managing some high-risk cases with the potential for serious complications. Although AAs were only a small fraction of the peri-operative workforce their scope of practice included inducing anaesthesia without direct supervision, leading a cardiac arrest, providing anaesthesia for high-risk patients and major or complex surgery, delivering care for the whole perioperative period with distant supervision, and provision of regional anaesthesia.

Hanmer et al analysed the economic viability of introducing AAs into routine provision of anaesthesia in the NHS using a supervision staffing model endorsed by both the UK Royal College of Anaesthetists and the Association of Anaesthetists [49]. For the 1:2 supervision model to be economically viable they argued that the employment cost of two AAs must be equal to or less than that of a single supervisor physician and calculated that the AA salary would have to be less than £40,000 per year. They reported that actual advertised AA salaries significantly exceeded this and discussed options that might increase AA productivity to make an AA programme potentially economically viable. The alternative suggestion was to terminate the AA programme as being economically nonviable.

Studies have also examined the impact of physician assistants and advanced practice providers in adult critical care in comparison to physician residents/fellows. One systematic review [50] and one concise review of the literature [51] both suggested no difference in the quality of care. The systematic review included 30 comparative cohort studies most of which were of moderate to good quality. Meta-analysis showed no significant difference for length of stay on the ICU (0.34 days, 95% CI, -0.31 to 1.00; I = 99%) and odds ratio for ICU mortality 0.98 (95% CI, 0.81-1.19; I = 37.3%) and for hospital mortality 0.92 (95% CI, 0.79-1.07; I = 28%). The concise review of the literature included five systematic reviews, four literature reviews, and 44 individual studies. The studies assessed length of stay, mortality, and quality-related metrics, with a majority demonstrating similar or improved patient care outcomes from advanced nurse practitioners and physician assistants compared to physician residents/fellows.

Systematic scoping review of PAs working the emergency department (ED) found 31 studies that addressed perceptions of the PA, waiting times, the acuity of patients seen, length of stay, those leaving without being seen, clinical outcomes, pre-admission rates, well-being and scope of practice [52]. Doctors' and patients' attitudes towards PAs were generally positive but the inability to prescribe was an issue. The studies reviewed indicated that PAs working in the ED seeing moderate-to low-acuity patients led to a reduction in waiting times, length of stay, readmission rates, and those leaving without being seen. The same authors also conducted a quantitative retrospective chart review from a single ED in England to compare adult patients seen by PAs with those seen by Foundation Year 1 (FY1) doctors [53]. They

reported that PAs treated patients mainly in Majors and Resus and saw more patients out of hours compared with FY1s. After adjustment for confounders there was no significant difference in wait times, left without being seen rates and reattendance within 72 hours with the same complaint. However, patients seen by PAs versus FY1s had a significantly longer length of stay (52 min); 237 min vs 185 min, $p < 0.001$ (95% CI 45.03 to 59.67). The authors did not comment on how much of the difference in length of stay may have been contributed to by PAs inability to prescribe or request ionising radiation investigations.

A study from the US also examined PA management of paediatric patients in the emergency department [54]. A total of 10,369 children aged 6 years or younger were seen by either PAs alone, PAs and emergency physicians or emergency physicians alone during a 24-month study period. The 72-hour reattendance rates were used to compare the care provided. 807 (7.8%) patients returned within 72 hours of their initial ED visit with 57 (0.55%) subsequently admitted. Rates for the 3 clinical groups were as follows: PA alone (6.8%), emergency physician alone (8.0%), and PA & emergency physician (9.3%) ($P < 0.03$). Patients admitted to the hospital on their return visits for the 3 clinical groups 0.4%, (0.6%) and 0.7% respectively ($P = 0.2$). The authors concluded that based on their findings PA management of paediatric patients 6 years or younger was similar to that of attending emergency physicians.

The impact of the implementation of physician assistants in inpatient care has been studied using a multicentre matched-controlled study in the Netherlands [55]. The authors examined the effects of substitution of inpatient care from medical doctors to PAs on patients' length of stay, quality and safety of care, and patient experiences. Thirty-four wards were recruited across the Netherlands with data from 2307 patients. Patients were followed from admission till one month after discharge. The primary outcome measure was length of stay, which was no different between PAs and doctors. Secondary outcomes concerned eleven indicators for quality and safety of inpatient care and patients' experiences with the provided care (including mortality, unplanned intensive care admission, cardiorespiratory arrest and non-elective readmission following discharge). None of the indicators for quality and safety of care were different between study arms. However, the involvement of PAs was associated with better patient experience assessed through a self-administered questionnaire at discharge. This questionnaire focused on satisfaction with communication, continuity of care and cooperation between care providers, and the patients view on the medical competencies of the PA or doctor. The same data were also used to estimate the cost effectiveness of substitution of inpatient care from doctors to PAs [56]. Patients receiving daycare, terminally ill patients and children were excluded. All direct healthcare costs from day of admission until 1 month after discharge were included and cost-effectiveness was assessed through quality adjusted life years (QALY) gained. No significant difference for QALY gain was found

and the total costs per patient did not significantly differ between the groups (+€568, 95%CI –€254 to €1391, p=0.175).

A systematic review of international evidence to assess the cost-effectiveness of PAs included 39 studies published prior to June 2021 [56]. Four studies were from Europe, one from Africa and the remainder from North America. Most of the studies were of good methodological quality and the results all pointed in the same direction. The quality of care delivered by a PA was comparable to a physician's care in 15 studies and exceeded a physician's care in 18 studies. In total, 29 studies showed that both labour and resource costs were lower when the PA delivered the care than when the physician delivered the care. The authors concluded that PAs delivered the same or better care outcomes as physicians with the same or less cost of care.

6. Where are we now?

The LTWP ambitions to optimise the MDT [4] included:

- Increasing PA training places to over 1,500 by 2031/32. This would have translated to around 1,300 PAs being trained per year from 2023/24, increasing to over 1,400 a year in 2027/28 and 2028/29, establishing a workforce of 10,000 PAs by 2036/37.
- Increasing AA training places to 250 by 2028/29 which was to support the ambition to increase places to 280 a year by 2031/32.

Providing high quality, patient focused, safe and efficient care remains a priority for all health care professions. The size and complexity of the NHS workforce challenge requires sustained action across the health and care system [1,12]. Current opinions regarding the introduction of PAs and AAs have become increasingly animated reporting increased doctors' workloads, expressing patient safety concerns, issues over adequate supervision and the impact of PAs and AAs on reducing medical trainee access to essential clinical experience [32-34, 40, 57-61]. In addition, there have also been concerns raised that PA and AA students need mental health support during training [62].

In February 2024 The Royal College of Anaesthetists (RCOA) wrote to clinical leaders in the anaesthesia network to request a pause in the recruitment of new student AAs while the RCA undertook further research on the impact of the AA role [57]. In April 2024 the Association of Anaesthetists published their position statement regarding the role of AAs, expressing significant concerns about the roll-out of the AA project, specifically regarding their scope of practice, levels of autonomy and misleading representations of equivalence of AA roles to doctor roles [58].

Anaesthetic trainees have also raised concerns regarding impact on quality of training, inequity of opportunity, and financial disparity.

In June 2024 the Royal College of Physicians of London (RCP) called on NHSE to review its projections for growth in the PA workforce until issues of regulation, standards and national scope of practice are addressed. The RCP short life working group on the role of PAs made 16 recommendations covering scope of practice, accountability (of both PAs and doctors), evaluation, training opportunities impact and pace and scale of roll out [60]. Only the last recommendation, which called on the RCP to close the PA Managed Voluntary Register (PAMVR) to new entrants as soon as possible, was rejected by the RCP council. The remainder were accepted, either in full or in principle. The RCP advised its members and fellows that they should only take on supervision responsibilities for PAs if they are a senior doctor (consultant, GP or specialist/associate specialist doctor on an SAS contract), appropriately job planned and funded for the extra time commitment. They further counselled that the supervision and education of early career doctors (trainees, specialty and locally employed doctors) must take priority.

Contemporaneous with this advice the Royal College of Physicians Trainees Committee (RCP TC) recommended the following actions in response to concerns regarding the role of PAs [61]:

Advanced 'scope', including 'ceiling' of practice, must be nationally defined on a specialty-by-specialty basis following multi-stakeholder participation.

Clear guidance must be published for doctors in training on supervisory roles and relationships, and the medicolegal implications for prescribing, ordering ionising radiation and receiving and making referrals to PAs.

Evaluation on the impact of the PA workforce on training should be carried out, with inclusion of specific questions on this topic within existing national training surveys. What it means to be a 'senior decision maker' and the steps and qualifications required to reach this position must be clearly defined.

A wider evaluation of the state of postgraduate medical training is warranted.

The Royal College of General Practitioners (RCGP) had called for a strengthening of its 'red line' on PAs in March 2024 [33]. Their position stipulated that:

- PAs working in general practice must always work under the supervision of qualified GPs.
- PAs must not be substitutes for GPs and do not replace GPs or mitigate the need to urgently address the shortage of GPs.
- PAs must be regulated as soon as possible.
- Public awareness and understanding of the PA role must be improved.

- Training, induction and supervision of PAs within general practice must be properly designed and resourced.
- Funding allocations, resources and learning opportunities within general practice must be prioritised for the training and retention of GPs.
- PAs should not be employed unless sufficient supervision can be provided.

However, In September 2024 the RCGP's governing UK council voted to oppose a role for PAs working general practice completely [34]. Recognising that there are already circa 2000 PAs working in general practice in the UK the RCGP undertook to revise guidance to support GP practices already employing PAs.

7. Concluding Remarks

There is no doubt that worldwide the development of the PA and AA roles has been driven by a shortage of medical doctors and by filling workforce gaps in provision of healthcare. Elsewhere in the world comprehensive diploma or degree training programmes followed by a period of clinical supervision have evolved for PAs and AAs. In many countries these roles are also regulated by law and supported by the medical health professional bodies and societies.

Opposition to PAs and AAs working within our healthcare system cites public confusion regarding their role, patient safety considerations, maintaining quality of care and negative impacts on the supervision and training of doctors undergoing postgraduate education and training. Opposition to the introduction of PAs and AAs has been expressed through the Royal Colleges and professional societies, largely based and supported by survey of the opinion of the membership of those colleges and societies, noting that none of the surveys have been sufficiently representative of that membership to allow generalisation of opinion. Safety concerns have also arisen from high profile, emotive anecdotal reports and no balancing metrics have been offered or sought to enable true comparison with either doctors or doctors in training.

The medical profession prides itself on following evidence-based practice. Interventions involving procedures and treatments can be supported by strong evidence at low risk of bias through properly conducted randomised controlled trials. However, evidence relating to PA and AA practice is largely observational, often poor or at best of moderate quality, and often at risk of bias. Nevertheless, the published evidence suggests that PAs and AAs are at least non-inferior in comparison with doctors in terms of patient safety and patient outcomes. Most studies from a UK healthcare setting comment on the difficulties engendered by the

inability of PAs in particular to either prescribe or to request ionising radiation investigations. In terms of continuity of care, communication, patient satisfaction and patient trust and confidence the evidence for these roles is universally positive. Almost no evidence has been published that actually quantifies the impact that PAs and AAs have had on doctors' supervision and training and the published qualitative evidence is both positive and negative. Finally, evidence attempting to address the cost effectiveness of these roles in provision of healthcare has been hampered by difficulties in disaggregation of the contribution of PAs and AAs from other members of the various multidisciplinary teams. Overall, the evidence suggests that they can deliver healthcare at the same or less cost.

PAs and AAs are not doctors and clearly should not misrepresent their role. However, similar patient and public confusion regarding whether a 'doctor' was actually a doctor existed prior to the introduction of regulation for doctors in the UK through the 1858 Medical Act of Parliament. The principle of regulation is welcomed and encouraged by all stakeholders.

If the implementation and expansion of the PA and AA workforce in the NHS is to go ahead and succeed it must have the support and lack of opposition of the medical and nursing Royal Colleges and professional societies, the Royal Pharmaceutical Society and AHP societies and organisations together with support and acceptance by patients. Government support, funding, accredited training programs and a legal and regulatory framework alone will not be sufficient. Only then will we be able to address the healthcare workforce shortages and realise the maximum improvements in health outcomes that we are all committed to.

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