Integrating physician associates into the health workforce: barriers and facilitators

ABSTRACT

Physician associates have been identified as a potential solution to the shortage of health-care workers in the UK, but the introduction of physician associates has not been universally welcomed and some uncertainty exists around their specific roles. This review enhances understanding of the barriers and facilitators for integrating physician associates into the workforce and identifies six key themes to inform future policy decisions at local and national levels.

The need to reform the UK's health-care workforce has been driven by staff shortages, rising demand, increasing complexity of care and changes in relationship between professionals (Imison and Bohmer, 2013). The UK government has identified physician associates (also known as physician assistants in other countries) as one of the solutions to address the staffing challenge in the NHS (Hunt, 2015; NHS England, 2017). The physician associate role has been introduced alongside expanded scopes of practice for existing health professionals (e.g. nurse practitioners), many of which have existed for some years.

A physician associate is defined as 'a new health-care professional who, while not a doctor, works to the medical model, with the attitudes, skills and knowledge base to deliver holistic care and treatment within the general medical and/or general practice team under defined levels of supervision' (Department of Health, 2012). Since the first UK-trained physician associate graduated in 2007, the profession has experienced steady growth (Aiello and Roberts, 2017). In 2017, there was an estimated 450 qualified physician associates in the UK, and up to 1200 physician associate students. Physician associates work in a wide range of specialties, with general practice, acute medicine and emergency medicine being the most common (Ritsema, 2017).

However, the introduction of physician associates into the UK health-care workforce has received a mixed response, with commentaries and anecdotal evidence suggest that introduction of physician associates is not universally welcomed (e.g. Bhardwa, 2015; McCartney, 2017). Understanding and addressing the concerns of stakeholders is therefore essential for their successful integration (Greenhalgh et al, 2004). Although the professional development and education of physician associates in the UK has been subject to previous review (Hooker and Kuilman, 2011; Merkle et al, 2011; Abraham et al, 2016; Aiello and Roberts, 2017), these publications have not summarized the barriers and facilitators for integrating physician associates into the workforce.

Dr Matthew CH Szeto, Chief Registrar in General Medicine, Medway NHS Foundation Trust, Gillingham ME7 5NY

Dr Alex Till, Health Education North West, Manchester, Honorary Clinical Senior Lecturer, Swansea University Medical School, Swansea

Professor Judy McKimm, Professor of Medical Education and Director of Strategic Educational Development, Swansea University Medical School, Swansea

Correspondence to: Dr MCH Szeto (matthew.szeto@nhs.net)

Aims and methods

This literature review aims to answer the research question: 'What do stakeholders perceive as barriers and facilitators for the integration of physician associates into the UK health system?' The objective is to identify and analyse the literature related to the concerns of stakeholders, including government, employers, doctors, physician associates, other health-care professionals and patients. The purposes are first to inform local and national policy makers of practices that enable physician associate integration, and second to recommend areas for further research or exploration.

A scoping review was undertaken using the framework described by Arksey et al (2005). This is an appropriate method to summarize a broad range of heterogeneous studies which are relevant to the research question. The scope of this review includes literature relating to physician associates working or training in the UK, published between April 2008 and April 2018. This review excluded literature that only relates to physician associates in the USA, as they cannot be generalized to the UK context because of the substantial differences in health-care system, statutory regulation and physician associate education (Hooker and Kuilman, 2011; Merkle et al, 2011; Arbet et al, 2012).

This review is limited to literature published after April 2008 to reflect that most physician associates currently working in the UK graduated after 2007 (Aiello and Roberts, 2017; Ritsema, 2017). Commentaries, secondary reports of studies and other opinion pieces were excluded from full text review. Review articles were excluded from data extraction, but they were read in full to provide context for this review, and their reference lists were searched for relevant literature. Non-English language articles were excluded.

Literature searches of Pubmed, Medline and CINAHL databases were conducted. The search terms used were ('physician associate' or ' physician assistant') and

('National Health Service', 'NHS', 'England', 'Scotland', 'Wales', 'Northern Ireland' or 'United Kingdom'). Additional literature was identified from the reference lists of selected articles and the Faculty of Physician Associates website. The inclusion and exclusion criteria were applied to the abstract of each article, and full text review was undertaken in uncertain cases. Full texts of the selected articles were then read in detail. Key findings related to stakeholders' concerns were extracted. The data were charted using thematic analysis (Pope et al, 2006). Anticipated themes were drawn from the seven stages of concerns (American Institutes for Research, 2016a) in the concern based adoption model (American Institutes for Research, 2016b), which has been found to explain empirical studies of innovations in complex organizations (Greenhalgh et al, 2004). Themes were relabelled and modified as driven by the data. The data were also analysed for emergent themes.

Summary of selected articles

Sixty-eight articles were identified after removal of duplicates. Eighteen articles were selected for data extraction and charting (*Figure 1* and *Table 1*).

The most common study design was survey study (n=8), followed by interview study (n=4) and mixed methods study (n=3). Three articles (Drennan et al, 2015; de Lusignan et al, 2016; Halter et al, 2017b) appeared to be part of a larger study (Drennan et al, 2014), and some findings were duplicated.

Table 2 illustrates how the anticipated themes were modified as driven by the data, resulting in six final themes. Information and personal concerns were found to be intimately related, so they were merged. Subsequently, the information–personal concerns of patients were found to be distinct to those of health-care professionals, resulting in two separate themes. No data were charted to the 'unconcerned' stage (which is not surprising given that those unconcerned with physician associates are unlikely to be studied) and no additional themes emerged from the data.

Increase understanding of the physician associate role among health-care professionals to overcome initial resistance

Studies of doctors and other health-care professionals described a poor understanding of the physician associate role (White and Round, 2013; Williams and Ritsema, 2014; Jackson et al, 2017), which was repeatedly cited as a barrier to physician associate integration. This finding was also echoed by a survey of physician associates (Ritsema and Roberts, 2016). The lack of understanding resulted in resistance and hostility in existing health-care professionals, who saw physician associates as competition for jobs and training opportunities (Drennan et al, 2011; White and Round, 2013). Some doctors also viewed introduction of physician associates as a mean of devaluing their profession (Jackson et al, 2017), and solely as a cost-saving measure (Williams and Ritsema, 2014). However, as health-care professionals have gained more knowledge of the physician associate role, initial hostility has given way to seeing physician associates as valuable members of

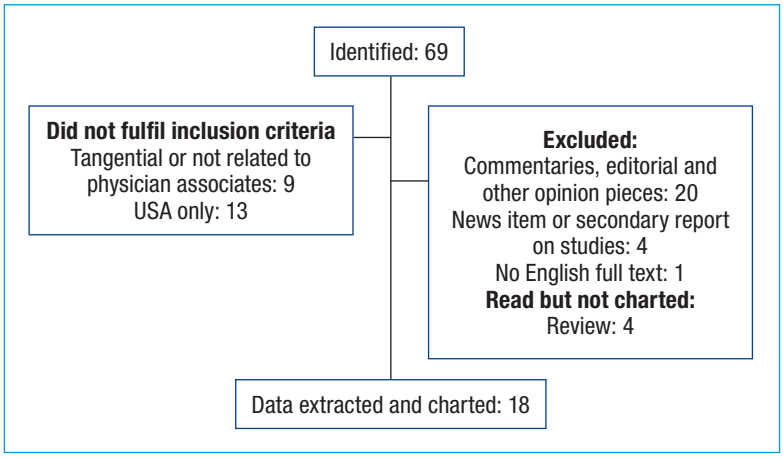

Figure 1. Article selection.

Table 1. Summary of selected papers

Type of study	Reference	Participants
Survey studies	Ritsema and Paterson (2011)	Physician associates
	Williams and Ritsema (2014)	Doctors
	Ritsema and Roberts (2016)	Physician associates
	Nasir et al (2017)	Students – physician associates, medical or other health-care professionals
	Halter et al (2017a)	Doctors, employers
	Rizzolo et al (2017)	Students – physician associates
	Ritsema (2017)	Physician associates
	Wheeler et al (2017)	Physician associates
Interview studies	Drennan et al (2011)	Doctors, employers
	Farmer et al (2011)	Physician associates, doctors, other health-care professionals, patients
	Jackson et al (2017)	Doctors, other health-care professionals, patients
	Halter et al (2017b)	Patients
Mixed method studies	White and Round (2013)	Physician associates, doctors, other health-care professionals
	Drennan et al (2014)	Physician associates, doctors, other health-care professionals, employers, patients
	Drennan et al (2015)	Physician associates, doctors, patients
Other studies	Arbet et al (2012)	Students – physician associates
	de Lusignan et al (2016)	Doctors, physician associates
	Howie (2015)	Physician associates

> “As health-care professionals have gained more knowledge of the... role, initial hostility has given way to seeing physician associates as valuable members of the team.”

the team (Farmer et al, 2011; White and Round, 2013). Similar experiences were observed when advanced nurse practitioners were first introduced (Jackson et al, 2017).

Health-care professionals can be educated about the physician associate role through presentation and induction (Farmer et al, 2011), working together as part of a multidisciplinary team (White and Round, 2013), and observing physician associates' consultations (Drennan et al, 2011). An interprofessional learning session involving physician associate students and other undergraduate health-care professionals also facilitated better understanding of the physician associate role (Nasir et al, 2017). Furthermore, the Faculty of Physician Associates (2017a) has published a wide range of literature to help employers and other stakeholders understand the physician associate role.

Patients accept physician associates despite incomplete understanding

Patients also showed little understanding of the physician associate role, but appeared willing to consult with physician associates. This was facilitated by trust derived from their GP practices and the wider NHS, prioritizing continuity of care over the type of clinician seen, and recognizing the need to take pressure off doctors (Halter et al, 2017b; Jackson et al, 2017). To maintain trust, patients must be provided with information about the physician associate role by health-care organizations and the physician associates, otherwise they might feel deceived if they subsequently found out that they consulted with a physician associate rather than a doctor. Patients also wished for choice in who to consult, as their willingness to consult physician associates was condition-dependent (Drennan et al, 2014; Halter et al, 2017b).

Table 2. Summary of themes

Anticipated themes	Final themes
Information concerns	Increase understanding of the physician associate role among health-care professionals to overcome initial resistance
Personal concerns	Patients accept physician associates despite incomplete understanding
Management concerns	Lack of statutory regulation as a major barrier
Consequence concerns	Physician associate consultations are safe, but cost effectiveness is unclear
Collaborative concerns	Role of physician associates can evolve to meet demands of employers
Refocusing concerns	Comparing physician associates to other health-care professionals

Lack of statutory regulation as a major barrier

Physician associates currently do not have statutory regulation in the UK, therefore are not able to prescribe drugs or request ionizing radiation. This differs from practitioners in expanded roles who are able (following training) to carry out a range of activities which were previously only the remit of a doctor. This was stated by all stakeholders as a major barrier to effectively integrating physician associates into the workforce (Williams and Ritsema, 2014; Halter et al, 2017a). The impact was felt particularly in providing out-of-hours services (Farmer et al, 2011), in general practice (Halter et al, 2017b) and in home visit settings (Drennan et al, 2011), where there was no immediate access to a prescriber.

The absence of statutory regulation means that doctors perceive a need for additional supervision for physician associates (White and Round, 2013; Jackson et al, 2017). In efforts to overcome this and set professional standards, the Faculty of Physician Associates (2017b) has published a code of conduct and administers the physician associate managed voluntary register. To remain on the physician associate managed voluntary register, physician associates must undertake 50 hours of continued professional development per year and pass a re-certification examination every 6 years (Faculty of Physician Associates, 2017c). The Department of Health and Social Care (2018) has announced plans to introduce legislation for statutory regulation of physician associates. This could be a significant step in the integration of physician associates into the health-care workforce.

Physician associate consultations are safe, but cost effectiveness is unclear

The ability to maintain patient safety during physician associates' consultations was assessed in two comparative studies. Drennan et al (2015) found no difference in re-consultation rate after an index consultation with either GPs or physician associates and when patients re-consulted with the same or a related problem, 82% of the physician associate index consultations (*vs* 51% of the GP index consultations) were found to have been appropriate.

de Lusignan et al (2016) compared video records of physician associate and GP consultations. All physician associate consultations were judged to be safe. In this study, GPs outperformed physician associates in history taking, physical examination, patient management, problem solving, behaviour and relationship with patients, and anticipatory care; however, the GPs in this study were substantially more experienced than the physician associates. Patient satisfaction was similar between GPs and physician associates (Drennan et al, 2015; Halter et al, 2017b). Drennan et al (2015) also investigated the cost effectiveness of physician associates, and demonstrated a

mixed picture. The process of care (e.g. rate of prescribing and referrals) was similar between physician associates and GPs. The average consultation time for physician associates is longer than that for GPs, with GPs seeing three patients for every two seen by physician associates. The cost per consultation is £34.35 for GPs and £28.14 for physician associates, although the costs associated with supervision of physician associates could not be determined.

No comparative study exists between physician associates and other health-care professionals in secondary care. The available literature showed high levels of satisfaction in patients (Farmer et al, 2011), doctors (Williams and Ritsema, 2014), and other health-care professionals (White and Round, 2013). Improving continuity of care and good communication skills were most valued by stakeholders.

Roles of physician associates can evolve to meet demands of employers

Physician associates are dependent practitioners, working in collaborative and supportive relationships with their clinical supervisors (Faculty of Physician Associates, 2017a). The physician associates' scope of practice can expand to meet the needs of the employer, but the lack of clear definition of the physician associate's scope of practice has led to doctors feeling unsure about a physician associate's position within a health-care team (Jackson et al, 2017). The drive to employ physician associates came from access time targets, gaps in medical staffing, the desire to improve continuity of care, and the need to support doctors in specialty training (Drennan et al, 2011; Halter et al, 2017a). In primary care, physician associates often provide same day appointments. Receptionists use practice guidelines to assign patients to physician associates, which have resulted in physician associates' patients being younger, having less complex medical backgrounds and presenting with more minor problems. This then frees up GPs to see the more complex cases (Drennan et al, 2014, 2015).

A key facilitator for integrating physician associates into the workforce is the potential for the physician associate's scope of practice to expand as relationships with clinical supervisors develop (White and Round, 2013; Drennan et al, 2014). Primary care employers describe an incremental induction process where GPs observed physician associates' consultations for minor conditions to ensure safety and competence before allowing them to see more complex cases (Drennan et al, 2011). There is also evidence of evolving scope of practice in secondary care with some physician associates reporting undertaking specialist procedures such as skin surgeries, central line insertion and chest drain insertion (White and Round, 2013; Ritsema, 2017). The supervision arrangements in secondary care appear to be variable in frequency and nature, with some physician associates reporting no ongoing supervision (Wheeler et al, 2017). Further study is required to investigate the effect of supervision on physician associates' development, and the associated impact on the health-care team.

Comparing physician associates to other health-care professionals

In 2017, the median annual pay for full-time physician associates was £37 000 (Ritsema, 2017), which is comparable to that of doctors in training (Review Body on Doctors' and Dentists' Remuneration, 2015) and band 7 nurse practitioners (NHS Employers, 2017). Compared to doctors in training, some doctors felt that physician associates were less able to manage complex presentations, uncertainty and risk (Jackson et al, 2017). Physician associates took longer time to consult (Farmer et al, 2011) and a medical consultant felt that a physician associate was less effective than a doctor (Halter et al, 2017a). Physician associates usually work for a single clinical team (Wheeler et al, 2017), as opposed to doctors in training who rotate through different jobs, so physician associates could provide better continuity of care (Faculty of Physician Associates, 2017a).

There were mixed views regarding the effectiveness of physician associates *vs* senior nurses or nurse practitioners. Some stakeholders felt that physician associates offered no advantage over senior nurses and were more expensive (White and Round, 2013; Halter et al, 2017a), while others found physician associates to be more effective and required less supervision (Drennan et al, 2015). Many stakeholders felt that being trained in the generalist medical model gave physician associates an advantage over nurses, citing physician associates' capacity for differential diagnoses, decision making, willingness to think outside protocol and flexibility to work in different settings (Farmer et al, 2011; Jackson et al, 2017). Employers expressed difficulties in recruiting all types of health-care professionals, but some reported that physician associate recruitment can be facilitated by developing links with university physician associate training programmes (Halter et al, 2017a).

Discussion

Expansion of the health-care workforce is needed to meet current and future demands (NHS England, 2014; Addicott et al, 2015). This literature review shows that physician associates can be an effective part of the workforce solution. However, integrating physician associates and optimizing their effectiveness will be challenging.

Cost effectiveness

This review found that physician associate consultations are safe, but cost effectiveness is unclear (Drennan et al, 2014, 2015). Unsurprisingly, the consultation skills of physician associates appeared inferior to those of experienced GPs (de Lusignan et al, 2016), highlighting that physician associates are not replacements for GPs. To optimize effectiveness, clear guidelines to define the type of cases suitable for physician associates should be developed in collaboration with their clinical supervisors. Further comparative studies in the secondary care setting would be desirable.

Table 3. Recommendations for policy makers	
National policy	Accelerate legislative process for statutory regulation, to enable prescribing drugs and ordering ionizing radiation
Local policy	Develop strategies to inform existing staff of the physician associate role, and how it could complement existing roles
	Identify appropriate supervisors who understand the development trajectory of physician associates before physician associate appointments
	Develop and regularly review policies defining which cases are suitable for physician associates
	Establish relationship between universities and potential employers
	Implement strategy to inform patients of physician associate involvement in their care

Table 4. Questions for further study
What impact does the introduction of physician associates have on the training and employment opportunities of existing health-care professionals?
What impact does the introduction of physician associates into secondary care multidisciplinary teams have on safety, processes of care and patient outcomes?
What is the nature and frequency of supervision required for physician associates in routine clinical practice and in training to expand their scope of practice?

Flexible and adaptable workforce

The uncertainty over future demand and the ambition to implement new care models highlights the need for a flexible and adaptable workforce (Addicott et al, 2015). A key facilitator for physician associate integration is that the roles of physician associates can evolve to meet demands of employers. This is facilitated by their generalist training in the medical model, and supportive relationships with their clinical supervisors. Employers must ensure that suitable supervisors are identified before appointing physician associates. Clinical supervisors should be aware that physician associates' effectiveness may initially be low, but (in line with experiences in other countries) should increase with appropriate support. Early evidence pointed to marked variation in supervision arrangements for physician associates (Wheeler et al, 2017), suggesting that further studies are required to define appropriate supervision for physician associates.

Overcoming resistance

A key challenge is to increase understanding of the physician associate role among health-care professionals to overcome initial resistance. Such initial resistance is not specific to physician associates, as similar resistance has been reported when other professionals have taken on work traditionally expected to be undertaken by doctors (Coombes, 2008). This review shows health-care professionals (especially doctors) have concerns regarding the erosion of their professional identity, job security and training opportunities (Drennan et al, 2011; White and Round, 2013). Employers should use resources, such as those published by the Faculty of Physician Associates, to explain how physician associates can complement existing roles. Studies into the impact of physician associates on training and job opportunities for existing health-care professionals are recommended.

Regulation

The lack of statutory regulation is a major barrier to physician associates' effectiveness. This point was highlighted in the pilot programme more than a decade ago (Farmer et al, 2011). The government's announcement of the introduction of statutory regulation (Department of Health and Social Care, 2018) is a welcome development but legislation must progress at a quicker pace to maximize physician associates' effectiveness.

Patients

Patients accept physician associates despite incomplete understanding of their role, and appear unlikely to become a barrier to physician associate integration if they are provided with information and a choice of clinicians (Halter et al, 2017b).

Comparisons with other health-care professionals

When stakeholders compare physician associates to other health-care professionals, each group has relative strengths and weaknesses. Many professionals have demonstrated capacity for expanding their scope of practice to fulfil local needs (Abraham et al, 2016), but there are staff shortages across all professions (Nuffield Trust, 2017). Therefore, in a general health-care setting, the decision about which mid-level practitioner to employ may be determined by local factors such as availability, familiarity and links to training programmes.

Conclusions

This review has developed understanding of the perceived barriers and facilitators to integrating physician associates into the UK health-care workforce. Undoubtedly, strong and proactive leadership is required at all levels for physician associates to fulfil their potential (https://doi.org/10.12968/hmed.2019.80.1.18) and this review has suggested recommendations (*Table 3*) and further research questions (*Table 4*) which will help physician associates to develop into a vital and valued profession within the NHS. **BJHM**

Conflict of interest: none.

Abraham J, Whiteman B, Coad J, Kneafsey R. Development and implementation of non-medical practitioners in acute care. Br J Nurs. 2016 Nov 10;25(20):1129–1134. https://doi.org/10.12968/bjon.2016.25.20.1129

Addicott R, Maguire D, Honeyman M, Jabbal J. 2015. Workforce planning in the NHS. (accessed 4 June 2018) https://www.kingsfund.org.uk/sites/default/files/field/field_publication_file/Workforce-planning-NHS-Kings-Fund-Apr-15.pdf

Aiello M, Roberts KA. Development of the United Kingdom physician associate profession. JAAPA. 2017 Apr;30(4):1–8. https://doi.org/10.1097/01.JAA.0000513357.68395.12

American Institutes for Research. 2016a. Stages of Concern Concerns-Based Adoption Model. (accessed 7 April 2018) https://www.air.

org/resource/stages-concern-concerns-based-adoption-model
American Institutes for Research. 2016b. Concerns-Based Adoption Model (CBAM). (accessed 7 April 2018) https://www.air.org/resource/concerns-based-adoption-model-cbam
Arbet S, Parle J, Lathrop JL. UK and US physician assistant student performance on an international test of core biomedical science knowledge. Internet J Allied Health Sci Pract. 2012;10(3):5.
Arksey H, O'Malley L. Scoping studies: towards a methodological framework. Int J Soc Res Methodol. 2005 Feb;8(1):19–32. https://doi.org/10.1080/1364557032000119616
Bhardwa S. 2015. Physician associates plough same furrow as advanced nurse practitioners. (accessed 27 November 2018) http://www.independentnurse.co.uk/news/physician-associates-plough-same-furrow-as-advanced-nurse-practitioners/82350/
Coombes R. Dr Nurse will see you now. BMJ. 2008 Sep 09;337 sep09 1:a1522. https://doi.org/10.1136/bmj.a1522
de Lusignan S, McGovern AP, Tahir MA et al. Physician Associate and General Practitioner Consultations: A Comparative Observational Video Study. PLoS One. 2016 Aug 25;11(8):e0160902. https://doi.org/10.1371/journal.pone.0160902
Department of Health. 2012. Competence and curriculum framework for the physician associate. (accessed 1 December 2018) https://www.fparcp.co.uk/download-handler/?mid=58&lid=1
Department of Health and Social Care. 2018. Introduction of statutory regulation for Physician Associates and Physician Assistants in anaesthesia. (accessed 1 Dec 2018) https://dhscworkforce.crowdicity.com/page/view/16651
Drennan V, Levenson R, Halter M, Tye C. Physician assistants in English general practice: A qualitative study of employers' viewpoints. J Health Serv Res Policy. 2011 Apr;16(2):75–80. https://doi.org/10.1258/jhsrp.2010.010061
Drennan VM, Halter M, Brearley S et al. 2014. Investigating the contribution of physician assistants to primary care in England: a mixed-methods study. Health Services and Delivery Research. Southampton: NIHR Journals Library.
Drennan VM, Halter M, Joly L et al. Physician associates and GPs in primary care: a comparison. Br J Gen Pract. 2015 May;65(634):e344–e350. https://doi.org/10.3399/bjgp15X684877
Faculty of Physician Associates. 2017a. Who are physician associates? (accessed 27 May 2018) http://www.fparcp.co.uk/about-fpa/Who-are-physician-associates
Faculty of Physician Associates. 2017b. Code of Conduct for Physician Associates. (accessed 4 June 2018) https://www.fparcp.co.uk/download-handler/?mid=210&lid=1
Faculty of Physician Associates. 2017c. PAMVR. (accessed 28 May 2018) http://www.fparcp.co.uk/employers/pamvr
Farmer J, Currie M, Hyman J, West C, Arnott N. Evaluation of physician assistants in National Health Service Scotland. Scott Med J. 2011 Aug;56(3):130–134. https://doi.org/10.1258/smj.2011.011109
Greenhalgh T, Robert G, MacFarlane F, Bate P, Kyriakidou O. Diffusion of innovations in service organizations: systematic review and recommendations. Milbank Q. 2004 Dec;82(4):581–629. https://doi.org/10.1111/j.0887-378X.2004.00325.x
Halter M, Wheeler C, Drennan VM et al. Physician associates in England's hospitals: a survey of medical directors exploring current usage and factors affecting recruitment. Clin Med (Lond). 2017a Apr;17(2):126–131. https://doi.org/10.7861/clinmedicine.17-2-126
Halter M, Drennan VM, Joly LM, Gabe J, Gage H, de Lusignan S. Patients' experiences of consultations with physician associates in primary care in England: A qualitative study. Health Expect. 2017b Oct;20(5):1011–1019. https://doi.org/10.1111/hex.12542
Hooker RS, Kuilman L. Physician assistant education: five countries. J Physician Assist Educ. 2011;22(1):53–58. https://doi.org/10.1097/01367895-201122010-00010
Howie N. A new kid on the block: the role of physician associates. Clin Med (Lond). 2015 Jun;15(3):309–310. https://doi.org/10.7861/clinmedicine.15-3-309a
Hunt J. 2015. New deal for general practice. (accessed 27 May 2018) https://www.gov.uk/government/speeches/new-deal-for-general-practice
Imison C, Bohmer R. 2013 NHS and social care workforce: meeting our needs now and in the future? (accessed 2 June 2018) https://www.kingsfund.org.uk/sites/default/files/field/field_publication_file/perspectives-nhs-social-care-workforce-jul13.pdf
Jackson B, Marshall M, Schofield S. Barriers and facilitators to integration of physician associates into the general practice workforce: a grounded theory approach. Br J Gen Pract. 2017 Nov;67(664):e785–e791. https://doi.org/10.3399/bjgp17X693113
McCartney M. 2017. Are physician associates just 'doctors on the cheap'? BMJ. 2017 Nov 20;359:j5022. https://doi.org/10.1136/bmj.j5022
Merkle F, Ritsema TS, Bauer S, Kuilman L, Kuilman L. The physician assistant: shifting the Paradigm of European medical practice? HSR Proc Intensive Care Cardiovasc Anesth. 2011;3(4):255–262.
Nasir J, Goldie J, Little A, Banerjee D, Reeves S. Case-based interprofessional learning for undergraduate healthcare professionals in the clinical setting. J Interprof Care. 2017 Jan 02;31(1):125–128. https://doi.org/10.1080/13561820.2016.1233395
NHS Employers. 2017. Agenda for Change pay scales - Annual. (accessed 2 June 2018) http://www.nhsemployers.org/sitecore/content/nhs confederation/home/confed18
NHS England. 2014. NHS Five Year Forward View. (accessed 6 June 2018) https://www.england.nhs.uk/wp-content/uploads/2014/10/5yfv-web.pdf.
NHS England. 2017. Next steps on the NHS Five Year Forward View. (accessed 6 June 2018) https://www.england.nhs.uk/wp-content/uploads/2017/03/NEXT-STEPS-ON-THE-NHS-FIVE-YEAR-FORWARD-VIEW.pdf
Nuffield Trust. 2017. The NHS workforce in numbers. (accessed 3 June 2018) https://www.nuffieldtrust.org.uk/resource/the-nhs-workforce-in-numbers
Pope C, Ziebland S, Mays N. 2006. Analysing qualitative data. In: Pope C, Mays N, eds. Qualitative Research in Health Care. Oxford: Blackwell Publishing: 63–81.
Review Body on Doctors' and Dentists' Remuneration. 2015. Contract reform for consultants and doctors & dentists in training – supporting healthcare services seven days a week. (accessed 2 June 2018) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/445742/50576_DDRB_report_2015_WEB_book.pdf
Ritsema T. 2017. Faculty of Physician Associates Census results 2017. (accessed 6 June 2018) https://www.fparcp.co.uk/download-handler/?mid=173&lid=1
Ritsema TS, Paterson K. Physician assistants in the United Kingdom: an initial profile of the profession. JAAPA. 2011 Oct;24(10):60–60. https://doi.org/10.1097/01720610-201110000-00010
Ritsema TS, Roberts KA. Job satisfaction among British physician associates. Clin Med (Northfield Ill). 2016 Dec 01;16(6):511–513. https://doi.org/10.7861/clinmedicine.16-6-511
Rizzolo D, Leonard DR, Massey SL. Factors that Influence a Physician Assistant/Associate Student Career Choice: An Exploratory Study of Students from the United States and United Kingdom. J Physician Assist Educ. 2017 Sep;28(3):149–152. https://doi.org/10.1097/JPA.0000000000000137
Wheeler C, Halter M, Drennan VM et al. Physician associates working in secondary care teams in England: interprofessional implications from a national survey. J Interprof Care. 2017 Nov 02;31(6):774–776. https://doi.org/10.1080/13561820.2017.1341390
White H, Round JE. Introducing physician assistants into an intensive care unit: process, problems, impact and recommendations. Clin Med (Northfield Ill). 2013 Feb 01;13(1):15–18. https://doi.org/10.7861/clinmedicine.13-1-15
Williams LE, Ritsema TS. Satisfaction of doctors with the role of physician associates. Clin Med (Northfield Ill). 2014 Apr 01;14(2):113–116. https://doi.org/10.7861/clinmedicine.14-2-113

KEY POINTS

- Physician associates have been successfully integrated into the UK healthcare workforce in primary and secondary care settings.
- The barriers to physician associate integration include lack of statutory regulation, poor understanding of the physician associate role and uncertain cost effectiveness.
- Successful integration has been facilitated by the flexibility of the physician associate role and the safety of physician associate consultation.
- Implementation of national and local policies are key for physician associates to realize their potential as an innovative workforce solution.