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The experience of working with Anaesthesia Associates in the United Kingdom and the impact on medical anaesthetic training.

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Abstract

Anaesthesia Associates have been established in the UK for over 10 years, but without statutory regulation. Renewed interest surfaced based on a widening gap between patient need and workforce supply in the UK and established non-doctor roles within healthcare systems elsewhere. However, there are no robust data on their impact on patient or hospital outcomes, or training opportunities for medical anaesthetists, and perceptions of the profession within the anaesthetic community are mixed.

This paper describes the demographics and scope of practice of Anaesthesia Associates in the UK in 2017, and the experience of working together as an anaesthetic team. Through qualitative interviews, we explored the role and relationships, the impact on medical anaesthetic training and ideas about future development.

The overall experience of working with Anaesthesia Associates was positive. Successful integration requires understanding of the educational needs and competencies of all. Future development relies on strong leadership and robust patient outcome and efficiency measures. Interviewees strongly supported statutory regulation, which was successfully approved in 2019. Anaesthesia Associates were seen as a benefit to anaesthetic departments and as such may provide part of the solution to the prevailing workforce issues in UK Anaesthesia, further critically challenged by the SARS-CoV-2 pandemic.

Keywords

Anaesthesia, workforce, training, non-doctor roles, Anaesthesia Associates

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Introduction

Global healthcare systems face serious challenges in meeting rising patient demand and complexity of care in the context of limited resources, particularly shortages of doctors and nurses¹. In many countries this has led to the development of non-doctor roles across primary and secondary care, often drawn from nursing or allied healthcare backgrounds². Within Anaesthesia, non-medical practitioner roles are established in many healthcare systems around the world including the US, Europe and Australasia³, where they have been shown not to be unsafe³, and may alleviate potential staff shortages in this specialty. The skillsets, team models and extent of independent anaesthetic practice for these roles differs between healthcare systems, and this has made comparison of the effectiveness and safety of Anaesthetic care delivered by doctor-led or mixed teams difficult to assess⁴.

In the UK, the 2014 Five-Year Forward View acknowledged serious challenges restricting the NHS' ability to meet rising demand for quality healthcare, including financial constraints and a developing shortage of staff⁵. Within Anaesthesia, the 2015 Centre for Workforce Intelligence (CfWI) Specialty Report concluded that demand for care would increase by 25% within 20 years⁶, and will outstrip supply of Consultants by 2033⁷ (Figure 1). Workforce modelling predicts that 11,800 full time equivalent Anaesthetists and Intensivist CCT holders would be required by 2033 - an increase from current levels of around 6,100 - this is acknowledged to be unachievable within the current training structures of the NHS⁶.

The Anaesthetic Associate (previously Physicians' Assistants in Anaesthesia (PA(A))) role emerged in the UK in the early 2000s as part of the response to these workforce and system pressures. Their introduction intended to increase capacity, facilitate service reorganisation and importantly to enhance clinical teaching for Anaesthetic doctors by freeing trainees from excessive service commitments⁸. Anaesthetic Associates are independent professionals with a Postgraduate Diploma qualification who work within the Anaesthetic team under the supervision of consultant Anaesthetists. Entry is from 2 routes: existing registered healthcare practitioners (nurses, operating department practitioners), or graduates from biomedical sciences with a commitment to a healthcare career⁹. AAs are qualified to work within an agreed scope of practice, jointly produced by the RCoA and the Association of Anaesthetists of Great Britain (AAGBI)¹⁰. Following qualification, AAs may extend their scope of practice for professional development and to meet the needs of their department: training and assessment for extended practice is currently governed locally by a lead Consultant.

In 2017, 123 Anaesthetic Associates appeared on the RCoA voluntary Register, compared to 165 according to the Department of Health¹¹. This lack of assurance over AA numbers, extended practices, training quality

and supervisory arrangements, in addition to the high-risk interventions and clinical autonomy necessary to their role, led to a national consultation on the appropriate level of regulation for Anaesthetic Associates and 3 other Medical Associate Professions¹² (MAPs) (Physician Associates, Surgical Care Practitioners and Advanced Critical Care Practitioners). The Department of Health concluded in 2019 that statutory regulation was proportionate for Anaesthetic Associates¹¹. Through formal registration, quality-assured training and fitness to practice procedures, statutory regulation provides public assurance of safe care and accountability. However, there remains a paucity of robust assessment of the impact of Anaesthetic Associates on care outcomes, theatre efficiency and the impact on the medical anaesthetic team.

In 2008 the Institute of Employment Studies was commissioned to evaluate the impact of the Anaesthetic Associate profession in the UK, but a low response rate made it difficult to draw meaningful conclusions on efficiency, training, quality or productivity¹³. Similarly, a 2014 Cochrane review examining mortality and morbidity for surgical patients treated by physician versus non-physician anaesthetists worldwide¹⁴ was unable to draw any conclusion as to superiority on either measure. No UK studies were included.

The AAGBI surveyed Anaesthetic Associates and conducted interviews at Trusts employing AAs in 2011 to explore the impact on patient outcomes. Where practice was audited there was no evidence of negative effects with AAs in the team, and there were examples of reduced theatre turnaround times¹⁵. No negative impact was found on training for medical anaesthetists overall, and aspects of training were enhanced by freeing consultants, in venous access and regional anaesthesia. The Heart of England Trust demonstrated some improved post-operative symptoms and unplanned admission rates when comparing care by a two-to-one model of AAs and a supervising Consultant to a sole Anaesthetist¹⁶. In contrast, in a 2015 Group of Anaesthetists in Training (GAT) survey¹⁷ 64% of respondents felt the role negatively impacted training, with only 12% reporting enhancement. It was reported that extended practices particularly challenged training and consultant employment prospects, and a majority felt the role should not develop further. This study was limited by a low return rate (1.6% trainees nationally), but indicates that ongoing assessment of the impact on care, efficiency and training opportunities for doctors is desirable.

Since these publications the NHS as well as its patient and workforce dynamics continued to evolve: indeed the 2016 Joint Statement on the scope of practice of AAs represented an updated approach from key stakeholders¹⁰. This paper aimed to investigate the deployment of Anaesthetic Associates in the UK in 2017, to explore the experience of working with AAs as part of the Anaesthetic Team, and to assess their perceived impact on medical Anaesthetic training.

Methods

A qualitative study was undertaken in the interpretivist tradition using semi-structured interviews¹⁸. A purposive sample of College Tutors and Trainee representatives were approached to volunteer in 8 NHS trusts; 4 employing AAs, 2 employing and training AAs, and 2 neither employing nor training AAs (Table 1). These sites were identified from the RCoA's voluntary register to cover a range of anaesthetic departments from rural and urban centres, and with large and small cohorts of AAs, and across all four UK Nations. All interview sites were centres with medical Anaesthetic trainees at ACCS/Core and ST level. Table 2 shows the number of staff interviewed at each site, according to grade.

Qualitative interview guides were designed to address the research questions on working relationships, impact, strengths and weaknesses and future directions (Appendix A), and validated by panel review comprising Consultant Anaesthetists, representatives from the RCoA's Anaesthesia-Related Professionals Committee, Anaesthetic Associate representatives and Trainee Representatives. **Two questions addressed the interviewee's role, staff composition of their department, their interaction with anaesthesia associates and in what clinical capacity AAs practised. Three questions explored the impact of AAs on the clinical team, patients and service delivery. A further three questions sought examples of benefits and limitations of AAs on medical anaesthetic training, and perceptions of the role more broadly. The final questions explored interviewees' opinions on key future priorities and challenges for successful development of the AA role in the UK, before inviting any additional information.** Interviews were undertaken between March and July 2017 by one or more authors. Interviews were voluntary, undertaken in person or by telephone and recorded for the purpose of transcription. Verbal consent for transcription and publication of anonymised findings was confirmed prior to commencing interview, and findings were offered to be sent to participants prior to finalisation to minimise risk of misinterpretation: as such no formal ethical approval was necessary.

Interviews were transcribed and anonymised by the researchers in attendance, and manually coded by a single researcher thematically¹⁹, before panel member checking and triangulation to enhance trustworthiness²⁰.

Findings

Amongst the 8 Trusts who took part, there were 27 qualified AAs in practice, and 4 in training at the time of interview (Table 1). Interviews were undertaken with each site, including a total of 11 College Tutors or Clinical Leads, and 7 Trainee Representatives (Table 2). The findings from all interviews have been organised to address 4 key research areas: roles and relationships, impact, strengths and weaknesses and future directions.

Roles and relationships

In general, the case for introduction of Anaesthetic Associates at all sites was perceived to be to facilitate future planning for consultant shortages, rather than to meet acute rota shortages at trainee level. Overall, their introduction was not for the purpose of expansion of specific services e.g. sedation lists or venous access, though these settings were frequently found to include AAs on the clinical team.

The specific roles and practices undertaken by AAs were varied, and individual to each department. This was felt to be an effective method to match clinical need to local AA training. In the majority of Trusts interviewed, AAs had developed extended roles and more independent practice than detailed in the Scope of Practice guidance¹⁰, managed via local governance structures. Examples of extended practices included indirect supervision for induction and emergence, leadership of regional anaesthesia lists and procedural sedation, as well as neuraxial anaesthesia, under direct or local Consultant supervision.

Anaesthetist (College Tutor) *'The biggest benefit has been the line service... [It's] a shining example'*

At one Trust however, Consultant interviewees described their uncertainty over the level of AAs' clinical competence and accountability resulting in their cohort having a very restricted and directly supervised scope of practice – they perceived this as a failure of the AA programme there. In this case, the College Tutor reported that insufficient education and leadership around the clinical capability of AAs meant that they were not receiving adequate professional development or support to be of value to the anaesthetic team. They described limiting the AA roles locally to venous cannulation, assistance with medical anaesthetists' breaks and recovery, and they were deliberately never scheduled to work alongside junior anaesthetic trainees.

The case mix of patients cared for by AAs was not strictly limited to lower-risk American Society of Anaesthesiology grade 1 – 2²¹ patients as in the Scope of Practice Guidance¹⁰, though this was reported as the mainstay of their patient exposure. There were no reports of AAs working out of hours, though the potential for supporting weekend elective lists was perceived favourably by College Tutors and Trainees.

The experience of professional relationships between AAs and the anaesthetic team was overwhelmingly positive. All sites described a fraction of colleagues from both the Consultant and Trainee body who were sceptical of the role at the time of introduction to their Departments, but all reported that the overwhelming majority of these had changed their opinion based on their experience. Initial reticence was reported as relating to uncertainty over AA clinical capability, when compared with the relatively clear expectations of each grade of trainee.

Factors which were reported as fostering good professional relationships and integration included having more than one AA per department, a designated Consultant Lead, being governed by the Anaesthetic Department rather than nursing or other theatre-based directorates, and inclusion in the anaesthetic department's audit and teaching programmes plus social activities.

Anaesthetist (Trainee representative) 'They're involved in teaching so there's shared learning'

Perceived potential risks of incorporating AAs into the anaesthetic team included one Trainee's concern that they might be rostered into a greater proportion of out-of-hours service work, since daytime workload could be adequately covered by Consultants and AAs. Another concern raised was that the salary of medical trainees on full shift rotas with greater overall responsibility for patient care felt disproportionately low compared to the AA salary. However, both Trainees and College Tutors reported that these concerns were anxieties rather than realities.

Impact on outcomes and efficiency

Small-scale audit at local centres revealed the impact of extended practices performed by AAs on patient outcomes was at least equivalent to those performed by medical anaesthetists including consultants and registrars. At sites where practice was not audited, College Tutors and Trainees described a perception that there was no difference in outcomes between the two staff groups. The training and governance processes which supported extended competencies was managed variably by individual departments. Better standardisation of this was felt to be desirable, but there were no concerns reported by College Tutors, Clinical Leads or Trainees relating to probity or safety incidents concerning AA practice.

Anaesthetist (College Tutor) '*Patient satisfaction surveys have all been really positive*'

It was reported that financial and clinical efficiency were not routinely measured, but the general perception from all staff groups interviewed was that AAs' inclusion resulted in fewer cancelled lists, more flexible rotas and better flow of staggered admissions and emergency lists.

Impact on medical anaesthetic training

The overall experience of both College Tutors and Trainee Representatives in departments with established AA programmes was that there was no detriment to training opportunities, and that there were some examples where AAs enhanced the training experience. AAs were reported to be aware of their role in supporting trainee education, and accommodating in switching lists to protect this. Where specialist areas of extended practice were established, trainees described high quality training by AAs, in particular in central venous access and regional anaesthesia.

One example given where training had been enhanced was the Birmingham Hand Surgery Unit, where trainees received dedicated attachments to the AA-led upper limb block service. This resulted in high case numbers, high trainee satisfaction and had even attracted a senior Trainee from outside the region to undertake part of their Higher Regional Anaesthesia module there. Other reported examples of enhanced training opportunities were where senior trainees acted as supervisors for AAs as part of leadership development, and where AAs provided service capacity for trainees to attend regional and other study days.

An additional benefit consistently reported by trainees was around induction to new departments, where the experience and continuity of AAs was invaluable in familiarising trainees with local equipment and protocols.

There was one example of a negative impact on medical training needs reported, where one AA had been self-allocating lists, and this had encroached upon particular modules for junior medical anaesthetic colleagues. However this was promptly recognised and raised to the College Tutor by trainees, and resolved locally without conflict. Some Trusts described an organisational challenge in ensuring the availability of suitable lists in departments with both student AAs and anaesthetic Trainees, but this was reported to be successfully managed by Lead Consultants and College Tutors, and was not noted as a concern by the Trainees that were interviewed. When qualified AAs worked alongside trainee anaesthetists, there were no reported problems with providing training lists.

In the department where the AA role was reported to be poorly integrated, there was no reported negative impact upon training opportunities because the College Tutor deliberately separated trainees from working directly with AAs.

Future developments

Key priorities for the future of the AA role were identified as securing regulation and the development of extended practices. Regulation was felt to be of central importance for the assurance of competency, supervision and responsibility, as well as in providing clarity of the role for colleagues, managers and patients. In addition, regulation would permit qualified AAs to undertake non-clinical prescribing courses in common with other professional groups such as nurses and physiotherapists, and this was seen to be of major benefit for improved patient flow. Supporting a bid for statutory regulation was felt to be a key priority for the RCoA.

Expansion of the AA profession and particularly the development of extended competencies were felt to be best managed through strong collaboration with the RCoA, and all interviewees felt that stronger representation at College level would be of benefit. This was with the intention of ensuring that any expansion in the workforce was matched to local demand. Further areas suggested for focus were continuing education and professional development for AAs, and extending invitation to RCoA events and conferences to AAs was felt to be desirable.

It was suggested that an Anaesthetic Associate career framework should be developed in collaboration with the RCoA, in order to maintain motivation for this highly skilled workforce. Interviewees were not in favour of an unlimited scope of extended practice, but reported that in some cases the capability of AAs was being underutilised. Despite the absence of patient safety incidents involving AAs described by interviewees, it was felt that a clearer professional identity, including appropriate coding on the Electronic Staff Record, would allow equivalent transparency as for other professional groups.

Discussion

This study offers the most up-to-date experience of the impact of Anaesthesia Associates working within the Anaesthetic team in the UK NHS. In particular, it provides examples of enhancements to medical anaesthetic training, and of factors which improve integration with the medical Anaesthetic team as well as key limitations to further development of the role.

Our evidence reveals that the experience of working with Anaesthetic Associates in 2017 was overwhelmingly positive, as reported by both College Tutors and Trainees. Departments where AAs were not employed did not report significant opposition to the role, and in one department where the AA programme had not been successful, this was felt to be due to insufficient education, support and governance rather than clinical or safety concerns.

The roles and skillsets of AAs were different in each department, and this benefitted local need and service capacity. There was no current evidence reported by Trainee representatives or College Tutors about a negative impact on medical training opportunities; in fact several examples were highlighted of enhanced training, and the anaesthetic service was generally perceived to benefit from this group of professionals. Key reported benefits and limitations are summarised in Table 3.

Integration into the wider anaesthetic team was enhanced by training more than one AA in a department, governance under the anaesthetic department rather than nursing, and inclusion in anaesthetic non-clinical work such as audit, rota planning and morbidity and mortality meetings.

Recommendations for interprofessional working include strong representation of Anaesthesia Associates within the Royal College of Anaesthetists and Lead Consultants at local level, to balance the educational needs of both AAs and medical anaesthetists. A career framework for AAs was proposed to standardise career progression and retain skilled professionals.

The positive experience of integrating AAs into the wider anaesthetic team are in keeping with similar research on the impact of other non-doctor roles in the UK NHS²², and the inclusion of nurse anaesthetist models elsewhere has contributed to better matching of workforces to the population healthcare needs^{23, 24}. Robust quantitative data on patient safety outcomes relating to care delivered by Anaesthetic Associates in the UK NHS are lacking, in part due to the difficulty of understanding the impact of individual factors within complex multi-disciplinary care systems²². However the lack of evidence of superiority of doctor vs non-doctor anaesthesia provider on safety outcomes from the established US model supports the views of our interviewees that AAs are an acceptable and safe member of the team²⁵.

Limitations of this study include a small sample and the single-method qualitative nature. Strengths include the diversity of interview sites in terms of experience with AAs, size, location across all 4 nations, varied geography and demography of hospitals included, and specific focus on the impact of AAs on medical anaesthetic training to address concern within the specialty^{15,17}. Robust quantitative and qualitative data is required to assess the ongoing impact of AA work on team-working and training, efficiency, patient outcomes and safety, and to support further professional development and expansion of the role in light of forthcoming statutory regulation by the General Medical Council.

The intervening SARS-CoV-2 pandemic has devastated healthcare systems globally since this study was undertaken, and indeed delayed the legislative process of regulation for AAs in the UK²⁶. The full impact of the pandemic on UK anaesthesia continues to evolve but is likely to accelerate the need for transformation of anaesthetic care models, and adds urgency to robust evaluations of workforce development in the NHS. In this context this paper, the most current assessment of the impact of AAs in the UK in publication, provides a valuable foundation for comprehensive future work in this area.

Conclusions

This study reports the most up-to date assessment of the impact of Anaesthesia Associates on UK anaesthetic care models. Our findings suggest that Anaesthesia Associates are a benefit to the wider anaesthetic team, and as such may provide part of the solution to the significant long-term workforce shortfall in this specialty. Reflecting the views of the interviewees and in the view of the authors the proceeding legislation to bring AAs under statutory regulation by the General Medical Council represents a major advancement in formalising and safeguarding the Anaesthetic Associate role.

However, it is crucial that the impact of the Anaesthetic Associate role on patient outcomes, efficiency and the wider Anaesthetic team are regularly and robustly assessed, and not more so than in the context of the intervening SARS-CoV-2 pandemic in the UK. This will be essential to ensure that quality training and working models exist to attract and retain highly skilled Anaesthetic professionals of all backgrounds, and to provide optimal care to patients.

Tables

Table 1. Trust sites (anonymised) and number of Anaesthetic Associates (AAs) by stage of training, in 2017

Trust Name	Number of qualified AAs	Number of student AAs
Trust A, England	11	0
Trust B, Wales	5	3
Trust C, England	4	0
Trust D, Scotland	3	0
Trust E, England	1	1
Trust F, Northern Ireland	3	0
Trust G, England	0	0
Trust H, England	0	0

Table 1. Trust sites and number of AAs by stage of training, in 2017

Table 2. Number of Interviewees by site (anonymised), according to grade.

Trust Name	Number of College Tutors and/or Clinical Leads interviewed	Number of Trainee Representatives and/or Trainees interviewed
Trust A, England	3	1
Trust B, Wales	1	1
Trust C, England	2	2
Trust D, Scotland	1	1
Trust E, England	1	1
Trust F, Northern Ireland	1	0
Trust G, England	1	1
Trust H, England	1	0

Table 2. Number of Consultants and Trainees interviewed by site.

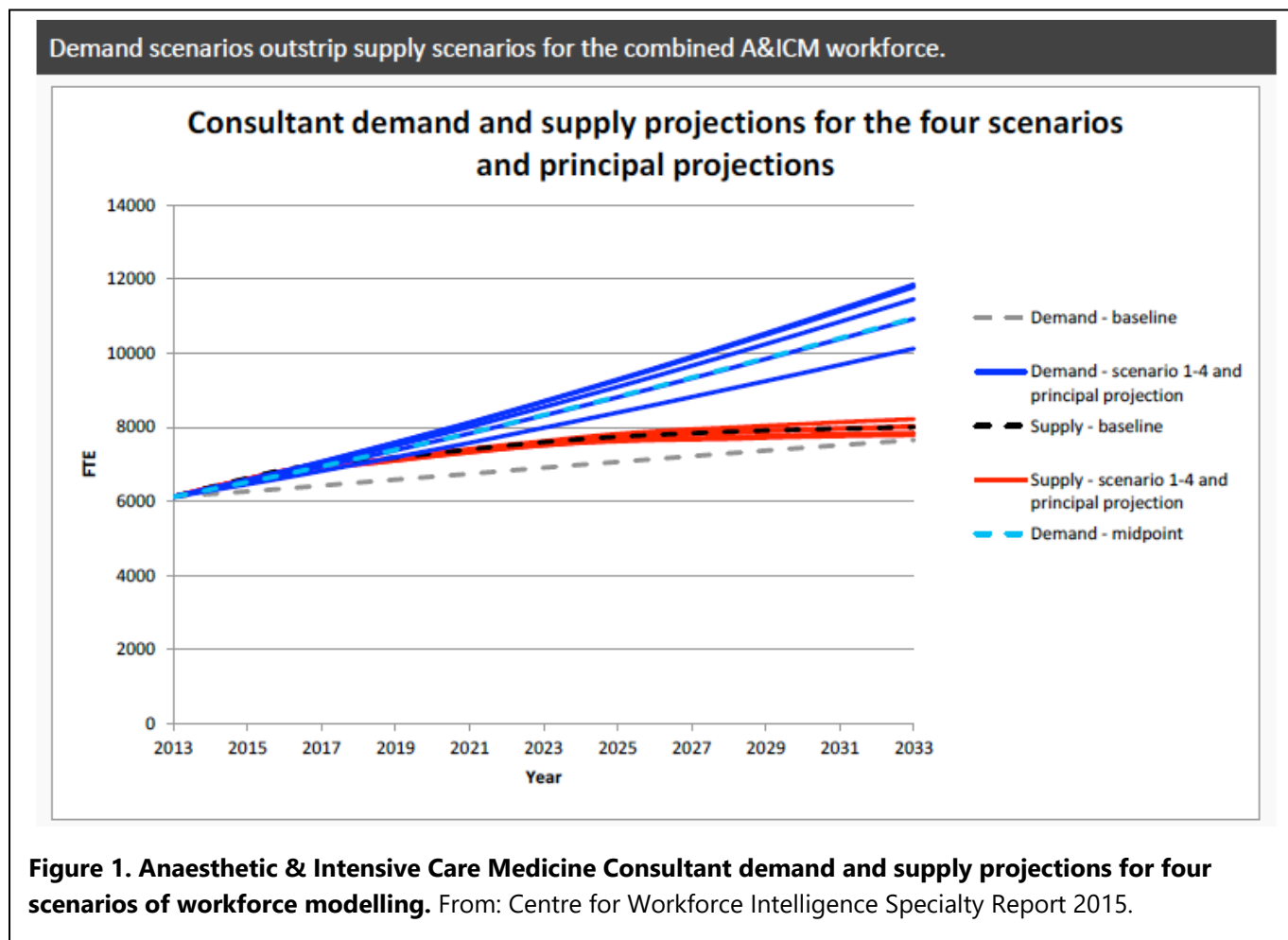
Table 3. Summary of key reported benefits and limitations of working with AAs in 2017

Summary of key reported benefits	Summary of key reported limitations
Capacity for non-theatre services e.g. central venous access, sedation	Lack of statutory regulation is felt to limit AA practice and is a barrier to Consultant's readiness to supervise and hold overall clinical accountability
Developing specialist lists/services e.g. regional anaesthesia in tertiary centres	Appropriate list allocation when both AAs and anaesthetists are in training requires managing by individuals aware of both trainees' requirements, so that neither is disadvantaged. This is suggested to be College Tutors in combination with the Consultant Lead for AAs
Skills training for medical anaesthetists e.g. regional anaesthesia, central venous access	Lack of familiarity with the AA clinical capability and supervision may limit their functionality
Service capacity to allow consultant and trainee 1:1 time, and for trainees to attend regional training days	Poor integration with the Anaesthetic department can result in underutilisation and financial inefficiency
Perceived improvement in patient flow, especially for emergency lists and staggered admissions	
Perceived reduction in theatre 'down-time'	

Table 3. Summary of key reported benefits and limitations of working with AAs in 2017.

Figures

Figure 1



Appendix

Qualitative Structured Interview Guide

1. Introduction

- Thank participant for taking part and introduce self/RCoA
- Explain purpose of interview. To explore perceptions of PA(A)s in the medical anaesthetic workforce and their impact upon training opportunities, experience of working and training together.
- Confidentiality – reassure participant that responses **are anonymous** and that information about individual cases will not be passed on unless they give express permission – we are just here to gather views
- Permission to record – for analysis and transcription
- Interview length – typically 60 minutes

2. Working relationships

Can you describe your role, and how you/your organisation interacts with Physicians' Assistants in Anaesthesia?

- What kind of contact do you mainly have?
- How many PA(A)s do you employ/train?
- How many medical trainee anaesthetists do you train?
- How many medical anaesthetists do you employ in non-training grades?
- Are you aware of your organisation's relationship with PA(A)s or medical anaesthetic trainees changing in the near future? (e.g. training post commissioning/workforce planning/business case for PA(A)s in development)

In what capacity do PA(A)s work in your department?

- E.g. Theatre, non-theatre, pain, obstetrics, radiology, pre-assessment clinics, transfers, out of hours, crash team, training and education, audit/QI and governance, research, administration, supervision

3. Impact of PA(A)s

How do you feel PA(A)s impact upon the anaesthetic team in general?

- Integration with the anaesthetic team (consultants/ODPs/juniors/recovery staff)
- Integration with administrative/managerial team?
- Relationship with patients
- Level of engagement
- Clinical proficiency
- Supervision

How do you feel PA(A)s impact upon training opportunities for medical anaesthetists?

- Any particular groups/fields/times of day more than others?
- How is this measured/monitored?
- Is there shared learning?
- Do PA(A)s actively train medical anaesthetists?

- Examples of particular positive experiences
- Examples of particular negative experiences

How do you feel PA(A)s impact upon service delivery in your department?

- How is this measured/monitored?
- Examples of particular positive experiences
- Examples of particular negative experiences

4. Strengths and weaknesses

What are the major strengths of PA(A)s with regards to medical anaesthetic training?

- PROBE FOR EXAMPLES

What are the major weaknesses of PA(A)s with regards to medical anaesthetic training?

- PROBE FOR EXAMPLES

What is the general perception of PA(A)s within the department? Within the hospital? Within the wider anaesthetic community?

- E.g. clinical, managerial, senior board, academics, patients, RCoA, AAGBI, other groups
- Any particular opinions from particular groups?
- Have any perceptions been changed in the past few years? How/Why?

5. Future directions

How do you think the role of PA(A)s should change in the future?

- External factors or changes that might influence this? (e.g. financial changes, medical anaesthetic workforce, 5 Year Forward View changes, devolution, Brexit etc)

How should PA(A)s be trained and employed in the NHS to best effect?

- Alongside medical anaesthetists
- Alongside other Medical Associate Professional roles (Physician Associates, Advanced Critical Care Practitioners, Surgical Care Practitioners etc)

What do you see as the current major challenges for PA(A)s with regards to their professional role?

- E.g. regulation, supervision, financial impact, prescribing, out of hours
- Relationship with RCoA/HEE/AAGBI

What do you see as the current major priorities for PA(A)s with regards to their professional role?

- E.g. regulation, supervision, financial impact, prescribing, out of hours
- Relationship with RCoA/HEE/AAGBI

Is there any area where you would like to see PA(A)s have a greater impact?

6. Wrap up

In summary, in relation to the impact of PA(A)s on medical anaesthetic training in 2017, what do you see as the most important focus for the RCoA/HEE/Association of PA(A)s over the next year?

Is there anything else you would like to add before we finish?

THANK AND CLOSE

ASK IF THEY WOULD LIKE QUOTES TO BE ATTRIBUTED OR ANONYMOUS

IF ANONYMOUS: Are you happy for your comments to be attributed to you by broad sector/role? e.g. Trust, Clinical Tutor, Consultant, Trainee etc.

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