

REGIONAL ANAESTHESIA – EDUCATION AND ARTIFICIAL INTELLIGENCE

Regional anaesthesia education for consultants and specialists in the UK: a mixed-methods analysis

Xiaoxi Zhang^{1,2,*}, Ross J. Vanstone³, Lloyd Turbitt⁴, Simeon West^{1,†} and Eoin Harty^{2,†}

¹Department of Anaesthesia, University College London Hospitals NHS Foundation Trust, London, UK, ²Department of Anaesthesia, London North West University Healthcare NHS Trust, London, UK, ³Department of Anaesthesia, Derriford Hospital, University Hospitals Plymouth NHS Trust, Plymouth, UK and ⁴Department of Anaesthesia, Belfast Health and Social Care Trust, Belfast, UK

*Corresponding author. E-mail: x.zhang@nhs.net, [X@xiaoxi_6](https://twitter.com/xiaoxi_6)

†Joint last authors.

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Abstract

Background: Regional anaesthesia plays an important role in perioperative care, but gaps in proficiency persist among consultants and specialists. This study aimed to assess confidence levels in performing Plan A blocks among this cohort and to examine the barriers and facilitators influencing regional anaesthesia education.

Methods: Utilising a mixed-methods design, we performed a quantitative survey to gauge self-reported confidence in performing Plan A blocks, coupled with qualitative interviews to explore the complexities of educational barriers and facilitators. UK consultant and specialist anaesthetists were included in the study.

Results: A total of 369 survey responses were analysed. Only 22% of survey respondents expressed confidence in performing all Plan A blocks. Specialists (odds ratio [OR] 0.391, 95% confidence interval [CI] 0.179–0.855, $P=0.016$) and those in their roles for >10 yr (OR 0.551, 95% CI 0.327–0.927, $P=0.024$) reported lower confidence levels. A purposive sample was selected for interviews, and data saturation was reached at 31 interviews. Peer-led learning emerged as the most effective learning modality for consultants and specialists. Barriers to regional anaesthesia education included apprehensions regarding complications, self-perceived incompetence, lack of continuing professional development time, insufficient support from the multidisciplinary team, and a lack of inclusivity within the regional anaesthesia community. Organisational culture had a substantial impact, with the presence of local regional anaesthesia champions emerging as a key facilitator.

Conclusions: This study highlights persistent perceived deficiencies in regional anaesthesia skills among consultants and specialists. We identified multiple barriers and facilitators, providing insights for targeted interventions aimed at improving regional anaesthesia education in this group.

Keywords: continuing professional development; medical education; Plan A blocks; regional anaesthesia; specialists; training

Editor's key points

- Regional anaesthesia has assumed an important role in modern perioperative care, but gaps in proficiency and training exist among consultants and specialist anaesthetists.
- This mixed-methods analysis in the UK surveyed and interviewed consultants and specialists for their confidence levels in performing and teaching Plan A blocks.
- Only 22% of respondents expressed confidence in performing all Plan A blocks, and confidence was lower in those in with >10 yr of experience.
- Multiple barriers and facilitators for providing and teaching regional anaesthesia were identified, which provide opportunities for improving regional anaesthesia education in this group.

Regional anaesthesia (RA) plays a vital role in perioperative care, offering superior analgesia, reduced recovery time, and earlier hospital discharge.^{1,2} RA education is now crucial for anaesthetists, with recent initiatives aimed at improving the delivery of RA teaching. There has been an international drive to promote widespread core competence in a small number of high-value 'Plan A' blocks which cover the vast majority of surgical procedures.³ In the UK, an updated training curriculum gives increased prominence to RA.⁴ Consultant and specialist anaesthetists are actively encouraged to maintain proficiency in Plan A blocks and are expected to provide instruction to trainees.^{3,5} However, it is unclear how many senior anaesthetists are confident in performing and teaching Plan A blocks as research in RA education predominantly focuses on trainee anaesthetists.⁶ No studies have addressed the specific learning needs of consultant and specialist anaesthetists.

Identifying efficacious methods for consultants to learn nerve blocks has been recognised as a research priority in RA education.⁷ Consultants and specialists, being experienced learners, might adopt learning approaches different to novices.⁸ Furthermore, understanding the interplay between cognitive, affective, social, and environmental factors is essential for enhancing learning.⁸ We aimed to assess the confidence of consultant and specialist anaesthetists in Plan A blocks, and to explore barriers and facilitators affecting their learning. The findings from this research are intended to inform strategies to drive broader competence and improve the learning experience.

Methods

This study was granted UK Health Research Authority approval on February 24, 2023 (project ID 325127), and informed consent was obtained from all participants.

This was a mixed-methods study comprising an anonymous survey, followed by semi-structured interviews. UK anaesthetic consultants and specialists (including specialists, associate specialists, and senior specialty doctors with experience comparable with consultants)⁹ were eligible to participate. The survey was conducted via Qualtrics (Provo, UT, USA) and developed iteratively by XZ, EH, RV, and SW. We piloted the survey locally to refine the questions. The survey was

disseminated using three approaches: (1) e-mail to lead consultants and college tutors; (2) the study investigators' Twitter accounts; and (3) via consultant and specialist social media groups. The survey ([Appendix 1](#)) was open for 3 weeks in March 2023, and consisted of 10 multiple choice questions primarily focused on gauging confidence in performing and teaching Plan A blocks. In addition, the survey examined the availability of, and potential barriers to, RA education, thereby informing the topic guide for subsequent interviews. Duplicates and bots were deleted. Results were analysed using SPSS (Version 29.0; IBM, Armonk, NY, USA). Respondents were given the option to enter their e-mail addresses and further demographic information via a separate link if they consented to additional contact for interviews.

The interviews constituted the primary data source, providing an in-depth exploration of factors influencing barriers and facilitators in RA education. Our qualitative methodology was grounded in the constructivist perspective, which asserts that individuals shape their understanding and knowledge from their experiences.¹⁰ Purposive sampling was used to ensure representation of a diverse range of participant characteristics.¹¹ A topic guide ([Appendix 2](#)) was developed by XZ, EH, SW, and RV using an iterative process that involved reviewing literature, brainstorming, question selection, piloting the topic guide, and question refinement. Three pilot interviews informed the topic guide but were not included in analysis. Video interviews were conducted between April and June 2023 on Microsoft Teams by XZ, but not recorded to ensure candid discussions. Interview transcriptions generated by the Teams utility were checked for accuracy and anonymised.

Iterative analysis and data collection occurred concurrently to allow emerging findings to inform subsequent interviews and to ascertain the point of data saturation, where no additional themes were emerging.¹⁰ After reaching this point, participant recruitment ceased.

Thematic analysis was used to analyse the qualitative data using NVivo (Version 1.0; QSR International, Burlington, MA, USA) with an inductive approach.^{12,13} Analysis was primarily performed by XZ, who has experience in qualitative research. This involved familiarisation with the data by repeatedly examining the transcripts and noting preliminary ideas. Initial codes were systematically produced from key features of the data and subsequently grouped into overarching themes. To ensure intercoder reliability, codes and themes were checked independently by EH, SW, and RV. The research team met regularly to deliberate any differences in code application until a consensus was reached. We critically evaluated the thematic map to refine the meaning and definitions of the themes. Careful consideration was given to the prevalence and strength of expression for each theme relating to our research questions within and across transcripts. Data from the quantitative survey were triangulated with findings from the semi-structured interviews. The entire process was also reviewed externally by a highly experienced qualitative researcher.

Results

A total of 369 completed surveys were received and included in the analysis, representing ~3.7% of the consultant and specialist anaesthetic workforce in the UK.¹⁴ Characteristics of survey participants are summarised in [Table 1](#). Of the respondents, 298 (80.8%) were consultants and 71 (19.2%) were specialists, which reflects the recent anaesthetic workforce report.¹⁴ All UK deaneries were represented.

Table 1 Summary of survey participant characteristics. Data are presented as n (%).

Characteristics	N=369
Region	
North East	23 (6.2)
North West	16 (4.3)
Yorkshire and the Humber	22 (6.0)
East Midlands	9 (2.4)
West Midlands	23 (6.2)
East of England	26 (7.0)
London	104 (28.2)
Kent, Surrey, and Sussex	30 (8.1)
South West: Peninsula region	36 (9.8)
South West: Severn region	15 (4.1)
Thames Valley	7 (1.9)
Wessex	27 (7.3)
Scotland	6 (1.6)
Northern Ireland	15 (4.1)
Wales	10 (2.7)
Current role	
Consultant	298 (80.8)
Specialists, associate specialists, and senior specialty doctor with experience comparable with a consultant	71 (19.2)
Number of years in current role	
<10 yr	210 (56.9)
10–20 yr	104 (28.2)
>20 yr	55 (14.9)

Respondents reported confidence in performing an average of 4.5 (SD 2.1) out of the seven Plan A blocks, and in teaching an average of 4.2 (2.2) blocks. A total of 81 (22.0%) respondents expressed confidence in performing all Plan A blocks, whereas 72 (19.5%) felt confident in teaching all of them. In contrast, 24 (6.5%) respondents reported lack of confidence in performing any of the Plan A blocks, and 34 (9.2%) did not feel confident in teaching any of them. Most respondents felt confident performing (86.4%) and teaching (82.7%) the femoral nerve block, whereas the erector spinae plane block had the lowest confidence for performing (36.9%) and teaching (33.1%) (Fig. 1).

Compared with consultants, specialists were less likely to report confidence in performing all Plan A blocks (odds ratio [OR] 0.391, 95% confidence interval [CI] 0.179–0.855, $P=0.016$, χ^2). Respondents with >10 yr in their current roles were less likely to express confidence in performing all Plan A blocks than their more recently appointed counterparts (OR 0.551, 95% CI 0.327–0.927, $P=0.024$, χ^2 ; Table 2). Although the same trends were observed concerning confidence in teaching all Plan A blocks, these did not reach statistical significance (Table 3).

Of the survey respondents, 88 (23.8%) consented to further contact for interviews. We interviewed 31 participants, ensuring representation across the spectrum of participant characteristics. Interviews lasted an average of 42 min. Characteristics of the interview participants are summarised in Table 4. Major themes focused on availability and efficacy of teaching, barriers and facilitators to RA education, and proposed improvements for RA training aimed at consultants and specialists.

Availability and efficacy of RA education delivery for consultants and specialists

Participants reported a spectrum of available RA teaching modalities. The most common methods included peer-led

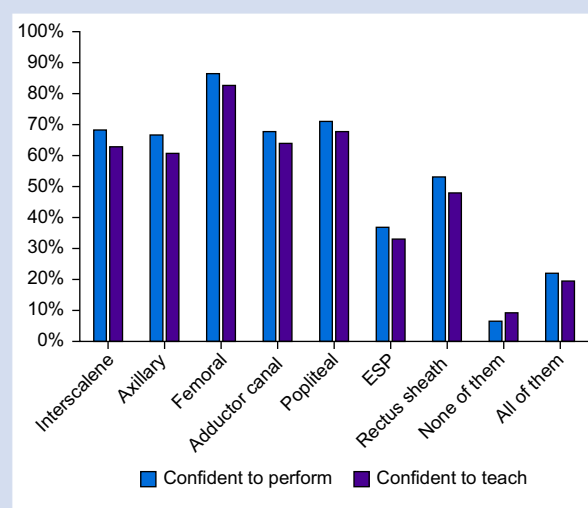


Fig 1. Proportions of consultants and specialists confident in performing (blue bars) and teaching (purple bars) each of the seven Plan A blocks. ESP, erector spinae plane.

learning, human scanning workshops, *ad hoc* 'tea trolley' sessions, and phantom model training. Only two participants mentioned the availability of cadaver workshops. Almost universally, participants identified peer-led learning, such as joining an expert's list, as the most effective learning method. This preference was attributed to the targeted, relevant instruction and immediate feedback provided, and the trust and understanding established with a known peer.

'The most effective way to learn is from my colleagues. Because it's someone you trust, someone who knows you, understands you and your learning requirements.'

All participants emphasised the importance of self-directed learning, utilising resources such as online videos, social media, RA society websites, and smart phone applications. Many indicated that deliberate practice was instrumental in acquiring and sustaining proficiency. Those experienced in RA valued learning through teaching others, attending expert-run workshops for gaining advanced insights, and exploring new techniques.

Barriers to RA education for consultants and specialists

Participants who infrequently perform blocks highlighted lack of confidence, stemming from insufficient training and limited practice, as a key barrier to learning and performing blocks. This fostered fear of complications and block failure, anxiety associated with perceived vulnerability, feelings of incompetence, and a tendency towards avoidance behaviour.

'It's a vicious circle, unless you do blocks, you're not going to get confident... You're not going near a patient with a needle if you think you might do them harm which makes your lack of confidence even worse... I just thought, for patient safety and my stress levels, it's not worth it. So I don't do blocks.'

Table 2 Consultant and specialist anaesthetists' reported confidence in performing all Plan A blocks. Values are number (proportion) of respondents reporting feeling confident in performing all Plan A blocks, odds ratio (OR), 95% confidence interval (CI).

	n (%)	OR	95% CI	P-value
Current role				
Consultant (reference group)	73 (24.5)	1		
Specialists	8 (11.3)	0.391	0.179–0.855	0.016
Number of years in current role				
<10 yr (reference group)	55 (26.2)	1		
≥10 yr	26 (16.4)	0.551	0.327–0.927	0.024
Overall	81 (22)			

Participants reported various disincentives to learning RA. Some mentioned irrelevance of RA to their job plans, whereas others did not believe that RA conferred sufficient benefits to patients to justify the risks and the time pressure it imposed on list turnover. Several participants felt ageing diminished the incentive to invest time and effort in acquiring new skills.

Acknowledging the updated UK curriculum's focus on RA for trainees, some participants found it awkward to vie for the same learning opportunities, thereby limiting their own development. The obligation to teach and the associated vulnerability further impeded learning.

'There's an expectation when you're a consultant you should be able to do these things. I don't feel competent to even do blocks, let alone teaching them.'

Most participants pinpointed organisational culture as a significant influence on their RA practice and learning. Those who occasionally performed blocks cited systemic deficiencies, such as a lack of standardised RA care pathways and insufficient multidisciplinary team training, as barriers. Some expressed frustration over resistance to the adoption of regional techniques, often driven by concerns about efficiency and perception that RA offered limited benefit.

'You need the whole system to support you... The nurses in recovery and on the wards, the physios, the surgeons ... Unless you have wider support of the whole system, it's quite risky changing things. The underpinning culture has a huge influence.'

Time constraints were a widespread barrier to RA learning, driven by rota inflexibility, staffing shortages, and the prioritisation of service over education. This was particularly felt by specialist anaesthetists and infrequent block performers, who

cited a lack of protected continuing professional development (CPD) time. Other commitments, such as mandatory training, often superseded RA learning.

'We get put into our silos and when we suddenly get exposed to blocks when we're on-call, we're more likely to say, well, just set up the PCA, because on-call is not the time to learn... What we need is a degree of redundancy to allow the consultant body to double up and train.'

Some participants, particularly paediatric anaesthetists, reported a scarcity of local RA courses. Limited access to equipment, such as ultrasound machines and phantoms, was cited by a minority as a learning barrier. Moreover, several older participants expressed a preference for consultant and specialist-only teaching sessions, suggesting this would foster a more relaxed and supportive learning environment without feeling intimidated.

Many of the participants noted a lack of support from the multidisciplinary team, particularly from surgical colleagues. This resistance often stems from the perception of RA as a time-consuming 'inconvenience' that hampers efficiency, a view intensified by the pandemic elective backlog. Some participants recounted instances where surgeons rejected regional techniques, fearing complications such as compartment syndrome, nerve damage, and hindrance to mobilisation. Others attributed resistance to surgeons' failure to recognise the benefits of RA to patients, or a preference for local infiltration techniques over RA.

'Surgeons think doing blocks is just 'faffing around'. If you mention doing a block at the team brief, they'd say, do you really need to do it? No, I'll just infiltrate at the end.'

Another identified barrier was the lack of inclusivity in RA, manifesting in four distinct ways. Firstly, nearly all specialist anaesthetists felt their role was primarily service provision, with

Table 3 Consultant and specialist anaesthetists' reported confidence in teaching all Plan A blocks. Values are number (proportion) of respondents reporting feeling confident in teaching all Plan A blocks, odds ratio (OR), 95% confidence interval (CI).

	n (%)	OR	95% CI	P-value
Current role				
Consultant (reference group)	64 (21.5)	1		
Specialists	8 (11.3)	0.464	0.212–1.019	0.051
Number of years in current role				
<10 yr (reference group)	48 (22.9)	1		
≥10 yr	24 (15.1)	0.600	0.349–1.030	0.062
Overall	72 (19.5)			

Table 4 Summary of interview participant characteristics. Data are presented as n (%).

Characteristics	N=31
Sex	
Female	15 (48.4)
Male	16 (51.6)
Region	
North West	1 (3.2)
Yorkshire and the Humber	2 (6.5)
East Midlands	2 (6.5)
West Midlands	3 (9.7)
East of England	3 (9.7)
London	8 (25.8)
Kent, Surrey, and Sussex	2 (6.5)
South West: Peninsula region	1 (3.2)
South West: Severn region	4 (12.9)
Wessex	2 (6.5)
Scotland	1 (3.2)
Northern Ireland	1 (3.2)
Wales	1 (3.2)
Age (yr)	
30–39	5 (16.1)
40–49	13 (41.9)
50–59	7 (22.6)
60–69	5 (16.1)
≥70	1 (3.2)
Current role	
Consultant	26 (83.9)
Specialists, associate specialists, and senior specialty doctor with experience comparable with a consultant	5 (16.1)
Self-reported frequency of block performance using ultrasound	
Frequently	7 (22.6)
Regularly	8 (25.8)
Occasionally	9 (29.0)
Rarely or never	7 (22.6)
Less than full time	
Yes	7 (22.6)
No	24 (77.4)

insufficient focus on their RA learning needs. Secondly, some older participants expressed a lack of empathy from younger colleagues regarding unfamiliar ultrasound technique. Thirdly, a minority of female participants perceived gender as an obstacle to learning, attributing it to women's tendency towards risk aversion, lack of confidence, and a need for additional support to bridge the gender gap. Three participants characterised RA as a male-dominated 'boys' club'. Fourthly, some of those who occasionally performed RA expressed the perception that RA is often viewed as an exclusive subspecialty, too advanced and complicated for generalists to engage with.

'The lack of confidence and self-doubt in females is terrible because it hinders your learning opportunities. You feel you need to be perfect before you try anything and then you never get to do it to become good at it. It's a vicious cycle.'

Facilitators in regional anaesthesia education for consultants and specialists

Witnessing and recognising the benefits of RA for patients emerged as a significant facilitator of learning. This understanding inspired several participants to actively seek out

opportunities to hone and sustain their proficiency in RA. Personal interest in procedural skill acquisition, enjoyment in teaching, acknowledgement of personal limitations, recognition of individual learning needs, and taking ownership of personal learning progress were also identified as facilitators. Regular RA practitioners recognised an organisational culture that normalises RA as facilitating in their practice and learning.

'It's not just about doing the block, it's the support you have... The ODP (operating department practitioner) gets the ultrasound without me asking... The culture here is that everybody does blocks. If patients wake up in pain in recovery, it's taken very seriously.'

Almost all participants felt that the presence of enthusiastic local RA trainers, who organise workshops, draft RA protocols, design and share educational materials, fostered learning. Participants particularly appreciated the role of a dedicated 'block anaesthetist' on the rota, whose expertise and availability for assistance, supervision, and tailored hands-on instruction was deemed invaluable.

'The culture has changed. It used to be everyone on their own... Having the block anaesthetist means I can just ask them to watch me do a block... If we had that ten years ago, the learning curve would have been very different.'

Some participants noted that surgical colleagues can actively contribute to RA education and practice. Examples include collaborating on projects, engaging in open discussion about analgesia plans, participating in collective decision-making, and recognising the benefits of RA to patients.

Participants acknowledged that Plan A blocks, which streamline core requirements for generalists, improve RA inclusivity. However, they cautioned that universal proficiency in Plan A blocks might be impractical, and anaesthetists should align skillset to their specific job plans.

Improvement suggestions for regional anaesthesia education for consultants and specialists

Participants proposed multi-level recommendations to enhance RA education for consultants and specialists. These are categorised into individual, organisational, and systemic dimensions (Table 5).

Discussion

To our knowledge, this study is the first to focus specifically on RA education for consultants and specialists, addressing a gap in current literature. We found that only 22% are confident in performing all Plan A blocks, and 19.5% teaching them. These figures, albeit showing moderate improvement compared with a prior London-based survey,¹⁵ highlight persistent deficiencies in RA skills among consultants and specialists with potential implications for patient care. Additionally, fulfilling the UK's revised curriculum could prove challenging without widespread confidence within the training body, but this new requirement would raise standards and spur professional adaptation.

Peer-led learning was widely preferred, facilitating deliberate practice through targeted, expert instruction and feedback.¹⁶ The benefits of peer-led teaching are well recognised

Table 5 Proposed strategies for improving regional anaesthesia education.

Level	Recommendations
Individual	Utilise appraisal processes for goal setting Recognise own learning needs Take responsibility for personal development
Organisational	Gain support from leadership for value of regional anaesthesia in patient care Champion local regional anaesthesia experts Normalising regional anaesthesia through implementing standardised protocols Improve regional anaesthesia training for multidisciplinary teams and foster collaboration opportunities Offer rota flexibility for tailored peer learning Align regional anaesthesia education with job roles and expertise
Systemic	Advocate high-quality research to validate impact of regional anaesthesia on patient outcomes National organisations to improve resource compilation, issue formal regional anaesthesia competence guidance for consultants and specialists, create adaptable protocols, set safety standards for practice and disseminating examples of good practice Recognition of learning requirements of specialists More support to meet the education demands of older anaesthetists who lack ultrasound training Increase awareness of gender disparities and encourage female leadership in regional anaesthesia

and incorporated in formal guidance on CPD.¹⁷ Self-directed learning using digital resources was also highlighted as a valuable learning modality. Both approaches align with adult learning theories that endorse learner autonomy, providing important implications for future educational resource development.^{16,18–21}

Infrequent practitioners often avoid RA because of apprehensions about complications, self-perceived incompetence, insufficient CPD time, limited evidence favouring RA over alternative techniques, and a lack of support from surgeons and the multidisciplinary team. These barriers align with previous studies, underscoring their significance in impeding RA learning.^{22–24}

Organisational culture is pivotal in shaping RA practice and educational uptake. Infrequent practitioners reported organisational prioritisation of service provision over workforce skill development, and limited multidisciplinary team buy-in. These findings are consistent with existing literature.²⁴ Effecting cultural shift requires multifaceted strategies,^{25–27} including leadership engagement, having local RA champions,²² protocol development, and multidisciplinary team collaboration to normalise RA in perioperative care.

Beyond organisational measures, participants advocated for more RA research to validate its positive impact on patient outcome. Initiatives such as the research priority-setting project by Regional Anaesthesia UK (RA-UK) aim to identify key research questions in RA.²⁸ In addition, participants recommended that national organisations develop a compendium of educational resources, consider incorporating RA into accreditation and appraisal procedures, offer guidelines on RA education and competence for consultants and specialists, establish adaptable protocols and safety standards for RA, and disseminate examples of good practice. Notably, RA-UK has developed a range of educational content, especially on Plan A blocks.²⁹ Nevertheless, the limited awareness of these resources among our study participants suggests a need for improved dissemination and signposting within the professional community.

Our study suggested lack of inclusivity as a barrier to RA education. Specialist anaesthetists reported limited training

access, consistent with published literature.³⁰ This also aligns with our survey, indicating specialists' lower confidence in performing Plan A blocks. The rapid increase of specialist doctors highlighted by a recent workforce report emphasises the importance of supporting their professional development.³¹

Additionally, older participants cited challenges in ultrasonography skill acquisition, attributing this to both a generational gap in training and age-related hesitancy towards skill acquisition, in line with earlier research.³² This reluctance, in some cases, was compounded by a lack of empathy from younger colleagues. These factors may explain the observation that those with over a decade in their roles are less likely to feel confident in performing Plan A blocks. Thus, targeted educational intervention for older anaesthetists might be warranted.

Furthermore, three female participants perceived gender as an obstacle to RA education, echoing the well-documented gender disparities in medical training, particularly in procedural skills.^{33,34} Male overconfidence and female underrepresentation in leadership roles could be contributing factors.^{33,34} However, the small sample size reporting this issue, combined with the absence of gender data in our survey, constrains the conclusiveness of these findings, warranting further research.

Some participants perceived RA as an exclusive domain, suggesting a barrier to broader engagement. Plan A blocks were conceived to mitigate this exclusivity.³ The Plan A concept, although generally well-received, necessitates ongoing re-evaluation and implementation through supportive frameworks and resources.

Our study has several limitations. Firstly, the survey for evaluating confidence in performing Plan A blocks was susceptible to self-reporting and selection bias. Secondly, as our target respondents could not be identified through a publicly available database, we adopted an open dissemination strategy to increase survey participation, which precluded reporting of a response rate. Thirdly, the sample size constrains the wide applicability of our findings, although existing workforce data suggest the sample is broadly representative of the

population studied.¹⁴ The rich qualitative interview data and achievement of data saturation offsets these limitations.¹¹ Fourthly, as a UK-based study, the international generalisability of the findings is limited warranting further research with a global cohort.

In conclusion, this study underscores persistent gaps in RA proficiency among consultants and specialists while elucidating barriers and facilitators in RA education, thereby informing strategies for improved training in this cohort.

Authors' contributions

Study design: all authors

Data acquisition: XZ

Data analysis and interpretation: XZ, EH, RV, SW

Drafting of manuscript: XZ

Revision of manuscript: all authors

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Declaration of interest

SW and LT are RA-UK board members.

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Appendix 1. Survey questions

Q1. Region.

North East
North West
Yorkshire and the Humber
East Midlands
West Midlands
East of England
London
Kent, Surrey, and Sussex
South West: Peninsula region
South West: Severn region
Thames Valley
Wessex
Scotland
Northern Ireland Wales Deanery

Q2. Please select your current role.

Consultant
Specialist doctor.
Associate specialist.
Senior specialty doctor with experience comparable with a consultant.

Q3. How long have you been working in this capacity?

<10 yr
10–20 yr
>20 yr

Q4. What teaching in regional anaesthesia is available to you in your hospital/deanery (select all that apply)?

Cadaver courses
Simulation.
Scanning course with human models
Tea trolley teaching.
Out of hours teaching (e.g. after work workshops)
Online masterclass.
Other (please give details)

Q5. What are the most effective ways for you to learn blocks?

Cadaver courses
Simulation.
Scanning course with models.
Tea trolley teaching.
Out of hours teaching (e.g. after work workshops)
Online masterclass.
Self-directed learning (e.g. reading books, watching YouTube videos, social media)
Other (please give details)

Q6. Which of the following factors represent a barrier for you to learn blocks?

I do not have enough time to learn blocks.
The cost of courses is too high.
Blocks are not relevant to my job plan.
There is no incentive to learn because blocks slow down list turnover.
Lack of practice to maintain proficiency.
Lack of local regional anaesthesia teaching and learning resources.
Lack of departmental support.
Lack of national regional anaesthesia teaching and learning resources.
I am not motivated to learn because there is no evidence that regional anaesthesia techniques are superior.
Lack of support from surgical colleagues.
Lack of equipment locally (e.g. simulation tools)
Other (please specify)

Q7. Which of the following blocks can you confidently perform under ultrasound guidance (please select all that apply)?

Interscalene brachial plexus block.
Axillary brachial plexus block.
Femoral nerve block.
Adductor canal block.
Popliteal sciatic block.
Erector spinae plane block.
Rectus sheath block.

Q8. Which of the following blocks do you feel confident in teaching and supervising a trainee/junior SAS doctor to perform under ultrasound guidance (please select all that apply)?

Interscalene brachial plexus block.
Axillary brachial plexus block.
Femoral nerve block.
Adductor canal block.
Popliteal sciatic block.
Erector spinae plane block.
Rectus sheath block.

Q9. Is regional anaesthesia relevant to your job plan?

Yes.
No (I am not expected to teach nerve blocks and I do not have regular orthopaedic, trauma, CEPOD, obstetric, or other lists where regional anaesthesia may improve peri-operative care.)

Q10. In the past 3 months, roughly how many of the following Plan A blocks have you performed?

- Interscalene brachial plexus block.
- Axillary brachial plexus block.
- Femoral nerve block.
- Adductor canal block.
- Popliteal sciatic block.
- Erector spinae plane block.
- Rectus sheath block.

Appendix 2. Semi-structured interview topic guide

What teaching in regional anaesthesia is available to you in your hospital or deanery?

What have you found to be the most effective way to learn blocks and why? How does ... (teaching modality) help you learn?

How do you retain proficiency of knowledge and skills learnt after attending training?

What are the barriers to regional anaesthesia education for consultants and specialists? How does ... affect your learning?

What are the facilitators/what helps you learn? How does ... help you learn?

How should regional anaesthesia education be improved for consultant and specialist anaesthetists?

What do you think impacts consultants' and specialists' confidence in performing and teaching Plan A blocks?

Do you have any other comments?

We used the following probes when appropriate during semi-structure interviews to allow the participants to explain, compare, and reflect:

Can you expand on that?

Why do you think ...?

Could you give me an example?

How is ... different compared with ...?

When ... happened, how did that impact your learning?

Could I clarify what you said earlier about?

How do you mean when you said ... ?

You mentioned... can you explain a little more?

How do you think ... impacted your view/practice?

In an ideal world, how do you think ... should be?