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Research Article

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Implementing a Perioperative Ultrasound Guided Regional Anaesthesia Block Service in a District General Hospital

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Abstract

Background: Regional anaesthesia techniques, both as a primary anaesthetic or as an adjunct to general anaesthesia offer potential significant benefits in perioperative care: improved wound healing and localised blood flow, decreased stress response, improved patient outcomes, reduced hospital length of stay and reduced opioid use. This study evaluated the feasibility of implementing an ultrasound-guided regional anaesthesia (USGRA) service in a district general hospital without a dedicated block room.

Methods: A dedicated team of anaesthetists performed ultrasound-guided nerve blocks over a 70-day period across multiple specialties. We tracked block types, intraoperative anaesthesia requirements, complications, and patient satisfaction scores.

Results: 47 nerve blocks were performed (Orthopaedics: 22, Plastics: 6, General Surgery: 1, Pain Management: 18). 14/19 patients received target-controlled infusion sedation or remained awake. No intraoperative complications, pain, or strong opioid use were observed. 100% of follow-up patients (11/11) reported maximum satisfaction.

Conclusions: Regional anaesthesia when implemented as part of a 'Block Service' improves patient outcomes and satisfaction. This study also showed that an USGRA service can be safely implemented without a dedicated block room, with potential for improving surgical workflow and patient experience.

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Introduction

Regional anaesthesia techniques have emerged as a transformative approach in perioperative medicine, demonstrating substantial potential to improve patient outcomes and healthcare economics, making it increasingly attractive for clinical implementation.

Large retrospective studies have illustrated significant clinical benefits, including reduced perioperative mortality and morbidity. The clinical advantages derive from comprehensive multimodal anaesthetic strategies, which is gaining increasing importance in contemporary healthcare, where there is a need to minimise postoperative pain and provide strong opioid-sparing analgesic interventions [1,2].

The economic implications of regional anaesthesia are equally compelling. By facilitating enhanced recovery pathways, these techniques enable expedited patient rehabilitation and shortened hospital stays. For instance, USGRA for hip arthroplasty allows for safe, targeted analgesia that promotes early mobilisation, accelerates discharge and therefore reduces complication rates. USGRA alone has enhanced safety and accessibility, which allow for precise interventions with low complication rates.

Historically, implementing dedicated regional anaesthesia services has been challenging, primarily due to infrastructure and resource constraints. Traditional 'block room' models [3], while offering significant educational opportunities in addition to improved operational efficiency, have been limited by the requirement for specialised facilities and dedicated infrastructure. Consequently, in a healthcare setting with constraints we have sought innovative approaches to integrate these techniques.

Our service development project aims to address these challenges by evaluating the feasibility of implementing a comprehensive ultrasound-guided regional anaesthesia service using existing hospital resources. We hypothesise that a dedicated multidisciplinary team can safely perform nerve blocks across surgical specialties, enhance patient satisfaction, and strategically reduce reliance on general anaesthesia and systemic opioid medications.

By bridging USGRA with patient-centred care, regional anaesthesia represents an important area of perioperative medicine demonstrating improved clinical outcomes and holistic pain management strategies.

Methods

Study Design and Ethical Considerations

This service development project was conducted at Buckinghamshire Healthcare NHS Trust, with approval from our organisational board. Patient consent was obtained for individual procedures.

Service Implementation

A dedicated regional anaesthesia service was structured around a core clinical team comprising a Consultant anaesthetist and a specialist registrar. The implementation model incorporated a

multidisciplinary approach, engaging key healthcare professionals including recovery and emergency medicine nurses, operating department practitioners, and surgical teams to ensure holistic patient care and logistical coordination.

At a patient-facing level, the regional anaesthesia team conducted a structured patient selection process, emphasising rigorous clinical assessment and patient suitability for USGRA. Comprehensive informed consent was undertaken, ensuring thorough understanding of the proposed anaesthetic intervention – risks and benefit. The core clinical team performed precise ultrasound-guided nerve blocks recording: safety/complications data, administered volume and concentration of local anaesthetic.

Intraoperatively, detailed documentation was recorded, capturing additional anaesthetic modalities, further pain management interventions and any complications. Post-procedure, a systematic follow-up was implemented to track patients beyond the immediate perioperative period. This involved the use of a Likert scale once patients were discharged, to monitor clinical outcomes and assess their patient experience. Nerve blocks were performed in:

- Anaesthetic rooms
- PACU spaces
- ICU, ED, and other wards (using a dedicated 'mobile block' trolley and monitoring)

Data Collection

The data collected focused on the evaluation of regional anaesthesia blocks and their outcomes across pre-operative, intra-operative, and post-operative phases.

Pre-operatively, information included the date and location of the block, patient identifiers (Medical Record Number and name), and the operators' seniority involved. Surgical specialty, the proposed operation, and the block details (type, laterality and success on first attempt) were also documented. Complications during block insertion and adherence to safety protocols: "Prep, Stop, Block" [4] were noted alongside the local anaesthetic (LA) type, volume, concentration, and the exact time of block administration.

Intra-operatively, data captured included the patient's additional anaesthetic requirements, the block's effectiveness in providing analgesia, and any complications related to its administration during the procedure. Categorised by the WHO analgesic ladder, It was recorded if any weak or strong opioids were required.

Post-operatively, follow-up details were recorded, including the responsible anaesthetist, the follow-up date, and patient satisfaction scores on a Likert scale (1- highly unsatisfied, 5-highly satisfied) for both analgesia effectiveness and service quality. The duration of block effectiveness as perceived by the patient and any post-operative complications were also documented.

Statistical Analysis

Given the nature of this service development project, formal statistical analysis was not performed. Descriptive statistics were used to summarize block types, patient outcomes, and satisfaction scores.

Results

See table 1

During the implementation period, a total of 47 ultrasound-guided nerve blocks across multiple surgical specialties, including 22 blocks in Orthopaedic Trauma, 18 in Pain Management, 6 in Plastic Surgery, and 1 in General Surgery, demonstrating the versatility and cross-specialty applicability of the regional anaesthesia service.

The ranges of LA administered (Levo-Bupivacaine) are recorded alongside each block with the most commonly used percentage concentration.

Out of 47, 6 cases required stronger analgesia than non-opioids. These cases were distributed across each of the specialties, blocks and seniority of operator making it difficult to find a clear reason why this occurred.

Table 1

Theatre List/specialty	Block	Numbers	Most common % conc. Levo-bupivicaine	Range of LA volume (mls)	Total
Orthopaedics trauma	Supraclavicular	9	0.375%	20-30	
	ISB	1	0.375%	15	
	ISB+CP	1	0.25%	14	
	PENG + LCFN + Femoral	3	0.25%	40-50	
	Infraclavicular	2	0.375%	23-30	
	Popliteal + saphenous	6	0.25%	20-40	22
Plastics	Supraclavicular	4	0.375%	20	
	Infraclavicular	2	0.375%	30	6
General Surgery	Ilioinguinal	1	0.25%	20	1
Pain (analgesia)	ESP	13	0.25%	25-40	
	ESP + AS	1	0.25%	50	
	TAP	3	0.25%	20-50	
	Femoral	1	0.25%	20	18

*ISB: Interscalene Block; CP: Cervical Plexus Block; PENG: Pericapsular Nerve Group Block; LCFN: Lateral femoral cutaneous nerve; ESP: Erector Spinae Plane Block; AS: Anterior Serratus Block; TAP: Transverse Abdominis Plane Block

Anaesthesia Management

Intra-operative anaesthesia management was recorded for only 19 cases, of these: 5 patients had a general anaesthetic (GA) with volatile agent, 8 had TCI sedation with propofol and 7 completed their procedure without an anaesthetic.

GA's were given to alleviate patient concerns and for each of these cases, patients reported high levels of satisfaction.

Patient Satisfaction

- 11 patients provided follow-up feedback
- 100% reported maximum satisfaction (5/5 score)

Discussion

Our project demonstrates the feasibility of implementing an ultrasound-guided regional anaesthesia service without a dedicated block room. The key finding is the ability to safely perform nerve blocks across multiple specialties outside of the traditional anaesthetic room with high patient satisfaction and minimal complications.

Limitations of this study include the small sample size, short trial period, and limited follow-up data. The lack of a control group and formal statistical analysis also restrict definitive conclusions.

Future developments should focus on expanding service staffing, enhancing team training, and increasing engagement with surgical teams to optimize regional anaesthesia delivery.

Whist there clearly is a gold standard to a have a dedicated 'block room' this in a significant number of settings may not be affordable or achievable. We took safe practices from other hospitals with a funded service and strived to replicate these in a constrained healthcare setting in order to benefit our patients.

In conclusion, a USGRA service can be successfully implemented in a district general hospital setting, offering potential benefits in surgical care and patient experience.

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