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Gaze training to improve performance during ultrasound-guided regional anaesthesia

Submission date
24/12/2025

Recruitment status
Recruiting

Registration date
30/12/2025

Overall study status
Ongoing

Last Edited
23/01/2026

Condition category
Other

[X] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[X] Record updated in last year

Plain English summary of protocol

Background and study aims
Regional anaesthesia is the performance of spinal, epidural or peripheral nerve blocks to provide post-operative pain relief. Anaesthetists inject local anaesthetic using specialist blunt-tipped needles close to nerves to prevent transmission of pain. Hand-held ultrasound is often used by anaesthetists to direct these needles to the correct position i.e. close to, but not in the nerve itself (so-called ultrasound-guided regional anaesthesia, UGRA). If the needle is not adequately seen using the hand-held ultrasound it may pierce the nerve causing permanent nerve damage and significant patient harm. All anaesthetists should be trained in the safe performance of UGRA according to new postgraduate medical curricula issued by the UK Royal College of Anaesthetists.

Within the time and resource constraints of postgraduate medical training (with lack of access to real-world educational opportunities in clinical training), it would be advantageous to optimise acquisition of practical UGRA skills with a self-directed educational intervention which can be administered away from the bedside. Therefore, our aim is to test whether a single episode of gaze training is associated with improved performance at an ultrasound-guided peripheral nerve block task compared with standard self-directed practice. Based on previous work in the field of laparoscopic skill acquisition we hypothesise that gaze control training will improve the technical performance of an ultrasound-guided needle task.

Who can participate?
Qualified medical doctors enrolled in a Royal College of Anaesthetists Stage 1 training programme (novice group), and a small group of consultant anaesthetists with regular clinical experience in ultrasound-guided regional anaesthesia (expert group). All participants must be aged 18 years or older.

What does the study involve?
Each participant will attend a single study visit lasting approximately two hours at the Queen's Medical Centre - University of Nottingham. Participants will complete informed consent, questionnaires these include measures of anxiety, mood, sleepiness, and visuospatial ability. Perform a simulated ultrasound-guided needle task, and wear eye-tracking glasses while completing the task. Novice participants will then be randomly allocated to either a gaze

training group or a self-directed (discovery learning) group. All novice participants will repeat the task after training. Performance will be assessed by trained assessors using standardised scoring tools and eye-tracking measurements.

What are the possible benefits and risks of participating?
Participants may benefit from additional educational experience and insight into their performance, although there may be no direct personal benefit. The risks are minimal and include mild fatigue or temporary discomfort from wearing eye-tracking equipment. The task is performed on a bench model and not on patients, so there is no clinical risk.

Where is the study run from?
The study will be conducted at the Academic Unit of Injury, Recovery & Inflammation Sciences, School of Medicine, University of Nottingham, UK.

When is the study starting and how long is it expected to run for?
January 2026 to December 2026.

Who is funding the study?
This study forms part of a PhD programme funded by Umm Al-Qura University, Saudi Arabia. The sponsor of the study is the University of Nottingham, UK.

Who is the main contact?
Osama Natto, PhD Research Student in Anaesthesia, Academic Unit of Injury, Recovery & Inflammation Sciences, School of Medicine, University of Nottingham, UK, osama.natto1@nottingham.ac.uk

Contact information

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Additional identifiers

Study information

Scientific Title
The effect of gaze training on task performance, safety, and skill acquisition during ultrasound-guided regional anaesthesia: a randomised controlled trial

Acronym
GAZE Trial

Study objectives
The primary objective of this study is to evaluate whether a gaze-training educational intervention improves task performance during a simulated ultrasound-guided regional anaesthesia procedure compared with discovery learning. Secondary objectives are to describe differences in eye-tracking metrics and objective performance measures between novice and expert participants, and to explore how gaze behaviour relates to skill acquisition.

Ethics approval required
Ethics approval required

Ethics approval(s)
approved 21/11/2025, Faculty of Medicine & Health Sciences Research Ethics Committee (Research Ethics Committee E41, E Floor, (next to School of Life Sciences Reception) Medical School Queen's Medical Centre Nottingham University Hospitals NG7 2UH, Nottingham, NG7

2UH, United Kingdom; louise.sabir@nottingham.ac.uk; fmhs-researchethics@nottingham.ac.uk), ref: FMHS 36-1025

Primary study design
Interventional

Allocation
Randomized controlled trial

Masking
Blinded (masking used)

Control
Active

Assignment
Parallel

Purpose
Health services research

Study type(s)

Health condition(s) or problem(s) studied
Training and performance in ultrasound-guided regional anaesthesia among anaesthesia clinicians.

Interventions
Participants will attend a single study visit. All novice participants will first complete a simulated ultrasound-guided regional anaesthesia (UGRA) needle insertion task on a sciatic nerve model (Task 1). The goal is to accurately place the needle toward the target structure located at 6 o' clock using the in-plane technique. Task performance will be independently evaluated by two assessors using the Global Rating Scale (GRS) and the Composite Error Score (CES). Additionally, eye-tracking data will be recorded concurrently.

Novice participants will then be randomised in a 1:1 ratio using opaque, sequentially numbered, sealed envelopes to receive either a gaze-training educational intervention or discovery learning. One assessor will be blinded to group allocation and will not be present during envelope opening or delivery of the educational intervention; this assessor will attend only the task assessments.

In the gaze-training group, participants will watch a brief, standardised video demonstrating expert visual behaviour during an ultrasound-guided regional anaesthesia procedure. After that, participants will complete five supervised practice attempts using the eye-tracking glasses, during which participants will have to replicate the expert gaze patterns. The control group will undertake discovery learning, and participants will complete five independent UGRA task attempts without receiving any specific gaze-related instruction or guidance.

Following the intervention, novice participants will repeat the UGRA task (Task 2) under identical conditions, with performance again independently assessed by two assessors using GRS and CES.

Expert participants will complete the initial UGRA task only and will not be randomised.

Intervention Type
Behavioural

Primary outcome(s)
1. Procedural performance during ultrasound-guided regional anaesthesia measured using the Composite Error Score (CES) assessed by two independent assessors at immediately following completion of Task 1 and Task 2 during a single study visit

2. Procedural performance during ultrasound-guided regional anaesthesia measured using the Global Rating Scale (GRS) assessed by two independent assessors at immediately following completion of Task 1 and Task 2 during a single study visit

Key secondary outcome(s))
1. Task completion time measured using the time in seconds to complete the needling task at immediately following completion of Task 1 and Task 2 during a single study visit

2. Visual attention behaviour during UGRA measured using eye-tracking metrics including fixation total duration, fixation count, fixation time, glance count, saccade count at immediately following completion of Task 1 and Task 2 during a single study visit

Completion date
31/12/2026

Eligibility

Key inclusion criteria
1. Aged 18 years or older.
2. Qualified medical doctors currently enrolled in a Royal College of Anaesthetists training programme for Stage 1 training.
3. Consultant anaesthetist with regular clinical exposure to Ultrasound-guided regional anaesthesia.

Healthy volunteers allowed
Yes

Age group
Mixed

Lower age limit
18 years

Upper age limit
120 years

Sex
All

Total final enrolment

53

Key exclusion criteria
Previous experience of gaze training or eye-tracking software applied to medical interventions.

Date of first enrolment
12/01/2026

Date of final enrolment
04/12/2026

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Nottingham University Hospitals NHS Trust - Queen's Medical Centre Campus
Nottingham University Hospital
Derby Road
Nottingham
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Sponsor information

Organisation
University of Nottingham

ROR
https://ror.org/01ee9ar58

Funder(s)

Funder type

Funder Name
Umm Al-Qura University

Alternative Name(s)

UQU

Funding Body Type
Government organisation

Funding Body Subtype
Local government

Location
Saudi Arabia

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study will be available upon reasonable request from the corresponding investigator (Osama Natto; osama.natto1@nottingham.ac.uk). Data will be shared in an anonymised form following publication of the primary study results, subject to appropriate ethical approval, data-sharing agreements, and participant consent, in accordance with institutional data governance policies.

IPD sharing plan summary
Available on request