# Augmented Reality for

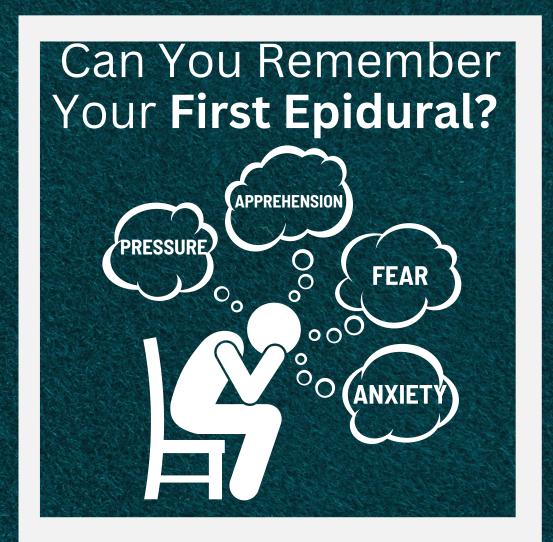
## Neuraxial Back Training

G EVANS, J WILSON, W TROAKE, K CASSIDY, C LAMOON LANCASHIRE TEACHING HOSPITALS NHS FOUNDATION TRUST RCOA COLLEGE TUTORS MEETING, 13TH-14TH JUNE 2024



#### WHY WAS IT SO TOUGH?

Complex anatomy
Difficult to appreciate 3D
structures
Traditionally taught by "feel"
"Nothing to see"
Compounding factors - (eg obesity, abnormal anatomy, mobile patient)



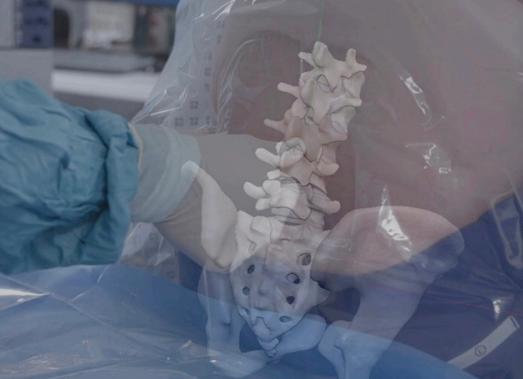


#### HOW DID YOU LEARN? See one, do one, teach one?

Like many centres, currently at our trust a neuraxial part task trainer (NPTT) is available for epidural simulation training, which allows learners to become familiar with epidural kit and practice insertion.

It does not, however, improve understanding of the three-dimensional structures being targeted during insertion and so does not help overcome some of the key challenges.

We created a novel augmented reality epidural simulator for anaesthetists new to obstetric anaesthesia. It is a comprehensive, personalised teaching package which uses AR to enable the independent learning of a complex skill in a safe environment and will become part of our routine IAOC teaching programme.



#### WHAT IS IT?

-NPTT with a superimposed AR 3D holographic image of the lumbar spine anatomy.

-A dynamic training tool that **targets anatomical appreciation** whilst simultaneously allows trainees to gain confidence and dexterity in epidural insertion.

-Allows varying perspectives of the anatomy of the back as the user moves around the trainer and real time visualization of the needle position in relation to the anatomical structures and its trajectory towards the epidural space.

-Enables **real time modification** of technique and appreciation of why procedure may have failed or been difficult.



#### HOW?

We created a working group of anaesthetists, a medical graphics artist, a blended learning expert, and a senior clinical photographer and multimedia developer.

The simulator was created using

The simulator was created using Microsoft Hololens. All material is accessed within the AR environment using AR headsets.



### WHAT NEXT? CHALLENGES

-Changing of epidural equipment in the trust during the project resulted in work duplication and delays.

-Large team with many complex steps also contributed to delays.

#### **FUTURE DEVELOPMENT**

-Expansion to other epidural techniques eg para median approach, thoracic epidural insertion.

-Expansion of technology for other similar procedures such as spinal anaesthesia and peripheral nerve blocks -Introducing US of back to teaching programme

#### **ADDITIONAL FEATURES**

Built in editable tutorials, video demonstrations and specially produced animations, including 'patient positioning', 'kit set up' and 'insertion method comparisons (continuous v intermittent)', allowing direct reference to gold standard technique throughout the learning process.