

Augmented reality to facilitate ultrasound-guided regional anesthesia procedures: a feasibility study

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INTRODUCTION

- Augmented reality (AR) has emerged as a promising technology to enhance visualization in ultrasound-guided procedures
- AR has potential to improve needle visualization, reduce cognitive load, and streamline workflows ^{1,2}
- AR has promise in bridging the gap between novice and expert operators by providing enhanced visual cues and overlaying critical information during procedures.
- AR offers potential benefits for training and skill assessment in regional anesthesia.³

AUGMENTED REALITY IN ANESTHESIA

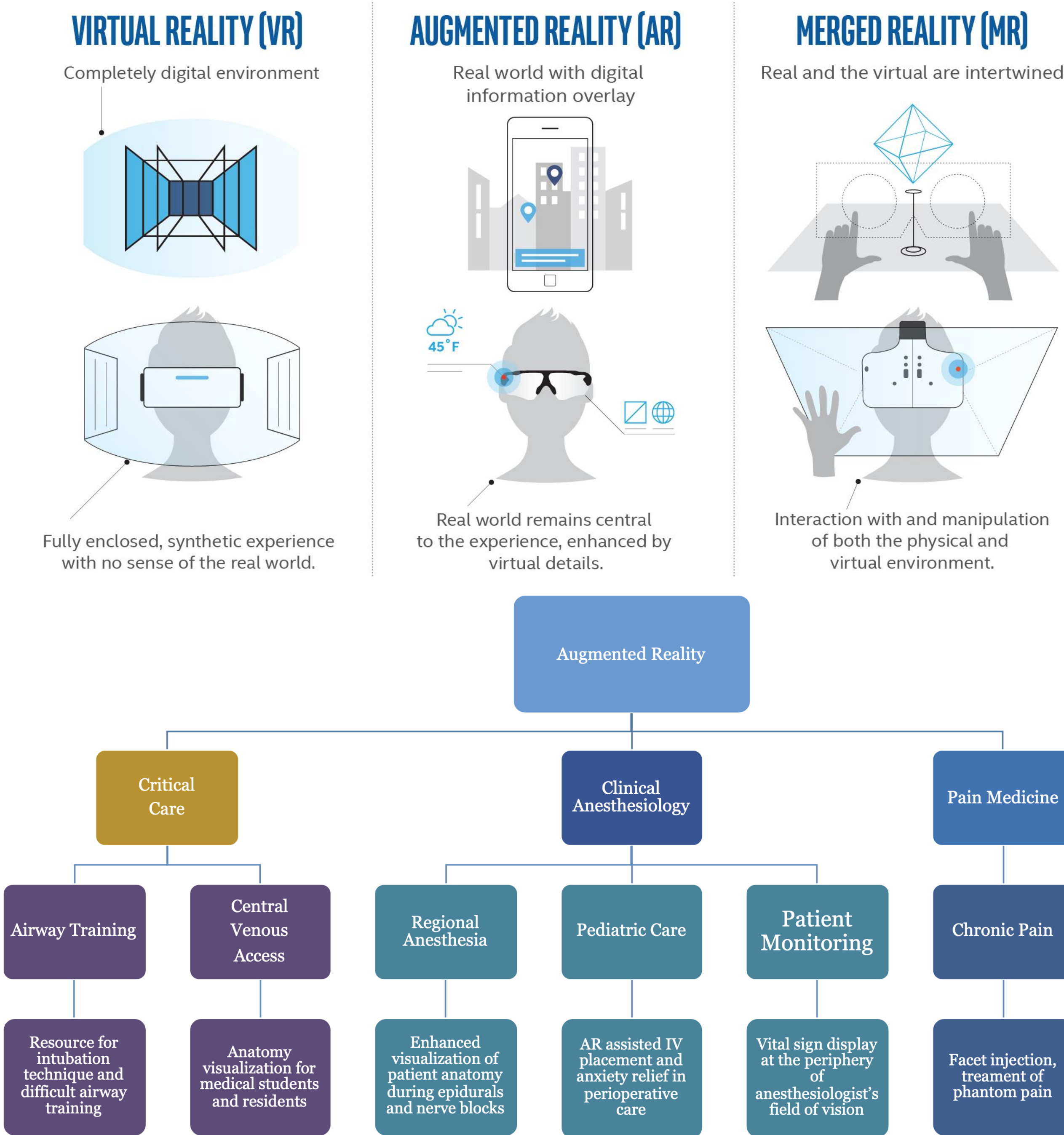


Fig. 2 Areas of clinical anesthesiology, critical care and pain medicine where augmented reality has been implemented for research, education or clinical practice
Privorotskiy et al 2022

CASE OVERVIEW

Seven Patients: Receiving PNBs: Single Injection or Catheters

Intervention: Utilized Augmented Reality for Block Placement

Outcome Measure: Successful block outcomes, minimize complications

ADVANTAGES AND DISADVANTAGES

Advantages	Disadvantages
Enhanced visualization of anatomical landmarks with AR	High cost limits accessibility
Hands-free interaction with guidance tools, allows performer to adjust image	Potential distraction from excessive features
Ability to integrate additional screens (Vitals, AI assistance, etc) into field of view	Dependence on battery life and external power
Improved ergonomic posture	Potential for technical malfunctions during
Customizable display options tailored to user preferences	Uncertain long-term durability
Continuous video recording of block field and ultrasound image allows for review and model training	Possible discomfort for extended wear periods.
Simple learning curve, users reported proficiency after one block	
Positive user feedback, preferred AR method over traditional approaches	

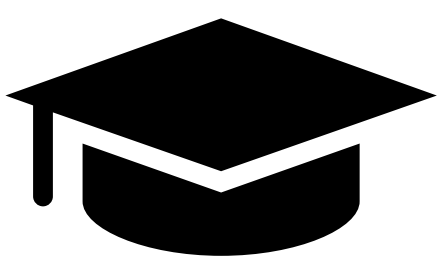
CONCLUSION

- Operators reported immediate proficiency using the VP and excellent visualization with improved US image compared to the machine display, consistent with improvements in needle visualization found in prior studies.⁵
- All blocks were successfully performed on the first pass without complications, including single injection and catheter placements.
- No adverse events occurred
- Clinicians unanimously found the integration of AR to be both feasible and highly effective across all procedures.
- Notably, the use of AR mitigated ergonomic challenges traditionally associated with prolonged ultrasound-guided procedures, demonstrating an additional benefit for clinician comfort.

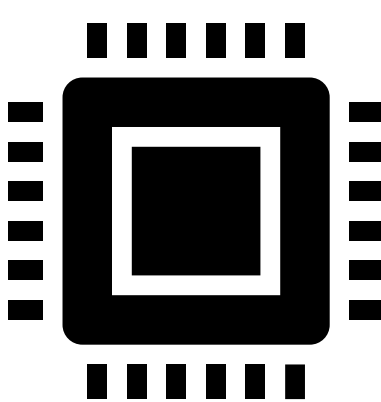
IN PRACTICE



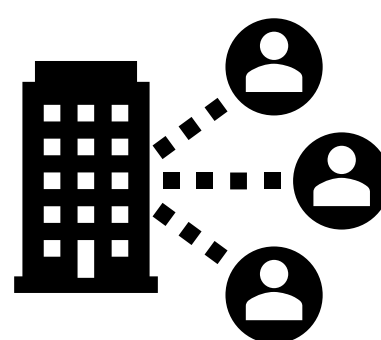
FUTURE DIRECTIONS



EDUCATION



AI / ROBOTIC
TRAINING



REMOTE
CARE

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