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Promoting Technology and Collaboration

Augmented Reality Glasses for Real-Time Bedside Guidance in General Surgery Resident Education: A Feasibility Study

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Background: Surgical faculty are not always available at the bedside for resident guidance, evaluations or urgent consultations. We tested whether augmented reality (AR) glasses could allow for real-time, interactive supervision of general surgery residents and assessed feasibility for extending this technology to guide emergent bedside procedures.

Technology Overview: General surgery residents wore AR glasses during inpatient evaluations and routine bedside procedures. The device transmitted a secure, HIPAA-compliant, first-person live video feed to attending surgeons, accessible via desktop or mobile interface. Attendings were able to deliver real-time audio commentary, answer questions, and provide overlay digital annotations directly onto the resident's field of view. Residents completed clinical assessments, chest tube management, routine bedside procedures, wound care, line placement, ostomy and drain evaluation, and more. Both residents and faculty completed structured surveys evaluating comfort, confidence, workflow integration, and perceived patient safety.

Potential Application in Surgical Simulation and Education: This pilot study demonstrated markedly improved resident-reported confidence across all areas of application. Faculty reported enhanced ability to provide targeted, real-time context-specific teaching and increased assurance of patient safety. Both groups identified minimal workflow disruption. The platform increased resident capabilities, boosted performer confidence, improved overall technique and was well-received by faculty.

Potential Opportunities to Collaborate: Preliminary data from resident-faculty encounters allowed for attendings to virtually join residents at the bedside, providing immediate, focused supervision and enhancing procedural and clinical teaching without disrupting workflow. Feasibility analysis suggest that the technology could be implemented for real-time guidance during urgent bedside procedures, trauma work up, and more, although logistical and connectivity challenges remain.

