

## #116 - MIXED-REALITY HOLOGRAPHIC SCREENS AS SURGICAL MONITORS REPLACEMENT AT THE ENDOSCOPY SUITE: A FEASIBILITY STUDY

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**BACKGROUND:** Mixed reality (MR) is an interactive, real-time processed, three-dimensional (3D) registered spatial computing technology that combines virtual reality (VR) and augmented reality (AR). In Endoscopy, MR holographic screens allow gesture operation and 3D spatial guidance, with more comfortable ergonomic interactions for gastrointestinal (GI) endoscopists as users, in terms of translation and rotation. MR makes touching surgical monitors unnecessary, increasing situational awareness, with their reduction or even replacement.

**AIMS:** To evaluate the feasibility of MR holographic screens in terms of interconnectivity and user-endoscopists' experience during endoscopic procedures.

**METHODS:** Feasibility interventional trial (Nov/2022–Mar/2023) to assess the added utility and endoscopist-user's experience with MR holographic screens. The user-endoscopists performed procedures with the HXtend™ system processor (mdconsgroup; Guayaquil, Ecuador), paired with the HoloLens™ (Microsoft Corporation; Redmond, WA, USA) during diagnostic procedures in adults (Figure 1A). The outcomes were device technical assessment (interconnectivity and frame rate) and user-endoscopist's acceptance (comfort, functionality, and learnability), measured by the HXtend™ platform and an Ad hoc questionnaire, respectively.

**RESULTS:** Thirty user-endoscopists used the HXtend™ software as a replacement for the surgical monitors: 26/30 males, median age of 36 years (31 – 37). Each user-endoscopist performed a procedure: 15/30 esophagogastroduodenoscopies, 3/30 cholangioscopies, 10/30 colonoscopies, and 2/30 endoscopic ultrasounds. One hologram (Figure 1B) was used in 27/30 procedures, 2/30 two holograms, and 1/30 cholangioscopy three holograms. The user-endoscopist's acceptance in terms of comfort, functionality, and learnability is summarized in Figure 1C. The mean latency was 89.7 ± 2.87 ms and the holograms performed 58.50 ± 1.11 frames per second (FPS).

**CONCLUSIONS:** The HXtend™ system can replace surgical monitors within endoscopy suites with good interconnectivity and FPS rate. Operators indicated that the software and hardware were comfortable and easy-handle. This must continue into a real-world study assessing remote assistance and adverse events.

**ClinicalTrials ID:** NCT05640401

**Figure 1.** A) User-endoscopists using HoloLens™ system (Microsoft Corporation; Rendmond, WA, USA); B) Mixed-reality holographic screen; C) Summary of user-endoscopists' acceptance.

