

Virtual ACS 2021 Surgeons and Engineers: A Dialogue on Surgical Simulation Meeting

Promoting Technology and Collaboration

Digital Transformation of Surgery In and Out of the Operating Room

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Background: Despite the high volume, surgery is non-standardized and variations often occur in performance, delivery and surgical approach. Such variation can result in errors and complications that can potentially be avoided.

Technology Overview: A central digital ecosystem based on software and hardware to drive consistent surgical practice and assist towards the standardization of procedures through process and workflow understanding and mapping is being developed. Intraoperative displays present information on the current surgical phase. A hardware device, powered by AI, updates the phase-related information shown and also records the procedure. A web-based video platform stores the recorded video, automatically analyzed in real-time prior to upload.

Potential Application in Surgical Simulation and Education: This technology enables sharing of surgical workflow information pre-, intra- and postoperatively via the Touch Surgery app, TS Pro. TS Pro offers an annotated video-sharing tool, which embodies the learn and test mode of the TS academically validated app, to enable online learning. Preoperatively, surgeons will share their surgical workflow and preferences with their teams, to drive learning and preparation for upcoming surgical cases. Intra-operatively, the AI-powered hardware and displays will drive team coordination and enhance team performance, allowing team alignment at each phase of the operation. Post-operatively, the recordings of the procedure will be automatically uploaded to our web platform where AI algorithms extract different analytics and benchmarks that will drive standardization and discover best practices to share across surgical teams.

Potential Opportunities to Collaborate: Through sharing best practices, surgeons can collaborate within and between teams, to not only benefit the surgical trainees but the whole team, and specifically the scrub techs too. Trainees will have a novel education platform before, during and after the operation with procedural guidance content, including patient- and procedure-specific content and workflows through innovative digital tools and displays.