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A unified approach to surgical training, mentorship, and quality improvement leveraging a pre-, intra-, and post-operative intuitive ecosystem

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Introduction

The evolution from open/laparoscopic surgery to digital surgery has made it possible to facilitate surgeon lifelong learning and performance improvement through an interconnected digital ecosystem. By creating a virtuous loop of pre-operative preparation and training, intra-operative O.R. enhancements and mentorship technologies, and post-operative case insights and video review, the Intuitive da Vinci 5 system offers healthcare providers the ability to quantify performance and approach improved patient care through the refinement of surgical techniques.

Technology overview

Da Vinci 5 and the Intuitive Ecosystem is comprised of interconnected training, mentorship, and analytics technologies that operate across pre-, intra-, and post-operative environments. It builds upon the formalized training pathway that has been used successfully over the last 28 years to train surgeons in their initial use of the da Vinci system, providing a robust platform to facilitate lifelong learning. It has been shaped by an experience base of more than 12M surgical procedures and over 10 years of research and development.

Pre-operative

In the pre-operative environment, surgeons may refine their psychomotor skills using virtual reality simulation on the SimNow simulator. Additionally, the Intuitive Learning platform facilitates surgeon acquisition of technical and clinical skills through on-demand video technology.

Intraoperative

Intraoperatively, surgeons engage in mentor or mentee sessions with remote surgeons using the Telepresence system. They may also mentor or collaborate with surgeons locally via Dual Console. These technologies are seamlessly integrated and facilitate surgical collaboration without the limitations of distance or patient access associated with other surgical modalities. The platform additionally facilitates recording of surgical video, instrument motions, and system events via the Hub system. This allows intraoperative, asynchronous review of case video, as well as postoperative analysis of case video, instrument activity, and operative kinematics.

Postoperative

Postoperatively, the platform provides facilities to review case performance and to evaluate avenues for enhancing performance and patient outcomes. Surgeons may review case metrics (case time, instrument usage, and case type) via the My Intuitive app. Additionally, case video may be postoperatively reviewed by the surgeon and shared with patients via the Media Manager. Furthermore, video and kinematic data collected during cases can be analyzed by the Case Insights system to deliver objective performance indicators and empower academic-led outcomes research that may inform training priorities and surgical technique evolution.

Preliminary results

The Intuitive Digital Ecosystem has facilitated both resident/fellow education and the clinical growth of experienced surgeons. In resident/fellow training, integrated case logging, simulation, video review, and telementoring have facilitated the training of thousands trainees on the da Vinci system. Additionally, surgeons in practice are now extending their training on the da Vinci system beyond their initial training and into a continuous cycle of lifelong learning, augmented by remote case observations, video case review, and analytics of their case data. Furthermore, experienced surgeons are able to leverage these digital tools to teach new learners more effectively.

Conclusion

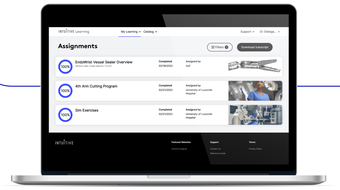
The interconnected Intuitive Digital Ecosystem transforms case data into actionable insights, delivering a unified approach for healthcare providers to quantitatively measure performance, identify area for performance improvement, and ultimately improve patient outcomes . As this digital ecosystem matures further, artificial intelligence and machine learning will play an additional role in optimizing surgery.

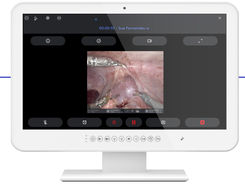
I'm not sure we can state this without something like "…might support improved patient outcomes" until we have the right evidence.

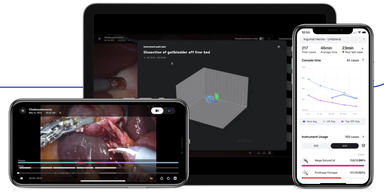
Intuitive's Integrated Ecosystem



The da Vinci 5 Surgical System







Pre-operative
Intuitive
Learning Portal

Intraoperative
Intuitive Hub
with Telepresence

Postoperative
My Intuitive App
with Case Insights

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