# CASE INSIGHTS: COMBINING SURGICAL VIDEO AND INTRAOPERATIVE INSIGHTS FOR SURGICAL EDUCATION AND PRACTICE

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## Objective

The practice of surgery has undergone digital transformation. Robotic surgical platforms collect rich multimodal data about what happens during an operation. We describe and share initial experience with Case Insights, a novel application, which was launched with the da Vinci 5 surgical system and delivers a unique combination of da Vinci system data, kinematic movement data, and AI-powered video analysis to extract objective performance indicators (OPIs) from surgery and identify opportunities for surgeons to improve patient care.

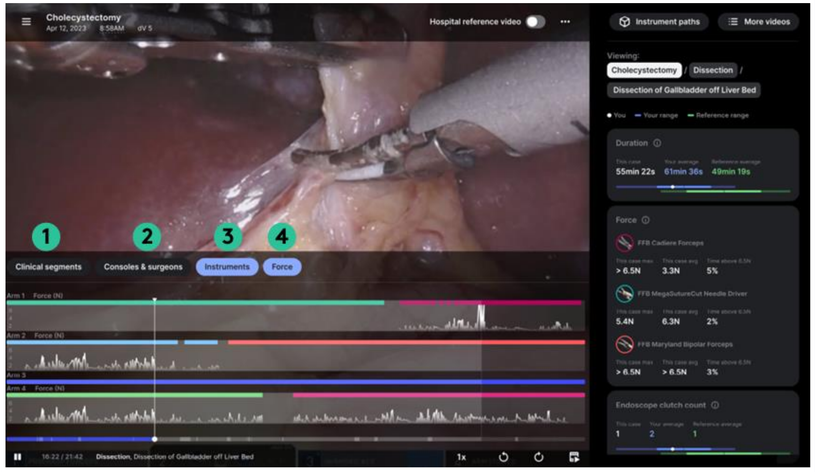



Figure 1. Force timeline display on Intuitive's Case Insights.

## Technology Description & Method of Use or Application

Case Insights, powered by Intuitive Hub collects surgical video, and robotic surgical system data, including kinematic data and system events, and generates OPIs. OPIs provide detailed metrics on a surgeon's activity on the robotics platform, such as how smoothly they operate the robot's arms or how much force they apply to tissues. OPIs can be measured for the whole case or for a particular phase of the procedure, such as dissection of key structures, or reconstruction after a resection. These insights can be viewed with surgical video on the My Intuitive mobile or web applications. Objective metrics of performance can be compared with institutional or national benchmarks, which help surgeons understand what good looks like, identify areas for improvement, and track their performance over time. System usage data from system launch on March 28, 2024 to November 19, 2024 were analyzed to characterize adoption. Surgeons who used Case Insights were surveyed about their experience in using the product, understanding and actionability of OPIs, and impact. Selected surgeons participated in semi-structured interviews. The study protocol was approved by the WCG Institutional Review Board.

## Preliminary Results

Since system launch on dv5, Case Insights has captured video and generated OPIs for **8,406 cases** done by **1329 unique surgeons**. 2003 videos have been reviewed by at least one surgeon**. Surgeons across specialties have reported leveraging Case Insights to improve technique through video review and enhance the teaching of residents and fellows**. Case Insights was noted to help drive home technical principles that are taught in real time during surgery, but further reinforced in subsequent video analysis. Annotations combined with video timelines enabled easy navigation. **Attending surgeons reported that comparing their technique to trainees with a focus on OPIs enabled efficient and accurate educational feedback.**

## Conclusions

Case Insights empowers surgeons with actionable insights about intraoperative activity that **can identify opportunities for improvement**. Video review and objective performance metrics have the **potential to identify areas for improvement, accelerate learning, and improve feedback during training**