Video transparency: a powerful tool for patient safety and quality improvement

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Transparency can be a powerful driver of better healthcare quality.[1] In 2013, it was proposed that recording video data in healthcare begin with the several medical procedures that are already video based (cardiac stent placement, arthroscopic surgery, colonoscopy, etc).[1] Different from the past era when recording required new hardware, most of the procedures performed in medicine today are now mediated by video, enabling a new opportunity for learning health systems.[2][3] Some hospitals, like Johns Hopkins, have even built operating rooms (ORs) equipped with cameras—some of these are used to monitor room turnover times for scheduling efficiency, while others have been installed in anticipation of a future of increased transparency.

Ever since our group first described a surgery checklist,[4] compliance with the tool has been a challenge. Overdyk et al[5] demonstrate the potential of using video-derived data to improve compliance rates. The authors, based at Hofstra North Shore-LIJ School of Medicine, performed a prospective study in which surgeons and other OR staff were randomised to video monitoring with real-time feedback on key patient safety activities, including compliance with the safety checklist during sign-in, time-out and sign-out procedures. They found that the feedback increased compliance dramatically and reduced OR turnaround times for scheduled cases by 14%. Moreover, these improvements were sustained throughout the feedback period. As Overdyk et al shows, video transparency is one of very few interventions in healthcare to result in immediate behaviour change around safe practices.

This is a landmark study in the rapidly expanding field of using technology to take patient safety to the next level and can be generalised to improve compliance with other established safe practices in healthcare. For years, healthcare has suffered from endemic problems associated with unwarranted variation in practice patterns, behaviours and compliance. Transparency works because it increases accountability with little room to argue about the circumstances. In principle transparency makes sense, but in practice it requires leadership to invite increased accountability.

The principle 'video doesn't lie' has important implications in many fields. For example, decades-long allegations of unwarranted police brutality of white police officers against black people have been debated for years, and some even denied the problem existed, until video shed light on the issue. Within a year, a litany of highly disturbing videos of these events solidified a broader call to action to increase accountability and, in some regions, to introduce legislation requiring police officers to wear small body cameras.[6]

Medical institutions that have historically led patient safety innovation now have the opportunity to lead in the new space of using video in a sensitive, yet meaningful way. There are two independent uses of video transparency in healthcare. First, video can be used in a legally protected fashion for quality improvement to improve compliance with best practices as demonstrated by Overdyk et al. And second, it can be shared with patients. We explore the implications of each path of using video to improve care.

While medicine has achieved remarkable advances in state-of-the-art care, delivering that care can be messy. For that reason, the proposition of using video to identify outliers in quality can be a territorial, even emotional, subject for some. We suggest that using video for quality improvement can be optimised by developing local

buy-in around the metrics being tracked, ensuring protections around the data and using the data for formative, rather than punitive, purposes.

Video documentation has already been used effectively in healthcare for educational and quality improvement purposes, such as in a coaching programme at Brigham and Women's Hospital.[7] Surgeons reviewed their procedure videos with an expert for feedback and discussed alternative approaches. Birkmeyer et al[8] used peer-rated videotaping to describe variation in surgeon technical skill and its association with complication, readmission and mortality rates. New technology has presented more ways for videos to be used for real-time feedback and telementoring. The Society of American Gastrointestinal and Endoscopic Surgeons has already partnered with technology groups to coach, mentor and review surgical technical skills by video.[9] Performance around non-technical (behavioural) skills can similarly benefit from video feedback.

Video recording enables a feedback loop. If people are given real-time information or feedback about their actions, they can modify those actions for the better. In 2003, Garden Grove, California had the issue of drivers speeding through school zones.[10] When the city instituted dynamic speed displays showing drivers their current speed and the speed limit ('your speed signs') at school pedestrian signals, drivers drove an average of 14% slower.

In healthcare settings, feedback systems through remote video auditing (RVA) have been developed to address hand hygiene compliance variation. Studies on RVA with feedback have since demonstrated improvement in compliance of healthcare workers to produce a significant and sustained improvement in hand hygiene.[11–13] Armellino et al used devices such as doorway motion sensors and narrow-focus video cameras aimed at sinks and sanitiser dispensers to send information to remote auditors to review hand hygiene compliance. Remarkably, compliance rose from 7% to 82% during the intervention period.

At St Michael's Hospital in Toronto, surgeon Dr Teodor P Grantcharov built a 'black box' with a similar idea to how the flight recorder in an aircraft helps create a learning feedback system in the aviation community.[14] But while black boxes in aeroplanes are used to investigate what went wrong after the crash occurred, the goal of Grantcharov's innovation is to prevent mistakes from transpiring in the first place.[15] The surgical 'black box' concurrently records patients' health data and the surgical team's actions and speech. It follows the surgeon's actions during an operation and gives real-time feedback, while an outside computer identifies when mistakes are made. The black box's purpose is primarily educational for improving performance and surgical outcomes. Having a reliable account of the event could also be used to teach all of us in the healthcare community at large in the same way pilots around the world can learn from the events of a single isolated crash.

The public has also been calling for more video technology to increase hospital transparency. Consider the case of a Wisconsin woman who presented to a hospital for a routine elective surgical procedure. During the procedure, excessive amounts of the anaesthetic propofol sent her into cardiac arrest. Remarkably, the surgeon delayed starting chest compressions. Three months later, she died. Since then, her brother has fought to create more accountability behind hospital doors, and, because of his efforts, Wisconsin could be the first US state to implement a law requiring video data to be collected in every OR.[16] If this bill passes, other US states could follow. Already, a judge reacted to a string of wrong-site surgery events at a Rhode Island hospital by ordering the hospital to install cameras in their ORs. These are a few examples of an escalating public movement to use video to increase accountability in ORs.[14]

While a government mandate is never ideal, patients like the idea of having their procedure recorded. In a survey of 248 patients undergoing colonoscopy, 81% expressed interest in having their procedure videotaped and 61% said they would be willing to pay for it.[17] It is our opinion that the guidelines and use of video for quality improvement be driven by the healthcare community rather than by the government. Clinician-authored quality improvement projects are historically more effective than those issued by a larger governing body. Hospitals are in a unique position to step forward in this space.

Despite the potential of video recording to improve quality and patient safety, care must be taken to ensure that video recording is used to encourage best practices and not threaten patients and physicians. When the data are used for internal quality improvement, patient anonymity should be preserved. When the data are shared with patients, as with any other part of the health record, patient confidentiality should be ensured. Patients may consent to specific uses of the recording, which may include research or quality improvement. Care must also be taken to ensure that this added transparency does not worsen the problem of frivolous medical malpractice claims. Research suggests, however, that more transparency, including the timely disclosure of mistakes and offer of apology, reduces claims.[18] Thus, in our opinion, patient satisfaction and transparency are the most reliable safeguards. In addition, videos could help the defence of a physician facing malpractice.

Video recording is taking centre stage in healthcare as technology increasingly allows it to be feasible and streamlined. Despite some fears that video will be used for the wrong purposes, we anticipate that a growing physician and public demand for accountability will reward hospitals and surgical centres that lead the way in advancing this highly effective tool. Leading academic centres will likely be the first to pioneer video transparency, and many have already started to do so. As the medical community continues to seek high-

impact ways of advancing patient safety and quality, implementing videos with feedback represents the next great leap forward.

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