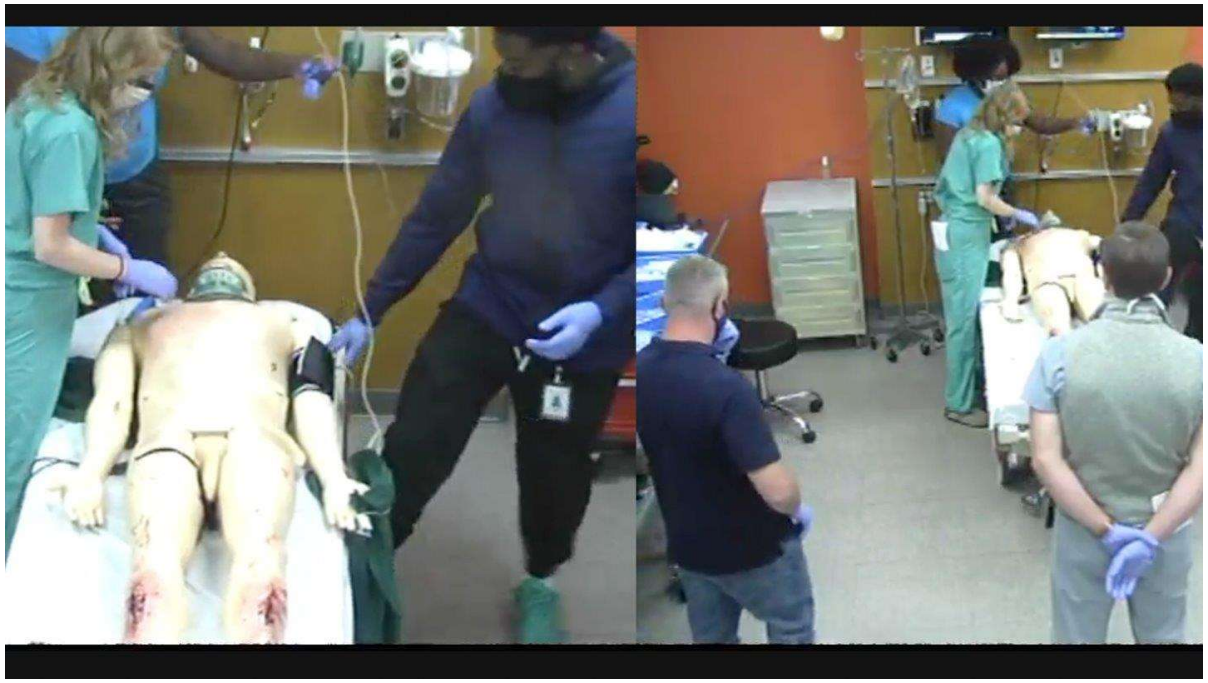
A million billion words: video is a high value tool

Lucy Ruangvoravat, MD FACS

Xiao, Y., Seagull, F.J., Mackenzie, C.F. *et al.* Adaptive leadership in trauma resuscitation teams: a grounded theory approach to video analysis. *Cogn Tech Work* **6**, 158–164 (2004)

Disclosures

- We are not currently doing video review at Yale



Humans are imperfect

- Memory and medical records do not show the whole picture
- Time-stamped, granular
- Able to review repeatedly

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NEWS

ABS to Explore Video-Based Assessment in Pilot Program Launching June 2021

The ABS has announced today that it is launching a pilot program in video-based assessment (VBA), with plans to recruit at least 150 diplomates to participate in the pilot for each of three video platforms.

Trauma video review outperforms prospective real-time data collection for study of resuscitative thoracotomy

John R. Rees, BS[a], Zoe Maher, MD[b], Ryan P. Dumas, MD[c], Michael A. Vella, MD, MBA[d], Mary E. Schroeder, MD[e], David J. Milia, MD[e], Alea I. Zone, BA[f], Jeremy W. Cannon, MD, SM[a,f,g], Daniel N. Holena, MD, MSCE[e,*]

Table III
Missingness associated with procedural milestone time data collected prospectively in real time compared to data abstracted from video review

RT procedural milestone	Missing by prospective collection, *N* (%)	Missing by audiovisual recording collection, *N* (%)	*P*
Skin incision ($n = 51$)	18 (35%)	1 (2%)	< .001
Retractor deployment ($n = 51$)	22 (43%)	2 (4%)	< .001
Right chest decompression ($n = 48$)	20(42%)	1 (2%)	< .001
Pericardiotomy ($n = 51$)	32 (63%)	2 (0%)	< .001
Aortic occlusion ($n = 43$)	16 (37%)	0 (0%)	< .001
Internal compressions ($n = 38$)	13 (34%)	3 (8%)	< .006

P values are for McNemar's test for paired dichotomous data.
RT, resuscitative thoracotomy.

Table IV
Median (IQR) time in minutes to completion of procedural milestones of RT and % bias between data collected prospectively or from audiovisual review

RT procedural milestone	Timing in prospective collection (min)	Timing in audiovisual recording collection. (min)	% Bias
Skin incision	2.6 (1.6–4.6)	2.0 (1.1–3.0)	42.2 (IQR 9.4–92.1)
Retractor deployment	3.6 (2.6–4.6)	3.6 (2.9–5.5)	19.5 (IQR 8.6–33.9)
Right chest decompression	4.1 (3.1–6.6)	3.9 (2.6–6.1)	43.1 (IQR 14.1–85.0)
Pericardiotomy	5.6 (4.6–7.5)	4.3 (3.6–6.3)	18.9 (IQR 3.8–35.0)
Aortic occlusion	7.6 (6.5–12.4)	6.2 (4.9–10.8)	10.3 (IQR 6.6–37.0)
Internal compressions	7.5 (4.7–11.6)	7.0 (5.5–11.9)	21.9 (IQR 5.7–52.0)

RT, resuscitative thoracotomy.

1. Multiple camera angles allow better visualization of the critical events
2. Time stamping allowed for reliable timelines.

Using Video Recording to Identify Management Errors in Pediatric Trauma Resuscitation

Ed Oakley, MBBS, FACEM[a], Sergio Stocker, MD[b], Georg Staubli, MD[b], Simon Young, MBBS, FACEM[a]

[a]Department of Emergency Medicine, Royal Children's Hospital, Melbourne, Australia; [b]Children's University Hospital, Zurich, Switzerland

FIGURE 1
Still image of view of resuscitation from camera (video link).

- Pediatrics, 2004
- Identified 25 errors over 90 resuscitations (2.16 per pt)
- Only 10 (20%) of those identified on record review

Using Video Recording to Identify Management Errors in Pediatric Trauma Resuscitation

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[a]Department of Emergency Medicine, Royal Children's Hospital, Melbourne, Australia; [b]Children's University Hospital, Zurich, Switzerland

FIGURE 1
Still image of view of resuscitation from camera (video link).

- *Inadequate assessment*
  - *Task omission*
- *Delay in treatment or assembly*
- *Protocol deviations*

Non-technical skills are more readily captured on video

- Team dynamics
- Focus can be made on interpersonal items that can be missed with other forms of review
- T-NoTECHS: Trauma Non-technical skills
  - Leadership
  - Cooperation and resource management
  - Communication
  - Assessment and decision making
  - Situational awareness

Team Assessment and Decision Making Is Associated With Outcomes: A Trauma Video Review Analysis

Dumas et al

J Surg Res 2020

- Video review of ED thoracotomy
- Scored Trauma Nontechnical skills score (best/average/worst)
- Correlated with ROSC
- 31% ROSC…not statistically significant

However…..“best” in domain of assessment and decision making correlated with 5.3x higher likelihood of ROSC

Teaching Trauma Nontechnical Skills

- Tailored to any role within the trauma team
- More reliable than manual chart review
- Focus can be made on interpersonal items and other intangibles
- Debrief can be reliably done after video review

2022 APDS SPRING MEETING

Roll the Tape: Implementing and Harnessing the Power of Trauma Video Review

Ryan P. Dumas MD *, Caitlin Cook MD †, Daniel N. Holena MD, MSCE ‡, Yanjie Qi MD §, Nora Tabone MS, RN ‖, Spencer L. Studwell JD ¶, Aekta Miglani MD **, Michael A. Vella MD ††

J Trauma. 1988 Apr;28(4):435-40. doi: 10.1097/00005373-198804000-00003.

Video recording trauma resuscitations: an effective teaching technique

D B Hoyt [1], S R Shackford, P H Fridland, R C Mackersie, J F Hansbrough, T L Wachtel, J B Fortune

A scoping review of nontechnical skill assessment tools to evaluate trauma team performance

Avneesh Bhangu, BMSc, Christina Stevenson, MSc, Adam Szulewski, MD, PhD, Aidan MacDonald, *and* **Brodie Nolan, MD, MSc**, *Kingston, Canada*

05373-198804000-00003

The Role of Trauma Video Review in Optimizing Patient Care

McNicholas, Amanda Renee DNP, CRNP; Reilly, Eugene Francis MD

Author Information

Journal of Trauma Nursing 25(5):p 307-310, September/October 2018.

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Surgical Innovation

Supporting the Educational, Research, and Clinical Care G the Academic Trauma Center

Video Review for Trauma Resuscitation

Michael A. Vella, MD[1]; Ryan P. Dumas, MD[1,2]; Daniel N. Holena, MD[1,3]

Lights, Camera, Action... Spotlight on Trauma Video Review

An Underutilized Means of Quality Improvement and Educati

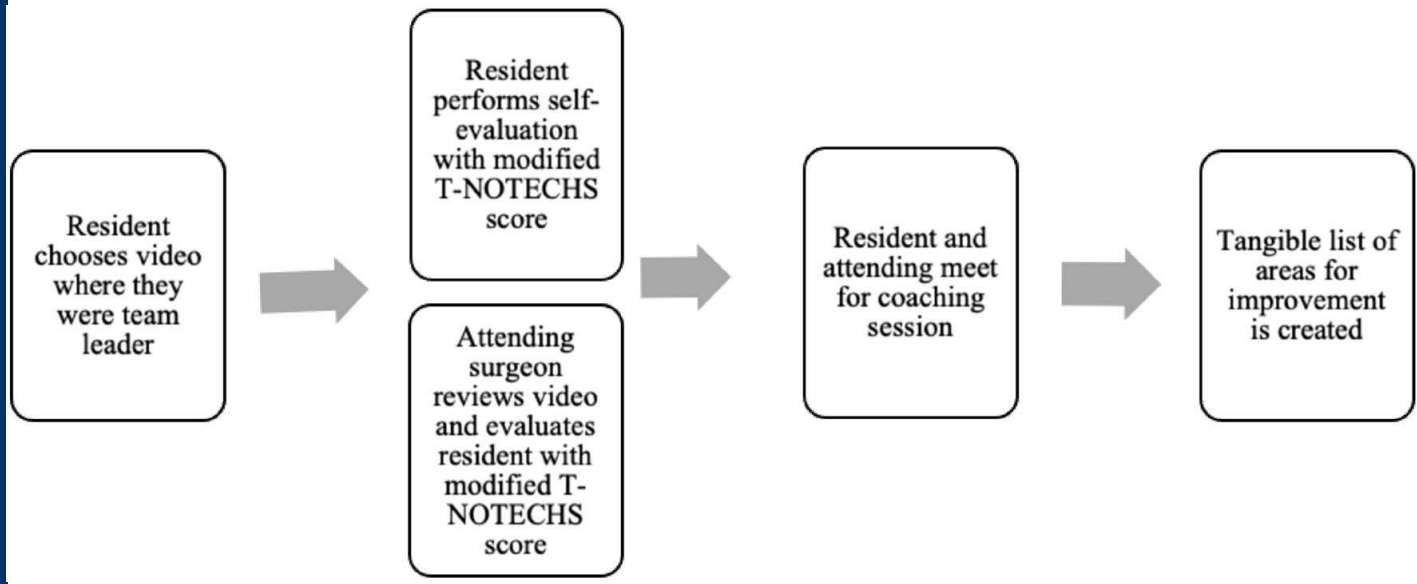
Rogers, Steven C. MD*; Dudley, Nanette C. MD†; McDonnell, William MD†; Scaife, Eric MD‡; Morris, Stepher Nelson, Douglas MD†

Author Information

Pediatric Emergency Care 26(11):p 803-807, November 2010. | **DOI:** 10.1097/PEC.0b013e3181fa874a

Teaching Trauma Nontechnical Skills

Figure: Fitzgerald, C.A., Dumas, R.P. Trauma Quality Improvement and Team Education: How Can We Better Optimize Our Training?. *Curr Surg Rep* **11**, 117–125 (2023)..



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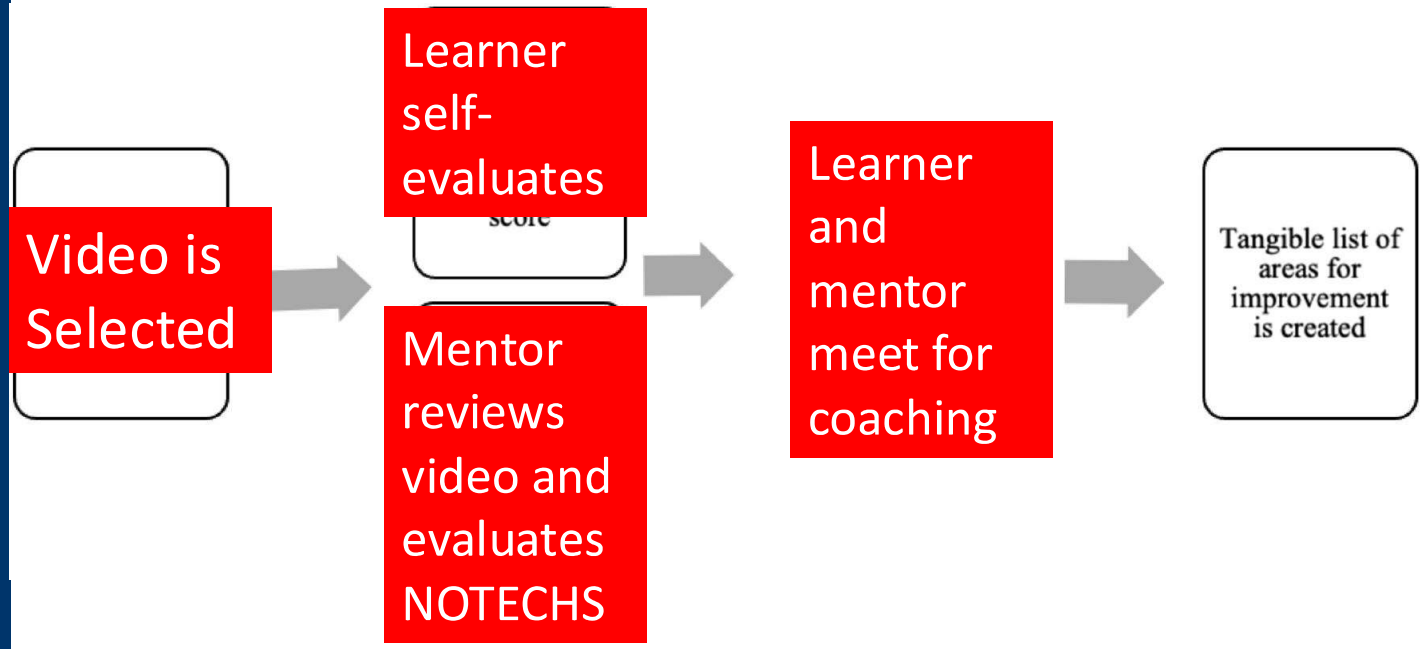
Teaching Trauma Nontechnical Skills

Figure: Fitzgerald, C.A., Dumas, R.P. Trauma Quality Improvement and Team Education: How Can We Better Optimize Our Training?. *Curr Surg Rep* **11**, 117–125 (2023)..



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HALO events

High Acuity Low Occurrence

- Video allows more learners to benefit from these events
- Interprofessional learning opportunity
- Adult and pediatric
- Learners who are not present
- Hoyt et al 1988: time to definitive care decreased after video review

Video can be compliant with legal and privacy concerns

- 2010 ACS survey:18% of adult centers
- 2019 EAST survey:
  - 51 Level 1 trauma centers (28.9% of respondents)
  - 20 Level 2 centers (27.8%)
  - 6 centers reported a medicolegal issue

Dumas et al Am J Surg, 219 (1) (2020), pp. 49-53

Trauma video review through the legal lens:
Improving care while minimizing risk

Bahaa Succar, MD, Michael A. Vella, MD, MBA, Daniel Holena, MD, Jordan Estroff, MD, Beatrice Rule, JD, Madeline Rivera, BA, Spencer Studwell, JD, Dhara Shukla, MBA, *and* **Ryan P. Dumas, MD**, *Dallas, Texas*

- 2.8% of centers reported direct knowledge of any medicolegal implication
- Only 2 legal cases identified in review
  - Non-discoverable
  - Re-deposition by plaintiff based on selection of the video in question for an educational review

Health care operations are any of the following activities: (a) quality assessment and improvement activities, including case management and care coordination; (b) competency assurance activities, including provider or health plan performance evaluation, credentialing, and accreditation; (c) conducting or arranging for medical reviews, audits, or legal services, including fraud and abuse detection and compliance programs;

TABLE 2. Factors That Mitigate Litigation Risk With an Active Trauma Video Review Program

Factors Increasing Litigation Risk	Factors Reducing Litigation Risk
• Spoliation (*destruction of evidence*)	• Autodeletion policies
• Consenting	• Universal audiovisual hospital consenting policies
• Patient privacy	• Deidentified videos with restricted access
• Protected Health Information (PHI)	• Peer review statutes providing protection *(if hospital is part of a peer review program and quality assurance activities)*

Succar et al, J Trauma Acute Care Surg 2024; 97:978–82.

Video can be compliant with legal and privacy concerns

- Technical protection
  - limited access to networks
  - Autodeletion
- Consent
  - Joint Commission Compliance
  - After recording/within admission consent
- Quality Improvement/Peer Review status

Without video review we don't know what we don't know

1. **Reliable data**

   Increased adherence to ATLS and protocols

2. **Tool for measuring difficult to capture data**

   Communication is the key

3. **Protected and safe**

   Minimal precedent for harm or legal vulnerability

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Xiao, Y., Seagull, F.J., Mackenzie, C.F. *et al.* Adaptive leadership in trauma resuscitation teams: a grounded theory approach to video analysis. *Cogn Tech Work* **6**, 158–164 (2004)