

YouTube Surgeons:

The Role of Video Learning in Urology

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Objectives (in 20 minutes or less)

- Discuss the changing landscape in surgical education
- Highlight the need for Continuing Professional Development
- Review the data on video-based surgical coaching/analysis
- Outline strategies for optimizing personal performance



Caveats



- We are supposed to be ‘lifelong learners’
- “A doctor who treats himself has a fool for a patient” (17th century fable): likely implies that one who trains himself has a fool for a teacher
- “Everything on the internet is true.” –Abraham Lincoln

How do we 'stack up'?



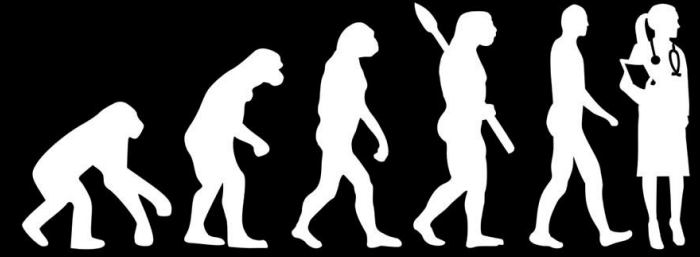
- Operative skill remains a poorly defined construct given no concrete measure of technical competence
- Majority of adverse surgical events attributable to technical error (despite value in focusing on systems)
- The proxies for skill that are used to provide privileges (graduated residency, board certification, personal recommendations, arbitrary case volumes) are inadequate metrics

Challenges

- Rapid changes in surgical technology
- Work-hour restrictions among trainees
- Many surgeons fail to improve after reaching proficiency
- Learning curve persists after completing training



Evolution in Education



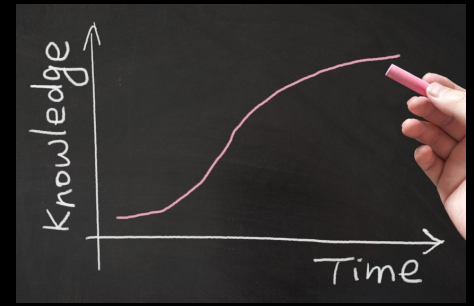
- More to learn, less time to do it, and those in training want more personal time
- Generational differences in learning styles/preferences
 - Trainees today were raised in front of screens
 - Rapid delivery of information is the norm (facilitates impatience)
 - Impact of COVID-19 (Zoom, empty classrooms)
- Rise of social media for group discussion of topics and advice on cases
- CME is often a box to check, and perhaps a disguised vacation

Halsted model



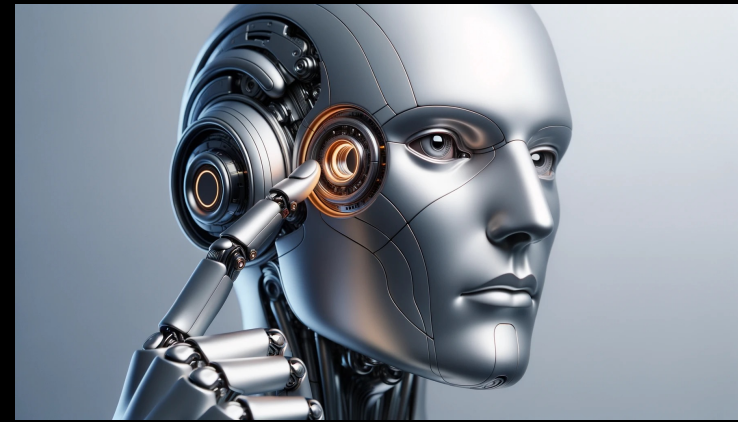
- Surgeons in 19th/early 20th century preferred private practice and avoided teaching/research. Fear of training surgeons who create competition.
- *“We need a system...which will produce not only surgeons, but surgeons of the highest type, men who will stimulate the first youths of our country to study surgery and to devote their energy and their lives to raising the study of surgical science.”*
- Halsted replaced apprenticeship model with surgical residency in 1890. Poor student at Yale, never checked out a library book. Started in NY with energy/passion for teaching. Became addicted to cocaine and morphine and went to Hopkins when their first choice backed out. Downhill after. (Osborne MP. 2007. PMID 17329196)
- Only unmarried men, available 24h/d, 7d/w, 365d/y. Numerous residents eliminated at each level of training. No specific length of training, as *duration determined by time required to attain necessary skills*. (Richmond BK. 2022. PMID 35331014)

Learning Curves



- Differ among surgeons, and “watch one, do one, teach one” is a fallacy
- In a time of transparency/scrutiny, ‘cracking a few eggs to get there’ can be problematic
- Push to adopt the flurry of new technologies can stress a provider as patients request new approaches (e.g., BPH therapies)
- Assessing place on the curve(s) requires objective viewpoint, metrics, time, interest

Need to stay relevant...



- Cars can drive without you
- AI can outperform many of us in select ways
- Most ESWL cases would've been fine without you being nearby
- Aquablation did more than you used to, and in much less time

What we know...



- Higher volume associated with lower mortality and complications
- Due to variation among surgeons, it is difficult to define a threshold for proficiency based on #cases or time spent training
- Continuous Professional Development (CPD) is felt to be poorly served by traditional CME (teacher-driven rather than learner-driven, didactic over interactive); ACS CPD committee offers mentoring/precepting for surgeons
- Self-directed learning requires deliberate practice and reflection, but this is improved upon by feedback

Embracing the Digital Age



- Patient found you online, watched your YouTube video, and went into a chatroom/online forum involving your patients
- They are sent a text reminder of their appointment and use an app to check their medical record, possibly doing a video visit
- Digital wallboard in clinic exam room offers condition/procedure-specific video information
- Automated checkout, text-message to complete online survey, with platforms to forward video messages leading up to surgery (e.g., Vidscrips)

Mixed Bag



- Iowa study of surgeons, surgery residents, and students found that 90% used video to prepare, with **YouTube the most common source**. (Rapp et al. 2016. PMID 27316383)
- **Low quality content** based on multiple scoring systems across Gen Surg, Plastics. (Gupta et al. 2023 PMID 36909043, Savran and Elibol 2023 PMID 36100244, Sturiale et al. 2020 PMID 32448106, Anand et al. 2021 PMID 34527472)
- However, other studies have found **high educational value**. (Chorath et al. 2022 PMID 34895376)
- Additionally, some scoring systems (e.g., LAP-VEGas) have been criticized for lack of relevance to social media platforms as an educational tool (Goh et al. 2022 PMID 36468899)

Journals? What are those?



- Over 100 pediatric surgeons and fellows studied in a randomized trial involving the impact of a detailed manuscript vs a surgical video in improving self-confidence relative to performing a specific operation.
- Both groups improved confidence from video, but only attending surgeons significantly improved from manuscript (Reck-Burneo et al. 2018. PMID 30483511)

Video



- Best modality to reflect on your performance, and perhaps the most effective means to illustrate surgical technique after the fact (also less investment of time/money than simulators)
- Used extensively for demonstrations at academic conferences
- Superior to verbal feedback alone and mitigates denial factor in surgeon self-assessment
- Assisted interpretation with an expert coach appears most valuable (since experience is associated with knowledge AND credibility)

Peer-based Coaching



- Increases accuracy of self-assessment of surgical ability (Bull et al. 2020. PMID 31570149)
- Barriers include time, concerns about reputation/image, notion that surgeons are at apex of ability
- We need skilled coaches who don't make others feel judged and people who are coachable
- Instructional Coaching seems more appropriate with a veteran/novice relationship and Reciprocal Coaching may be better when more senior surgeons are being coached (bidirectional learning)

His Airness

- “My greatest skill was that I was coachable. I was a sponge and aggressive to learn.” –Michael Jordan



Post Game Analysis



- Post Game video analysis of surgical cases was reported to improve subsequent performance by residents as early as 1969 (Goldman et al. PMID 5788379)
- Harvard study (2012) including Atul Gawande used video playback with peer-judged surgical experts as coaches and included an educational psychologist. (Hu et al. PMID 22192924; also highlighted in J Urol)
- Valuable at all levels; Coaching implies gradient in expertise and likely best for junior surgeons, whereas Post-Game Analysis better for peer-peer
- Feedback occasionally framed in terms of resident performance to make interaction less confrontational (same with QI/M&M)

Items of interest

- Choice of incision and quality of exposure
- Operative technique (technical + decision-making)
- Failure-to-progress and troubleshooting
- Identifying intraoperative teaching opportunities and style of teaching (may benefit from additional camera view and audio)



SPECIAL ARTICLE

Surgical Skill and Complication Rates after Bariatric Surgery

John D. Birkmeyer, M.D., Jonathan F. Finks, M.D., Amanda O'Reilly, R.N., M.S.,
Mary Oerline, M.S., Arthur M. Carlin, M.D., Andre R. Nunn, M.D.,
Justin Dimick, M.D., M.P.H., Mousumi Banerjee, Ph.D.,
and Nancy J.O. Birkmeyer, Ph.D., for the Michigan Bariatric Surgery Collaborative

- 20 surgeons watched peer video; blinded review of perceived skill level
- 1-5 scale and mean ratings ranged from 2.6 to 4.8
- Compared to top quartile, the **bottom quartile had significantly greater complication rates, mortality, operative time, and rates of reoperation**
- Suggested peer rating of operative skill may be effective strategy for assessing a surgeon's proficiency

Expert Coaching in Urology

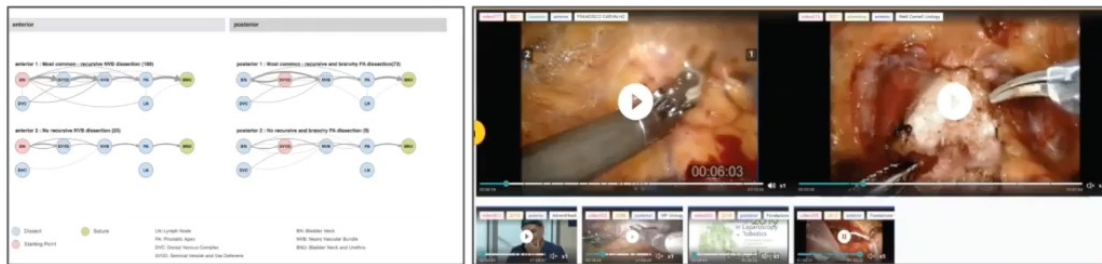


- Peter Scardino was trained on coaching methodology and then junior (<100 RALP), intermediate (100-500), and expert surgeons (>500) went through 3 one-hour coaching sessions using intraop video. (Fainberg et al. 2022 PMID 35872029)
- Goals were developed together b/w surgeon and coach
- Jr and Sr surgeons focused on different items, but all participants cited value and noted improved self-confidence
- Felt to potentially shorten the learning curve for complex surgeries

Video Analysis

Surch (Surgery + Search)

Video interface that supports structural search and cross-video comparison for surgery videos



Based on the findings of the interviews, we designed and implemented a system named Surch,

Surch: Enabling Structural Search and Comparison for Surgical Videos

- Computer vision model for surgical phase detection (281 prostatectomy videos)
- Allows comparisons between videos in synchronized playback
- Can click nodes for specific phases
- Learners found it improved task efficiency and self-confidence

Jeongyeon Kim, DaEun Choi, Nicole Lee, Matt Beane, Juho Kim. ACM CHI 2023

Telestration



Tips/Action Items

- Embrace the concept of CPD
- Seek input from a respected source
- Intentionally focus on being coachable and willing to change
- Aim small, miss small; give yourself credit for the wins





