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Peer video review and feedback improve performance in basic surgical skills

Carolyn J. Vaughn, M.D.[a,*], Edward Kim, M.D.[a], Patricia O'Sullivan, Ed.D.[b], Emily Huang, M.D.[a], Matthew Y. C. Lin, M.D.[a], Susannah Wyles, M.D.[a], Barnard J. A. Palmer, M.D., M.Ed.[c], Jonathan L. Pierce, M.D.[d], Hueylan Chern, M.D.[a]

[a]Department of Surgery, University of California San Francisco, 505 Parnassus Ave, M-593 San Francisco, CA, USA; [b]Medicine, University of California San Francisco, San Francisco, CA, USA; [c]Department of Surgery, University of California San Francisco- East Bay Program, San Francisco, CA, USA; [d]Department of Surgery, University of California Davis, Davis, CA, USA

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Abstract

BACKGROUND: Incorporation of home-video assessments allows flexibility in feedback but requires faculty time. Peer feedback (PF) may provide additional benefits while avoiding these constraints.

METHODS: Twenty-four surgical interns completed a 12-week skills curriculum with home-video assignments focused on knot tying and suturing. Interns were randomized into 2 groups: PF or faculty feedback (FF). Peers and faculty provided feedback on home videos with checklists, global rating, and comments. Learners' skills were assessed at baseline, during, and at the conclusion of the curriculum. Performance of the 2 groups as rated by experts was compared. FF and PF were compared.

RESULTS: Both groups improved from baseline, and the highest rated scores were seen on their home-video assessments. The PF group performed better at the final assessment than the FF group (effect size, .84). When using a checklist, there was no significant difference between scores given by peers and faculty.

CONCLUSIONS: The PF group performed better at the final assessment, suggesting reviewing and analyzing another's performance may improve one's own performance. With checklists as guidance, peers can serve as raters comparable to faculty.

The acquisition of technical skills has historically taken place in the operating room, but with work hour limitations putting constraints on time spent in the operating room, some of this teaching is conducted in a skills laboratory setting. Surgical skills laboratories vary widely in availability of resources in terms of protected time for learners, money for supplies, and faculty for teaching and assessment. One method around these constraints is video- or computer-assisted learning. Researchers report that computer-based video instruction can be as helpful as in-person expert feedback for the learning of basic surgical skills.[1] Video or computer training can be interactive and

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* Corresponding author. Tel.: +1-415-353-9985; fax: +1-415-353-4320.

E-mail address: carolyn.vaughn@ucsf.edu

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allow for slow motion or replay of each skill. In a longitudinal study, Summers et al[2] showed that those who learned by computer-based training actually had improved retention of skills at a 1-month follow-up evaluation compared with those who participated in a didactic session, despite no difference between groups in practice time for knot tying and less time spent practicing suturing skills among the computer-based training group compared with the didactic group. The results suggest that computer-based training may enhance the quality of at-home practice and allow learners to participate in more deliberate practice.[2]

The use of video-based assessments has the potential to alleviate some of the constraints on feedback. Assessment with videotapes of simple simulations has been shown to be feasible and reliable, and scores correlate with competence in the operating room.[3] Feedback is an essential component of new skill acquisition as it provides the learner with a clear understanding of a goal and how to make progress toward that goal.[4] Without good feedback, practice may be repetitive, but misguided; whereas in the setting of quality feedback, the learner can participate in deliberate practice.[5] Providing specific and timely feedback on basic skills in the educational laboratory setting can be difficult and requires attending surgeons to set aside valuable time for teaching sessions.[6] These constraints on feedback make it a resource-limited activity.

In our experience, although video-based assessments make it easier for faculty participation, they still require significant faculty time. Peer feedback (PF) has become a popular tool in many aspects of medical education and is another opportunity to alleviate the constraints on feedback. In addition to addressing faculty availability, there are other advantages to PF. When based on specific guidelines, PF in a surgical skills laboratory can promote better understanding of a task and can result in increased confidence, motivation, and camaraderie.[7] Teaching and critical assessment of peers stimulate insights and improvements in one's own work, especially if the assessment itself provides specific guidelines for refinements.[8] When coupled with educator guidance, peer assessments can be particularly beneficial because they emphasize the cooperative learning residents already practice in the hospital.[9]

In this study, we sought to evaluate the use of PF in the setting of our home-video curriculum for basic surgical skills. Specifically, we wanted to compare intern performance based on whether they received feedback from their peers or received faculty feedback (FF) and compare the quantity and quality of the feedback given by faculty and peers.

Methods

Given the advantages of video-based learning and assessment, we developed a home-video curriculum for surgical interns, which supplements our in-person teaching sessions.[10] The curriculum includes 5 assignments each with 4 to 8 tasks. Each assignment has a corresponding instructional video, which is 5 to 15 minutes long. (Videos can be accessed on YouTube at University of California San Francisco Skills Lab https://www.youtube.com/channel/UCBFtD8mo3M4EE3swn1vtvQg.)

Residents are given a 2-week period to complete each assignment. They are instructed to practice at home until they feel that their performance is ready for submission and review. Interns are equipped with flip-cams ($120) and tripods ($25) (both reused each year) so that they can perform and videotape these assignments at home in their free time. Alternatively, residents may use smart phones, but these need to be placed in a stable position.

This was a study to evaluate performance over time between those who received either PF or FF and determine the quality and concordance of PF and FF. Twenty-four surgical interns at the University of California San Francisco, Department of Surgery attended a biweekly surgical skills laboratory session, which covered basic knot tying and suturing skills. Skills were assessed at baseline, before starting the curriculum, with a 7-task assessment that was videotaped at the skills laboratory. The curriculum then consisted of six 3-hour in-person teaching sessions. All interns concurrently completed 4 home-video assignments with 6 to 7 tasks per assignment. The home-video assignments included the 7 tasks used in the baseline and final assessment. Each of the home-video assignments had a supplementary instructional video for review.[10] (Available at: https://www.mededportal.org/publication/9683.) Learners received a video camera and tripod to record their practice. There was no limit on the number of attempts, and they were to hand in their best performance. Number of attempts performed by the trainee was not recorded.

Interns were then randomly divided into 2 groups. The FF group ($n = 12$) received feedback from faculty; the PF group ($n = 12$) gave and received anonymous feedback to and from their peers. Faculty received deidentified videos and rated the videos on a global score (0 to 10) and with a checklist (scored yes or no for each item; Fig. 1).[11] Checklist scores were then normalized to a 10-point scale for comparison purposes. The feedback (global score, checklist, and comments) was returned to the interns before the completion of the next assignment. PF participants received deidentified videos of their peers in the PF group and provided feedback with the same global score (0 to 10) and same checklists. PF participants also received feedback before completion of the next assignment. Faculty raters were asked to watch the instructional videos and familiarize themselves with the checklist before grading the videos. Both faculty and peers were given the same instructions about the checklist, and both were allowed to fast-forward the video and selectively view the content. The time spent reviewing and grading the videos was not recorded for either faculty or peer raters. Faculty graded PF videos, but only for comparison purposes, and PF participants were blinded to the FF during the study period.

At the end of the 12-week curriculum, all interns were videotaped performing the same 7 tasks at a final evaluation