

Immediate Surgical Skills Feedback in the Operating Room Using “SurF” Cards

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Abstract

Background Ensuring residents develop operative skills requires application of the principles of guided learning, deliberate practice, and directed feedback.

Objective We sought to create and implement a tool to promote procedural “key” step review and immediate feedback on surgical skills, and examined faculty and resident satisfaction with surgical skills feedback.

Methods We created surgical skills feedback (SurF) cards for 8 gynecologic procedures. Faculty/fellows and residents completed prestudy surveys querying frequency of preoperative key step review and satisfaction with surgical skill feedback, a SurF card each time 1 of 8 procedures was performed, and poststudy surveys to evaluate for changes.

Results Prestudy surveys were completed by 31 faculty/fellows and 20 residents, with 55% (17 of 31) of the faculty/fellows and 5% (1 of 20) of the residents reporting key step review before surgery. All reported

low satisfaction rates with feedback frequency, quality, and timeliness. After implementation of SurF cards, preoperative key step review occurred in 78% (82 of 105) of the procedures. Twenty-one faculty/fellows (68%) and 16 residents (80%) completed our poststudy survey. Faculty/fellows reported statistically similar key step review ($n = 15$ [71%], $P = .23$), while residents reported that key step review had significantly improved ($n = 6$ [38%], $P = .01$). Resident satisfaction with feedback frequency (5% to 50%, $P = .002$) and quality (15% to 50%, $P = .02$) increased significantly.

Conclusions The SurF cards we developed facilitated procedural key step review, were associated with significantly improved resident satisfaction with surgical feedback, and could prove helpful with outcomes assessments, such as Accreditation Council for Graduate Medical Education–required documentation of Milestone attainment.

Introduction

Duty hour limitations and increased pressures for clinical efficiencies provide serious challenges to the long-standing

system of “learning by doing” in the operating room.^{1–3} The principles of guided learning, deliberate practice, and directed feedback provide effective, evidence-based strategies to address some of these teaching challenges.^{4–6} Using these principles, surgical teachers can provide learners with preprocedural preparation (guided learning), intraoperative direction (deliberate practice), and immediate postprocedure feedback (directed feedback), with benefits including improvements in immediate retention, delayed retention, and problem solving.⁵

The objectives of this study were to create and implement a curricular tool to promote both guided, procedural “key” step review as well as immediate feedback on surgical skills in the operating room. We also examined teacher and learner satisfaction with frequency, quality, and timeliness of surgical skills feedback to residents, before and after using this tool.

Methods

Residents, fellows, and faculty in the Department of Obstetrics and Gynecology at the University of North Carolina participated in this study from December 2010 through May 2011. Prior to the intervention study, there was no systematic approach to surgical skills feedback.

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BOX PROCEDURES FOR WHICH SURF CARDS WERE DEVELOPED

- Total abdominal hysterectomy
- Total vaginal hysterectomy
- Total laparoscopic/robotic hysterectomy
- Bilateral salpingo-oophorectomy
- Diagnostic laparoscopy
- Anterior repair
- Posterior repair
- Cystoscopy

The Surgical Skills Feedback card or “SurF” card was modified from an evaluation tool presented at the 2010 Association of Professors of Gynecology and Obstetrics (APGO) Faculty Development workshop (A. Currrens, S. T. Romero, and S. L. Galvin, written communication, November 2010). SurF cards were created by applying key concepts on which the objective structured clinical examination is based: (1) Expert opinion input guides content for instruction and evaluation,^{7,8} and (2) Faculty development aims to ensure consistency with instruction and assessment.^{9–12}

UNC Department OB/GYN
Surgical Skills Feedback Card

Laparoscopic BSO

Indication: _____
Date: _____

Level descriptors found on back of this card

Key Steps	Novice	Adv. Novice	Apprentice	Competent	Expert	N/A
Position patient						
Place ZUMI / KOH ring / uterine manipulator						
Enter abdomen / pelvic survey / port placement						
Transect round ligaments and / or open side wall peritoneum						
Develop retroperitoneal space, identify ureters, transect IPs						
Develop the medial border of the dissection						
Develop the anterior / caudal border of the dissection						
Assist while completing opposite side (including use of camera)						
Remove adnexa from the body						
Remove ports						
Close skin; as appropriate, close fascia						

Pre-procedure review of Key Steps.

Overall competence demonstrated with this procedure.

Yes Yes No

Faculty Signature: _____ Resident Signature: _____

UNC Department OB/GYN
Surgical Skills Feedback Card

Laparoscopic BSO

Resident Name: _____

Resident: Identify 2 things done well:

1. _____
2. _____

Resident: Identify 2 things to improve:

1. _____
2. _____

Faculty/Fellow: Identify 2 things done well:

1. _____
2. _____

Faculty/Fellow: Identify 2 things to improve:

1. _____
2. _____

Initials:

Faculty/Fellow: _____

Resident: _____

Resident	Overall Procedure Level	Faculty/Fellow
☐	Expert Performs procedure and manages complications independently	☐
☐	Competent Performs procedure independently; partial guidance with complications	☐
☐	Apprentice Minimally guidance needed with procedure; moderate guidance with complications	☐
☐	Adv. Novice Moderate guidance needed with both procedure and complications	☐
☐	Novice Limited understanding; full guidance needed with procedure and complications	☐

FIGURE 1

SURGICAL SKILLS FEEDBACK (“SURF”) CARD (FRONT AND BACK): LAPAROSCOPIC BSO

Note: Although exact time was not recorded, roughly 20 hours was used to develop the SurF cards. SurF card copies are available upon request.

TABLE 1	“KEY” STEP REVIEW		
Survey Participants	Key Step Reviewed ^a		
	Yes, No. (%)	No, No. (%)	P Value ^b
Residents			
Preintervention survey, n = 20	1 (5)	19 (95)	.01
Postintervention survey, n = 15	6 (38)	10 (62)	
Faculty			
Preintervention survey, n = 31	17 (54.8)	14 (45.2)	.23
Postintervention survey, n = 21	15 (71.4)	6 (28.6)	

^a Key step review responses: yes, response of *half of the time, most of the time, or all of the time*; no, response of *never or some of the time*.
^b χ^2 analyses.

The SurF cards were developed using publications from the Council on Resident Education in Obstetrics and Gynecology^{13,14} and *Te Linde’s Operative Gynecology*,¹⁵ with these resources used to outline the key steps of each procedure. Key steps were reviewed by faculty, and agreement was reached regarding specific key steps to include. Development of the SurF cards took approximately 20 hours.

The 8 procedures selected for SurF card development (shown in the BOX) were typically scheduled in advance in the Department of Obstetrics and Gynecology. An example of a SurF card (FIGURE 1) shows that the rating scale uses the Dreyfus model for the acquisition of competence.¹⁶ In December 2010, residents, fellows, and faculty in the program were oriented to the study and to SurF cards. Participants were instructed to complete a SurF card for each scheduled case involving 1 of the 8 procedures. Postprocedure, residents completed self-assessments of individual key steps and overall procedure ability level. Then, while in the operating room with the resident, faculty performed a similar review.

The same study participants were asked to complete preintervention and postintervention surveys. Surveys were developed by the first author and were reviewed prior to

implementation by the study team. These surveys included questions on whether preprocedural review of key steps occurred as well as questions on satisfaction with feedback frequency, quality, and timeliness, which were rated on a 5-point Likert scale. The presurveys and postsurveys were identical, with the poststudy survey having additional questions addressing SurF card use. The survey did not undergo validity testing.

The University of North Carolina Institutional Review Board deemed this work exempt from ongoing review.

Data were analyzed with descriptive, χ^2 , and Spearman correlation coefficient testing using SPSS version 19.0 (IBM Corp).

Results

From December 2010 through May 2011, participants completed SurF cards for relevant operating room cases. In May 2011, the poststudy survey was administered. Fellow and faculty data are reported together as “Faculty” because fellows provide feedback to residents on these generalist procedures. Prestudy surveys were completed by 31 of 37 eligible faculty (84%) and 20 of 20 (100%) eligible residents, with key step review before surgery reported by 17 of 31 (55%) faculty and 1 of 20 (5%)

TABLE 2 RESIDENT SATISFACTION (SATISFIED, VERY SATISFIED, OR EXTREMELY SATISFIED) WITH FEEDBACK RECEIVED FROM FACULTY ^a			
Characteristic	Prestudy Total (n = 20), No. (%)	Poststudy Total (n = 16), No. (%)	P Value ^b
Frequency	1 (5)	8 (50)	.002
Quality	3 (15)	8 (50)	.02
Timeliness	3 (15)	7 (44)	.05

^a Total number of eligible residents: 20.
^b χ^2 analyses.

TABLE 3 FACULTY SATISFACTION (SATISFIED, VERY SATISFIED, OR EXTREMELY SATISFIED) WITH FEEDBACK GIVEN TO RESIDENTS^a

Characteristic	Prestudy Total (n = 31), No. (%)	Poststudy Total (n = 21), No. (%)	P Value ^b
Frequency	10 (32.3)	10 (47.6)	.37
Quality	13 (41.9)	14 (66.7)	.21
Timeliness	10 (32.3)	13 (61.9)	.11

^a Total number of eligible faculty: 37.

^b χ^2 analyses.

residents (TABLE 1). All study participants reported low rates of satisfaction with the prestudy practice of providing feedback on procedures (TABLES 2 and 3).

SurF cards were completed for 105 of 572 (18%) of the eligible procedures during the study period, with cards completed for all 8 procedures included in the study. Analysis of SurF cards completed during the study period showed that review of preprocedural key steps was documented in 82 of 105 cases (78%). Residents recorded their own overall performance level in 90 of 105 cases (87%), and faculty recorded resident overall performance level in 93 of 105 cases (89%). There was a strong positive correlation between resident and faculty ratings of performance ($r = 0.83$, $P < .01$).

The poststudy survey was completed by 21 faculty members (57%) and 16 residents (80%). Faculty key step review was similar, while resident-reported review improved significantly (TABLE 1). Residents also reported significantly improved satisfaction with feedback frequency and quality, while faculty reported no difference in satisfaction with feedback (TABLES 2 and 3).

Overall, 70% (26 of 37) of respondents reported that the SurF card program improved their satisfaction with feedback (FIGURE 2).

Discussion

The SurF card process provided real-time opportunities for direct incorporation of literature-supported guided learning and directed feedback^{17,18} into the surgical curriculum, and was implemented within 6 months. Faculty and residents performed task-specific, preprocedural, key step review in almost 80% of cases. Feedback occurred immediately after the procedure, most often while still in the operating room with residents self-assessing their own performance before faculty assessment. In most cases, there was a strong positive correlation for performance level on each key step, and for the procedure overall.

Prior work has addressed the utility of simulation models and workplace assessments to measure procedural skill ability.^{19–22} Much of this prior work, such as the BID (briefing, intraoperative teaching, debriefing) model¹⁹ has not assessed satisfaction with feedback. The SurF card process provided an instructional tool that significantly improved resident satisfaction with feedback frequency and quality. When asked to comment on the SurF cards, 70% (26 of 37) of respondents reported that the program improved their satisfaction with feedback, whether given or received.

This study has limitations, including the use of a survey tool without validity evidence. Respondents may not have interpreted questions as they were intended. In addition, there was no reliability or validity testing of the SurF cards. Although SurF cards were readily available in operating room holding areas, a low rate of card completion was noted. This may have resulted from challenges in having faculty members remain after cases to perform such review or from faculty not feeling adequately skilled to provide such procedural skill feedback. The low completion rate may also have resulted from the fact that it may take longer than 6 months to affect changes in faculty teaching behavior, which may have contributed to the finding that, although resident satisfaction with feedback improved significantly, it

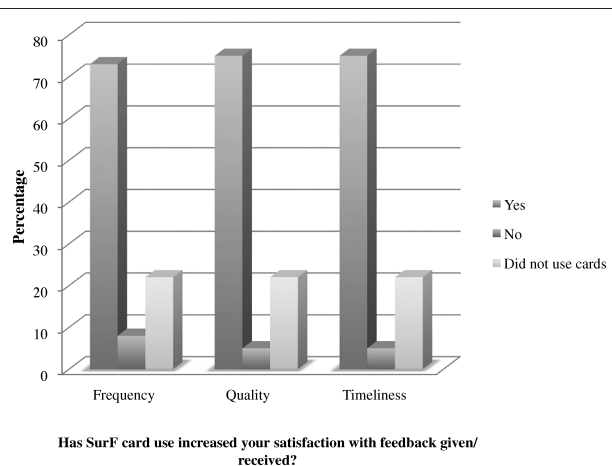


FIGURE 2 CARD USE AND REPORTED SATISFACTION WITH FEEDBACK GIVEN AND RECEIVED

was still only 50% (8 of 16). Finally, this was a single site study and may not be generalizable to other sites or programs.

Future work in this area in our department will include extension of the SurF cards to obstetrics procedures and instituting a requirement that SurF cards be completed for 50% of procedures performed.

Conclusion

The SurF card process facilitated procedural key step review and was associated with improved resident satisfaction with feedback. This approach could be implemented in clinical training settings for outcomes documentation, such as procedural skills and Accreditation Council for Graduate Medical Education–required Milestone attainment.

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