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Supplemental Digital Appendix 1

End-of-rotation Evaluation Used for Assessing Surgical Residents at Northwestern University Feinberg School of Medicine, 2015-16

Resident Evaluation							
	[Subject Name] [Subject Status] [Evaluation Dates] [Subject Rotation]				Evaluator [Evaluator Name] [Evaluator Status]		
	PATIENT CARE						
	1) Diagnosis						
Unable to perform accurate H+P	Performs a focused, efficient and accurate H+P of all patients including critically ill patients	Accurately diagnoses <u>many</u> common conditions and initiates management for some	Accurately diagnoses and initiates management for <u>most</u> common conditions	Recognizes <u>atypical presentations</u> of a large number of conditions	Not observed		
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
2) Postoperative care							
Does not recognize or manage common post op problems	Manages common post op problems with a senior resident <u>physically present</u>	Manages common post op problems with a senior resident <u>available by phone</u>	Manages common and complex post op problems <u>independently</u>	Supervises junior residents managing common and complex postoperative problems	Not observed		
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
3) Technical skills							
Lacks basic surgical skills (e.g. knot tying, NG tube, foley, I+D)	Has basic surgical skills (e.g. knot tying, NG tube, foley, I+D)	Has respect for tissue and developing instrument handling skills	Proficient at most instrument handling and exhibits technical efficiency	Proficiency in use of all instruments and equipment for essential operations	Not observed		
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
4) Operative autonomy							
Unprepared for most operative experiences	Show and tell for most common operations	Active help for most common operations	Passive help for most common operations	Supervision only for most common operations	Not observed		
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
MEDICAL KNOWLEDGE							
5) Knowledge about diseases							
Lacks basic knowledge expected of a medical student	Understands signs, symptoms and treatment of some common conditions	Basic knowledge and recognizes variations in presentation of many common conditions	Significant knowledge of many common conditions	Comprehensive knowledge of common conditions and basic knowledge of advanced conditions	Not observed		
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
6) Knowledge about operations							
Does not know steps of common operations	Basic knowledge of <u>some</u> steps of common operations	Basic knowledge of steps and perioperative care for <u>many</u> common operations	Significant knowledge of <u>most</u> common operations, basic knowledge of <u>some</u> complex operations	<u>Comprehensive</u> knowledge of common operations, basic knowledge of <u>many</u> complex operations	Not observed		
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
SYSTEMS-BASED PRACTICE							

7) Discharge Planning	No knowledge of steps required for safe discharge	Lists resources available (e.g. social work, OT, PT)	Knows how to access resources including complex ones (e.g. home TPN or antibiotics)	Efficiently arranges disposition planning including preparing all necessary materials	Coordinates activities of residents, nurses, etc. to optimize discharge planning	Not observed
8) Health systems	No understanding of health care delivery systems	Knows how health systems operate and recognizes systems component to medical errors	Understands how local hospital works and follows protocols and guidelines for care	Makes suggestions for changes and reports problems with technology	Participates in QI project and develops protocols to improve care	Not observed
PRACTICE-BASED LEARNING						
9) Teaching	Ignores or abuses students	Teaches willingly and uses media appropriately	Communicates accurately and effectively to learners and at conferences	Effective teaching when responsible for conference or formal presentation	Recognizes teachable moments and engages learner	Not observed
10) Self-directed learning	No self-directed learning	Participates in conferences and learning activities	Independently uses literature to answer questions related to patients	Looks for patterns in patient care and uses literature to understand them	Leads skills experiences and conferences for junior learners	Not observed
11) Personal learning plan	Unaware of gaps in knowledge	Identifies weaknesses in knowledge base or technical skills	Develops learning plan to address gaps	Independently practices surgical skills	Develops process to keep up with literature	Not observed
12) Care improvement	Does not recognize impact of errors or demonstrate interest in improving	Actively participates in M+M, responds appropriately to feedback	Uses relevant literature to support discussions at M+M	Identifies probable causes for bad outcomes and strategies for improving care	Ongoing self-evaluation and improvement applying strategies developed from M+M to patients	Not observed
PROFESSIONALISM						
13) Professional behaviors	Undesirable behaviors (e.g. lying, disrespectful)	Polite, respectful, responsive, honest and trustworthy	Maintains composure under stress, recognizes limits of knowledge	Accepts responsibility for error and initiates corrective actions	Role model for colleagues, consistently prioritizes patient needs	Not observed
14) Personal Health	Behavior and physical	Complies with duty hour standards, understands	Monitors own personal health and mitigates fatigue or stress,	Models appropriate management	Promotes a healthy work environment	

	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15) Administrative tasks						
Poor response time to pages/emails, many incomplete records	Op logs, duty hours up to date with minimal reminders	Prompt conference attendance and pager responses	Ensures others under their supervision respond to responsibilities	Sets an example for attendance, promptness and attention to administrative tasks	Not observed	
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

INTERPERSONAL AND COMMUNICATION SKILLS

16) Communication with patients						
Unclear or disrespectful	Effective communication of basic information to patients and families	Customizes communication and ensures appropriate updates as plan changes	Delivers bad news sensitively and effectively	Negotiates and manages conflicts with patients and families	Not observed	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17) Communication with team						
Disrespectful or resentful	Willingly exchanges info with team, consultants, performs handoffs of care	Invites information sharing with other team members	Discusses plans and updates team members, delivers information appropriately during transitions of care	Assumes leadership of team by seeking and valuing input from all, supervises transitions of care	Not observed	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18) Communication in the OR						
Gives incomplete or incorrect information	Communicates key facts, understands elements of informed consent	Leads a time out, performs informed consent discussion for basic procedures	Anticipates logistical issues for OR, performs informed consent discussion for complex procedures	Capable of leadership during unexpected events in the OR	Not observed	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

19) In the comment box below, please provide feedback regarding the resident's Technical Skills:

Comment Box

Remaining Characters: 5,000

In the comment box below, please list 3 strengths and 3 areas of improvement for this resident:

Overall Comments:

Supplemental Digital Appendix 2

SIMPL Questions Used to Assess the Intraoperative Performance (A) and Autonomy (B) of Surgical Residents from the Northwestern University Feinberg School of Medicine, (2015-2016)

*SIMPL (system for improving and measuring procedural learning), a smartphone-based application, is an assessment tool used to provide immediate feedback to residents in the workplace. SIMPL ratings are based on the Zwisch Scale. For more information on the Zwisch Scale, see Bohnen JD, George BC, Williams RG, et al. The feasibility of real-time intraoperative performance assessment with SIMPL (System for Improving and Measuring Procedural Learning): Early experience from a multi-institutional trial. J Surg Educ. 2016;73:e118-e130.

A

The screenshot shows a smartphone interface for the SIMPL app. At the top, the status bar shows 'Verizon', signal strength, time '4:06 PM', and battery '72%'. The app header has a dark blue bar with 'BACK', 'Performance', and 'CLOSE' buttons. Below the header, the date and time 'FRI 4/01/2016 4:03 PM' are displayed, followed by the procedure name 'Cholecystectomy (laparoscopic)'. A profile picture of a person is shown next to the name 'Brian George'. Below this, a question is posed: 'What was this resident's performance for the majority of the critical portion of this procedure?'. To the right of the question is an information icon (a lowercase 'i' in a circle). Below the question are five teal-colored buttons with white text: 'Unprepared / Critical Deficiency', 'Inexperienced w/ Procedure', 'Intermediate Performance', 'Practice-Ready Performance', and 'Exceptional Performance'.

B

The screenshot shows a smartphone interface for the SIMPL app. At the top, the status bar shows 'Verizon', signal strength, time '4:06 PM', and battery '72%'. The app header has a dark blue bar with 'Zwisch' and 'CLOSE' buttons. Below the header, the date and time 'FRI 4/01/2016 4:03 PM' are displayed, followed by the procedure name 'Cholecystectomy (laparoscopic)'. A profile picture of a person is shown next to the name 'Brian George'. Below this, a question is posed: 'How much guidance did you provide for the majority of the critical portion of this procedure?'. To the right of the question is an information icon (a lowercase 'i' in a circle). Below the question are five teal-colored buttons with white text: 'Show & Tell', 'Active Help', 'Passive Help', and 'Supervision Only'.

Supplemental Digital Appendix 3

Random Effects Contributing, to Different Degrees, to Variance in Both End-of-Rotation (EOR) and SIMPL Scores in a 2017 Study Comparing EOR and SIMPL, a Workplace-Based, Post Operative Case Feedback Tool at Northwestern University Feinberg School of Medicine

	<i>Variance</i>	<i>Proportion of Total Variance</i>
Faculty on EOR Evaluation	0.21	0.21/0.59
Resident on EOR Evaluation	0.02	0.02/0.59
Rotation on EOR Evaluation	0.11	0.11/0.59
Residual on EOR Evaluation	0.26	0.26/0.59
Resident on SIMPL	0.14	0.14/0.82
Rotation on SIMPL	0.51	0.51/0.82
Residual on SIMPL	0.17	0.17/0.82