A Model for Developing ACGME Competencies in an Academic Anesthesiology Department

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Special Article

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Abstract

In response to the American College of Graduate Medical Education's Outcomes Project and its mandate for a transition to a competency based curriculum, the Department of Anesthesiology at the Penn State Milton S. Hershey *Medical Center executed a focused 18 month program which* engaged the entire faculty and effected not only curricular. but cultural change in how anesthesiology residents are taught and evaluated. This article describes the process through which the department leadership educated, engaged, and focused the department's efforts and created an environment that sustained progress and provided incentives for performance. This process also resulted in the development of a novel web based evaluation tool tailored to meet the challenge of evaluating performance in the context of a competency based curriculum. This model, which proved effective for transition to a competency based curriculum, is one which can be applied to any large scale departmental education initiative.

Key Words – Curriculum, Competency, Evaluation, GME

In 1999 the American College of graduate medical Education (ACGME) established the framework for what was arguably one of the most sweeping changes in graduate medical education. The general competencies endorsed in the Outcomes Project were designed broadly to allow their adaptation across all medical specialties and accredited training programs. The broad nature of their definition required that each specialty interpret and adapt the competencies individually. This article describes the steps taken to develop a department-wide initiative to teach and evaluate the six ACGME general competencies in an academic anesthesiology program. We describe the processes the department used to develop faculty awareness, and involvement in production of curriculum and evaluation criteria, leading to the development of a novel computerized competency-based evaluation tool.

Background: ACGME Outcomes Project

The ACGME has become increasingly concerned about patient safety and assuring the public that practitioners are competent to practice their specialties.^{1 2 3} Recognizing this accountability, the ACGME developed the Outcomes Project. This project increases the emphasis on *educational outcomes* rather than the educational process (leading to improvement in the health of patients and society in general) for both the physician in residency and the training program. This change in emphasis would be effected through the mechanism of program recertification. Prior to this initiative, residency programs were accredited based on their *potential* to train residents, rather than the *outcomes* of this training. The ACGME Outcomes Project focuses criteria for accreditation on a program's ability to evaluate "competent practice".¹

After a survey of competency measures in medicine and consultation with stakeholders in Graduate Medical Education, the ACGME defined six General Competencies of medical practice as Patient Care, Medical Knowledge, Practice-Based Learning and Improvement, Interpersonal and Communication Skills, Professionalism, and Systems-Based Practice. Incorporating these concepts in the Program and Institutional Requirements, residency programs were expected to identify learning objectives essential to each of the general competencies, using increasingly more dependable (valid and reliable) methods of assessing residents' attainment of these competency-based objectives, and using outcome data to facilitate continuous improvement of both resident and residency program performance. Beyond a simple "paper" change to curriculum, this initiative required a "cultural change" in how resident training and evaluation was implemented by faculty and institutions mandating a departmental approach.

Planning for Department ACGME Competency Initiative

At the time of the initiation of this endeavor, the Penn State Department of Anesthesiology was comprised of 35 faculty and 42 residents (Post Graduate Year 1 through 4), had recently received a 5 year accreditation from the RRC for Anesthesiology, and had a history of innovation and institutional leadership in graduate medical education. The department leadership recognized that successful implementation of the Outcomes Project would require a shared vision within the department of how the general competencies applied to the practice of anesthesiology. Creating this shared vision would require a coordinated departmental effort incorporating a team Leader for

each competency identified by the department chair, preliminary education of Faculty and Residents on the General Competencies, and engaging all faculty and selected residents, representative of future academic faculty, in the process and as members of a specific Competency Team. While initial background research by each team would be required to establish a starting point for the definition of each general competency, an off-site retreat was identified as an essential component in focusing the efforts of the department as a whole, minimizing redundancy, and maximizing productivity. It was also agreed upon that initial efforts would focus on addressing the general competencies where the greatest need and best chance for early success were identified. A review of the current curriculum and outcome measures such as in service training exam scores, Anesthesia Knowledge Test (AKT) performance, and American Board of Anesthesiology (ABA) board certification pass rates, led the department leadership to conclude that the competency of Medical Knowledge was already well addressed. In addressing the competency of Systems-based Practice it was noted that this competency was undergoing development at the institutional level by the Office of Graduate Medical Education as part of the common program requirements. To avoid redundancy of effort, a determination was made to postpone development of a curriculum for Systems Based Practice to allow institutional efforts to develop and mature.

After this preliminary assessment it was determined that the departmental initiative would focus on the general competencies of Patient Care, Interpersonal and Communication, Professionalism, and Practice Based Learning and Improvement. Using the next faculty meeting to start the initiative, volunteers were solicited for the Competency Development Teams, a time line and format for the retreat was established, and a schedule for pre-retreat team preparation was put in place.

Over the subsequent six week period resources about the general competencies and the evaluation of residents were distributed including the ACGME "Toolbox of Assessment Methods"⁴, and faculty volunteered for specific Competency teams. A formal action plan based on the time line established during the faculty meeting was put into place ensuring prompt formation of Competency Teams and timely retreat preparation including reports from each Team Leader at a Faculty Meeting 2 weeks prior to the retreat.

Faculty development in the form of coaching in team formation and competency development was provided to the team leaders by the department educationalist. In final preparation for the retreat, a National expert on ACGME Competency Development, Dr. Rita Patel, Assistant Dean for GME and Faculty Development, University of Pittsburgh School of Medicine, conducted a Grand Rounds entitled "ACGME Evaluations". An example of what a successful Retreat Summary would look like was discussed with the Department at Grand Rounds, including the importance of creating an Action and Implementation Plan.

The Retreat

The Retreat was designed to maximize time utilization, assure production of an executable plan, and, recognizing that there would be significant potential for overlap in evaluation tools, minimize redundant efforts. The basic format consisted of Large Group

presentations to define and maintain the group goals alternated with Small Group (Competency Team) breakout sessions to refine the goals into executable objectives. This format required that each Competency Team come to the retreat with background work completed. By defining each competency as it applied to anesthesiology and identifying areas of clinical practice where these competencies could be best evaluated before the retreat, the focus of the retreat became one of integration and implementation. The result of the retreat was a set of action plans for each Competency Team that focused enough to minimize redundant efforts yet still tied to a unified the department goal of establishing a common definition and expectation for the selected general competencies.

Follow-up Plan

In an effort to maintain the momentum generated by the retreat, essential action items were identified as the keys to maintaining continued competency development. Oversight and accountability for these items fell to the Chair and Executive Committee establishing this program as a high priority initiative within the department. At the core of these action items were regular progress updates to the Chair from each Competency Team as well as scheduled department updates as part of grand rounds presentations. These regular reports kept the mission of establishing a competency based curriculum at the forefront and kept team projects from "dying on the vine." Competency related projects were given a high priority for department allocation of non-clinical time and financial support encouraging and rewarding participation in competency based initiatives at local and national levels. While these initiatives raised the awareness and priority of the initiative at the department level, at the individual level, active participation in competency development was adopted as an expectation for each faculty, and individual contributions were incorporated in performance appraisals by the Chair.

Development of Curriculum

As the Competency Teams defined competent practice and established tools for evaluating performance, the existing curriculum was converted to a competency-based format. In its simplest form this process consisted of three steps the first of which was a direct "translation" of the existing curriculum content, organized "taxonomically", to a format consistent with teaching and learning anesthesiology from a "competency" perspective. A simple template that outlined each of the six competencies was used to review the existing content. Faculty subspecialty directors were asked to simply "cut and paste" their topics into the template. Recognizing that there were common elements that spanned all areas, each anesthesiology subspecialty segment in our training program was considered additive to the general expected knowledge of the anesthesiologist, which allowed specific competency element education to be placed in the specific subspecialty rotation of best fit, building on experience in prior rotations without creating excessive As an example, we chose the cardiac anesthesia rotation as the redundancies. subspecialty curriculum in which the prescription, implementation, and use of invasive monitors would be addressed in the greatest depth. Knowing that this area would be covered in detail during the cardiac rotation allowed other subspecialty rotations to devote time and resources in other areas of competency, avoiding redundancies and allowing residents and faculty to focus energy and time for education on developing the depth of knowledge and practice required of a consultant. Once reorganized, the resulting competency-based curriculum was reviewed to identify gaps where competencies were not fully addressed. The use of a standardized template allowed for easy identification of competencies that were not addressed for a given subspecialty. Lastly, competency-based curriculum elements were developed to address the gaps with an emphasis placed on identifying explicit items of knowledge, skill, and affect that could be evaluated.

An Example of the Process - "Professionalism" Competency Education Development

The Competency Team on Professionalism members were six department faculty members, one resident, and one department administrative staff member (the Residency Coordinator).

Prior to the retreat, the Team explored literature on the elements of professionalism from broad medical and specific anesthesiology literature. This research was then applied to the competency as defined by the ACGME (figure A). Three of these elements - patient confidentiality, informed consent, and sensitivity to a patient's medical problems - were identified by the group as being particularly relevant to teaching and evaluation in an Anesthesiology Perioperative Care curriculum. The team decided to build from these key elements of professionalism and chose the Preoperative Anesthesia Clinic setting as best suited to teaching, learning, and evaluating professionalism competencies. The team then organized and developed a detailed education system conveying the knowledge, skills, and attitudes that residents must demonstrate. Didactic and clinical teaching experiences were planned for each of these three elements. As an example, figure B shows a part of the teaching program developed for the element of "informed consent". This program emphasized feedback to each resident from patients during a preoperative interview, and faculty members observing the interaction. A subsequent postoperative patient interview provided an opportunity to see the more personal side of patients, and to provide continuity of interaction with the patients seen preoperatively, enhancing professionalism feedback to the resident. Finally, the team reviewed the elements shown in figure A, in light of broad professionalism concepts, the practice of Anesthesiology, and specifically, the preoperative interview. The team then developed a list of discrete skills, knowledge, and attitudes or judgments as a comprehensive resident assessment tool (figure C). They also created a patient assessment form (figure D) to collect direct patient feedback. These tools would be used by the resident and the faculty members to assess both the resident's level of professionalism and the effectiveness of the education system in developing professionalism competency.

Development of a Computerized Evaluation System

It was evident early on that the clinical evaluation tool in use prior to this initiative did not accurately assess the characteristics being identified by the competency teams. The system was paper based and designed to evaluate the resident's general performance based on the elements of the American Board of Anesthesiology's (ABA's) clinical competence report.⁵ This general approach lacked specificity, allowing a broad range of interpretation and subsequently poor inter-rater reliability. As an interim step, a competency-based evaluation form was created with twenty-one items that broadly covered the six ACGME General Competencies. Beyond filling the immediate need for a competency based evaluation tool, it also provided reinforcement of the faculty development component. Faculty were actively engaged in a more "theoretical" discussion of how the competencies should be taught and evaluated within the department at the same time the change to this interim evaluation tool forced early adaptation of the competencies as part of the faculties' daily evaluation and feedback of residents. Forcing early adaptation in the clinical teaching environment provided a "reality check" for the application of ideas discussed in the competency teams. However, as we attempted to use feedback from the competency teams to improve the evaluation form and incorporate all elements of competence for all six general competency areas, we quickly came to realize that a single static tool would not suffice. Inconsistencies in the interpretation and application of survey questions between raters limited the ability to compare evaluations and spot trends in performance. Referred to as inter rater reliability, this variability is often a result of non specific questions or evaluation scales. The broad nature of questions applicable to the competencies still left a great deal of leeway for interpretation (inference) which impaired inter rater reliability. If a single tool were created that limited inter-rater reliability by covering specific items of performance (a low inference tool), it would require faculty to review an extensive list to find items applicable to the current patient and clinical situation for a given resident performance evaluation. As a result faculty would be less apt to invest the time and effort required to fill out the entire form resulting in omitted data. If created as a high inference tool, with a limited number of open ended statements, as was our initial form, variability in the interpretation of expectations by faculty would resulted in a low degree in inter-rater reliability and little specific information to use in identifying performance deficits. Our answer to this dilemma would require a "smart" evaluation system that linked general statements of competence to specific expectations for performance, allowing faculty general expectations to be filtered and focused using specific task lists.

A second problem identified in converting to competency-based evaluation was that reports to the ABA still required evaluation using the ABA Clinical Competence Report (CCR) which referred to resident performance in terms of the Essential Elements, Professional Skills, Knowledge, Judgment, and Clinical Skills. While the ABA had incorporated some ACGME competency language into the CCR, it was far from a one to one relationship. As a result the department's Resident Clinical Competency Committee was faced with translating between the two evaluation tools when submitting reports to the ABA or developing remediation programs. To meet this challenge, our "smart" evaluation system would have to cross reference items of competency and their associated expectations of performance to ABA elements of performance.

We recognized the need for a "smart" evaluation tool that was competency based, used discrete data points (to limit inter rater variability), provided an opportunity for resident self evaluation (developing the competency of Practice Based Learning and Improvement), and provided a "crosswalk" for linking items of AGCME Competency to elements of ABA Clinical Competence. In addition it would require an interface that was easy use, encouraging and facilitating regular faculty evaluations. Our solution was to develop a database of competency based questions each with an associated detail list

that describes expected actions and attitudes necessary to perform "competently". Using feedback from the competency teams, twenty questions and their associated expectations were identified for each of the 6 ACGME Competencies and linked to the ABA elements of Clinical Competence, and the appropriate cognitive domains (knowledge, skill, or judgment)⁶. After a search of existing commercial survey tools, we were unable to identify a system that would allow dynamic user interaction with the data base and we established the need to develop our own survey tool.

The resultant evaluation tool is a Web-based system which automatically selects a set of 15 questions applicable to the clinical environment, two for each of the six competencies and three specific to airway management regional anesthesia, and invasive monitors. Residents are evaluated based on expectations for their level of training and use a programmed algorithm to ensure follow-up in problem areas by increasing the frequency of selection of questions previously graded below level of training and decreasing the frequency of repetition of items previously evaluated as competent. To provide context to the evaluation the program also requires the evaluator to include written comments. Figure E shows a screen shot of a sample evaluation for a CA3 resident. At the top it is noted that 8 questions reflect areas where the resident has been rated poorly in the past and 4 were selected from the database. The evaluation scale represents a continuum of progression from medical student to consultant where each point of the evaluation scale represents 6 months of training. In this example the default response is in the CA3 column, showing that the resident is currently in the first 6 months of the CA3 year. If a faculty felt that the resident's performance was more indicative of a resident in their CA2 year they would simply shift the score down one or two points representing the last 6 months and first six months of the CA 2 year. The first 12 questions are ACGME competency related while the last three are specific to clinical management questions asked of all residents. The comment box at the bottom is provided to expand on the faculty's observations and input in mandatory. Initial beta testing has been successful, and has provided specific competency based evaluation to the department's Resident Competency Committee. This has facilitated biannual resident evaluations and aided identification of specific areas for focused resident remediation.

Summary

This article discusses the transition of a department from a taxonomic to an ACGME competency based curriculum. However, it is the opinion of the authors that this process could be equally applied to other issues that require a cultural shift within a department. Using a business management approach to an education issue resulted in an initiative that first defined the problem at the executive level and identified a desired goal and objectives. The goal was to facilitate a departmental transition to meet the ACGME's requirement for competency based resident education with objectives that included the need to educate the faculty about the competencies, rewrite curriculum in a competency format, and change the way we evaluated residents to reflect this new approach. Recognizing that a "top down" mandate from a small number of key faculty would not result in the desired cultural change, the department invested the time and resources to engage the entire faculty in the process through a series of meetings and presentations. In addition the change was given a high profile and priority by making the faculty's contributions part of their personal performance evaluations and by setting aside valued

non clinical time and meeting time for those individuals actively engaged in facilitating change. Recognizing that a change of this magnitude would not happen overnight, ample time was allotted for the initiative, however, there was the hard deadline for completion within 24 months set by a pending ACGME Residency Review Committee (RRC) site visit.

All key metrics for success were met including complete revision and documentation of curriculum into a competency based format and revision of the evaluation tools used by faculty to reflect the ACGME competencies. Had this project been left to the Program Director as an individual project the time required for completion would have been prohibitory, and perhaps even more importantly, application of the end product by the faculty would have suffered from their lack of understanding of the competencies. The process of actively engaging the faculty in the application of the competencies resulted in transitions in other areas as well. Competency based education and evaluation has continued to develop within the department and has been integrated into the metrics of the Clinical Competency Committee and the Quality Assurance Committee. The ultimate validation of this initiative came with the RRC's site visit. As part of the site visit the curriculum and evaluation tools were reviewed and both faculty and residents were interviewed to asses the application and integration of the ACGME's competencies into the residency training program. We are happy to report that the result of this evaluation was a full 5 year accreditation with no citations including a specific notation in the letter of notification that "the Review Committee commended the program for its demonstrated substantial compliance with the ACGME's Requirements for Graduate Medical Education" suggesting that the initiative has indeed been successful in making a department wide transition.

Figure A **Professionalism** (ACGME Definitions)

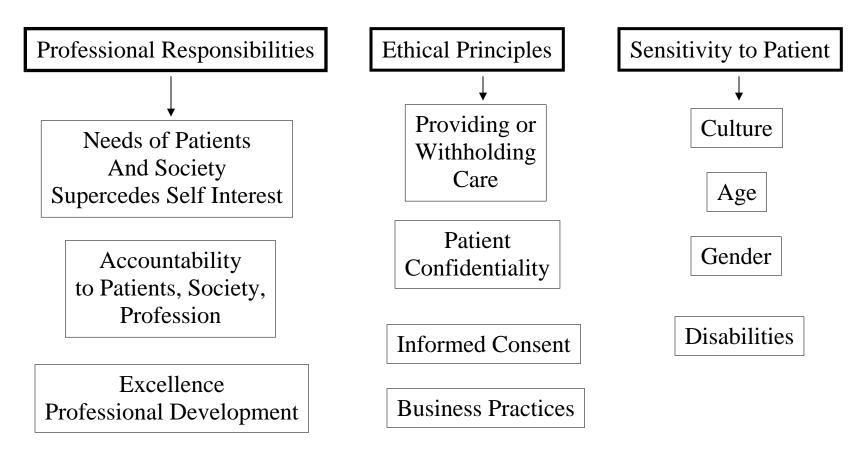


Figure B

Informed Consent

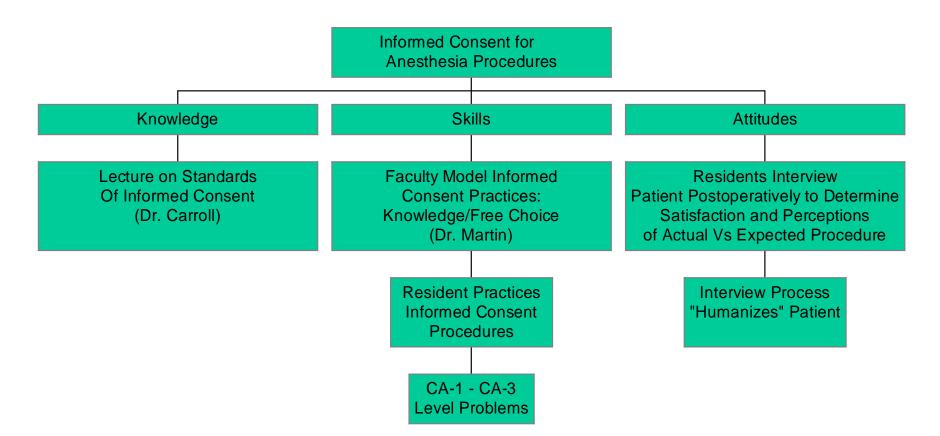


Figure C

Department of Anesthesiology ACGME Competency Professionalism Task Force

Elements of Competency/ Assessment --Professionalism

Element of Competency	Items for Assessment	Туре	Training Level		
Primacy of Patient	1. Providing Time to meet patient needs	Judgment	CA 1		
Welfare	2. Patient welfare placed before personal needs	Judgment	CA 1		
	3. Able to Prioritize Competing Needs		_		
	4. Effectively act as advocate for Patient Welfare	Skill	CA 2		
	with OR Team and Surgeon	Skill,	CA 3		
		Judgment	0110		
Patient Autonomy	1. Clear explanation of anesthetic procedures,	Skill	CA 1		
r attone r fatonomy	including risks and benefits	OMI	CITI		
	2. Interest in and complete answers to patient				
	questions	Skill	CA 2		
	3. Honesty with patients	SKIII	CA 2		
		Skill	CA 1		
			CA 1 CA 2		
	implications of a procedure?	Judgment	CA Z		
	5. Encourage patient to make responsible decisions	01.11			
	within the bounds of accepted care	Skill	CA 3		
Patient Confidentiality	1. Refrain from idle conversation about patients	Skill	CA 1		
	2. Conduct medical conversations with patients in				
	private setting	Skill	CA 1		
	3. Obtain patient consent when appropriate before				
	sensitive discussions in front of family members	Judgment	CA 2		
	4. Assessment of situations when patient				
	confidentiality may be superceded by public				
	interest	Judgment	CA 3		
Establishing Patient	1. Speak directly to each patient	Skill	CA 1		
Trust	2. Treat each patient with respect	Skill	CA 1		
	3. Knowledge of patient's medical and surgical	Knowledge	CA 2		
	problems				
	4. Subjective and objective insight into patient's	Judgment	CA 3		
	needs				
	5. Convey attitude of competence, confidence, but	Skill	CA 3		
	not arrogance				
Competency and	1. Possess knowledge and skills for managing	Knowledge	CA 2		
Improving	patient's procedure and co-existing diseases				
Quality of Care	2. Practices to minimize medication errors				
-	3. Practices to eliminate equipment errors	Skill	CA 1		
	4. Establishes practice patterns to increase patient				
	safety	Skill	CA 1		
		Skill	CA 3		
Element of	Items for Assessment	Туре	Training		
Competency		-, PC	Level		
Distribution of Finite	1. eliminate conflict of interest in choice of	Judgment	CA 1		
Resources	medications and devices	Judginein			
ixesources	incurcations and devices				

2.	use only medically necessary resources in care of	Judgment	CA 2
	individual patient		
3.	Establish practices of cost-effective care	Judgment	CA 2
4.	Include cost of care, when appropriate, in patient		
	care discussions and decisions	Judgment	CA 3

Figure D

CLINICAL IMPROVEMENT PROGRAM DEPARTMENT OF ANESTHESIOLOGY PRE-ADMISSIONS CLINIC

The Department of Anesthesiology is committed to improving our professional service and the effectiveness of our visits with you. Therefore, we want to provide you with this chance to assess the visit that you just had with one of the physicians in our department, Dr. ______, who discussed your upcoming anesthesia with you. You are providing this information confidentially for the benefit of both this anesthesiologist and of the other physicians in our department, so that we can learn the parts of the visit which were the most, and the least, helpful to you.

QUESTION		ANSWER (Circle the Best Answer – 1, 2, 3, 4, or 5)							
1. Was the visit with your anesthesiologist	1	2	3	4	5				
	Too Shor	t	Just right		Too Lo	ong			
2. You were able to discuss all of your concerns about the		2	3	4	5				
procedure with the anesthesiologist.	Agree				Disag	ree			
3. Which of these factors helped you to speak freely with the									
anesthesiologist about your procedure?	Agree				Disag	ree			
a. The location was confidential.	1	2	3	4	5				
b. You were given adequate time	1	2	3	4	5				
c. The anesthesiologist felt your questions were	1	2	3	4	5				
important.									
d. The anesthesiologist answered your questions completely.	1	2	3	4	5				
e. Choices of anesthesia were completely explained to	1	2	3	4	5				
you.			-		-				
f. You were able to make an informed choice of	1	2	3	4	5				
anesthetic options, and are comfortable with your	Agree				Disag	ree			
choice	U				U				
4. Which of the following aided in your understanding of the									
anesthesia that you will receive:					Disag	ree			
a. I could understand the anesthesiologist (spoke slowly	1	2	3	4	5				
and distinctly).									
b. The anesthesiologist described the procedure in words	1	2	3	4	5				
I could understand.									
c. The anesthesiologist spoke directly to me.	1	2	3	4	5				
d. I was encouraged to ask questions.	1	2	3	4	5				
e. The anesthesiologist was very familiar with the type of	1	2	3	4	5				
anesthesia that I would require.	Agree				Disag	ree			
5. If they were present, did the anesthesiologist include my	1	2	3	4	5	Does Not			
family in the discussion?		h	Just right	Too	Long	Apply			
6. The anesthesiologist appeared to be concerned with you as a	1	2	3	4	5				
person?					Disag	ree			
7. How much information did the anesthesiologist provide to	Agree 1	2	3	4	5				
you regarding your anesthesia?	Too little Just right		Too much						

Thank you very much for helping the Anesthesia Department to best prepare you for your surgery and anesthesia. We wish you and your family all the best during and after your surgery and are ready to help you in any way that we can.

Figure E Screen Shot of Web Based Daily Evaluation Tool

Resident Evaluation eForm

for Resident, I

There will be 8 remedial questions used and 4 selected from the evaluation question database.

Observed Competencies	N/A	PGO	PG1	PG+1	PG2	PG+2	PG3	PG+3	P64	PG+4	P 65
Makes the Primacy of Patient Welfare a conerstone of practice.	0	0	0	0	0	0	۲	0	0	0	0
Establishes patient trust.	0	0	0	0	0	0	۲	0	0	0	0
Displays an understanding of patient's co-existing disease	0	0	0	0	0	0	۲	0	0	0	0
Provides a plan of anesthesiology care (verbally or written) that includes all revelant aspects of the patient's co-existing disease process(es).	0	0	0	0	0	0	•	0	0	0	0
Discussions of patient care reflect a depth of knowledge consistent with that expected of a consultant anesthesiologist.	0	0	0	0	0	0	•	0	0	0	0
Maintains vigilance when doing patient care	0	0	0	0	0	0	•	0	0	0	0
Communicates (verbally or written) pharmacologic rationale for dosage of each drug administered during case.	0	0	0	0	0	0	۰	0	0	0	0
Resident demonstrates critical self-awareness in describing performance immediately after case completion.	0	0	0	0	0	0	۰	0	0	0	0
Accurately self-evaluates delivery of care during each case immediately upon completion of the case. (discusses strengths and weaknesses)	0	0	0	0	0	0	۰	0	0	0	0
Demonstrates active exploration for new knowledge rather than reliance on "standard operating procedures" in each case.	0	0	0	0	0	0	۰	0	0	0	0
Actively seeks participation in patient care transfer with anesthesiology team colleagues.	0	0	0	0	0	0	•	0	0	0	0
Translates medical terms to clear everyday language in discussing care with patient or patient's significant other(s).	0	0	0	0	0	0	•	0	0	0	0
Procedure: Airway	0	0	0	0	0	0	0	0	0	0	0
Procedure: Invasive Monitors	0	0	0	0	0	0	0	0	0	0	0
Regional Anesthesia	C	0	0	0	0	0	0	0	0	0	0

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Global Assessment (500 Chars Max) Required Entry

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