Using the Affective Domain to Enhance Teaching of the ACGME Competencies in Anesthesiology Training

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Original Article

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Abstract

Teaching and assessing the advanced competencies will continue to be a challenge. Incorporating new and nontraditional skills into an already complex and challenging clinical curriculum and practice is not easy. This makes development of methods for curricular design, teaching and assessment of anesthesiology resident and fellow performance essential. The Domains of learning, particularly the Affective Domain can serve as an organizing structure for developing objectives and selecting teaching and assessment techniques.

Using the Affective Domain to select targeted teaching techniques might help foster development of key beliefs and values that underlie the advanced competencies (and sub-competencies). Targeted teaching, outside of the patient care arena, when combined with traditional clinical teaching practices, may help to ensure continued performance of desired behaviors. These include acting in a consultative role for other health professionals (ICS), providing culturally responsive care (Professionalism), using evidence to enhance the care of patients (PBLI), and advocating for quality of care and working to enhance patient safety (SBP). As educators, our aim is not only to impact knowledge, attitudes and skills, but to impact the daily behavior of our graduates.

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The Accreditation Council for Graduate Medical Education (ACGME) has recognized a significant problem with traditional methods of physician training and assessment [1,2]. They have addressed this need through the Outcomes Project and its implementation within the accreditation structure over the past decade. The particular contribution made through introduction of the Core Competencies is the codification of the advanced competencies of Interpersonal & Communication Skills (ICS), Professionalism, Practice-Based Learning and Improvement (PBLI) and Systems-Based Practice (SBP) [3]. Explicit teaching and assessment of these competencies is now required. Use of the taxonomies of learning, particularly the Affective Domain, can greatly assist in clarifying the learning objectives in these arenas and in selecting both teaching and assessment techniques.

Skills (or a lack thereof) related to the advanced competencies can have a direct impact on the delivery of quality clinical anesthesia care. In 2004, Lingard, et al [4] demonstrated that communication failures in the operating room are common and can result in sentinel events. In their sentinel event statistical summary for 1995-2005, the Joint Commission reported that communication failure was a root cause in over 60% of all sentinel events. Further, in their 2007 report of sentinel events within Anesthesia, they reported that communication failure was a root cause in almost 80% of sentinel events [5]. The advanced competencies also focus on building a set of behaviors that extend beyond the direct provision of health care and into the hospital, community and policy domains. Others focus on the anesthesiology trainee's professional habits and lifelong learning abilities.

Traditionally, in Graduate Medical Education (GME), teaching and assessment of performance has taken place within the context of providing patient care. For teaching the advanced competencies, hospital-based clinical programs have historically relied upon modeling and implicit learning, which have been shown to be unreliable for developing positive behaviors in professionalism and the other advanced competencies [6,7,8,9]. The ACGME advanced competencies often push our teaching and assessment out of clinical settings and into the less familiar territory of simulation labs, classrooms, and meeting rooms. This expansion of faculty teaching roles has been accompanied by restrictions on trainee duty hours. There is more for residents to master and less time for them to accomplish the task. To make matters even more stressful, the financial pressure on faculty to generate patient care dollars through their own direct patient care has increased. This makes development of efficient methods for curricular design, teaching and assessment of resident and fellow performance essential.

Although the need for improvement is clear, there are also reasons why graduate medical education programs continue to use passive methods to teach the advanced ACGME competencies (professionalism, ICS, PBLI and SBP). These include tradition, discomfort or unfamiliarity with non-traditional classroom-based methods and a lack of pedagogical models for achieving competence in these arenas [10]. The challenge is clear. We need to increase efficiency through clear understanding and usage of pedagogical tools. Clear intentionality is required for developing instructional sessions to teach the advanced competencies. One of the tools is application of the domains of learning, specifically the Affective Domain.

Four things influence the successful performance of any competency – learner knowledge, skill and attitude and the professional environment. Thus, to become a successful practitioner within all areas of competence necessitates knowledge of what is required, the component skills to accomplish these activities, the confidence and willingness (attitudes) to do what is required, and finally, maintaining an environment that allows for, or preferably actively supports, appropriate behaviors.

In the education arena, there is a taxonomy of learning domains developed to assist in the design and assessment of educational objectives. The three domains of learning are: 1) Cognitive, 2) Affective and 3) Psychomotor. The idea for the taxonomies arose in the late 1940s out of the work of Benjamin Bloom, a pioneer in the area of educational evaluation [11]. Bloom led a committee of College and University Examiners in developing the Cognitive Taxonomy [12]. Later followed the Affective Taxonomy[13] and the Psychomotor Taxonomy[14]. Bloom's taxonomy of learning domains remains a widely used system to organize objectives and activities in educational and corporate training both nationally and internationally [15].

Education at the GME level should focus on promotion of higher forms of thinking and the development of values over the acquisition of facts. Bloom noted decades ago that most teaching tended to focus on fact-transfer and information recall, considered the lowest level of educational objective [16]. Still today, much of medical school and post doctorate training is focused on knowledge and skill acquisition rather than on the personal development required to master the advanced ACGME competencies. This remains a central challenge for medical educators today and has moved us to consider the breadth and depth approach exemplified in the taxonomies as an organizing structure for teaching in Anesthesiology and Critical Care Medicine. The domains of learning and the taxonomies for educational objectives can aid us in utilizing the classic 'Knowledge, Attitude, Skills' structure and assist in selecting teaching/learning methods and evaluation techniques. Each domain focuses on one of these arenas.

The Cognitive Domain relates to "learner knowledge." For all competencies, basic and advanced, the learner must know how to accomplish the task, as well as when and under what circumstances. For example, for the Systems Based Practice sub-competency "advocate for quality patient care and optimal patient care systems," the learner must have knowledge about quality of care and know enough about the perioperative system to be able to identify what is "optimal" and what is not. The learner must also know about what it means to "advocate," and the expectations for the types of advocacy (e.g., rule following, rule making) and levels of advocacy (i.e., operating room, medical center, local community, state, national, global).

The Psychomotor domain relates primarily to the acquisition of technical skills, such as line placements and airway management. This domain is useful in teaching and assessing the competency of Patient Care and is less relevant to the advanced competencies. However, basic skills are required in order to demonstrate any competency. In our example subcompetency, the learner must have the requisite oral and writing skills to be able to communicate their viewpoint when they "advocate" for "quality patient care" and "optimal perioperative systems."

However, simply having the knowledge and skills does not ensure that the behavior will be performed. The anesthesia resident or fellow, and later the practicing anesthesiologist, must

choose to engage in advocacy – that is, they must "advocate." The Affective Domain relates to those values and attitudes that result in action. In 1964 Krathwohl, Bloom and Masia published the *Taxonomy of Educational Objectives, Handbook II: Affective Domain.* In that book, they described five levels of behaviors – receiving, responding, valuing, organizing and characterizing. This model provides a framework that we can use in developing instructional materials and teaching sessions for our learners. In examining our sample sub-competency, there might be several underlying attitudes and beliefs. For future anesthesiologists to actively choose to "advocate for quality patient care and optimal patient care systems," reflects a set of values that might include the following:

Quality is important,
Quality of care goes beyond my patient and me,
Perioperative systems affect quality,
Advocacy is something physicians should do,
Advocacy is something I should do,
I will be an advocate for quality of care, etc.
I will participate in a departmental quality improvement project.

Each sub-competency within the four advanced competencies has a similar set of beliefs or values underlying it that makes attention to the affective domain essential to effective teaching and assessment – which in turn promotes excellence in performance. The five levels form a continuum of attitudinal behavior, from an awareness and acceptance to the internalization of these attitudes [17]. In Table 1, each level is described and examples of learner outcome objectives are provided.

Table 1 – The Affective Domain (Definitions and Sample Objectives)

Domain Level and Description (Krathwohl et al., 1964).	Sample Objective from Example Subcompetency "advocate for quality"
Receiving - At the lowest affective level, behaviors range from awareness that the concept/belief exists, through willingness to hear about it, to selective, focused attention toward it.	Listen in mortality and morbidity conference when faculty promotes the importance of advocating for quality, e.g. nod and smile.
Responding – At the second level the learner shows active participation, moving from obedient response to enjoyment in responding	Demonstrate active participation in discussions of quality in perioperative settings and the need to advocate for high quality care
Valuing – At this level the learner makes a choice to express the belief, moving from acceptance of the value to preferring it, to a stated commitment	Discuss own quality of care during precepting; openly discuss quality improvement ideas in the classroom
Organizing – The fourth level is organizing where the learner gains deeper understanding of the value and merges it into his/her value structure	During care process identify quality-related issues and discuss possible systems solutions; intentionally uses time-outs in operations or procedures to ensure quality of care of whole team
Characterizing – At the highest level the value	Promotes quality of care within the system as

Domain Level and Description (Krathwohl et al., 1964).	Sample Objective from Example Subcompetency "advocate for quality"
has been "internalized" and behavior is consistently positive	part of "normal operating procedures" – e.g. habitually engages team in preoperative debriefing

Teaching and Assessing at Each Level of the Affective Domain

When using the Affective Domain as an organizing structure for teaching the advanced competencies, the learner outcome objectives are designed to address each training level separately. In resident or fellow level training the faculty determines the target level. For example, at the resident level for some subcompetencies the "responding" level may be adequate, whereas for fellows, we might target the "valuing" level. Once the objectives have been selected, the teaching and assessment techniques can be determined. Below are some suggestions for teaching and assessing at each level of the Affective Domain.

Receiving: At this level, we expose the residents and fellows to the value. The types of techniques used at this level are those that can create exposure and hopefully awareness of the issue or value and might include use of a video clip, story or anecdote, learner brainstorming, and independent use of written or digital media. Assessment at this level might include proof of attendance at a formal session or evidence of "attention" to assigned materials in the form of an exercise, quiz, or reflection. An example of training at this level was provided by Simpson et.al. 2006 [18]. They used brief video clips to increase resident understanding of geriatric care in relation to the advance competencies of interpersonal and communication skills, system-based practice and practice based learning and improvement.

Responding: At this level, the trainee must produce some form of response (written, verbal or digital) that can be built into the instructional process or accompany it. Teaching techniques that build response into them include use of interactive digital media, use of polls or audience response systems, case-based exercises, role-play, and use of simulation or standardized patients. Assessments at this level include proof of completion of a pre-class or in-class task, or production of a written journal entry, reflection or other portfolio entry. In 2009, Quinn reported use of a case-based exercise using the ""healthcare matrix" to engage residents in active review of patient cases [19]. The residents met bi-monthly to discuss patient care issues with the ultimate product being an ideal patient flow chart designed to enhance quality of care. This method ensured "responding" and used repeatedly across time, may have taken residents to even higher levels within the Affective Domain.

Valuing: The trainee should demonstrate a voluntary expression of the value or produce an action consistent with the value. Techniques that encourage movement to this level include debriefing with real cases or simulation, small group activities, think-pair-share, and commitments to change. At this point, we can use review of journals, activity logs, commitments to change, and portfolio entries for written expression of the value and to one-to-one and small group interaction to document verbal expression of the value. At Childrens Hospital Los Angeles, the Department of Anesthesiology Critical Care Medicine conducts a 10-session leadership training program for the pediatric anesthesiology and critical care fellows. The program uses a variety of small group activities to promote values related to all of the advanced

competencies. Fellow progress is tracked though use of commitment to change and a variety of written portfolio entries. Learners' reports describing how they are incorporating new concepts into their work reflect actions consistent with these "new" values.

Organizing: At this point, the trainee should be "intentionally" demonstrating behaviors stated as consistent with the value. In addition to focused classroom activities, setting clear expectations and incorporating expected behaviors into individualized learning plans are some of the techniques that can encourage trainees to demonstrate usage of the value. Ratings of performance in relation to the competency, activity logs, and portfolio entries can provide evidence of the value in practice. In addition, observing the resident teach others such as medical students about evidence-based quality care standards can be demonstrated as organizing. In our sample competency we would be looking for a record of behaviors that indicate that the trainee has advocated for quality care or quality systems. Within anesthesiology, anesthesia crew resource management training has been used to address the advance competencies, specifically team communication and system based practice. This type of training aims toward the organizing level of the Affective Domain, using briefs as a communication tool to improve patient safety. Learners practice intentional action to apply within an actual work setting, the periopeartive team [20].

Characterizing: At this level, the trainee should be repeatedly engaging in activities consistent with the value. The attitude or belief has become part of the individual's value system and been incorporated into their actions. Reinforcement for consistent performance and helping to ensure a positive, encouraging environment are essential if the goal is to move residents or fellows to this level. An example of a curriculum for both residents and practitioners is the TEAM STEPPS curriculum developed by the Department of Defense to promote team development and patient safety [21]. The curriculum uses multiple modalities that would take residents from initial receiving, through all levels, toward the goal of permanently changing how team members interact in the operating room and other patient care settings.

Targeting Teaching Techniques for the Affective Domain

Values and beliefs at the receiving and responding level can be promoted in the classroom. Moving learners toward the higher levels demands taking the implicit lessons from excellent modeling in all settings and teaching them in an explicit manner. In 2008 one of the authors (JGN) developed a complementary system for categorizing teaching methods that organizes them in relation to teaching task [22]. The system was designed to assist medical educators in matching teaching techniques to the task at hand. This system includes five categories (attention grabbers, skill builders, catalysts, intensifiers and trackers) and can be used for teaching in either the cognitive or affective domain. The five categories are described below in relation to teaching within the affective domain.

Attention Grabbers – These techniques open up a topic, grab the learners' attention and help them to focus on the issue under study. These include such things as brainstorming, use of video clips and use of other openers such as use of a quotation, visual image, personal anecdote or story, as well as presentation of a challenge to the group. In our example we might show clips of an operating room setting where quality of care is in jeopardy to raise awareness, one of the instructors might tell a story of a personal advocacy experience, and learners might brainstorm

about all of the ways that anesthesiologists can be advocates for quality. The aim is "receiving" and "responding."

Skill Builders – These techniques are used to help learners gain initial awareness and knowledge in relation to a topic, and to build core attitudes and skills needed for each sub-competency. These methods include independent study of written or digital media, formal presentation, case-based exercises, role-play, and use of simulation or standardized patients. At this level all of the domains come into play – that is we need to ensure that the cognitive and relevant psychomotor skills are built, in addition to the necessary attitudes and beliefs. In order to reinforce "valuing" in our advocacy example, we would structure activities to try and ensure that the learners' initial efforts are successful. They might review digital media on systems issues in the operating room, select a systems issue of personal importance to them, and role-play presenting the issue to the quality improvement committee. The aim is "responding" and "valuing."

Catalysts – These techniques are used to stimulate active learning in small or large groups and to ensure that learners are interacting with the concepts presented and with each other. These techniques include progressive disclosure cases, small group activities, think-pair-share, and quizzes, games, polls & audience response systems. In these activities we engage the learner in thinking about and sharing their ideas in relation to the values of interest. In our example we might engage the learners in an exercise where they are presented with a case scenario from a Mortality and Morbidity conference. The residents or fellows would move as a small group from analyzing the quality of care challenge, through making systems suggestions, through a "mock" committee meeting to discuss the systems changes. During this process we might have trainees discuss their reactions in pairs (think-pair-share) and end the session with individual "commitments" for how they will be advocates for quality in perioperative settings. The aim is "valuing" and "organizing."

Intensifiers – The skilled instructor uses these techniques to encourage learners to greater depth of awareness and knowledge in order to promote a positive change in their performance. This can be accomplished through skillful facilitation and debriefing of classroom activities designed to focus on the values of interest. These activities can include narrative/reflective writing, presentations by learners, and commitments-to-change. Much of the work of moving from "organizing" to "characterizing" is done within the learner, however skillful use of intensifiers can help reinforce the learners' commitment to a value and encourage positive action. For example, in relation to advocacy, the program director can set aside time each month for residents or fellows to present successful instances of advocacy within the hospital. Skillful debriefing of one learner success story can encourage others to incorporate advocacy into their activities. The aim is "organizing" and "characterizing."

Trackers – These tools are used to track learners across time and encourage continuing development. They are particularly useful for documentation of growth in the affective domain along with faculty feedback as a way of encouraging trainees to move to the next level of commitment in relation to valuing a subcompetency. Trackers include journals and portfolios, as well as self-assessments of performance on relevant activities. We encourage use of portfolios. A system that permits each portfolio entry to be keyed to all relevant sub-competencies can make this process more efficient. For example, a proposal to modify the transport system between the

operating and the intensive care unit, developed and presented by a group of residents, nurses and respiratory care specialists, might be linked to five different ACGME sub-competencies.

Communicate effectively with physicians and other health professionals
Work effectively with others as a member or leader of a professional group
Advocate for quality patient care and optimal patient care systems
Work in interprofessional teams to improve patient care quality
Participate in identifying system errors and implementing potential systems solutions

In medical education, we assess behaviors, not the values that underlie them. Tracking behaviors is essential and we want our tracking system to encourage and reward positive behaviors. An affective tracking system should be an avenue of continuing positive feedback to learners in relation to their documented growth, and should reflect skills that will be important throughout their careers.

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