

Anesthesiology
80:663-665, 1994
© 1994 American Society of Anesthesiologists, Inc.
J. B. Lippincott Company, Philadelphia

Criteria for Defining Clinical Competence of Anesthesiology Residents

Karin E. Madsen, M.D.,*† Harvey Woehlck, M.D.,† Eugene Cheng, M.D.,‡
John M. Kampine, M.D.,† Kathryn Lauer, M.D.†

THE task of resident evaluation and certifying clinical competence is a complex and arduous one that every academic anesthesiology department must face. It generally is recognized that both cognitive and noncognitive attributes are essential to the safe practice of anesthesia.¹ The reports from The Clinical Competence Committee to the American Board of Anesthesiology place great emphasis on the noncognitive areas of motivation, interpersonal skills, and values. Clinical Competence Committees struggle with the definition of these characteristics because they are subject to personal interpretation by faculty members based on their own experiences, expectations, and discomfort in sitting in judgment of others. Despite the growing refinement of daily and monthly evaluation systems, much of resident assessment remains subjective and intuitive. As such it is fraught with inconsistencies and lack of specificity, of particular importance where problem residents are concerned. There is a paucity of available literature on well defined criteria with which to measure resident competency and progress in anesthesiology.

In an attempt to achieve greater uniformity in evaluation of residents, a task force in our anesthesiology department created a list of Clinical Competency Criteria with specific standards for resident advancement and development. In addition to our monthly evaluation form, we developed more specific, graded standards of assessment (table 1). For each level of training,

these criteria incorporate discrete behavioral skills of increasing rigor and complexity in four broad categories: knowledge, case management, technical skills, and oral skills. With advancing seniority, residents are expected to show a growing understanding of the literature and its clinical application; improve their technical facility; manage, with growing autonomy, medically complex cases; and acquire the clinical sophistication and discriminating thought processes of a consultant in anesthesiology. The faculty at large as well as the department's Clinical Competence Committee note whether these criteria have been met when they perform their periodic evaluations. In addition, all residents receive a copy of these criteria when they begin their training to serve as self-reflective goals and guidelines.

Our criteria are measured at the end of the first 6 months of clinical anesthesia and at the end of each year of training. One could argue that these criteria could be applied after the first 3 months of clinical training, but the rate of development of residents can be variable in their early months. Also, the initial clinical experience in our multi-institutional department is broad enough to make much earlier use of these criteria difficult.

No evaluation process is perfect. Assessment of human behavior is difficult to make objective. The achievement of specifically defined standard skills is by itself insufficient to determine promotion or retention of trainees. Regardless of clinical skill or knowledge, an unsatisfactory grade in any one of the "Essential Character Attributes"—listed in the Clinical Competence Committee reports as honesty and ethics; reliability, conscientiousness, and responsibility; the ability to learn from experience; appropriate reaction to stressful situations; and freedom from chemical dependence—is the basis for an automatic unsatisfactory report from the Clinical Competence Committee. The criteria presented here must be viewed within a larger context

* Director of Clinical Education.

† Assistant Professor of Anesthesiology.

‡ Associate Professor of Anesthesiology and Medicine.

Received from the Departments of Clinical Education and Anesthesiology, Medical College of Wisconsin, Milwaukee, Wisconsin. Accepted for publication November 16, 1993.

Address reprint requests to Dr. Madsen: Department of Anesthesiology—112A, 5000 West National Avenue, Milwaukee, Wisconsin 53295.

Key words: Education: anesthesiology; competence; evaluation; resident.

Table 1. Criteria for Clinical Competency of Anesthesiology Residents: Medical College of Wisconsin**End of 1st 6 Months, CA1 Year***Knowledge*

- Understand basics of anesthesia machine and routine monitors (pulse oximetry, capnography, circuits, oscillometric blood pressure cuffs, electrocardiogram)
- Understand basics of neuromuscular blockade (relaxants, train-of-four monitoring, reversal)
- Understand use of routine vasoactive drugs
- Understand the indication for commonly used anesthetic drugs
- Understand major hemodynamic and respiratory effects of routine anesthetic agents and their indications
- Understand comprehensive examination and classification of the airway
- Understand key preoperative findings in history, physical, and laboratory work
- Understand application of "Universal Precautions" and aseptic technique
- Advanced Cardiac Life Support certification

Case management

- Manage ASA physical status 1 patients with minimal assistance for uncomplicated surgery, including induction, maintenance, emergence, and transport to the post anesthesia care unit
- Accurately estimate fluid (blood/colloid/crystalloid) requirements in routine cases
- Identify basic intraoperative problems (hyper-/hypotension, hypoxia, hypercapnia, arrhythmias, anuria, acidosis, laryngospasm) and formulate differential diagnosis and treatment plan
- Recognize key anatomic landmarks, indications/contraindications, and potential complications of regional blocks (spinal, epidural, axillary, intravenous regional)

Technical skills

- Set up a case in reasonable time (machine check, drugs, airway equipment)
- Ventilate lungs *via* mask, and intubate trachea of patients with easy to moderately difficult airways
- Place peripheral intravenous, arterial, and central catheters with minimal assistance
- Perform aforementioned regional blocks on suitable patients with assistance
- Keep legible and accurate intra-, pre-, and postoperative records
- Operate basic technical monitors and pressure transducers and trouble-shoot simple technical malfunctions

Oral skills

- Communicate effectively with patients
- Deliver concise, organized case presentation to staff that includes important pre-anesthetic concerns
- Formulate and describe in detail a plan for anesthetic management of ASA physical status 1–3 patients including anticipated problems and their solutions

End of CA1 Year*Knowledge*

- Understand physiology of significant cardiovascular events (compression of vena cava by surgeons, hypovolemia, hypervolemia, pulmonary embolism, ischemia, myocardial depression)
- Understand aspects of neuroanesthesia (management of increased intracranial pressure for craniotomy), vascular anesthesia (changes with aortic cross clamp), and orthopedic anesthesia (fat emboli)
- Understand choice of regional *versus* general anesthesia and need for selective invasive monitoring
- Understand basics of obstetric anesthesia (physiologic changes of pregnancy, techniques for cesarean section, special precautions)
- Understand how to obtain and apply information from a pulmonary artery catheter

Case management

- Manage, under supervision, patients with difficult airways who are undergoing elective surgery
- Perform emergency airway management with reasonable skill (rapid sequence *vs.* awake intubation) in the operating room and the intensive care unit
- Manage ASA physical status 3 patients for uncomplicated surgery with assistance
- Initiate management of trauma cases and other emergencies in proper sequence (airway, intravenous access, monitoring)
- Manage cesarean section by general or regional anesthesia with assistance
- Manage patients in the post anesthesia care unit with assistance (assure adequacy of airway or adjust ventilation; manage pain, hemodynamics and fluids; and determine readiness for discharge)
- Develop and implement a rational plan for tracheal intubation of patients in the intensive care unit

Technical skills

- Insert central and arterial catheters independently most of the time
- Insert a pulmonary artery catheter with direction
- Perform spinal and lumbar epidural anesthesia without assistance in most patients
- Perform fiberoptic or awake tracheal intubation with assistance

DEFINING THE CLINICAL COMPETENCE OF RESIDENTS

Table 1. (Continued)

Oral skills

- Cogently discuss management plan with anesthesiology staff or surgeon for ASA physical status 3 patients
- Defend choice of monitoring
- Defend choice of anesthetic technique and drugs used with discussion of options
- Recognize when to proceed, investigate further, or cancel a case
- Participate actively in teaching medical students

End of CA2 Year

Knowledge

- Understand physiology and anesthetic concerns associated with pediatric anesthesia
- Understand obstetric syndromes and their anesthetic implications
- Understand routine open heart procedures, including prebypass, bypass, and separation from cardiopulmonary bypass
- Understand pharmacology of a variety of vasoactive and anesthetic drugs in depth
- Know how to perform emergency airway maneuvers, including cricothyroidotomy

Case management

- Manage medical diseases in surgical patients (pulmonary, cardiovascular, hepatorenal, endocrine)
- Manage routine pediatric, vascular, thoracic, and neurosurgical cases with assistance

Technical skills

- Perform spinal and lumbar epidural anesthesia in patients with extremes of body habitus
- Insert peripheral intravenous catheters in pediatric patients older than 2 yr
- Perform a variety of regional blocks with frequent success
- Insert a pulmonary artery catheter with minimal assistance
- Assemble and calibrate transducers without assistance
- Manage acute postoperative pain (patient-controlled analgesia, continuous infusions of epidural opioids and/or local anesthetics)

Oral skills

- Cogently discuss management plan with attending and surgeon for ASA physical status 4 patients
- Review literature and participate in discussions for "Journal Club"
- Perform reasonably on oral board-style examination
- Lecture to faculty and residents at teaching conferences
- Actively teach medical students

End of CA3 Year

Knowledge

- Understand principles of all major subspecialties (ambulatory, cardiac, critical care, endocrine, neurosurgical, obstetrics, pediatrics, acute and chronic pain, thoracic, trauma, vascular) in depth
- Know and address important articles in recent literature

Case management

- Manage independently, with staff availability:
 - ASA physical status 4 patients with multisystem diseases for complex elective and emergency surgery
 - Acute and chronic pain
 - Recovery room care

Technical skills

- Perform all aforementioned anesthetic and invasive monitoring procedures independently

Oral skills

- Attain the qualities and attributes fundamental to performance as a consultant anesthesiologist (according to the American Board of Anesthesiology):
 - Ability to organize and express thoughts clearly
 - Sound judgment in decision-making and application
 - Ability to apply basic science principles to clinical problems
 - Adaptability to rapidly changing clinical conditions
- Supervise and mentor medical students
- Participate actively in teaching fellow residents

of resident assessment, with character attributes playing a dominant role. Further analysis will be required to determine the efficacy of these criteria in enhancing identification of resident deficiencies and development.

Reference

1. Rhoton MF, Barnes, A, Flashburg M, Ronai A, Springman S: Influence of anesthesiology residents' noncognitive skills on the occurrence of critical incidents and the residents' overall clinical performances. *Acad Med* 66:359-361, 1991