Anesthesia
Knowledge Test Series Examinations
Manual

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John A. Jensen
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1 Introduction to the Anesthesia Knowledge Tests

Three examinations constitute the Anesthesia Knowledge test series: The Anesthesia Knowledge Test 1 (AKT-1), the Anesthesia Knowledge Test 6 (AKT-6) and the Anesthesia Subspecialty Knowledge Test (AKT-24). The principal purpose of the AKT-1 is to determine the progress of a resident in anesthesiology at the completion of the first month of training. The AKT-1 also assesses a resident’s entry level knowledge. Typically, the AKT-1 is administered on or about the first day of residency training and again on or about the last day of the first month of residency. Given these two data points, it is then possible to evaluate a resident's performance by comparing the two scores (and several derivative scores). Comparisons may also be made between the scores obtained by one resident and those obtained by other residents in his program and in programs across the United States, Puerto Rico and Canada.

The AKT-6 assesses a resident's knowledge near the end of his or her sixth month of clinical anesthesia training and provides a third data point for evaluation of progress and of relative standing with other North American residents with similar clinical experience.

The AKT-24 is specifically designed to assess knowledge expected of a CA-II resident whose rotations have been in subspecialty areas. The instrument includes 210 questions that reflect seven of the subspecialty areas identified by the RRC.

1.1 The Inter-Hospital Study Group for Anesthesia Education

In 1972, a small group of anesthesiologist-educators decided that some formal instruments should be developed to assist institutions that supported residency programs in anesthesiology. This original group resulted in what today is the "Inter-Hospital Study Group for Anesthesia Education" (IHSGAE). Members of the IHSGAE now include representatives from thirteen major institutions in the United States.

The present group that designs and conducts the examination includes: Thomas Cox, Saundra Curry, Melissa Davidson, Brian Egan, Ron Hall, Michael Hernandez, Michael Hutchens, Christopher Kent, Catherine M. Kuhn, Beth Minzter, John D. Mitchell, Scott Schartel, Jeffrey Schwartz.

Other persons who participated in producing earlier versions of the AKT-1 and the AKT-6 include:

- Robert Armstrong
- Lee Cooperman
- Bruce Cullen
- Mary Depaolis
- Charles Hardy
- George Herr
- Philip L. Liu
- Elliott Miller
- Michael F. Mulroy
- Frank Murphy
- William Pope
- Francis Rhoton
- Wendell Stevens
- Bruce Triplett
- Peter Waterman
- Robert Willenkin
- Peter Winter
The principal thrust of the IHSGAE has been the development of innovative tools for education and evaluation in anesthesia. Concurrently, the IHSGAE has supported the development of several skill (or performance) tests applicable to clinical settings, a set of behavioral objectives for resident performance at the sixth month level, and a knowledge test that was originally known as "The First Month Resident Examination in Anesthesiology and Cardiopulmonary Resuscitation." That instrument was administered for two years on an "experimental" basis while the items that constituted the instrument were refined and preliminary national norms were developed. Since 1977, the revised instrument has been known as the "Anesthesia Knowledge Test 1" or AKT-1.

In 1985 and 1986, questions appropriate for the six month level of training were field tested and revised, and a new instrument, AKT-6, became available for use in 1986. The AKT-24 was developed in 2009 to provide measures of knowledge in each of seven subspecialty areas for residents at about the 24th month. It became available in 2009.

1.2 What the AKT Instruments Measure

The AKT-1 was designed to determine the extent to which a resident in anesthesiology has progressed in knowledge during his or her first month as a resident. The AKT-1 also allows an entering resident's knowledge to be assessed. In either case, the AKT-1's items reflect two major learning goals:

- Mastery of knowledge concerning cardiopulmonary resuscitation.
- Mastery of knowledge necessary to administer an anesthetic to a healthy patient for an uncomplicated surgical procedure.

1.3 The Structure of the AKT-1

The AKT-1 provides a single total raw score as a summative assessment. Each examinee's raw score is then expressed as several derived and standard scores in relation to the current national norming sample and in relation to the individual institution.

Items that constitute the examination can be grouped under twelve major headings:

- Anesthesia Technique and Procedures (AN)
- Airway (AW)
- Cardiovascular (CV)
- Cardiopulmonary Resuscitation (CPR)
- Equipment (EQ)
- Instrumentation and Monitoring (IM)
- Neuromuscular Blockade (NM)
- Pharmacology (PH)
- Preoperative Assessment (PR)
- Respiratory (RE)
- Regional (RG)
- Recovery Room (RR)

Formative reports are provided that list weaknesses in each of the above areas for each examinee and for an institution's program as a whole.
1.4 The Structure of the AKT-6

The AKT-6 is a multiple choice examination similar in length and style to the AKT-1, but is written for six month residents and is intended to be taken only by residents who are near completing their sixth month of training.

The AKT-6 provides a single total raw score as a summative assessment. As with the AKT-1, raw scores are also expressed as several derived and standard scores that are reported numerically and in graphic form. Items that make up the AKT-6 represent eight major curriculum areas:

- Anesthesia (AN)
- Cardiovascular (CV)
- Equipment (EQ)
- Miscellaneous (MI)
- Neuromuscular (NM)
- Pharmacology (PH)
- Regional Anesthesia and Pain Therapy (RG)
- Respiration (RE)

As with the AKT-1, the AKT-6 provides formative reports that list weaknesses in each of the above areas for each examinee and for an institution’s program as a whole.

1.5 The Structure of the AKT-24

The AKT-24 is specifically designed to assess the subspecialty knowledge expected of a CA-II resident, whose rotations are designed in subspecialty areas. This test was developed in response to the results of a survey that indicated great interest in such an assessment tool. The instrument contains 210 questions with a content representation in each of seven subspecialty areas:

- Perioperative (PER)
- Critical Care (CC)
- Cardiovascular (CV)
- Pediatrics (PED)
- Pain Management (PAI)
- Neuroanesthesia (NEU)
- Obstetrics (OB)

1.6 Reliability and Validity

The reliability of a measuring instrument reflects the accuracy with which it measures what it purports to measure. An instrument’s validity reflects whether it actually measures what it claims to measure justifying inferences made from test scores. The AKT instruments claim to measure knowledge of anesthesia. They have been developed and revised biannually by a group of anesthesiologist-educators over several years. The principal approach to validation is, therefore, content validity, which assumes the test questions represent the domain of knowledge appropriate for a one month resident in the case of the AKT-1 or a sixth month resident in the case of the AKT-6 or a resident at 24 months in the case of the AKT-24.

The validity of the AKT instruments is not considered to be permanent. The IHSGAE meets annually to review and update the examinations to ensure that they will contain timely questions, in a proper balance. Each instrument is revised every other year.

The reliability of the AKT instruments is also analyzed on an annual basis. For the AKT-1, the reliability is consistently about .90 - .91. The AKT-6 and AKT-24 show similar values for reliability. For a more complete discussion of the reliability and validity of the AKT instruments, see Parts 3, 4 and 6.
1.7 How to Use this Manual

If you are about to administer any of the AKT instruments for the first time, you should read Part 2 carefully before attempting to do so. When the results of the testing session have been returned to you, you should read Parts 3 through 5 in order to make proper interpretations of the results. These sections of the manual describe the scoring systems used in reporting results and the nature of the subscales that constitute the AKT series. There are also examples of how both the individual examinee reports and the institution summary report may be interpreted. Part 6 provides technical information concerning the development, reliability and validity of the AKT instruments.