In the second of a two-part feature on clinical evaluation, the author takes a case study approach to trace the methodology used by a school of nurse anesthesia to revise its clinical curriculum. The author discusses the components of the curriculum, identifies the roles of contributors, provides examples of evaluation instruments, and discusses the record-keeping mechanism utilized by the school.

In Part I of this article (published in the February, 1983 issue), clinical evaluation of student performance was explored in terms of its role, focus, research and legal implications. Part II will take these concepts and illustrate how they can be applied in revising the clinical curriculum at a nurse anesthesia school, in this case, the Minneapolis School of Anesthesia in St. Louis Park, Minnesota.

The Minneapolis School of Anesthesia offers a 24-month program in nurse anesthesia with an optional Master of Science degree. The students obtain their clinical experience in eight medical facilities on a rotating basis. Students rotate to five of the eight facilities for a period of four to five months each. Special experiences are scheduled in the areas of post-anesthesia recovery, respiratory therapy, cardiovascular anesthesia, department management and pediatrics. A clinical coordinator is employed by each facility and is responsible for the day-to-day clinical activities of assigned students.

The original strategy

The school undertook an extensive project to delineate objectives and performance expectations which could be used to evaluate students' clinical performance at the end of each of their five clinical rotations. As the project progressed, however, it became apparent that the results were going to be unwieldy and impractical. The original strategies did not work as envisioned due to the diversity of clinical environments, random rotation sequences of each student, wide variances of specific learning activities, and the scope of surgical procedures and anesthetic techniques employed at the eight clinical facilities associated with the school.

At monthly clinical coordinator meetings, a task analysis of expected student behaviors was accomplished. The identified behaviors would be the focus of end of rotation evaluations. Each rotation and special experience was addressed at a separate meeting. From this task analysis, the tasks identified were incorporated into enabling objectives encompassing the integration of knowledge, attitudes and skills for the expected level of achievement. Difficulty in sequencing, prioritizing, and placing the large number of identified objectives in the appropriate rotation made it infeasible to continue with this evaluation project as planned.
An alternative strategy

The following strategies were then used in revising an alternative clinical practicum curriculum:

1. A comparison data base was obtained from other nurse anesthesia programs throughout the United States.
2. A comprehensive list of curriculum components reflective of clinical anesthesia practice was developed.
3. The special experiences were organized into well defined learning activities.
4. A rationale was developed for each component which correlates the importance of and reason for each area of learning.
5. A terminal objective was developed for each component which, in turn, became a terminal objective of the entire program.
6. Intended learning outcomes were written for each terminal objective.
7. The rationale, terminal objective and intended learning outcomes for each component were validated through discussion with school directors, clinical coordinators, the graduate school examining committee, the content expert and second year nurse anesthesia students.
8. Evaluation instruments were developed to evaluate student clinical performance.
9. The final proposal was submitted to the school directors for approval, adoption and implementation into the school curriculum.

The data base: A comparison data base was solicited from accredited nurse anesthesia programs. Using the List of Recognized Educational Programs published by the Council on Accreditation of Nurse Anesthesia Educational Programs/Schools, programs were categorized according to the credential awarded upon completion (graduate degree, undergraduate degree, or certificate). From this list, a simple random sampling technique was used to select 24 nurse anesthesia programs. The selected programs received a letter requesting (1) program design, (2) terminal objectives; (3) clinical objectives, (4) sequenced clinical objectives, (5) evaluation instruments, and (6) other information—any instruments or guidelines used in the evaluation of student performance.

Six programs (24%) responded to our request. The information we received provided assistance in conceptualizing how other nurse anesthesia programs approached the clinical practicum. However, the programs reviewed did not have the multiplicity of medical facilities unique to our school, since most anesthesia schools conduct their programs in a one-hospital setting with occasional affiliations.

Role of contributors

Throughout the planning stages, a number of individuals were consulted for input. Each of these individuals possessed expertise in their specific area.

School directors: The Minneapolis School of Anesthesia employs three full-time professional staff members—a program director, an education director and a clinical director. Each of these individuals is a CRNA. The program director and education director are currently credentialed at the Master's level in the field of curriculum and instruction. These individuals served as internal formative evaluators for the project. The clinical director is credentialed at the Master's level in the area of instructional systems.

Clinical coordinators: The role of the clinical coordinators has traditionally been that of clinical resource persons. They assisted in all aspects of the evaluation project through their monthly meetings and informal discussions. The input of these individuals was invaluable since they knew they would be working with the results of the project on a daily basis. Involvement of the clinical faculty in a project of this nature is the vital link in the implementation and utilization.

Department heads: Two of the special experiences are obtained in departments other than anesthesia. These are in postanesthesia recovery and respiratory therapy. Individuals responsible for student learning and evaluation participated in the formulation of this aspect of the curriculum.

Special experiences

The school provides students with five special experiences. Briefly, these experiences consist of the following.

Postanesthesia recovery: The postanesthesia recovery special experience was developed with the assistance of the head nurses from the postanesthesia recovery rooms in four of the affiliated hospitals. This experience is one week in length and occurs during the first and second rotations.

Respiratory therapy: This special experience was prepared with the assistance of the chief of education of the Department of Respiratory Therapy. This individual is responsible for the daily educational learning activities and evaluation of student performance conducted during this experience.

Pediatrics: The anesthetist primarily responsible for student learning activities during the
pediatric special experience met with the clinical coordinators to discuss and prepare the objectives. This individual presented valuable insights as to the kinds of experiences students have during the four-week concentrated experience in administering pediatric anesthesia.

Cardiovascular: The clinical coordinator and anesthesiologist directly involved in this experience identified the objectives and intended learning outcomes. Several resource articles are provided to each student to read prior to this four-week experience.

Department management: This one-week experience was designed by the chief nurse anesthetists directly involved in this experience. With the exception of the postanesthesia recovery special experience, which occurs during the first and second rotations, the remaining four occur during the last three rotations or 13 months of the program. In each instance, the curriculum planning involved the use of the task analysis format, which was used to identify behaviors the student should be able to accomplish during each special experience.

Design of clinical curriculum components

Following an analysis of several possible formats, the clinical curriculum was delineated into 10 major clinical curriculum components and five special experiences (Figure 1). For each of the components, there are three sections: rationale, terminal objective and intended learning outcomes. Each clinical component is described in the school’s *Clinical Practicum—Student Handbook*.

In general, the rationale describes the component; the terminal objective reflects the expectation of the graduate nurse anesthetist; and the intended learning outcomes are statements adaptable to learning situations and student performance at any point in the program.

Rationale: In determining the rationale for the identified curriculum components, the needs of the learner were addressed in each case. The statements explain the reason for defining and adopting the topic into the curriculum. Additionally, the relationship between the student, the patient, and the health care team are identified. The rationale also introduces the component in a general sense and provides the student with direction in the clinical environment.

Terminal objective: The intent of the curriculum is manifested in the form of a broad general statement known as the terminal objective. Mager admonishes the educator to initially decide what the desired end result will be following a learning segment. After considering the intent of the curriculum, the first action is to determine the objectives which will enable the evaluator to measure student attainment.1 Dykes comments that the primary determinant of quality education is reflected in the validity of the learning objectives.2

In a study of nurse anesthesia educational programs, Halliburton reported “congruence between the curriculum intents (program terminal objectives) and outcomes.”3 Of the graduates of the programs in her study (n = 40), 80% perceived their preparation was adequate in relation to the stated terminal behaviors. During the interview portion of this study, interviewees stated that “all of the program terminal behaviors were necessary to meet their professional needs. Furthermore, the graduates appeared to perceive their theoretical exposure as a strength of the program, whereas they feel the clinical phase of the curriculum needs to be improved.”3

*Intended learning outcomes:* The intended learning outcomes of the curriculum design can also be labeled as the *learning objectives*. They represent the outcome of what is to be learned. While there is more specificity when compared to the terminal objectives, these broad statements allow the student and instructor latitude in establishing specific objectives for each learning situation or, in this case, each anesthetic administered.
Within the context of day-to-day clinical experiences, objectives will often consist of a verbal exchange between the instructor and student and will be directly applicable to the procedure. Additionally, unintended or opportunistic learning situations develop during the course of the anesthetic procedure.

Posner and Rudnitsky discuss intended learning outcomes by explaining the label itself. They maintain the use of the word intended emphasizes the notion of control and direction. The use of the word learning emphasizes the major purpose of planning an activity that affects student learning. Finally, outcome focuses on what the student will have gained as a result of the experience.

In general, intended learning outcomes are sets of statements written within the context of the three domains of learning which are designed to bring coherence and rationality to the curriculum plan. In reality, they are representative of the process which guides the student to attainment of the stated terminal objective.

Gronlund diagrams this concept and comments that the experiences of the learner during the process are not the end but a means to an end. In the framework of anesthesia education, the patient condition, the anesthetic plan, and administration of the anesthetic are viewed as the tools to bring about the intended learning outcomes. Ultimately, the end product of the process is a safe and competent practitioner. The relationship of learning outcomes to learning experiences is diagramed in Figure 2.

**Application of evaluation concepts**

The purpose of evaluation may vary from institution to institution and even from student to student. The purpose and management of an evaluation program in a nurse anesthesia program must be congruent with sound evaluation principles and in compliance with the Standards and Guidelines of the Council on Accreditation of Nurse Anesthesia Educational Programs/Schools. The guidelines state that: "Evaluation is an ongoing process by which levels of performance and progress are determined. It is used to guide behavioral changes in the process of the student becoming a safe, competent, professional nurse anesthetist. . . . Formal, written evaluation delineating students' strengths and weaknesses shall be conducted every three months. A student having academic or clinical problems should be counseled/evaluated at least every month with appropriate documentation."

Relating the concept of formative evaluation to nurse anesthesia students, the main purpose for such an evaluation would be to determine the level of attainment for a given set of learning tasks and to identify the parts of the tasks which have not been mastered. Following this, an evaluation conference should be conducted with the student to discuss the results of the evaluation and to establish the goals for the remainder of the rotation.

Summative evaluation is the assessment of the student's performance at the completion of a given segment of learning. At the Minneapolis School of Anesthesia, a summative evaluation occurs at the end of each rotation. The final or fifth rotation evaluation determines if the student has met the objectives and requirements of the school.

The difference between the formative and summative evaluation roles is that formative evaluation seeks data which will improve instruction to allow the student to achieve a greater degree of competency. Summative evaluation, in contrast, focuses on the attainment of minimum competencies designated by the anesthesia program's goals and objectives and bypasses the instructional processes. Combining the two roles of evaluation provides a mechanism for continuous monitoring of the student's clinical education.

Utilizing the terminal objectives of the program, a checklist was developed to evaluate student clinical performance (Figure 3). Evaluation of student performance is based on the degree to which the student requires assistance from an instructor to accomplish the established outcome; that is, does the student frequently, occasionally or rarely need assistance.

This instrument is completed at the midpoint and end of each rotation. The beginning student naturally requires assistance more frequently, whereas the more advanced student should be able to perform with rare assistance. The beginning student is cautioned that requiring frequent assistance does not indicate negative behavior and is not to be construed as a less than desirable evaluation.

**Figure 2**

Relation of learning outcomes to learning experiences

Student → Teaching-learning → Learning outcomes (end products)

The Evaluation of Clinical Performance (Figure 4) is a narrative companion document which is used to document and clarify ratings made on the Terminal Objectives Performance Checklist. This instrument allows the rater to expand on positive and/or negative behaviors exhibited during the rating period. If ratings of “frequently needs assistance” or “unsatisfactory” performance are given on the checklist, documentation is required on this instrument. Any qualifying statements needed relevant to the assessment made on the checklist are made on this form. In addition, a plan for resolution is to be incorporated into the goals for the next rating period.

The Periodic Evaluation Record and Anecdotal Record are used by individual clinical instructors to document periodic or daily performance. These instruments focus on data gathering and are the basis for completing the mid-rotation and end-rotation evaluations.

In the case of unsatisfactory performance, the clinical faculty has the option of placing the student on clinical probation if the student's performance is not corrected or significantly im-

### Figure 3.
Terminal objectives performance checklist
(=Minneapolis School of Anesthesia)

<table>
<thead>
<tr>
<th>Terminal Objectives</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1. Preanesthesia assessment—Conduct a preanesthetic assessment and interview considering the psychological and physiological characteristics of the patient in relation to the anesthetic management.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#2. Anesthesia care plan—Formulate a plan of care for each patient prior to administering the anesthetic.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#3. Room preparation—Demonstrate proficiency in selecting, assembling and maintaining proper equipment and accessories while preparing for an anesthetic.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#4. Anesthesia record—Complete an anesthesia record reflecting physiologic responses to anesthesia and surgery including the pharmacologic and supporting therapy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#5. Management of induction—Demonstrate an independent and skillful induction utilizing the prepared anesthetic plan and selected equipment for administration of an anesthetic.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#6. Management of maintenance—Demonstrate skill in the maintenance of anesthesia care based upon the ongoing needs of the patient.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#7. Management of emergence—Demonstrate skill in assessing and managing the patient emerging from anesthesia.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#8. Postanesthesia assessment—Evaluate the postanesthetic condition in relationship to the anesthetic administered.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#9. Call experience—Manages circumstances unique to the call experience.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#10. Personal attributes—Demonstrate professional responsibility towards the patient and health care team.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

April/1983 171
proved within a mutually agreed upon period of time. During this time, the student has a weekly conference with the clinical and school faculty to monitor performance and to set realistic goals toward which the student can work.

A performance checklist is used by clinical instructors to evaluate student performance during the postanesthesia recovery, respiratory therapy and department management special experiences. Each checklist states the terminal objective and intended learning outcomes. Student performance is rated as "attained," "not attained," or "not observed." Additional comments regarding student performance can be made on the narrative Evaluation of Special Experience instrument. The student also completes a self-evaluation.

Upon completion of the pediatric and cardiovascular special experiences, student performance is evaluated and documented on the same instrument used in the mid-rotation and end-rotation evaluations. A self-evaluation is accomplished by the student utilizing the same instrument.

All evaluation documents are reviewed and discussed, including the students' self-evaluation, at an evaluation conference with the student in the hospital. Following that conference, the documents are reviewed by one of the school directors and a conference is held. This occurs at the midpoint of the rotation and at the completion of the rotation.

At the completion of each rotation and special experience, the student has the opportunity to anonymously critique the learning experience. The student completes both the Student Evaluation of Clinical Instructor and Student Evaluation of Hospital Rotation documents. This information is reviewed, compiled and disseminated to the clinical coordinator in the respective hospital with a copy of the clinical instructor evaluation going to the individual instructor. This type of evaluation provides feedback to the clinical coordinator and individual clinical instructors regarding the students' perception of instructor performance.

Clinical records. Record keeping is an important aspect of monitoring student progress throughout the program. The Clinical Experience Record published by the Council on Certification of Nurse Anesthetists is completed by the student each month. At the end of the month, this record and the completed anesthesia care plans are turned in to the school office. The information from the records is compiled, a cumulative class average is calculated and a comparison is made between the student's cumulative total and the class average. (At our institution, this is accomplished through the use of the CPT 8100 word processor. A complex program was developed between the CPT market support representative and the school to provide succinct and pertinent data to follow student programs.)

Upon completion of the calculations, a Student Profile Report is printed (Figure 5). The reports are reviewed by the clinical director and are subsequently given to the student and the clinical coordinator. This permits both individuals an opportunity to identify categories which need

---

**Figure 4.**

**Evaluation of clinical performance**

(Minneapolis School of Anesthesia)

*Note: This form has been condensed for publication; the actual form is 3 pages long to ensure ample writing space.*

**Instructions:** Evaluate the students' typical performance in relationship to the terminal objectives of the program. Ratings of frequently needs assistance or unsatisfactory on the Performance Checklist require documentation below. Additional comments are at the discretion of the evaluator. Please use ink!

- #1. Preanesthesia assessment
- #2. Anesthesia care plan
- #3. Room preparation
- #4. Anesthesia record
- #5. Induction
- #6. Maintenance
- #7. Emergence
- #8. Postanesthesia assessment
- #9. Call experience
- #10. Personal attributes

**Overall evaluation of clinical performance**

**Student performance at this time is:**

- Superior
- Above average
- Average
- Needs individualized instruction

**Additional comments**

**Goal setting**

**Signatures:**

- Clinical coordinator
- Student

**Number of days absent:**

**Date of evaluation conference:**

**Conference with school director and student**

**Date**

**Director**

**Student**
additional experiences in order to meet requirements and to assist in assigning the student to correct deficiencies.

Orientation to clinical practicum

Prior to the initial entrance into the clinical environment, class time is allocated for reviewing the contents of the Clinical Practicum-Student Handbook and Orientation to Clinical Practicum-Student Materials. A brief overview of the clinical evaluation process includes the use of the evaluation instruments, and a review of the orientation materials and special experiences which occur during the first rotation.

It is believed that this activity will adequately detail student and faculty expectations prior to entering the clinical area. On this premise, it is felt that transferring adequate information, engaging in open discussion, and supplying reference materials will reduce anxiety from the student's perspective. It will also answer questions of common concern and minimize the time of orientation into the clinical environment.

The students appreciate receiving as much information as possible about a rotation or special experience before entering the new and unfamiliar environment of the respective learning activity. The student materials are designed to give the student information regarding orientation, hours for clinical experience, parking, basic procedures, expectations and the like. There are also selected journal articles included which are of common interest and importance to the clinical practice of anesthesia.

Student Profile Folder. A Student Profile Folder is given to each student upon entry into the clinical environment. It contains a copy of each end-rotation evaluation and special experience and the monthly Student Profile Report. The purpose of this folder is to provide documents which will communicate the status of student progress to the clinical coordinator in subsequent rotations. The student is responsible for presenting this folder to the clinical coordinator on the first day of a new rotation.

Summary

Through the methodological approach used in designing the clinical curriculum of the Minneapolis School of Anesthesia, the author believes the results of this work will enhance the management of the clinical evaluation program, improve the clinical instruction, and provide the student with a more valid and reliable evaluation of clinical performance. To quote Miller:

"The path has been long, but the circle is now complete. Evaluation begins and ends with the behavioral goal of education, not with the instruments used to measure it or the instruction.
used to encourage it. It is at once a continuous process designed to facilitate learning and an intermittent activity to determine whether an acceptable amount of learning has occurred. Evaluation is a tool for education not merely an administrative device for the separation of those who falter from those who succeed.”

REFERENCES
(8) Holloway RL. 1980. Some issues surrounding the implementation of objectives-based education in family medicine. Presented at the Annual Meeting of the Society of Teachers of Family Medicine, May 6.

AUTHOR
Glen C. Ramsborg, CRNA, MA, is a graduate of Northwestern Hospital School of Nursing and Northwestern Hospital School of Anesthesia, Minneapolis, Minnesota. He received his Bachelor of Science in Nurse Anesthesia from the University of Minnesota in 1977 and his Master of Arts degree in Instructional Systems from the University of Minnesota in 1982. He served in the United States Air Force and was a staff anesthetist at the University of Minnesota Hospitals prior to accepting his current position as Clinical Director of the Minneapolis School of Anesthesia in St. Louis Park, Minnesota. Mr. Ramsborg is presently chairman of the AANA Continuing Education Committee and a member of the Council on Recertification of Nurse Anesthetists. He also currently serves as a military consultant to the surgeon general of the United States Air Force.

ACKNOWLEDGEMENTS
The author would like to thank Sandra J. Kilde, CRNA, MA, program director, Raymond J. Jung, CRNA, MA, education director and secretaries Lorraine Ferree and Ruth Radeke of the Minneapolis School of Anesthesia for their assistance in preparing this article. Special appreciation goes to Kathy Newton and Kati Anderson, marketing support representatives of the CPT Corporation, for their assistance in programming the CPT 8100 word processor to accomplish the monthly Student Profile Report.