CORE CURRICULUM FOR CRITICAL CARE NURSING

American Association of Critical-Care Nurses

NAN BORG

DIANA L. NIKAS
JUNE STARK
SUSAN M. WILLIAMS

SECOND EDITION

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CONTRIBUTORS

KATHLEEN G. ANDREOLI, R.N., D.S.N., F.A.A.N.
Special Assistant to the President for Interdisciplinary Education Office of the President, University of Texas Health Science Center at Houston, Houston, TX.

BETTYE H. BALL, R.N., B.S.N., M.S.N.
Major, Army Nurse Corps
Clinical Coordinator, Medical, Intensive Care Unit, Walter Reed Army Medical Center, Washington, DC.

JOHN L. CARTY, R.N., M.S.N.
Major, Army Nurse Corps
Clinical Specialist, Liaison Psychiatry, Walter Reed Army Medical Center, Washington, DC.

RICHARD DeANGELIS, R.N., B.S., M.S.
Major, Army Nurse Corps
Thoracic-Cardiovascular Clinical Nurse Specialist, Thoracic-Cardiovascular Surgical Unit, Walter Reed Army Medical Center, Washington, DC.

HELEN HOLLMANN, R.N., B.A., CCRN
Adult Critical Care Program, Senior Nursing Instructor, Los Angeles County – University of Southern California Medical Center, Los Angeles, CA.

Head Nurse Emergency Department, Verdugo Hills Hospital, Glendale, CA.

BONNIE MOWINSKI JENNINGS, R.N., M.S.
Major, Army Nurse Corps
Instructor, Department of Nursing, Tripler Army Medical Center, Honolulu, HI.

ROSEANN N. LUTONSKY, R.N., B.S.N., CCRN
Nursing Care Coordinator, Coronary Intensive Care Unit, Audie L. Murphy VA Hospital, San Antonio, TX.

DIANA L. NIKAS, R.N., M.N., CCRN, CNRN

Assistant Professor, Critical Care Clinical Nurse Specialist Program, California State University, Long Beach, CA.

Clinical Nurse Specialist, Neurology/Neurosurgery, Los Angeles County – University of Southern California Medical Center, Los Angeles, CA.

NANCY PIERCE-ERCK, R.N., M.S.N.

Independent Practitioner, Psychiatric-Mental Health Nursing, Bethesda, MD. Formerly Assistant Professor, Catholic University of America.

LINDA SCHAFF, R.N., M.S.N., R.N., C.S.

Formerly Teacher-Practitioner, Rush University College of Nursing, Chicago, IL.

JUNE STARK, R.N.

Critical Care Instructor, Staff Education; Nurse Consultant in Renal Nursing, Tufts-New England Medical Center Hospital, Boston, MA.

SUSAN VAN DeVELDE-COKE, R.N., M.A.

Full-time MBA Student, McGill University, Montreal, Canada. Formerly Teacher-Practitioner, Rush University, Chicago, IL.

SUSAN M. WILLIAMS, R.N., M.S.N., CCRN

Patient Care Coordinator, VA Medical Center, Shreveport. LA.

Formerly Director, Critical Care Courses, LDS Hospital, Salt Lake City, UT.

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DIANA NIKAS
JUNE STARK
SUSAN WILLIAMS

PREFACE

In 1975 the American Association of Critical Care Nurses (AACN) recognized the need for a core body of knowledge for the critical care nurse practitioner, and published *Core Curriculum for Critical Care Nursing.* Since that time an accumulation of new knowledge and changing technology in critical care is evident throughout the United States. Today's critical care setting offers not only new and exciting challenges for the practicing critical care nurse, but also a greater responsibility in the areas of clinical decision-making.

These ongoing changes require that critical care nurses pursue a more sophisticated level of knowledge, not only to insure better patient care, but also to allow them to relate more meaningfully with others of the health care team. This second edition of the *Core* is designed to expand the knowledge base of the critical care practitioner and may be used as a comprehensive study guide, as a resource document from which a course in critical care nursing can be constructed, and as one resource to prepare for the certification examination in critical care nursing.

In this edition the primary intent was to expand and update the core knowledge required for the critical care nurse practitioner. Each original section has been rewritten and new subject matter has been added. Behavioral objectives have been designed as a means to better assist readers in validating their learning. A systematic approach to assessment of the critically ill individual has been thoroughly addressed in each of these chapters. This should enhance the practitioner's ability to gather data and should insure a more accurate patient assessment.

The first four sections are devoted to the four major body systems – pulmonary, cardiovascular, neurologic, and renal. New material on the "Management of System Conduction Defects With Artificial Pacing" written by Dr. Kathleen Andreoli is included in the Cardiovascular section, as is an expanded discussion on Shock.

The fifth section addresses the critically ill patient with metabolic dysfunction, and two new sections on hematology/oncology and the gastrointestinal system have been added. Hematologic/oncologic patients are

usually seen in the critical care setting for crisis management. A thorough understanding of the physical and psychologic states of these patients will allow the critical care nurse to better meet their total needs. Many critically ill patients with either primary or secondary gastrointestinal problems will be cared for in either a medical or a surgical critical care setting. A more in-depth understanding of the underlying physiologic and psychosocial aspects of these conditions will assist the critical care nurse in the administration of more comprehensive care.

The second edition closes with the Psychosocial section, the purpose of which is to facilitate critical care nurse practitioners' understanding of the foundations of human behavior. They then can more accurately assess needs and appropriately plan and implement nursing interventions that can be evaluated in the process of providing ongoing care to critically ill patients with their family members. This section also addresses an awareness of problems that staff will encounter in the critical care setting.

The success and extensive utilization of the first edition of *Core Curriculum* has indicated the need for its expansion and updating. It must be emphasized that the sophisticated body of knowledge required by critical care nurse practitioners cannot be learned solely from this text. Since the subject of critical care itself necessitates a continuing education process, it is our hope that this edition will serve as a further challenge and stimulus to learning. Correlative clinical practice in the critical care setting is an imperative and vital complement to this learning process.

AACN
SCOPE OF PRACTICE

Critical care nursing practice is a dynamic process the scope of which is defined in terms of the critically ill patient, the critical care nurse and the environment in which critical care nursing is delivered; all three components are essential elements for the practice of critical care nursing.

The critically ill patient

The critically ill patient is characterized by the presence of real or potential life-threatening health problems and by the requirements for continuous observation and intervention to prevent complications and restore health. The concept of the critically ill patient includes the patient's family and/or significant others.

The critical care nurse

The critical care nurse is a registered professional nurse committed to ensuring that all critically ill patients receive optimal care. This nurse's practice is based on the following:

a) individual professional accountability

b) thorough knowledge of the interrelatedness of body systems and the dynamic nature of the life process

c) recognition and appreciation of the individual's wholeness, uniqueness and significant social and environmental relationships

d) appreciation of the collaborative role of all members of the health care team

To continually refine the practice, the critical care nurse participates in ongoing educational activities. In addition to basic preparation, the critical care nurse acquires an advanced knowledge of psychosocial, physiological and therapeutic components specific to the care of the critically ill. Clinical competency and the ability to effectively interact with patients, families and other members of the health care team are developed. Additionally, an awareness of the responsibility for an environment for safe practice is cultivated.

The critical care nurse utilizes the nursing process as a framework for practice. In caring for the critically ill, the nurse will collect data, identify and determine the priority of the patient's problems/needs, formulate an appropriate plan of nursing care, implement the plan of nursing care according to the priority of the identified problems/needs, and evaluate the process and outcome of nursing care.

The critical care environment

A critical care unit is any geographically designated area which is designed to facilitate the care of the critically ill patient by critical care nurses. It is an area where safety, organizational and ethical standards are maintained for patient welfare. Although critical care nursing usually occurs in a critical care unit, it can occur in any setting that meets the environmental and nursing standards such as an area which has a psychologically supportive environment for the patients and families, adequately functioning equipment and supplies, readily available emergency equipment, facilities to meet staff needs, and ready access to support departments.

UTILIZING THE NURSING PROCESS

As stated in the AACN definition of critical care nursing practice, the critical care nurse practitioner utilizes the nursing process as a framework for practice. The format of the second edition of *Core Curriculum* fosters the nursing process in managing the delivery of nursing care in the critical care setting.

The process begins with assessment – the collection of data. Through interview and observation of the patient, the critical care nurse gathers subjective and objective data (for example, a patient on a ventilator with PEEP is comatose; circulatory parameters are decreased, lung compliance reduced, and breath sounds and heart sounds are normal), which is used to arrive at a nursing diagnosis (in the example, decreased venous return related to use of PEEP) and to develop a plan of care.

The second step in the nursing process, care planning, involves coordination of input from nursing and other disciplines that will affect the patient during hospitalization and after discharge. Following the example above, planning for the patient with decreased venous return related to the use of PEEP would include a goal of returning the patient to a stable cardiopulmonary status by increasing cardiac output to previous physiologic levels, and by frequent reassessment of cardiopulmonary status.

Implementation of the plan is the nursing management of the problem. In our example, implementation would include monitoring vital signs and respiratory parameters, reducing PEEP, consideration of Trendelenburg position, administration of short-term vasopressors, and provision of adequate volume intake.

Continuous observation, reinterpretation of data, and the input of new information and knowledge provide the basis for step four, evaluation of the care plan. Determining the response to measures to increase cardiac output and establishment of stable vital signs and respiratory parameters would help to evaluate the example care plan and to change it as required by the patient's condition.

Once you have learned the basic information presented in the *Core Curriculum*, you will be able to use the nursing process effectively in nursing care. This systematic and dynamic method of problem solving has its basis in core knowledge. You must be able to assess a patient's status, use the data from your assessment to plan and implement care, and again use your assessment skills to evaluate and adjust your nursing care. It is an ongoing process requiring integration of all your nursing knowledge and skills.

CONTENTS

THE PULMONARY SYSTEM

prepared by
SUSAN M. WILLIAMS, R.N., M.S.N., CCRN

BEHAVIORAL OBJECTIVES

Functional Anatomy

1. Identify the major functions of each given anatomic part of the pulmonary system.
2. Describe the relationship between pulmonary vascular mean pressures and diffusion of gases across the alveolocapillary membrane.
3. Compare the sites and modes of nervous system feedback mechanisms on ventilation.

Physiology

1. List the major functions (in terms of gas transport) performed during each of the four basic steps of respiration.
2. Calculate accurately the values of clinical laboratory tests that measure the first three steps in the gas transport system.
3. Analyze the relationship between the Pa_{O_2} and Sa_{O_2} and between the Pa_{O_2} and O_2 content.
4. Identify the mechanism by which alveolar ventilation is matched to metabolic demand.
5. When given a list of five general physiologic abnormalities that lead to hypoxemia, distinguish between each in terms of etiology, diagnosis, and appropriate oxygen therapy.
6. When given a set of arterial blood gas values, identify the dominant acid-base abnormality involved and the degree of compensation.
7. For each of the four major acid-base abnormalities, list the ways in which the physiologic parameters are altered, the probable causes for the alterations, and the role of compensation and/or correction in normalizing the body's acid-base status.

Assessment

1. Describe a systematic process for assessment of the pulmonary system, utilizing history and physical examination skills.
2. List and justify the diagnostic studies generally used in assessment of the pulmonary system.
3. When given several common pulmonary disease processes, select the characteristic changes in inspection, palpation, percussion, and auscultation that occur with each.

General Patient Care Management

1. Develop a plan for nursing intervention to establish and maintain optimal airway patency in the critically ill patient, while also minimizing the consequences of airway intubation procedures.
2. Describe the physiologic and psychologic consequences of ventilator therapy in terms of etiology, probable complications, and preventive measures.

3. Compare the advantages and disadvantages, and state the therapeutic uses, of pressure-cycled and volume-cycled ventilators.
4. Justify the specific nursing responsibilities required for a patient receiving positive end-expiratory pressure (PEEP).
5. Develop a systematic nursing plan to follow in caring for the patient on continuous ventilatory support, including the weaning phase. Include all essential parameters that must be observed, measured, calculated, and recorded.
6. When presented with a patient who has hypoxemia from a known cause, select the preferred method of oxygen delivery and justify that choice in terms of effectiveness, concentration of oxygen delivered, and possible complications.

Pathologic Conditions and Management

For each of the following: acute respiratory failure, adult respiratory distress syndrome, chronic obstructive pulmonary disease, status asthmaticus, pulmonary embolus, and chest trauma:

1. Describe the specific physiologic derangements that characterize each.
2. Select a systematic approach to the diagnosis of each, based on its clinical presentation, the presence of etiologic or precipitating factors, and the results of diagnostic testing.
3. Outline the essential elements of nursing care that will meet the needs of patients with these diagnoses, and justify the treatment modalities used in the management of each clinical problem or complication.