Review of Critical Care Nursing

Case Studies and Applications

MELANDER

REVIEW OF CRITICAL CARE NURSING

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CASE STUDIES AND APPLICATIONS

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NOTICE

Critical care nursing is an ever-changing field. Standard safety precautions must be followed, but as new research and clinical experience broaden our knowledge, changes in treatment and drug therapy become necessary or appropriate. The editors of this work have carefully checked the generic and trade drug names and verified drug dosages to ensure that the dosage information in this work is accurate and in accord with the standards accepted at the time of publication. Readers are advised, however, to check the product information currently provided by the manufacturer of each drug to be administered to be certain that changes have not been made in the recommended dose or in the contraindications for administration. This is of particular importance in regard to new or infrequently used drugs. It is the responsibility of the treating physician, relying on experience and knowledge of the patient, to determine dosages and the best treatment for the patient. The editors cannot be responsible for misuse or misapplication of the material in this work.

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Foreword

Almost two decades ago Knowles (1980) noted that the mission of education was to produce people who could apply their knowledge under changing conditions characterized by an explosion of knowledge and a revolution in technology. He further commented that a fundamental competence needed by all is to engage in lifelong self-directed learning. How are educators to fulfill this mission? What changes in traditional teaching strategies are needed to accomplish this task? Needed are strategies that help students learn to think, not just acquire information.

Yinger (1980) identified four major factors that affect students' ability to think: (1) knowledge and experience, (2) intellectual skills and strategies, (3) attitudes and dispositions, and (4) the thinking environment. The first three factors are internal and not amenable to teacher influence, but the fourth is external to the learner and is under the control of the teacher. A thinking environment is crucial for encouraging and supporting the internal factors. Among the various environmental influences on students' thinking, the most important are emotional and intellectual factors, which are reflected in instruction and teacher attitude.

Colgrove and colleagues (1995) characterize traditional instructional methods as "feeding the students prepackaged knowledge" and advocate a more active process of learning called *experiential learning.* This type of learning emphasizes the process of learning rather than the outcome and offers students the opportunity for direct exploration of complex concepts.

One example of experiential learning methods is the case study, which provides students with an opportunity to apply problem solving and decision making in the safe atmosphere of the classroom. Because the case study provokes critical thinking and motivates the student with active involvement, it promotes the acquisition of skills essential for a lifetime of learning.

This book of case studies in critical care nursing offers an important teaching and learning tool for faculty and students. In each case study, important concepts are emphasized, controversies in intervention are noted, and nursing management is extended beyond the critical phase of illness. An important contribution of this text is the opportunity for the faculty member to become a *facilitator* for student learning who can provide immediate feedback and challenge students to go beyond their initial response to the

presented case. Linking learners with learning resources is one of the most meaningful contributions a faculty member can offer to students. This text provides an excellent mechanism for this linkage.

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Preface

Review of Critical Care Nursing: Case Studies and Applications was compiled with the intent of capturing actual patient data from a critical care setting. The data were then placed in a scenario that recaptured patient events as they actually occurred. Patient scenarios were sought that represented common diagnoses seen in six body systems—respiratory, cardiovascular, renal, neurological, gastrointestinal, and endocrine—and in multisystems. The 26 chapters are grouped according to these systems for quick reference. These cases were compiled with one goal in mind, to create a tool for use with critical care students that provided a true perspective of patient needs in the critical care setting. Students could study actual patient situations and apply critical thinking skills in discussions of current treatment modalities, effectiveness of treatments and medications prescribed, alternative care options, the necessity for diagnostic tests ordered, and the impact of hemodynamic values on patient care and the "real life" necessity for hemodynamic monitoring.

The case study application text represents a different approach to education of critical care nurses. In each scenario, students follow the patient from entrance into the healthcare setting through his or her discharge from the acute care setting. Students are challenged to use critical thinking skills to accurately answer the case study questions that accompany each case and provide solutions to the patient's problem. Students can then study answers to those same questions written by the author of the chapter. Students should then be well versed in current diagnostic procedures, laboratory data required, pharmacologic needs, and treatment modalities for that particular disease entity.

This text is appropriate for the baccalaureate or graduate student and for use in the hospital setting in critical care training. The text may also serve as a review tool for nurses preparing for the CCRN examination. The answers to the case study questions provide a detailed account of the disease studied. Educators can choose the questions appropriate for the students' level or can adapt their expectations of the depth of the students' answers.

Healthcare needs are quickly changing, and we must prepare nurses to change and adapt with the healthcare system. Students who are challenged to think critically while still in the classroom setting can translate those skills into the clinical care setting to better meet the changing needs of the critically ill patient. It is hoped that this text will increase students' knowledge of the needs of the critically ill patient and enhance education in the clinical setting.

Sheila Drake Melander

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Sheila Drake Melander

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Adult Respiratory Distress Syndrome

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CASE PRESENTATION

Postoperative Day 3

Mr. Embry, a 63-year-old, 68 kg (150 lb) white man, had undergone an anterior colon resection for rectal polyps and had an uneventful postoperative course until the evening of the third postoperative day. He was monitored with telemetry and had no unusual complaints. At 10 PM on the third postoperative day he began to complain of not feeling "right." Assessment of the patient revealed hypotension and shortness of breath. Within minutes he became confused and agitated. The shortness of breath worsened (he began gasping for air), and he experienced severe hypoxia. He was intubated and transferred to the intensive care unit (ICU).

BP	60/40	pH	7.3
HR	160 bpm	P_{CO_2}	46 mm Hg
Respirations	12–35/min	P_{O_2}	104 mm Hg
Temperature	38.8° C (101.8° F)	HCO_3^-	22 mmol/L

On arrival in the ICU he was placed on a ventilator in the synchronized intermittent mandatory ventilation (SIMV) mode.

F_{IO_2}	90%
SIMV rate	6
V_T	800 ml

The patient was given a 500 ml bolus of normal saline. He received dopamine (Intropin) 3 to 5 µg/kg/min for renal perfusion and was given 1 g vancomycin (Vancocin IV) intravenously (IV) every 12 hours for prophylactic staphylococcal coverage. A pulmonary artery catheter (Swan-Ganz) was inserted, and the patient's pulmonary capillary wedge pressure (PCWP) was 12 mm Hg.

Postoperative Day 4

The next morning the patient remained on ventilatory support with pressure support of 7 cm H_2O. He received IV fluids at 250 ml/h and dopamine at 7 µg/kg/min. The patient was receiving total parenteral nutrition. He has an order for morphine sulfate (Roxanol) 2 to 12 mg every hour as needed for pain or restlessness.

BP	135/70	pH	7.35
HR	140 bpm	Pco_2	46.1 mm Hg
Respirations	6–16/min	Po_2	55.5 mm Hg
Temperature	39.4° C (103° F)	HCO_3^-	25 mmol/L
Urine output	20–30 ml/h		

The patient's FIO_2 is increased from 90% to 100%; tidal volume (VT) is 800 ml; SIMV is 6 with total respirations of 16/min. At this time a positive end expiratory pressure (PEEP) of 5 cm H_2O was added, and the patient remained on pressure support of 7 cm H_2O.

The patient was given several boluses of normal saline and continued to receive the dopamine infusion. He remained on the preceding ventilation settings. The following arterial blood gases (ABGs) were drawn 2 hours after the ventilator settings were changed:

pH	7.42
PCO_2	46.2 mm Hg
PO_2	75.2 mm Hg
HCO_3^-	28.9 mmol/L

Postoperative Day 5

PEEP is increased to 10 cm H_2O and VT is increased to 1000 ml.

pH	7.43	BP	130/60
PCO_2	46.2 mm Hg	HR	120 bpm
PO_2	86.8 mm Hg	Respirations	10/min
HCO_3^-	30.5 mmol/L	Temperature	38.3° C (101° F)

After these changes the patient's oxygen levels gradually stabilized, and the patient was weaned from ventilatory support. The patient's urinary output also increased significantly after administration of the fluid boluses. Ten days after intubation the patient was extubated and received oxygen by nasal cannula.