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UNIVERSITY OF SAN DIEGO
Hahn School of Nursing and Health Science
DOCTOR OF PHILOSOPHY IN NURSING

A Composite Cognition Instrument for Nursing Care of Combat Casualties

by

Patricia Frohock Hanes, MSN, MAED, RN

A dissertation presented to the
FACULTY OF THE HAHN SCHOOL OF NURSING AND HEALTH SCIENCE
UNIVERSITY OF SAN DIEGO

In partial fulfillment of the
requirements for the degree
DOCTOR OF PHILOSOPHY IN NURSING

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Cynthia Connelly, PhD, RN, Chair

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Abstract

In the course of caring for military and civilian combat casualties, military nurses must make rapid, accurate decisions. When developing methods to teach nurses essential content for combat casualty care, it is important to understand the cognitive and learning processes involved in acquiring that knowledge. Measures to examine how military nurses think and learn have significance, especially when applied to the high-stress, high-stakes practice arena of combat casualty care. Use of these measures in evaluating educational strategies will help answer the need for better deployment readiness for military nurses.

The purpose of this study is to develop an instrument to measure a newly conceptualized construct, composite cognition, formulated to explain the cognitive and learning processes related to the care of combat casualties using specific conditions seen in combat, and to examine its psychometric properties to establish preliminary reliability and validity.

The conceptual framework for this study was informed by the theoretical perspectives of Bloom's taxonomy, critical thinking theory, and the nursing process. Krathwohl's (2002) revised taxonomy was used while still retaining Bloom's more widely recognized original taxonomic terms/categories. These categories were combined to form the subscales of the Composite Cognition Instrument (CCI).

The CCI measures the three subscales of cognition: lower-level cognition, higher-level cognition, and critical thinking cognition. Seventy-five multiple choice questions were developed based upon three combat trauma scenarios: hypovolemic shock, tension pneumothorax, and cardiac tamponade.

The instrument was administered to 32 military nurses using a test-retest method to establish preliminary reliability and validity. Validity was supported through expert review; the congruency percentage was 100%; the item subscale/objective congruence was .8026. Test-test reliability was established with a Pearson r of .890; reliability was also statistically significant for the subscales. A Kuder-Richardson score (KR20) of .91 indicated text dependability. The mean item difficulty was .57 on the pre-and posttest. Point-biserial correlations and discrimination indexes demonstrated good item discrimination. Future testing is needed with a larger sample. This instrument adds to the body of knowledge for teaching combat casualty care and will be used to evaluate educational approaches for military nurses caring for injured soldiers and civilians in combat areas.

DEDICATION

To my mom and dad, Dick and Pat Frohock, who, although they are not here with me, gave me the tools that made this possible. I especially dedicate this volume to my husband, Bill Hanes, M.D., who, although a busy surgeon himself, willingly assumed many of the household chores for the past four years and is now a laundry expert. I also dedicate this dissertation to my children: Neil, Douglas, Timothy, Richard, and Genevieve, for learning to cook dinner and being willing to give up computer time while listening to Mom talk constantly about her dissertation. I love you all.

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Chapter I

Introduction

Military nurses are required to make complex decisions every day in the course of caring for severely injured soldiers and civilians in combat zones. In a stressful and dangerous practice arena, it is imperative that nurses be able to make swift and accurate life-and-death decisions for patients with multiple, severe, traumatic injuries not often seen in civilian practice. Nurses deployed to combat areas are often inadequately prepared for the intense, dangerous situations and severe traumatic injuries they encounter. In fact, nurses are telling us they are not ready to be deployed (Stevenson, Dremsa, & Austin, 2007; Duong, Shempp, Barker, Cupples, Pierce, Ryan-Wenger, Turner, & McCaughan, 2005; Rivers, Wertenberger, & Lindgren, 2006). They are challenged to use their clinical and critical thinking skills to render combat casualty care under the most adverse conditions (Johnson, 2005).

Duong and associates (2005) reported that the Tri-Service Nursing Research Program (TSNRP) gave the “highest priority” for research on “developing and sustaining competencies” (p. 365) while Stevenson, Dremsa, & Austin (2007) stated that “it is imperative to assist service members with more-complex-issues, including the ability to

use clinical skills in an austere environment with rudimentary equipment and numerous personal and organizational stressors” (p. 36). Rivers, Wertenberger, & Lindgren (2006) argue that the price for not preparing nurses for combat deployment would be at the cost of many lives.

There is a military mandate to investigate issues directly related to wartime nursing (Duong, et al, 2005, p. 362). Part of this research must be directed towards the development of educational programs to more effectively prepare these nurses for the intense experience of caring for severely injured soldiers and civilians in the extreme conditions associated with combat. For this teaching to be most effective, the cognitive and learning processes necessary to acquire the knowledge and skills to make these crucial nursing judgments must be identified. Measures to examine how military nurses think and learn have significance, especially when applied to the high-stress, high-stakes practice arena of combat causality care. Use of these measures in evaluating educational strategies will help answer the need for better deployment readiness for military nurses.

The purpose of this study is to develop an instrument to measure a newly conceptualized construct, composite cognition, formulated to explain the cognitive and learning processes related to the care of combat casualties using specific conditions seen in combat, and to examine its psychometric properties to establish preliminary reliability and validity.

Composite Cognition

Composite cognition consists of lower-level and higher-level cognition as described by Bloom (1956) and critical thinking cognition as delineated by four components of the nursing process: assessment, planning, intervention, and evaluation.

Composite cognition as defined (higher- and lower-level cognition and critical thinking cognition) was not found in the literature. Further examination of the state of the science related to the individual components was conducted. This review revealed two types of testing for critical thinking: norm-referenced testing using standardized tests such as the Watson-Glaser Critical Thinking Appraisal (WGCTA) and Facione's California Critical Thinking Skills Test (CCTST) (Adams, 1996); and criterion-referenced testing, where instruments are designed related to a specific context, for example, combat casualty care. There were controversial opinions in the literature as to the applicability, generalizability, and usefulness of the two types of tests.

Many studies used Bloom's taxonomy to formulate research questions but few were found that examined the cognitive components of Bloom's taxonomy. The six components developed by Bloom are combined in the study presented here to comprise both lower level cognition: knowledge and comprehension; and higher-level cognition: application, analysis, evaluation, and synthesis. In 2002, Krathwohl, one of the original developers of Bloom's taxonomy, updated and expanded the original taxonomy; these updated terms will be used with the original taxonomic terms throughout the rest of this study.

Composite cognition, with the aforementioned components, was a construct developed for this study. Brown (2000, p. 8) stated that "A construct...is an attribute, proficiency, ability, or skill that happens in the human brain and is defined by established theories." Although studies and instruments were found for the individual components of higher-and lower-level cognition and critical thinking, none were found that included all

three components, and none were uncovered specifically related to the care of combat casualties.

Conceptual Framework

The conceptual framework for this study was informed by the theoretical perspectives of Bloom's taxonomy, critical thinking theory, and the nursing process. In addition, Krathwohl's (2002) revised taxonomy was used while still retaining the six more widely recognized original taxonomic terms/categories. These categories were combined to form the subscales of the CCI (original terms in parentheses): Lower-level cognition: Remember (Knowledge) and Understanding (Comprehension); and the more advanced higher-level cognition: Apply (Application), Analyze (Analysis), Evaluate (Evaluation), and Create (Synthesis) (Bloom, 1956; Knowles, 2002). Recalling facts and discerning meanings comprises lower-level cognition while higher-level cognition requires the ability to use theories, rules, concepts, laws, principles, and knowledge in novel ways as well as being able to articulate the parts comprising the whole, to perform appraisals, and to look at existing situations in a new way (Johnson, 2005; Krathwohl, 2002).

Higher-level cognition subsumes lower-level cognition; both are necessary for critical thinking cognition to occur. All are crucial to the decision-making process (Johnson, 2005; Usova, 1997). Critical thinking cognition is comprised, in this study, of the elements of the nursing process: assessment, or data gathering; planning, or goal setting; intervention, that is, implementation of interventions to achieve the goals; and evaluation of the entire nursing process (Alfaro-LeFevre, 1994; Johnson, 2005, Wilkinson, 1996). Critical thinking using the nursing process is "goal-oriented",

“purposeful”, and requires “determining what data is relevant...and making inferences” (Wilkinson, 1996, p. 11). Figure 1 shows the relationship of the conceptual framework to the construct of composite cognition.

Figure 1. Composite Cognition and Subscales (adapted from Johnson, 2005. Used with permission).

Significance to Nursing

An identified focus of research in military nursing is on “current and emerging issues with direct application to nursing in wartime..”(Duong, 2005, p. 362). Nurses, closer to the front lines than ever before, are operating as “soldiers first and nurses second” (Colonel L. Pappas, United States Army [retired], personal communication, October 26, 2005). Measures to examine how nurses think and learn are needed, especially when applied to the high-stress, high-stakes practice arena of combat casualty care.

The development of the construct of composite cognition and the development of an instrument to measure it makes a contribution to the state of the science of thinking and learning in nursing. The context-specific nature of the instrument adds to the body of knowledge for teaching combat casualty care and will be used to evaluate educational approaches for military nurses caring for injured soldiers and civilians in combat areas. Better educated nurses translate to lives saved.

Composite cognition is a new construct not previously described in the literature. This construct is useful in unifying three overlapping concepts important to nursing and nursing education: Lower-level cognition, higher-level cognition, and critical thinking cognition (Johnson, 2005; Usova, 1997). The use of the nursing process and Bloom's taxonomy provide commonly used and easily understood frameworks, rendering the CCI and its subscales comprehensible and usable for a wider audience. This makes the construct of composite cognition and the CCI more accessible for further research with a new population in a different context.

Summary

Based on Bloom's taxonomy, critical thinking theory, and the nursing process, a new construct, composite cognition, will be investigated in the context of combat casualty care. Composite cognition consists of three subscales: lower-level cognition, higher-level cognition, and critical thinking cognition. A measure to examine how nurses think and learn based on this construct is also needed. The development and pilot testing of a criterion-referenced instrument will facilitate measurement of educational interventions to better prepare military nurses for practice in war zones and will add to

the state of the science in military nursing and nursing education, which ultimately can be translated to other specialty areas in nursing practice.

Chapter II

Literature Review

The concept of Composite Cognition has intuitive appeal for an explanation of how nurses think and learn with appropriate implementation of this knowledge. Measures to examine how military nurses think and learn have significance, especially when applied to the high-stress, high-stakes practice arena of combat casualty care. Use of these measures in evaluating educational strategies will help answer the need for better deployment readiness for military nurses.

A review of the literature examined current and historical perspectives of the experiences and preparedness of military nurses as well as the concept of composite cognition and its related components, lower- and higher-level cognition and critical thinking cognition. The state of the science with regard to these concepts and an examination of the research with regard to consistency, rigor, and applicability to the development of an instrument to measure composite cognition in military nurses is presented in this chapter.

An exhaustive literature search was conducted using 12 online databases from three different university libraries. Periodical resources in the physical library and books on the lived experience of military nurses and their preparedness for deployment, critical

thinking, learning, cognition, and learning taxonomies were also explored. Finally, experts on critical thinking, clinical decision making, learning, cognition, and instrument development were consulted. The overall search was limited by the restrictive nature of much of the military literature, especially in wartime.

Readiness for Deployment

“War and nursing are linked unequivocally” (Biedermann, 2001, p. 543). Nurses have been part of the combat milieu since before Florence Nightingale went to the Crimea. They have suffered and died along with the soldiers they were trying to save. In the 20th century, nurses participated in two major world wars as well other major and minor conflicts such as Korea, Viet-Nam, Iraq, and Somalia. The 21st century has seen a continued call for nurses to serve; nurses are currently stationed in combat zones such as Iraq and Afghanistan. This portion of the literature review will contextualize combat nursing and examine the current knowledge and readiness for deployment of military nurses.

There was a great deal written on the experiences of nurses in battle zones; however, much of the literature was anecdotal and from books and non-peer-reviewed sources. These are important writings because they are based on true stories and serve to contextualize military nurses’ important experiences and contributions. Scholarly writings included a qualitative inquiry of the experiences of Australian Army nurses during World War II (Biedermann, Usher, Williams, & Hayes, 2001), a Delphi study that examined medical-surgical combat competencies (Thompson, Repke, & Staggers, 2003), a review of the literature on nurses’ involvement in combat (Wild, 2003), and a review of military research by military nursing students (Abdellah, Levine, Sylvia, Kelley, Saba, &

Tennebaum, 2005). Fry, Harvey, Hurley, and Foley (2002), recognizing the moral distress inherent in combat nursing, developed a model of moral distress in military nursing; while Kennedy, Hill, Adams, and Jennings (1996) focused on deployment and clinical applications in their model of Army nursing practice. Scannell-Desch (2004), in a phenomenological study of Viet-Nam nurse veterans, examined lack of preparation and training and the implications for current and future military nurses.

Three recent articles discussed the current state of research priorities and readiness for deployment of nurses. Duong, et al, reported on the research priorities of the Tri-Service Nursing Research Program (TSNRP), which was “established in 1992 to serve the nursing research needs of the military” (2005, p. 362). The Readiness Estimate and Deployability Index (READI), a self-reporting instrument, was administered to military nurses and reported in two articles: Rivers, Wertenberger, & Lindgren (2006), and Stevenson, Dremsa, & Austin (2007).

Current State of Readiness

In Rivers', Wertenberger's, & Lindgren's (2006) study, the Readiness Estimate and Deployability Index (READI) was administered to 80 military registered nurses with reported specialties ranging from psychiatric nurse to nurse practitioner and nurse anesthetist. This self-reported instrument measured the nurses' perceptions of their deployment competencies in six scales: clinical nursing competency, operational nursing competency, soldier/survival skills, personal/physical/psychosocial stress, leadership and support, and group integration and identification. These subscales indicate the extent to which military nurses must be prepared beyond just their clinical competencies.

The clinical competency subscale consisted of 35 items. Nurses reported low levels of competency for greater than half of the items, including caring for patients with “different types of shock,” “code/emergency situation,” “performing ACLS protocols,” “recognizing tension pneumothorax,” “caring for life-threatening injuries,” and “airway management”. The very lowest levels of competency, scoring less than two on a five-point scale, included: “correct response to shock scenario,” “IV skills,” “describing life saving principles,” “assessing multiple-trauma patient,” and “caring for refugees” (Rivers, Wertenberger, & Lindgren, 2006, p. 146). These competency skills were perceived lower than in a previous study and lower than in a more recent, similar study of nurse anesthetists using a modified READI instrument (Rivers, Wertenberger, & Lindgren, 2006; Stevenson, Dremsa, & Austin, 2007).

In the Rivers, Wertenberger, & Lindgren study, perceiving the highest level of competency was not reported on any item by any participant. Low levels of readiness were also perceived for contextual factors such as “Death, carnage, one’s own death, battle fatigue, and weather extremes” (2006, p. 145). There was a general sense of not being ready for deployment.

In the past, nurses were expected to use their clinical experiences in the hospital to maintain their clinical skills; the authors emphasized a need to develop more and different skills than those used in a hospital setting. Preparedness went beyond the ability to use equipment and to have good clinical skills related to physical assessment, trauma, triage and clinical decision-making. Nurses needed the knowledge and confidence to be able to be flexible and to function in non-traditional roles. Essential skills were related directly to the nurse’s specialty but also included skills unique to the military as well as

trauma intervention skills, improvising when there were few supplies, trusting one's own judgment, the ability to function autonomously without a physician, and caring for highly diverse patients in an austere, challenging setting (Rivers, Wertenberger, & Lindgren, 2006, p. 149; Stevenson, Dremsa, & Austin, 2007).

In response to the recommendations from the TSNRP in Duong's et al. (2005) article, the authors of the previous articles made several recommendations for future research. Stevenson, Dremsa, & Austin (2007) discussed the need to support the individual nurse's readiness for deployment. Rivers, Wertenberger, & Lindgren (2006) recommended the development of a core competency tool for deployment readiness and emphasized the need for a conceptual model to guide military nurses' education and practice.

Historical Perspectives

Readiness was approached from several perspectives in the literature. Yackel (2003) described a training program where nurses were required to know the "Mission Oriented Protective Posture (MOPP)" that delineated the precautions nurses were expected to take and the degree of exposure to classes of hazards related to treatment. (p. 263) The philosophy behind teaching nurses to take care of themselves, that is, to maintain the health of nurses, was for them to be ready and available to care for injured troops (Yackel).

There was little preparation for working in harsh, extreme settings. Nurses reported working for days without sleep because there was no one else to do the job (Beidermann et al., 2001; Duncan, Pansoy, Towe, Nosalir, Sundem, Snyder et al., 2005; Van Devanter, 1983). Sleep deprivation contributed to physical and mental distress and

vulnerability; they were “never off duty” (Biedermann, 2001, p. 546). Darkness and blackout conditions, sometimes up to 11 hours per day, made caring for patients even more hazardous (Wild, 2003). Often, field hospitals were nothing more than beds spread across fields or in the jungle with nothing between the patients and the sky. Nurses had to weave their way through vegetation to get to patients and to other areas of the compound, a dangerous proposition since, if the nurse didn’t encounter some danger from plants or holes, there was danger from hidden enemies or mines (Norman, 1999).

Nurses reported feeling “anticipatory stress” before being deployed (Wild, 2003, p. 25). Lack of preparation for nursing in combat zones was the subject of numerous writings (Biedermann, 2001; Fry et al., 2002; Norman, 1999; Thompson et al., 2003; Wild, 2003; Van Devanter, 1983). It was as if by virtue of being a nurse, “it was expected that nurses would adapt to the war zone...” but, “...they were not clinically prepared for the type of nursing they would be expected to perform...” causing them to be “...uncertain and unprepared.” (Biedermann, 2001, pp. 543-544). This was echoed in Van Devanter’s book when she described how she and her roommate left for Army training a few weeks after graduating from nursing school; within a few months they were in field hospitals in Viet-Nam. Both suffered emotional scars that caused long-lasting hurt and hardships. Hartman (1991) wrote of the difficulty in making meaning of the whole process of war. The non-deployment of novices to the field was one aspect of consensus in Thompson’s Delphi study of nursing competencies (Thompson et al., 2003). Whether novice nurses are currently deployed was not reported in the recent literature.

The veteran Viet-Nam nurses in Scannell-Desch’s study echoed the concerns expressed by nurses in other studies. When asked to give their advice on training for

current military nurses, they said nurses needed intensive training to prepare them for the “environmental, clinical, cultural, and psychological” demands of war (2004, p. 606).

Nurses need to be self-reliant and confident in their skills, flexible, and “independent of technology” (2004, p. 603). Several of the participants who had remained in the military felt that, although there was better preparation since the Gulf War, nurses still were not adequately prepared to go to combat zones.

In reflecting on their own experiences, these nurses felt that, in addition to their lack of clinical preparation, they were unprepared for the environment, for no electricity or running water, and for caring for civilians and prisoners of war. They were not taught anything about local diseases, insects, reptiles, or climate. Finally, they said they had a lack of understanding of the expectations of their roles as military nurses and of the overall military mission. Having that preparation, they felt, would have delineated their roles and better prepared them for service in combat (Scannell-Desch, 2004).

Lack of preparation and readiness jeopardizes the health and morale of soldiers and nurses alike (Kennedy et al., 1996). Some regarded “training deficits” as a moral and ethical issue (Wild, 2002, p. 20). Nurses themselves were concerned with acquiring and maintaining their skills and being able to perform in combat conditions (Thompson, 2003; Wild, 2003). Historically, there has been little consideration of nurses’ prior preparation and experience; “they had no real concept of what was expected of them” (Biedermann, 2001, p. 549). Knowledge acquisition was forced to be rapid and teamwork was necessary to function effectively. For those with inadequate training or who could not function well in a team environment, this was a stressful and sometimes insurmountable task resulting in great emotional distress, taxing often inadequate coping

strategies (Biedermann, 2001; Hartman, 1991; Wild, 2003). Multinational forces generated even more stress as nurses struggled with different languages, training, equipment, and protocols often resulting in less than effective care for the patient (Wild).

Being in a state of readiness, needing to be ready personally, psychosocially, professionally, and physically, and never knowing when they would be deployed caused much stress among nurses (Fry et al., 2002). Worries about family, separation, loneliness, and fear led to stress reactions (Fry et al., 2002; Morro et al., 2005; Yackel, 2003). This foreshadowed the findings of Stevenson, Dremsa, & Austin (2007) and Rivers, Wertenberger, & Lindgren (2006), where nurses reported low competencies regarding these readiness factors.

What constituted achieving readiness was a state in which even the experts could not agree. Consensus on required competencies for medical-surgical nurses was not reached even by a panel of experts. In particular, maternal-child health competencies were rejected as not being essential even though there are many women in the military and nurses are caring for civilian women and children (Thompson et al. 2003). The lack of training standardization makes the ability to achieve readiness and to feel adequately prepared very difficult for nurses being deployed.

Construct: Composite Cognition

Composite cognition depicts levels of the cognitive process as defined by Krathwohl's (2002) revision of Blooms' Taxonomy of Educational Objectives and critical thinking cognition. Three components comprise cognitive cognition: lower-level cognition, higher-level cognition, and critical thinking cognition (Johnson, 2005). The following categories are represented in lower- and higher-level cognition (terms in

parenthesis represent Bloom's original taxonomy): Lower-level cognition: Remember (Knowledge) and Understanding (Comprehension); higher-level cognition: Apply (Application), Analyze (Analysis), Evaluate (Evaluation), and Create (Synthesis). Critical thinking cognition is "subject-matter specific and requires skills inherent within the nursing process" (Johnson, 2005, p. 5). While there were no references in the literature to the term composite cognition, several authors examined higher- and lower-level cognition (Bloom, 1956; Krathwohl, 2002; Su, Osisek, & Starnes, 2004, 2005).

Lower- and Higher-level Cognition

In examining the components of composite cognition, higher- and lower-level cognition as taxonomic categories were first developed as part of *The Taxonomy of Educational Objectives: Handbook I: Cognitive Domain* by Benjamin Bloom in 1956. It has since become popularly known as Bloom's Taxonomy. Originally designed to facilitate development of goals and assessment, it has become widely used by educators in many disciplines and at all levels (Bloom, 1956; Krathwohl, 2002; Paul, 1985; Su, Osisek, & Starnes, 2004, 2005; Usova, 1997). More recently, Krathwohl, one of the developers of the original taxonomy, revised and expanded the original work from one domain to two, also renaming some of the cognitive process categories (Anderson & Krathwohl, 2001; Krathwohl, 2002).

The original taxonomy defined a cognitive domain consisting of six categories: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. These categories were hierarchically structured from simple/concrete to complex/abstract (Bloom, 1956; Krathwohl, 2002). Krathwohl described a need to update and make the taxonomy more relevant by developing terms currently used by teachers and by

expanding the dimensions from a single dimension to a Knowledge Dimension and a Cognitive Process Dimension.

The Knowledge Dimension consists of four categories: Factual Knowledge (basic knowledge), Conceptual Knowledge (understanding of relationships between basic knowledge and global structures), Procedural Knowledge (skills and methods), and Metacognition (thinking about one's own cognition). Metacognition, a new category, was defined by Immel (2002) as "the ability of learners to be aware of and monitor their learning processes" (p. 1). Thought to increase performance, metacognition has been increasingly reported in the literature (Immel, 2002; Krathwohl, 2002).

In the Cognitive Process Dimension, terms were rearranged and renamed in verb format to reflect the way objectives are written, for example, "The learner will..." The six revised terms are (terms from the original taxonomy are in parenthesis): Remember (Knowledge), Understand (Comprehension), Apply (Application), Analyze (Analysis), Evaluate (Evaluation), and Create (Synthesis). The composite cognition framework includes Remember and Understand in the lower level cognition dimension and Apply, Analyze, Evaluate, and Create in the higher level cognition dimension. Interestingly, one of the dimensions considered in the revised taxonomy was critical thinking but it was dropped from consideration due to lack of a firm, consistent definition (Krathwohl, 2002).

In Remembering, the learner is able to obtain information stored in memory. Understanding reflects an ability to extrapolate meanings. To Apply is to use a skill properly and to Analyze is to reduce elements into parts while being able to articulate their connectedness. Evaluate is to "make judgments based on criteria and standards"

(Krathwohl, 2002, p. 215). Finally, to Create is to look at components in a new way.

Nurses frequently have the opportunity to perform higher-order thinking, for example, in the care of patients with non-standard symptoms or in situations that military nurses face when caring for critical patients with few supplies in remote, austere locations (Marshall, 2005; Su, Osisek, & Starnes, 2004, 2005).

Critical Thinking

The promotion of critical thinking as essential outcome criteria by both the American Association of Colleges of Nursing (AACN) and the National League for Nurses (NLN) represented a change in the philosophy from the nurse simply learning to the nurse thinking (Duldt-Batthey, 1998). Critical thinking was seen as subordinate to clinical decision making, that is, part of the decision-making process, (Dela Cruz, 1991; Facione & Facione, 1996; Hamers, Huijter, & Halfens, 1994) except by one author who equated critical thinking with clinical reasoning, clinical judgment, and clinical decision making (Ignatavicius, 2001). Critical thinking was seen as an element to be taught and assessed but articulating a universal definition was difficult (Rubinfeld & Scheffer, (1999).

In 1990, the American Philosophical Association (APA) defined critical thinking through a Delphi project. Experts in the field identified the essential skills of critical thinking and constructs of the ideal critical thinker. These criteria were adopted by Facione and Facione (1996) in their report on critical thinking and in the development of several instruments measuring critical thinking. They defined critical thinking as a “nonlinear, recursive process in which a person forms a judgment about what to believe or do in a given context” (Facione & Facione, 1996, p. 131). Other authors simplified the

definition while still retaining the essence of the APA's and Facione's and Facione's definitions. "Critical thinking is the process of purposeful, self-regulatory judgment" (Duldt-Batthey, 1998, p. 5), is "purposeful, outcome-directed" (Ignatavicius, 2001, p. 31), "enables nurses to reason and make judgments about patients" and form "a judgment about...what actions to take in a particular situation" (Oermann, 1999, p. 40C).

Through the development of critical thinking skills nurses are able to think through situations where memorization and rote learning are ineffective such as the complex care environments in critical care and combat nursing (Bucknall, 2000, 2003; Oermann, 1999). Three authors related critical thinking to higher-order thinking that includes metacognition (Krathwohl, 2002; Oermann, 1997; Pike, 1997).

Composite Cognition in the Literature

Composite cognition, as an entity or construct, was not mentioned in the literature. Studies were found that examined critical thinking and the higher- and lower-level cognitive dimensions described in Bloom's taxonomy. Search terms included, but were not limited to: critical thinking, clinical decision making, clinical reasoning, clinical judgment, cognition, higher-order and higher-level cognition, lower-order and lower-level cognition, and Bloom's taxonomy.

Bloom's Taxonomy

Literature from 1969-2007 was examined. Studies from the 1960s and 1970s were primarily reflecting on the use and usefulness of Bloom's taxonomy. One quasi-experimental study was found relating Bloom's taxonomy to intuitive judgment (Lipscomb, 1985). Another dissertation examined levels of cognitive development using the taxonomy as a tool for developing questions at various levels of thinking (Dobson,

2001). Interestingly, in that study, the California Critical Thinking Skills Test, developed by Facione, was administered for baseline assessment, demonstrating the overlapping relationship between Bloom's structure of knowledge and cognitive processes and current ideas about critical thinking.

Many other studies used Bloom's Taxonomy as an organizing framework for the development of questions, not studying the framework itself (Nassar, 1999; Gierl, 1997; Clifton, 1996). Clements and Rothenberg (1996), in a unique study, examined the cognitive level of test questions related to the length of the tests. Of the 84 articles examined, 16 (5.25%) were identified as empirical studies. Of particular importance was Krathwohl's (2002) article, where the author explained the development of the original taxonomy and the reasons for revisions.

Critical Thinking

Critical thinking became an essential outcome of the NLN accreditation process and the AACN essentials in the early 1990s (Duldt-Batley, 1998; Leppa, 1997; Rane-Szostak & Robertson, 1996). From the mid-to-late 1990s there was a proliferation of the literature examining critical thinking. Much of the literature looked at ways of measuring critical thinking and the instruments available (Adams, Whitlow, Stover, & Johnson, 1996; Duldt-Batley, 1998; Ennis, 1999; Pike, 1997; Rane-Szostak & Robertson, 1996; University of New Mexico, N.D.). Nothing was found on critical thinking related to critical care or combat casualty care.

Adams et al. (1996) examined four critical thinking tools: the Watson-Glaser Critical Thinking Appraisal (WGCTA), the California Critical Thinking Skills Test (CCTST), the Ennis-Weir Critical Thinking Essay Test (EWCTET), and the Cornell

Critical Thinking Test (CCTT) in a metasynthesis of studies using each instrument. Two studies were located which described the use of the CCTST and the California Critical Thinking Dispositions Inventory (CCTDI), (a tool to measure the tester's disposition to critically think rather than the cognitive skills in critical thinking measured by most of the other instruments), in a nursing and physical therapy program (Bartlett & Cox, 2002; Leppa, 1997). Oermann (1990, 1997), in two articles, delineated ways to use and assess critical thinking in clinical practice. Ignatavicius (2001) also examined ways to apply critical thinking to the clinical setting, using the framework developed by the APA. Fields and Loveridge (1988) measured critical thinking levels in nurses working eight and 12 hour shifts.

Findings.

Based on the definitions of critical thinking, development of critical thinking skills was seen as teachable and essential to good patient care (Duldt-Batney, 1998; Facione & Facione, 1996; Ignatavicius, 2001; Oermann, 1999) although few articles in the literature actually discussed application or how to teach critical thinking. Critical thinking was described as a concept difficult to define and even more difficult to measure (Duldt-Batney, 1998). Several instruments were mentioned with four designed to specifically measure the cognitive aspects of critical thinking: WGCTA, CCTST, EWCTET, and the CCTT. Additionally, the CCTD was developed to measure dispositions toward critical thinking. A newer instrument, the CCTST, was called "highly sophisticated" because of its incorporation of the APA's criteria for critical thinking (Rane-Szostak & Robertson, 1996, p. 3).

Later publications revealed a controversy related to the usefulness of general tools to measure critical thinking in specific disciplines (Bartlett & Cox, 2002; Leppa, 1997; Pike, 1997; Rane-Szostak & Robertson, 1996). The CCTST was reported in the literature to be both a general measure of critical thinking (Adams, Whitlow, Stover, & Johnson, 1996; Bartlett & Cox, 2002; Facione & Facione, 1996; Rane-Szostak & Robertson, 1996) and specifically developed to measure critical thinking in nursing (Adams, Whitlow, Stover, & Johnson, 1996). Reports of the use of tools yielded inconsistent results with all four aforementioned instruments studied. The WGCTA used two forms for pre-and-post testing and reported an internal consistency of 0.69-0.85 with a test-retest reliability of 0.73. Content and construct validity was measured but results were not reported. Use of the instrument revealed inconsistency in validity where the general construct being measured by the instrument was not the construct of interest, and in test-retest reliability (Adams, Whitlow, Stover, & Johnson, 1996).

The EWCTET essay test, although developed by an expert in critical thinking, was found to be labor and time intensive and to suffer from interrater reliability issues with scoring (Adams, Whitlow, Stover, & Johnson, 1996; Ennis, 1999; Rane-Szostak & Robertson, 1996). The CCTT, Level Z, is aimed at college students and adults; Level X is used for grades 4-14 (Ennis, 1999). Internal consistency was calculated using the Spearman-Brown Prophecy formula and the Kuder-Richardson procedure with reported results of 0.67-0.90 for Level X and 0.50-0.77 for Level Z. Skills measured by the CCTT were reported by one author to be too general and, like the WGCTA, did not measure the construct of interest (Adams, Whitlow, Stover, & Johnson, 1996; Ennis, 1999).

Later literature on critical thinking tests was dominated by Facione's CCTST, felt by several authors to be particularly desirable and accurate. This was partly because of Facione's affiliation with the APA's Delphi project which defined essential critical thinking attributes and his subsequent inclusion of them in the CCTST (Facione & Facione, 1996; Rane-Szostak & Robertson, 1996). Reports soon surfaced of results inconsistent with Facione's & Facione's reported Kuder-Richardson internal reliability of 0.69-0.69 (Leppa, 1997). Pike (1997) reported wide variations in reliability between Forms A and B: 0.14-0.68 on the subscales for Form A and 0.42-0.71 on the subscales for Form B. Performance on the CCTST was reportedly influenced by instructor characteristics such as experience teaching critical thinking and number of years teaching in higher education (Pike, 1997).

In actual application in a school of nursing, Leppa (1997, p. 3) stated that students said they felt "stupid" when they took the CCTST and were reconsidering their decisions to come back to a baccalaureate nursing program. Results showed a significant decrease in overall critical thinking skills and a significant decrease on two of five subscales. Ultimately the school of nursing discontinued use of the CCTST.

The CCTDI, another instrument developed by Facione, measures dispositions toward critical thinking on seven subscales: truth, open-mindedness, inquisitiveness, systematicity, cognitive maturity, and analyticity (Facione & Facione, 1996) and was also administered by the school of nursing studied in Leppa's article. The CCTDI was found to be reliable with a Cronbach's alpha of 0.60-0.78 on the subscales and 0.90 overall (Leppa, 1997); the test was retained by the school. Other experts have reported that

neither the WGCTA nor the CCTST are valid for measuring critical thinking in nursing students (F. Dela Cruz, personal communication, October 29, 2005).

State of the Science.

With controversy over the reliability and applicability of standardized (norm-referenced) tools, several authors discussed the local development of criterion-referenced instruments that were discipline-specific (Adams, Whitlow, Stover, & Johnson, 1996; Oermann, 1997; Oermann, 1999; Rane-Szostak & Robertson, 1996). Leppa (1999) and Bucknell (2000, 2003) discussed the differences in critical thinking in nursing versus other disciplines, particularly in critical-care nursing. Nursing authors emphasized the contextual nature of critical thinking in nursing (Adams, Whitlow, Stover, & Johnson, 1996; Bartlett & Cox, 2002; Leppa, 1999; Oermann, 1997, 1999; Rane-Szostak & Robertson, 1996) and congruency with the program of study (Bucknell, 2000, 2003; Duld-Batney, 1998).

Of the instruments found in the literature to measure critical thinking, the CCTST was cited and used most often. Additionally, Peter and Noreen Facione, the developers of the CCTST, have published and been cited extensively in the critical thinking literature (Adams, Whitlow, Stover, & Johnson, 1996; Bartlett & Cox, 2002; Duld-Batney, 1998; Ennis, 1999; Ignatavicius, 2001; Facione & Facione, 1996; Leppa, 1999; Oermann, 1997, 1999; Pike, 1996; Rane-Szostak & Robertson, 1996). A search of the literature revealed no instruments that measured composite cognition.

Finally, Facione and Facione (1996) stated that current models of critical thinking emphasize outcomes due to external factors such as time and money constraints and instrument design. The difficult aspect of examining critical thinking is in retaining the

process emphasis that is so crucial to understanding how individual critical thinking works.

Factors Influencing Composite Cognition

Again, composite cognition was not defined as a separate entity but the elements of composite cognition: higher- and lower-level cognition and critical thinking, were identified in the literature. The importance of context and the congruency of the critical thinking tool to the program of interest were the elements cited most often by authors as affecting critical thinking measures (Adams, Whitlow, Stover, & Johnson, 1996; Bartlett & Cox, 2002; Leppa, 1997; Oermann, 1997, 1999; Pike, 1996; Rane-Szostak & Robertson, 1996). Critical thinking was viewed by these authors as context-dependent rather than general. Although researchers claimed that norm-referenced measures do not necessarily measure the construct of interest, they also stated that they will continue to be used due to the time, skill, cost, and lack of generalizability involved in developing and using non-standardized instruments (Adams, Whitlow, Stover, & Johnson, 1996).

Measurement tools may contribute to students' stress levels or students may not take the test seriously, yielding flawed results (Adams, Whitlow, Stover, & Johnson, 1996; Leppa, 1997; Rane-Szostak & Robertson, 1996). In cases where there are unexpected results, the effect may be due to instrument or program issues (Adams, Whitlow, Stover, & Johnson, 1996; Rane-Szostak & Robertson, 1996). Educational levels and years of nursing experience were two factors impacting nurses' critical thinking. Several studies measured the relationship between critical thinking and educational levels with the results mostly, but not completely, pointing to those with baccalaureate degrees or higher in nursing having higher critical thinking scores (Adams,

Whitlow, Stover, & Johnson, 1996). Experienced nurses appeared to make better connections with disparate chunks of knowledge. Novice nurses (defined as having less than five years clinical experience) tended to be less certain of their knowledge, less confident in their decisions, and exhibited lower self-confidence when they attempted to think critically (Adams, Whitlow, Stover, & Johnson, 1996; Leppa, 1997; Pike, 1997). Lastly, the physical environment, stress, and fatigue were determined by some authors to affect critical thinking (Bucknell, 2000, 2003).

There is a dearth of empirical studies of the elements comprising composite cognition: higher-and lower-level cognition and critical thinking cognition. There were no studies at all on composite cognition. With the controversy between norm-referenced and criterion-referenced tools as well as general versus context-specific critical thinking measures, valid and reliable instruments need to be developed. Criterion-referenced instruments, while not generalizable, may address the needs of nurses better through congruency with their situations. Dissemination of these criterion-referenced instruments will aid researchers in developing their own criterion-referenced instruments. Finally, and specifically, there is no instrument to measure composite cognition, a construct consisting of lower- and higher-level cognition and critical thinking cognition.

Summary and Conclusion

Even in the 21st century, where more and more women and men are serving in the military in roles both inside and outside of nursing, there seems to be a stereotypical view of nurses as always ready, always prepared, no matter what their actual skill level--the angels ready to serve. Lack of preparation, the need for a constant state of readiness, and feelings of inadequacy regarding training and competencies were huge factors in stress

and distress among military nurses as well as their perceptions of their ability to provide safe and competent patient care (Rivers, Wertenberger, & Lindgren, 2006).

Power related to rank and politics, the “discourse of the dominant” (Hartman, 1991, p. 99) resulted in decisions being made that sent nurses, often inadequately prepared, into battle zones. Nurses frequently reported feeling constrained in giving care or having control to make decisions because of orders from superiors who often were not familiar with their operations (Fry et al., 2003). This was reflected in the study by Rivers, Wertenberger, & Lindgren where there was a “perceived feeling of the inability of leadership to keep troops informed” (2006, p. 146).

There were several limitations to this literature search. First, only resources related to Western nurses were examined, resulting in a distinctly Western view of military nurses and combat nursing. Many of the historical articles were anecdotal and were from American journals which may have resulted in the unintentional promotion of a specific viewpoint. Finally, the author is not, nor has ever been, a military nurse, so cannot have the insight and knowledge that the lived experience can bring.

Military nurses in the combat arena are faced with complex care decisions in a highly stressful environment. Nurses are required to have not only a significant knowledge base, but must use cognitive, that is, critical thinking skills, when caring for combat casualties (Johnson, 2005). In an effort to explore these cognitive skills, the literature was reviewed to examine the construct of composite cognition and to seek instruments for measuring it.

Little research has been done in the area of composite cognition, that is, higher- and lower-level cognition and critical thinking cognition in combat or critical care nurses,

or, in fact, nurses in general. In the review of the literature, no studies were found that examined the construct of composite cognition. Although composite cognition was not identified in the literature, its components, higher- and lower-level cognition, based on Bloom's revised taxonomy, and critical thinking cognition, were. Higher- and lower-level cognition within the context of Bloom's taxonomy was reported extensively in the literature but few empirical studies were found that only examined the components of composite cognition: lower-level cognition, higher-level cognition, and critical thinking cognition. Krathwohl (2002) reported on his revision of Bloom's taxonomy, making it more current and broader in scope. This impacts the higher- and lower-level cognition elements of composite cognition.

Critical thinking was defined as one element of the process of clinical decision making and was determined to be crucial to expert nursing care (Oermann, 1997, 1999). Norm-referenced, standardized, commercial critical thinking instruments were found to be inconsistent in their results. Situation-specific, criterion-referenced instrument development was examined, while recognizing that for some potential developers, the time, skill, cost, and lack of generalizability may inhibit local tool development. Methods of assessing lower- and higher-level cognition as well as critical thinking cognition must be developed to assist in the design of effective and efficient educational programs for the care of combat casualties.

The lack of literature on composite cognition, an emphasis on context-specific measures coupled with the inconsistency of the standardized measures, supports the need for an instrument specifically developed to measure composite cognition in combat care.

To better educate nurses is to render faster and better life-saving care to the wounded in the combat arena.

Chapter III

Methods

The purpose of this study was to develop an instrument to measure composite cognition in active- and reserve-duty military registered nurses (RNs) related to the care of combat casualties. The conceptual framework for the development of the Composite Cognition Instrument (CCI) was informed by the theoretical perspectives of Bloom's taxonomy (Anderson & Krathwohl, 2001; Bloom, 1956; Krathwohl, 2002), critical thinking theory (Adams et al., 1996; Oermann, 1997, 1999), and the nursing process (Alfaro-LeFevre, 1994; Johnson, 2005). This chapter will provide a detailed description of instrument development, including conceptualization, item generation, preliminary psychometric properties, and pilot testing, with a cohort of active and reserve duty military registered nurses. In addition, the research design, sample and sampling, instrumentation, data collection procedures, and data analytic techniques will be presented. The protection of human subjects and study limitations are also discussed.

Theoretical and Operational Definitions

Composite cognition.

Composite cognition consists of lower- and higher-level cognition as defined by Bloom (1956) and revised by Krathwohl (2002). A third component of composite cognition is critical thinking cognition. These different modes of thinking reflect all stages articulated by Bloom (1956) and revised by Krathwohl (2002) (terms in parenthesis represent Bloom's original taxonomy): Remember (Knowledge), Understanding (Comprehension), Apply (Application), Analyze (Analysis), Evaluate (Evaluation), and Create (Synthesis). Critical thinking cognition is context-specific and uses skills delineated in the nursing process: assessment, planning, implementation, and evaluation. Operationally, composite cognition will be measured using the total scores on the three subscales on the Composite Cognition Instrument (CCI) (Johnson, 2005).

Lower-level cognition.

Lower-level cognition is comprised of the basic levels of thinking: Remember (Knowledge) and Understanding (Comprehension). To think at the lower cognitive level is to be able to recall facts and discern meanings. This is operationally defined as the score on the lower-level cognition subscale of the CCI.

Higher-level cognition.

To operate at a higher level of cognition is to use advanced levels of thinking: Apply (Application), Analyze (Analysis), Evaluate (Evaluation), and Create (Synthesis). Thinking at this level requires the ability to use theories, rules, concepts, laws, principles, and knowledge in novel ways. The nurse must be able to articulate the parts comprising the whole, to perform appraisals, and to look at existing situations in a new way

(Johnson, 2005; Krathwohl, 2002). Usova stated that since “each level of cognitive functioning builds upon” prior levels, measuring thinking at higher levels is more valid and effective (Usova, 1997, p. 103). By examining higher levels of cognition, therefore, lower levels of cognition are also measured. The score on the higher-level cognition subscale constitutes the operational definition of higher-level cognition (Johnson, 2005).

Critical thinking cognition.

Critical thinking cognition differs in specific circumstances; it is context-specific. To go through the steps of the nursing process: assessment, planning, intervention, and evaluation, requires critical thinking skills. The critical thinking cognition subscale formed the operational definition for critical thinking cognition. Items may reflect both lower-or higher-level cognition as well as critical thinking cognition; some items were classified in more than one area (Johnson, 2005).

Development of the Composite Cognition Instrument (CCI)

Item Development

Item development evolved from a critical review of the current standards of practice; review of previously constructed scenarios related to patient conditions seen in the battlefield such as hypovolemic shock, cardiac tamponade, and tension pneumothorax; and in-depth discussions with experts in the field. Following the identification of essential content, objectives (also called learning outcomes) were developed based on Bloom’s Revised Taxonomy (Krathwohl, 2002) and a test blueprint was devised. The test blueprint is a grid that outlines the number of questions that are lower-level, higher-level, or critical thinking level related to the objectives and testing scenarios. Items were reviewed by experts after examining the test blueprint and

scenarios. The four member expert panel included educators, civilian, active and retired military nurses, and critical care/trauma experts. Contact with experts was conducted via email.

Reliability

The emphasis of the CCI, a criterion-referenced instrument, was on establishing military nurses' level of mastery of combat casualty care. To measure this accurately, the instrument must be shown to be stable over time (temporal stability) and to be internally consistent. Three methods were used to determine reliability: test-retest reliability, internal consistency reliability, and test dependability.

Test-retest reliability.

Test-test reliability measures the stability of the instrument over time; results are stated as scores between 0 and 1.0 (Johnson, 2005; Waltz, Strickland, & Lenz, 2005). For the pilot study, the instrument was administered to 32 active- and reserve-duty military nurses. Participants received no instruction on the content. The test was administered two weeks later to minimize the effects of time. This time frame was chosen based upon the work of Waltz, Strickland, & Lenz (2005), who stated that the interval between tests is important; too short an interval may result in confounded results because of recall while too long a period may result in maturation effects or loss of subjects. Other confounding effects may be participants seeking information about the subject, fatigue, boredom, or resenting repeating the test and purposefully sabotaging the results (Allen & Yen, 2002). Lastly, two weeks was chosen as the maximum amount of time between test administrators to military nurses since many of these nurses are being

rapidly deployed and might not be available if the time between administrations was longer.

After scores were tabulated for the instrument and subscales, the Pearson product-moment coefficient (Pearson r) was used to calculate the correlation coefficient between the two test administrations. Based on a score of 0-1.00, a correlation of 1.00 is ideal but a correlation of 0.80 is acceptable (Johnson, 2005, p. 16). Reliability refers to the stability of the instrument when administered to designated groups of people, that is, those for whom the instrument was intended. This instrument is being developed to measure composite cognition in a context-specific way to military nurses. Administration to other groups, for example, non-medical people, would result in different, but useless, reliability indices (Waltz, Strickland, & Lenz, 2005).

Internal consistency reliability.

Whether an instrument is consistent within itself, that is, its items or subscales, constitutes internal consistency. The question asked was: is a group's performance consistent across the instrument? In this instrument the information is dichotomous; answers are either correct or incorrect. This allowed the Kuder-Richardson 20 (KR 20) procedure for determining reliability to be used (Huck, 2004; Waltz, 2005). This measure is superior to other measures in that it accounts for multiple ordering of test items and split-half reliability coefficients (Huck, 2004).

Test Dependability.

With a computer test scoring program, the test dependability coefficient was calculated using the scores of the top third and bottom third of the participants. Dependability coefficients were calculated for the pretest and the posttest and for the

three subscales. This measure is an indicator of equivalent performance on future tests of a comparable nature.

Validity

Validity asks whether a test measures what it is supposed to measure, that is, is it accurate (Allen and Yen, 2002, p. 96; Huck, 2004, p. 88)? For this instrument, both content and construct validity were determined. Content validity verifies whether the items sampled are representative of, and relevant to, the subject being studied (Waltz, Strickland, & Lenz, 2005). Construct validity determines “the degree to which it measures the theoretical construct or trait it was designed to measure” (Allen and Yen, 2002, p. 108).

Content validity.

Allen and Yen stated that although content validity is subjective, it is “the first concern in the development of all tests” (Allen and Yen, 2002, p. 96) and determines how test items are written. Content validity is particularly important for measures of cognition and experts should evaluate test items for “relevance, sufficiency, and clarity in representing the concepts underlying the measure’s development” (Waltz, Strickland, & Lenz, 2005, p. 155). Content validity was established by having the expert panel develop and review objectives, the test blueprint, the test scenarios, and the test items.

Development of the test blueprint related to objectives, level of cognition, and the nursing process helped to define the domains being measured by the test and provide a logical means for developing test items. This represented logical, or sampling, validity (Allen and Yen, 2002, p. 96).

Criterion-referenced content validity.

In a criterion-referenced measure, both individual items and the test as a whole are examined to establish validity. Waltz, Strickland, & Lenz stated it succinctly, “Unless the items or tasks in a criterion-referenced measure assess the objective, any use of scores obtained will be questionable” (2005, p. 176.) As previously reported, content experts analyzed test items for validity, accuracy, and congruency with the content domain; thus, the quality of the experts used was crucial (Waltz, Strickland, & Lenz, 2005).

The congruency percentage was used as an additional measure of criterion-referenced content validity. In determining the congruency percentage, experts were given the definitions and parameters of composite cognition and asked to judge the congruency of each test item with those specifications for the individual elements of composite cognition. A four point Likert-type scale was used to quantify the congruency with the content domain with items rated as: 1—not relevant, 2—somewhat relevant, 3—quite relevant, 4—very relevant. This was recorded as a proportion of the number of items rated as not relevant and somewhat relevant or quite relevant and very relevant divided by the total number of items and then converted to a percentage. The total of all the experts’ percentages was then averaged with an ideal average of 90% (Johnson, 2005, p. 20; Waltz, Strickland, & Lenz, 2005).

Construct validity.

If the instrument fails to achieve construct validity, then one of three factors has occurred: something is wrong with the study/measure, the premise for the research is incorrect, or the instrument does not measure the construct of interest (Waltz, Strickland, & Lenz, 2005). Any of these represent serious flaws within the research design. The

results of criterion-referenced measures are frequently used for determining if the participant has mastered the object of interest. In the case of the CCI, nurses must demonstrate competency in caring for combat casualties safely, quickly, correctly, and efficiently. Construct validity was established through achieving expert consensus that the instrument accurately and adequately measured the constructs of interest. (Waltz, Strickland, & Lenz, 2005).

Item-Analysis

Although there are empirical measures for item analysis, content examination by experts is more valuable because discarding items solely on the basis of empirical measures may result in the instrument being unrepresentative of the content domain (Waltz, Strickland, & Lenz, 2005). That is, if more items are deleted from one specific content area than another, the instrument is no longer a valid measure of the content domain. For this study both expert and empirical measures were used for item analysis.

Item-subscale/objective congruence.

In this item-analysis measure, five experts were asked to look for congruence between the test items, cognitive level (lower-level, higher-level, or critical thinking level), and the written objectives as another measure of validity, similar to examining the relationship between the items and the content domain in criterion-referenced content validity. Experts analyzed each item for congruence with its corresponding objective on the test blueprint. Each test item was assessed by the judges performing the item-analysis. Results were tabulated and compared for expert agreement on the item-objective congruency for that particular test item. Items were modified, left unchanged, or discarded based on the item-congruence index and expert agreement or disagreement.

Items in question were resubmitted and the expert panel communicated as needed to modify test items until agreement was reached (Johnson, 2005, p. 19; Waltz, Strickland, & Lenz, 2005, p. 181).

Empirical measures.

Empirical item-analysis procedures examining criterion-referenced tests must be used carefully. Although empirical measures can differentiate between test items that effectively discriminate between participants who have and have not learned about combat casualty care, it does not account for other factors that may influence scores on the instrument. For example, groups being tested may respond differently or have varying levels of competency, thus affecting scores on the instrument. A small sample size, such as in this pilot study, may not be representative of the total population and may affect test scores.

Item difficulty.

It is important for test items to be clear and for participants to be able to discriminate between the correct answer and distractors. Items need to be sufficiently difficult to assess learning without being too difficult to answer. Item difficulty evaluates the number of participants who answered the item correctly on a scale of 0-100, written as a percentage. To compute the difficulty index, the number correct is divided by the number of participants who were administered the instrument. An ideal difficulty index is between 0.3-0.7 and is influenced by the type of question (e.g., higher- or lower-level cognition). Scores higher than 0.7 may mean the question does not discriminate, that is, it is too easy. Scores lower than 0.3 may mean the item is too difficult or unclear. The ideal difficulty was figured with this formula:

Ideal Difficulty = $(1+g)/2$ Where g = chance level of success

Example: Four Choice Item= $(1+.25)/2= 0.63$

Items that have a difficulty index of greater than 0.7 or less than 0.3 may be modified or eliminated. Some items may be retained even though they fall within the range for elimination if they are items that are decided by the expert panel to be critical to combat casualty care (Johnson, 2005, p. 17; Waltz, Strickland, & Lenz, 2005).

Item discrimination.

“Item discrimination refers to the ability of an item to differentiate among subjects on how well they know the material being tested, specifically the degree that an item discriminates between high and low achieving test takers” (Johnson, 2005, p. 17). The item discrimination index was measured by comparing the scores of the top one-third of the sample with those in the bottom one-third. The following equation was used to figure the item discrimination index:

Item Discrimination Index (d) = $(U-L)/N$

U = number of participants in the top 33% (High achievers)

L = number of participants in the bottom 33% (Low achievers)

N = total number of participants

Scoring ranges from +1 to -1. If all of the top scorers answered an item correctly and all of the low scorers answered the item incorrectly, the score would be +1; the item would be a good measure of discrimination and vice versa. The following scale will be used to assess item discrimination: ≥ 0.40 = highly discriminatory question; 0.30 = good discrimination; 0.20 = acceptable; 0.10 = review and possibly discard; negative

discrimination=discard. Questions were modified or discarded based on the item discrimination scores and expert evaluation (Johnson, 2005, p. 18).

The point-biserial correlation coefficient is a statistic used to measure item discrimination and is “used to estimate the degree of relationship between a naturally occurring dichotomous nominal scale and an interval (or ratio) scale” (Brown, 2001, p. 12). Scoring is the same as with item discrimination. In the CCI, the point-biserial correlation coefficient was calculated to determine the strength of the relationship between the correct/incorrect answer on a test item (a naturally occurring dichotomous nominal scale), and the score on the test (an interval scale) (Brown, 2001; Osterlind, 2004).

Readability

Part of validity is knowing that what is being measured is what was intended to be measured. It is important, therefore, to examine the readability of test items and scenarios for congruency with the population being tested. Questions for the CCI were evaluated for clarity and ease of reading by the expert panel. Registered nurses, such as those in the military, are able to read and comprehend at a college level. To make the questions readable, the Flesch Reading Ease score was expected to be greater than 80 with the Flesch-Kincaid Grade Level Score less than or equal to 14th grade level. Items scoring less than 80 on the Flesch Reading Ease scale or greater than 14th grade level will be considered for revision (Johnson, 2005). Both readability programs are contained within the Microsoft Word word-processing program.

Pilot Administration of the Composite Cognition Instrument

Pilot studies are undertaken to establish the reliability and validity of the instrument. A pilot study of the CCI was conducted to establish its reliability and validity. Subjects were selected from a pool of active- and reserve-duty military registered nurses. A test-retest method was used for instrument administration and descriptive statistics were analyzed for the CCI and the Demographic Data Instrument (DDI).

Subjects

A convenience sample of 32 active- and reserve-duty military registered nurses were recruited from sites in California, Louisiana, and Texas. Participants were licensed RNs on active or reserve duty in the military. Active duty RNs in the military have a minimum educational level of a baccalaureate degree in nursing while reserve duty registered nurses may, in some branches of the military (e.g., Army), have a diploma or associate's degree in nursing. A snowball technique was used for recruitment. The advantage of this sampling method was the ease of recruiting participants once civilian researchers gained entrée into the military system. Limitations included the small, non-randomized sample and confounding factors such as differing levels of education and experience among the nurses.

Data Collection

Upon obtaining informed consent from participants, the primary investigators administered the instrument to participants on two separate occasions, two weeks apart. To maintain fidelity, instruction on how to administer the instrument for consistency was received. Two weeks was determined to be an optimum amount of time to minimize the overlap effect, maturation, and to have access to the same sample of participants as

military nurses are frequently reassigned during wartime (Allen & Yen, 2002; Johnson, 2005). Tests were numbered and corresponded to names written on a different sheet and stored in a secure location to maintain confidentiality. At the conclusion of the survey, the researcher collected completed instruments and placed them in sealed envelopes. Results were tabulated using several software programs. Scores were coded with numbers to match the tests and any identifying information was removed. Personal information was securely stored to maintain confidentiality.

The administration of the instrument allowed for the collection of empirical evidence on composite cognition. The use of a criterion-referenced instrument is congruent with research as a way to measure context-specific domains such as combat casualty care (Adams, Whitlow, Stover, & Johnson, 1996; Johnson, 2005; Oermann, 1997, 1999; Rane-Szostak & Robertson, 1996).

Demographic information was obtained through administration of an investigator-created demographic data instrument (DDI). Examples of demographic information included in the DDI were: work experience, prior experience in healthcare, gender, age, degrees attained, military rank (an indicator of socioeconomic level), number of years as a military nurse, and prior deployment to a combat zone. An open-ended question was added to determine additional experience in the healthcare field not addressed in the other questions. The DDI was reviewed by experts prior to administration.

Instruments

Two instruments were developed: the CCI and the DDI. The DDI recorded demographic data as previously described. The CCI consisted of 75 multiple-choice items with three subscales: lower-level cognition, higher-level cognition, and critical thinking

cognition. Questions were derived from previously developed battlefield scenarios on conditions seen in combat: hypovolemic shock, cardiac tamponade, and tension pneumothorax. Items in a multiple-choice format resulted in dichotomous answers (correct or incorrect). A sample of the questions in the CCI with the corresponding cognitive levels is in Table 1. The objectives and cognitive levels can be found in Table 2. The complete instrument can be seen in Appendix C.

Table 1

Composite Cognition Instrument (CCI): Sample Questions

Lower-level cognition	<p>Test Item 3: The first parameter to change in hypovolemic shock is MOST likely a (an):</p> <ol style="list-style-type: none"> decrease in blood pressure decrease in pulse pressure increase in pulse increase in respirations
Higher-level cognition	<p>Test Item 10: The most fundamental reason for the symptoms seen in a patient with a tension pneumothorax is:</p> <ol style="list-style-type: none"> loss of positive intrapleural pressure mediastinal shift need for immediate insertion of chest tube increase in positive intrapleural pressure
Critical thinking cognition	<p>Test Item 72: You have a patient with a cardiac tamponade. You are performing a pericardiocentesis and note the following on monitor:</p> <p>You should implement the following:</p> <ol style="list-style-type: none"> administer lidocaine IV completely withdraw the needle withdraw the needle slightly until normal rhythm resumes continue with the pericardiocentesis

Analysis

The following descriptive statistics were generated for the instrument: frequency distributions, measures of central tendency, and variability on the DDI. Data was

analyzed using the Statistical Package for the Social Sciences (SPSS) and a computer test scoring program. To establish test-retest reliability, after scores were tabulated for the instrument and all subscales, the Pearson product-moment coefficient (Pearson r) was used to calculate the correlation coefficient between the two test administrations. Based on a score of 0-1.00, a correlation of 1.00 is ideal but a correlation of 0.80 is acceptable (Johnson, 2005, p. 16). Construct validity was established through expert consensus on the content and constructs being measured. Demographic data was used to describe the sample population.

Human Subjects

Prior to the beginning of the study, approval was obtained from the Institutional Review Boards of all institutions involved (see Appendix E). Potential subjects were asked to participate voluntarily and completed an informed consent form; each participant was given a copy of the form to keep. Participants were told that they could leave the study at any time, whether or not the test was completed, and that participation/nonparticipation had no effect on their rank or evaluations. A potential risk to the subject was diminished self-efficacy for performing combat casualty care if scores on the instrument were low or if the subject perceived that his/her performance on the test was poor. A mental health hotline number was included on the informed consent form which participants could call. Benefits included an important contribution to the state of the science for combat casualty care and the ability to modify educational programs based on the data obtained. Other important contributions were a sense of altruism and fulfillment of the professional responsibility of participating in research to improve nursing and nursing education for military nurses caring for combat casualties.

Summary

Composite cognition is a construct that has not been reported in the literature; consequently, there are no instruments to measure it. The purpose of this research was to develop and pilot test a criterion-referenced, context-specific instrument to measure composite cognition in military registered nurses who may be deployed to combat areas and need assessment of their knowledge of combat casualty care. Reliability and validity was established through the pilot administration of the instrument in a test-retest format, with two weeks between the test administrations. Through this research, a valid and reliable instrument was developed to further study composite cognition in military nurses and to evaluate educational programs used to train nurses being deployed into combat areas.

Chapter IV

Results

The purpose of this study was to develop an instrument to measure a newly conceptualized construct “composite cognition” formulated to explain the cognitive and learning processes related to the care of combat casualties using specific conditions seen in combat, and to examine its psychometric properties to establish preliminary reliability and validity. In this chapter results are presented as they relate to the stages of the study: instrument development and preliminary testing with a cohort of military nurses to establish the preliminary psychometric properties of the Composite Cognition Instrument.

Development of the Composite Cognition Instrument

Composite Cognition Instrument (CCI)

The questions on the CCI are based on types of trauma seen on the battlefield. The three conditions of hypovolemic shock, cardiac tamponade, and tension pneumothorax were targeted. They were chosen based upon the prevalence of each in combat and the high mortality rate associated with them. Scenarios for these conditions were developed by the investigator and then reviewed by a second expert panel comprised of military physicians and military critical-care combat nurses. Specific scenarios were chosen because the inherent nature of the interactions in them facilitated

investigating educational strategies using the human patient simulator (Colonel A. Johnson, United States Air Force [retired], personal communication, February 25, 2006).

Item development.

A panel of four experts was used for development and review of the test items. Three were active or retired military nurses; two from the United States (US) Army and two from the US Air Force. All were experts in test development and content with backgrounds in trauma and critical care; two had served in combat areas. One nurse had cared for combat casualties under fire in the Iraqi war and had recently returned to the United States from two tours of combat deployment. Another had cared for combat casualties in Viet-Nam. Three were certified in critical care (CCRN); one, an Army nurse, had a PhD in nursing, and one retired Air Force officer was a doctoral student who held master's degrees in nursing and education. Another expert was a civilian critical care faculty member in a university school of nursing who held a master's degree in nursing and was a nurse practitioner; an Army nurse had been a trauma consultant in a medical school. The expert review process was conducted primarily through email.

Four objectives (learning outcomes) were developed based on Bloom's Revised Taxonomy (Krathwohl, 2002) and the nursing process that reflected critical thinking (See Table 2). An initial test blueprint was developed prior to the writing of test items. Initially, 60 items were planned with 20 items each for the three trauma conditions and the three cognitive levels. Following the initial development of test items by the investigators, the questions were reviewed by the experts, who recommended adding 15 additional items for a more comprehensive representation of the content. The test blueprint was subsequently revised. The revised test blueprint reflects these additional

questions, the appropriate battlefield condition, and the cognitive level of each test item (See Table 3). Some items were assigned to more than one cognitive category because they included more than one learning outcome or objective. Specifically, some items reflected critical thinking and higher-level cognition. Therefore, the total number of items on the blueprint is greater than the number of items on the test.

Table 2

Composite Cognition Instrument (CCI): Objectives based on Cognitive Levels

Lower-level Cognition	Higher-level Cognition	Critical Thinking Cognition
<i>Objective 1.</i> Describe signs & symptoms of hypovolemic shock, tension pneumothorax, cardiac tamponade	<i>Objective 3.</i> Explain the mechanism of hypovolemic shock, tension pneumothorax, cardiac tamponade	<i>Objective 4.</i> Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, tension pneumothorax, cardiac tamponade
<i>Objective 2.</i> Identify correct treatment for hypovolemic shock, tension pneumothorax, cardiac tamponade		

Table 3

Revised Test Blueprint for the CCI based on Cognitive Categories and Combat Trauma Conditions

	Lower-level Cognition	Higher-level Cognition	Critical Thinking Cognition	Total
Cardiac Tamponade	7	6	10	23
Hypovolemic Shock	9	15	14	38
Tension Pneumothorax	5	8	8	21
Total	21	29	32	82*

*Total greater than number of test questions because some items were placed in two cognitive categories

Validity

After development, initial review, and modification of the test items, the entire instrument was resubmitted to the experts for review. Content validity was established by these experts through extensive review of the instrument and individual items. Content was specifically reviewed relative to the clinical conditions of cardiac tamponade, tension pneumothorax, and hypovolemic shock, as well as the cognitive level of the items: lower-level, higher-level, or critical thinking. Construct validity was established through expert review of the constructs of interest and consensus that the instrument had reached saturation for the content being measured, that is, no other content needed to be added to achieve accurate measurement of the constructs of interest.

Content validity.

Content experts looked for “representativeness of the total collection of test items” as well as the “quality and representativeness” of the individual test items for

“measuring the content domain” (Waltz, Strickland, & Lenz, 2005, p. 176). Experts were asked to quantify the congruency of the items with the content domain by rating the items as 1—not relevant, 2—somewhat relevant, 3—quite relevant, 4—very relevant. They were also asked to evaluate questions for the level of cognition: lower, higher, or critical thinking. The congruency percentage was then calculated and converted to a percentage. (See section on item subscale/objective congruence.) Because of initial disagreement among the experts, the instrument was submitted to the expert panel twice for evaluation and revision before congruency was achieved. The total of all the experts’ percentages was then averaged with a congruency percentage of 100%, complete agreement, which exceeded the proposed ideal average of 90%. After three reviews, experts achieved 100% agreement on the correct answers to the test items, strengthening the content validity. During these reviews, the experts discussed the answers in question with the investigators and some answers were clarified or changed. They were resubmitted and questions/answers again reviewed and modified until consensus was reached. The test and individual items, therefore, were established as being representative of the content domain.

Construct validity.

Construct validity involves establishing that the CCI is actually measuring the “construct of interest” (Waltz, Strickland, & Lenz, 2005, p. 250) or “traits or attributes at an abstract level” (Morrison, Nibert, & Flick, 2006, p. 95). Additionally, “the major focus of construct validation for criterion-referenced measures is to establish support for the measure’s ability to accurately categorize phenomena in accordance with the purpose for which the measure being used [sic]” (Waltz, Strickland, & Lenz, 2005, p. 178-179).

To establish that the constructs of interest were being measured several steps were taken. In the initial framing of the combat scenarios for tension pneumothorax, hypovolemic shock, and cardiac tamponade, prior to writing the test items, investigators referenced state of the science manuals for trauma care courses such as the Advanced Trauma Life Support course, the Trauma Nursing Care Course, and the Tactical Casualty Care Course (A. Johnson, personal communication, January 21, 2007). Through repeated expert review of the essential content and constructs, and after modification, elimination, and addition of test items, experts reached 100% consensus that no other content could be added to the instrument that would further clarify or measure the constructs of interest. See the section on item analysis for further explanation of the expert review process.

Item Analysis

After the initial test items were completed, they were sent to the expert panel for analysis. In this phase, the experts were asked to evaluate questions for correctness and relevancy to the topic(s)/constructs. Based on this initial analysis, three questions were eliminated, nine questions were revised, and three questions were added. Some differences in opinion appear to have been directly related to combat trauma experience. Specifically, on item #68, which asked for immediate treatment of hypovolemic shock, the correct answer was “assess adequacy of airway and administer oxygen.” One civilian reviewer disagreed, selecting “administer IV fluids in two sites using large bore needles.” Upon reevaluation by the expert panel, it was agreed that current standard field treatment for hypovolemic shock was not to administer large amounts of intravenous fluids (although this is a common treatment in civilian practice), but rather to assess the airway and administer oxygen. The rationale for this treatment is that massive amounts of fluid

dilutes the blood clotting factors; additionally, elevating the systolic blood pressure above 90 mmHg can dislodge a blood clot, resulting in further bleeding (A. Johnson, personal communication, January 21, 2007).

Item subscale/objective congruence.

Experts were asked to examine and rank each test item for congruence with the subscale and objective. The initial item subscale/objective congruence score was .7128; after modifying some items, deleting and adding other items, and resubmitting to the experts for additional evaluation, the score was .804. This was higher than the proposed acceptable score of greater than .80 for the item subscale/objective congruence.

Empirical Item-Analysis Measures

Empirical measures are used in addition to other measures to “evaluate the effectiveness of the items of the measuring tool” (Waltz, Strickland, & Lenz, 2005, p. 181). In addition to the other measures previously reported, the CCI was assessed for item difficulty, point-biserial correlations, and item discrimination coefficients.

Item difficulty.

Item difficulty scores were used to determine if test-takers were able to discriminate between the distractors and the correct answer. Scores less than 0.3 may mean the item is too difficult or unclear whereas items with scores higher than 0.7 may be too easy (Waltz, Strickland, & Lenz, 2005). The ideal item difficulty score was computed to be 0.63 or 63% using the formula:

$$\text{Ideal Difficulty} = (1+g)/2 \quad \text{Where } g = \text{chance level of success}$$

$$\text{CCI: Four Choice Items} = (1+.25)/2 = 0.63$$

For both the pretest and the posttest, item difficulty scores ranged from .13 to .94 with a mean item difficulty on the pretest of .5743 and .5747 on the posttest (See Table 4 and Figures 2 and 3). Using the item difficulty scores with point-biserial scores and item discrimination levels, items were reevaluated by three additional experts: two master's prepared and one doctorally prepared certified registered nurse anesthetists. Two had been deployed to the Iraqi combat zone. Based on their feedback, two items were eliminated. Two items were miskeyed on the scoring sheet; the miskeyed items were corrected for the data run two. Although some items scored above or below the ideal item difficulty range of less than 0.3 and greater than 0.7, these experts recommended retaining all but items 43 and 71 since the other items tested essential content not assessed in other parts of the instrument. See Appendix C for the Composite Cognition Instrument.

Table 4

Frequencies: Pre-and Posttest Item Difficulty

		Item Difficulty-Pretest	Item Difficulty-Posttest
N	Valid	75	75
	Missing	0	0
Mean		.5743	.5747
Median		.5900	.5900
Mode		.50	.66
Std. Deviation		.18071	.19054
Variance		.03265	.03630
Range		.81	.81
Minimum		.13	.13
Maximum		.94	.94
Percentiles	25	.4400	.4700
	50	.5900	.5900
	75	.7200	.7200

Figure 2. Graphic representation of Pretest Item Difficulty Scores

Figure 3. Graphic representation of Posttest Item Difficulty Scores

Item discrimination.

The point-biserial correlation coefficient (r_{pbi}) was used as a cursory measure in the first data run to examine the degree of the relationship between the correct answer on the test and the overall scores on the test. This form of item discrimination examined the ability of an item to distinguish high achieving test takers from low achieving test takers. The r_{pbi} scores are expressed as a range of -1 to +1. Items scoring closer to a +1 are better able to discriminate between high and low scorers.

On the pretest, r_{pbi} scores ranged from -0.378 to +0.694 with a mean r_{pbi} score of .372; while on the posttest, r_{pbi} scores ranged from -0.223 to +0.774; the mean r_{pbi} score was .376 (See Table 5). Items with scores greater than 0.40 are considered to be highly discriminatory (Johnson, 2005; Osterlind, 2005).

Upon expert review, items #43 (r_{pbi} pretest= -0.065, r_{pbi} posttest= -0.067) and #71 (r_{pbi} pretest= -0.223, r_{pbi} posttest= -0.378) were eliminated. The correct answer was modified on item #7 (r_{pbi} pretest= -0.147, r_{pbi} posttest= -0.020) based on feedback from experts. Item #61 (r_{pbi} pretest= -0.135, r_{pbi} posttest= -0.036) was retained as the investigators and the experts believed this item reflected essential content that needed to remain on the test. See Appendix C for the Composite Cognition Instrument.

An item discrimination index (DI) was calculated on the second data run where items 43 and 71 were deleted. This index compared the top achieving one-third of the participants with the bottom third resulting in a score of +1 to -1 indicating the ability of the item to discriminate. This statistic included high and low level achiever's scores for the pre-and posttest. Item #59 showed a negative index of -.009 on the pretest but had an index of .241 on the posttest. In examining the high and low scores on this item from the

pretest, the high achievers' DI score was 50 while the low achievers' DI score was 63.6, a negative index. In the posttest, however, the high achievers' DI score was 70 while the low achievers' DI score was 36.4, a positive discrimination index. Using these scores and examining the content of the item, investigators decided that item #59 should be retained.

In summary, item #7 had a negative point-biserial correlation and a negative discrimination index. The correct answer on this item was revised. Items #59 and #61, although they had negative discrimination indices, were retained as they were determined by the experts to reflect essential content. See Table 5 for frequencies for the discrimination index and the point-biserial correlation. Table 6 shows the discrimination data for the pre-and posttests.

Table 5

Frequencies: Point-biserial and Discrimination Index

	Point Biserial-Pretest	Point Biserial-Posttest	Item Discrimination Pretest Run 2	Item Discrimination Posttest Run 2
N Valid	75	75	73	73
Mean	.37299	.37692	.36975	.40077
Median	.40800	.39600	.39300	.42900
Mode	.278 ^a	.131	.279 ^a	.117 ^a
Std. Deviation	.225438	.206773	.195801	.198717
Range	1.072	.997	.852	.889
Minimum	-.378	-.223	-.125	-.117
Maximum	.694	.774	.727	.772

a. Multiple modes exist. The smallest value is shown

Table 6

Item Discrimination Data

Item #	Point Biserial Correlation		Discrimination Index		Pretest High/Low Scorers		Posttest High/Low Scorers	
	Pretest	Posttest	Pretest	Posttest	High	Low	High	Low
1	.323	.485	.425	.508	100.0	72.7	100.0	54.5
2	.528	.431	.300	.502	100.0	90.9	100.0	72.7
3	.278	.351	.362	.323	90.0	36.4	90.0	45.5
4	.166	.193	.051	.239	50.0	45.5	50.0	36.4
5	-.107	.131	-.005	.199	50.0	45.5	70.0	45.5
6	.399	.383	.309	.454	80.0	54.5	70.0	27.3
7	-.147	-.020	-.125	-.117	20.0	27.3	20.0	27.3
8	.079	.018	.052	.120	70.0	54.5	70.0	54.5
9	.164	.202	.009	.205	90.0	81.8	100.0	90.9
10	.344	.284	.259	.321	60.0	45.5	50.0	27.3
11	.436	.239	.460	.290	100.0	63.6	80.0	45.5
12	.241	.418	.087	.419	60.0	72.7	80.0	36.4
13	.503	.563	.543	.535	90.0	18.2	90.0	45.5
14	.231	.511	.463	.440	90.0	54.5	100.0	63.6
15	.364	.479	.373	.442	80.0	27.3	80.0	27.3
16	.354	.424	.279	.557	80.0	54.5	90.0	36.4
17	.606	.548	.555	.594	100.0	54.5	100.0	54.5
18	.510	.603	.450	.686	100.0	45.5	100.0	18.2
19	.435	.260	.467	.250	70.0	18.2	40.0	27.3
20	.213	.471	.471	.376	70.0	27.3	70.0	27.3
21	.610	.387	.464	.461	80.0	45.5	80.0	27.3
22	.452	.536	.461	.595	80.0	45.5	100.0	36.4
23	.545	.516	.548	.493	100.0	54.5	100.0	72.7
24	.248	.252	.149	.204	80.0	54.5	90.0	72.7
25	.187	.198	.235	.202	70.0	36.4	50.0	18.2
26	.626	.457	.549	.498	100.0	45.5	90.0	45.5
27	.565	.399	.476	.431	90.0	45.5	90.0	54.5
28	.682	.610	.727	.537	100.0	27.3	80.0	27.3
29	.648	.611	.589	.648	100.0	45.5	100.0	54.5
30	.632	.645	.600	.635	70.0	9.1	90.0	27.3
31	.127	.236	.280	.174	100.0	90.9	90.0	72.7
32	.591	.131	.379	.167	100.0	63.6	100.0	81.8
33	.636	.543	.482	.596	100.0	45.5	100.0	36.4
34	.623	.774	.594	.772	80.0	18.2	90.0	.0
35	.151	.230	.241	.139	30.0	9.1	20.0	18.2
36	.217	.010	.166	.117	30.0	18.2	10.0	.0
37	.049	.264	.083	.157	40.0	36.4	70.0	45.5
38	.546	.551	.450	.569	90.0	36.4	90.0	27.3

Item #	Point Biserial Correlation		Item Discrimination		Pretest High/Low Scorers		Posttest High/Low Scorers	
	Pretest	Posttest	Pretest	Posttest	High	Low	High	Low
39	.568	.616	.704	.557	100.0	36.4	100.0	45.5
40	.301	.189	.131	.299	100.0	81.8	100.0	63.6
41	.357	.233	.374	.117	90.0	36.4	70.0	54.5
42	.694	.497	.556	.563	100.0	45.5	100.0	36.4
43	-.067	-.065	deleted	deleted	deleted	deleted	deleted	deleted
44	.613	.440	.544	.445	90.0	36.4	90.0	63.6
45	.484	.531	.457	.511	70.0	27.3	90.0	27.3
46	.642	.631	.617	.659	70.0	.0	70.0	.0
47	.428	.336	.363	.379	80.0	45.5	80.0	36.4
48	.598	.489	.537	.513	100.0	54.5	90.0	45.5
49	.583	.550	.529	.622	90.0	27.3	90.0	18.2
50	.492	.254	.586	.128	80.0	9.1	30.0	18.2
51	.604	.347	.544	.379	90.0	45.5	90.0	63.6
52	.605	.640	.559	.702	80.0	27.3	100.0	9.1
53	.154	.099	.002	.157	20.0	27.3	30.0	18.2
54	.529	.568	.490	.574	70.0	18.2	80.0	9.1
55	.598	.570	.556	.550	90.0	27.3	90.0	27.3
56	.343	.207	.256	.214	50.0	18.2	40.0	18.2
57	.410	.267	.315	.347	80.0	54.5	80.0	36.4
58	.398	.693	.304	.682	60.0	36.4	90.0	9.1
59	.122	.295	-.009	.241	50.0	63.6	70.0	36.4
60	.492	.356	.390	.423	90.0	54.5	90.0	36.4
61	.036	.135	-.002	-.076	50.0	36.4	20.0	36.4
62	.408	.595	.574	.590	90.0	18.2	90.0	27.3
63	.540	.637	.563	.556	80.0	36.4	80.0	18.2
64	.575	.768	.561	.761	70.0	9.1	90.0	.0
65	.100	.069	.099	.295	60.0	36.4	30.0	18.2
66	.278	.396	.357	.429	60.0	18.2	80.0	45.5
67	.250	.434	.272	.415	60.0	27.3	80.0	18.2
68	.205	.326	.393	.295	90.0	63.6	90.0	54.5
69	.180	.149	.279	.115	70.0	54.5	60.0	63.6
70	.522	.542	.522	.518	90.0	36.4	90.0	45.5
71	-.378	-.223	deleted	deleted	deleted	deleted	deleted	deleted
72	.346	.271	.352	.389	90.0	63.6	90.0	54.5
73	.551	.585	.413	.652	90.0	54.5	100.0	27.3
74	.098	.228	.202	.164	70.0	45.5	90.0	63.6
75	.260	.290	.344	.353	60.0	27.3	70.0	27.3

Readability

The CCI was evaluated using the Flesch Reading Ease Score (Flesch, 1948).

Readability using the Flesch Reading Ease Score is based on average sentence length and average number of syllables per word using the following formula:

$$206.835 - (1.015 \times \text{ASL}) - (84.6 \times \text{ASW})$$

Where:

ASL- average sentence length (number of words divided by the number of sentences)

ASW= average number of syllables per word (the number of syllables divided by the number of words) (Microsoft Office Online, n.d.).

The instrument had a reading ease score of 34, below the stated preferred level of greater than 80 but within the range of 30-50 expected in academic writing (Flesch, 1948). The Flesch-Kincaid Grade Level Score was 9.8. This was within the acceptable range of less than 14.

Reliability

Three measures of reliability were used in the development and pilot testing of the CCI. Test-test reliability was used to measure the temporal stability of the instrument. Internal consistency reliability was measured using the Kuder-Richardson (KR 20) method of analysis. Test dependability was calculated for the instrument and subscales on the pretest and the posttest.

Test-test reliability.

Test-test reliability was calculated using the Pearson Product Moment Coefficient (Pearson r). Using a two-tailed test, the resulting initial Pearson r of .857 ($p < 0.01$) showed a statistically significant correlation between the first and second test administrations. In the second data run, the CCI was revised; two participants were dropped because of missing data and two items were deleted resulting in a statistically significant Pearson r of .890, again at the $p < .01$ level (See Table 7). Test-test reliability between the subscales was demonstrated using a two-tail test with correlations significant ($p < .01$) as evidenced by Pearson r : Subscale 1, Critical Thinking Cognition: 0.713; Subscale 2, Higher Level Cognition: 0.770; Subscale 3, Lower Level Cognition: 0.556. (See Table 8; See Table 11 for subscale descriptive statistics.)

Reliability coefficients range from 0 to 1.00, with higher scores indicating greater reliability. Polit stated that “reliability coefficients should generally be at least .70” (Polit, 1996, p. 249). A lower Pearson r may indicate that some changes are related to attributes that change over time. The reliability coefficient for the CCI was high at .890, showing a strong positive relationship between the first and second test administrations that was not due to chance and exceeding the expected level of .80 (Johnson, 1995). Although not as high, the scores on the subscales also showed a strong, positive, statistically significant relationship between the two tests, establishing reliability.

Table 7

Correlation between Pre-and Posttest 2 using Pearson r

		Pretest Run 2 Percent	Posttest Run 2 Percent
Pretest Run 2 Percent	Pearson Correlation	1	.890*
	Sig. (2-tailed)	.	.000
	N	30	30
Posttest Run 2 Percent	Pearson Correlation	.890*	1
	Sig. (2-tailed)	.000	.
	N	30	30

**. Correlation is significant at the 0.01 level (2-tailed).

Table 8

Correlation between Subscales Pre-and Posttest using Pearson r

		Subscale 1 Pretest Percent	Subscale 1 Posttest Percent
Subscale 1 Pretest Percent	Pearson Correlation	1	.713*
	Sig. (2-tailed)	.	.000
	N	30	30
Subscale 1 Posttest Percent	Pearson Correlation	.713*	1
	Sig. (2-tailed)	.000	.
	N	30	30

**. Correlation is significant at the 0.01 level (2-tailed).

		Subscale 2 Pretest Percent	Subscale 2 Posttest Percent
Subscale 2 Pretest Percent	Pearson Correlation	1	.770*
	Sig. (2-tailed)	.	.000
	N	30	30
Subscale 2 Posttest Percent	Pearson Correlation	.770*	1
	Sig. (2-tailed)	.000	.
	N	30	30

**. Correlation is significant at the 0.01 level (2-tailed).

		Subscale 3 Pretest Percent	Subscale 3 Posttest Percent
Subscale 3 Pretest Percent	Pearson Correlation	1	.556*
	Sig. (2-tailed)	.	.001
	N	30	30
Subscale 3 Posttest Percent	Pearson Correlation	.556*	1
	Sig. (2-tailed)	.001	.
	N	30	30

**. Correlation is significant at the 0.01 level (2-tailed).

Internal consistency reliability.

In this criterion-referenced test, the KR20 procedure was used as the data are dichotomously scored and items have varying levels of difficulty (Waltz, Strickland, & Lenz, 2005). The KR20 score of .91 showed high levels of consistency of group performance across the instrument.

Test Dependability.

The dependability coefficient for the CDI on both the pretest and the posttest was a very high .99, based on a 0-1.0 scale. Subscale 1, Critical Thinking Cognition, had a dependability of .78 on the pretest and .85 on the posttest. Subscale 2, Higher Level Cognition, had a dependability of .87 on the pretest and .89 on the posttest while Subscale 3, Lower Level Cognition, scored .84 on both the pretest and the posttest.

Pilot Administration of the Composite Cognition Instrument

The CCI and the DDI were administered to 32 military nurses at three sites in California, Louisiana, and Texas. The DDI was developed to reflect the study population, active and reserve duty registered nurses. Eleven multiple choice questions obtained information about age, gender, branch of service, rank, years as a nurse, years as a military nurse, previous time deployed in a combat zone, healthcare experience, and certifications (e.g., education, critical care). Subjects were fully apprised of their rights and informed consents were signed. (See Appendix A.) Data collection was conducted at baseline and at a two week follow-up.

Subjects

Thirty-two military registered nurses were recruited as a convenience sample for participation in the study. Two participants were eliminated in the second wave of data

analysis because of missing data on the answer sheets. Ages ranged from 18 to greater than 46 years with most (n=14) specifying the 36 to 45 age range on item #76 on the DDI. Ten females and 19 males were recorded (1 participant miskeyed the gender question on the DDI scoring sheet). Nurses were recruited from all branches of the military which included Army, Navy, and Air Force.

Experience was varied; some nurses were novices with less than one year's experience as a registered nurse (n=3); others had more than 11 years' experience (n=11). Many were new to the military; 19 had been commissioned for less than five years. Nine of the participants had been deployed to a combat zone; some had been to Iraq. Surprisingly, 17 participants (66%) had associate's degrees in nursing while nine participants (30%) had bachelor's degrees. One held a master's degree in nursing. Fourteen nurses had one or more of the following post-RN training or certifications: 1) Formal post-RN critical care course (n=8), 2) Certified Emergency Nurse (CEN) (n=3), 3) Certified Critical Care Nurse (CCRN) (n=2), 4) Trauma Nursing Care Course (TNCC) (n=2), or 5) Tactical Casualty Care Course (TCCC) (n=0). (See Table 9 for complete demographic data).

All participants were officers. Ranks are listed as levels that are consistent across all branches of the military; however, for clarity and frame-of-reference, the following levels correspond to ranks in the Army and Air Force: 01=second lieutenant, 02= first lieutenant, 03=captain, 04=major, 05=lieutenant colonel or higher. One participant was a Navy nurse with a rank of lieutenant, or 03, equivalent to a captain in the Army or Air Force. The only Air Force participant held a rank greater than or equal to 05, lieutenant colonel or higher.

Table 9

Participants' Demographic Data from DDI (N=30)

Item	n	% (rounded)
76. Current age		
18-25	2	7%
26-35	6	20%
36-45	14	47%
≥46	7	23%
Missing	1	3%
77. Gender		
Female	10	33%
Male	19	63%
Missing	1	3%
78. Military Rank*		
01	6	20%
02	11	37%
03	6	20%
04	3	10%
05 or above	4	13%
79. Branch of Military		
Air Force	1	3%
Army	26	87%
Navy	2	7%
Missing	1	3%
80. Years as RN		
<1 year	3	10%
1-5 years	5	17%
6-10 years	11	37%
≥11 years	11	37%
81. Years as Military RN		
<1 year	7	23%
1-5 years	12	40%
6-10 years	5	17%
≥11 years	6	20%
82. Went to Combat Zone		
Yes	6	20%
No	23	77%
Missing	1	3%
83. Total Months Deployed		
<6 months	4	13%
7-12 months	7	23%
13-18 months	3	10%
19-24 months	0	0%

≥25 months	0	0%
Missing (not deployed)	16	53%
84. Prior Experience in Healthcare	n	%
Yes	20	66%
No	9	30%
Missing	1	3%
85. Degrees		
Diploma/Associate	17	66%
Bachelor's in nursing	9	30%
Master's in nursing	1	3%
Master's other	0	0%
Doctoral	0	0%
Missing	2	7%
86. Additional training/certifications		
Critical Care Course	7	23%
CEN	3	10%
CCRN	2	7%
TNCC	2	7%
TCCC	0	0%
None	16	53%
87. Other Work Experience (open response)	No answers	0%

* The following levels correspond to ranks in the Army and Air Force: 01=second lieutenant, 02= first lieutenant, 03=captain, 04=major, 05=lieutenant colonel or higher.

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences version 14 (SPSS) and a computer test scoring program. Participants' answers were written on a prepared scoring sheet where they were required to fill in "answer bubbles". Two participants left some test items blank on the CCI scoring sheet; these participants were eliminated for the follow-up, leaving a sample of 30. Some participants miskeyed or left blank answers on the DDI; these participants were retained and the missing data was noted in Table 9.

Pre-and posttest scores were similar and ranged from 24.7% to 86.3% ($SD \pm 18.52$) on the pretest and 26.0% to 90.4% ($SD \pm 17.02$) on the posttest. (See Table 10 for CCI pretest and posttest percentage scores and frequency distribution; See Figures 4 and 5 for percentage scores on the pre-and posttest .)

Frequencies were calculated for the subscales using percentage scores (See Table 11). Participants scored lower on the higher-level and critical thinking subscales than on the lower-level subscales. On Subscale 1, Critical thinking cognition, the mean score for the pretest was 56.56% ($SD \pm 15.68$) while the mean score for the posttest was lower, 53.237% ($SD \pm 18.71$). Scoring was similar on Subscale 2, Higher-level cognition; the mean pretest score was 55.51% ($SD \pm 20.13$), while the mean posttest score was 54.82% ($SD \pm 21.67$). Subscale 3, lower-level cognition, had a slightly higher mean score on the pretest, 64.28% ($SD \pm 21.36$), and the posttest, 64.76% ($SD \pm 21.13$) but a narrower range on the posttest than on the pretest. Percentage scores for the subscales' pre-and posttests with normal curves are shown in Figures 6 through 11.

Table 10

Frequencies: Percentage Scores on Pre-and Posttest Data Run 2

	Pretest Run 2 Percent	Posttest Run 2 Percent
N Valid	30	30
Missing	59	59
Mean	58.4400	59.9567
Median	62.3000	62.3000
Mode	35.60 ^a	67.10
Std. Deviation	18.52176	17.02300
Range	61.60	64.40
Minimum	24.70	26.00
Maximum	86.30	90.40

a. Multiple modes exist. The smallest value is shown

Figure 4. Pretest Run 2 Percentage Scores

Figure 5. Posttest Run 2 Percentage Scores

Table 11

Frequencies: Subscale Percentage Scores on Pre-and Posttest Data Run 2

		Subscale 1 Pretest Percent	Subscale 1 Posttest Percent	Subscale 2 Pretest Percent	Subscale 2 Posttest Percent	Subscale 3 Pretest Percent	Subscale 3 Posttest Percent
N	Valid	30	30	30	30	30	30
	Missing	59	59	59	59	59	59
Mean		56.560	53.237	55.510	54.827	64.287	64.767
Median		59.400	53.100	58.600	56.900	69.050	71.400
Mode		62.5	28.1	58.6	79.3	81.0	71.4 ^a
Std. Deviation		15.6816	18.7134	20.1370	21.6757	21.3664	21.1376
Range		59.4	59.4	69.0	72.5	76.2	71.5
Minimum		28.1	25.0	17.2	17.2	19.0	19.0
Maximum		87.5	84.4	86.2	89.7	95.2	90.5

a. Multiple modes exist. The smallest value is shown

Figure 6. Subscale 1 Critical Thinking Cognition Pretest

Figure 7. Subscale 1 Critical Thinking Cognition Posttest

Figure 8. Subscale 2 Higher Level Cognition Pretest

Figure 9. Subscale 2 Higher Level Cognition Posttest

Figure 10. Subscale 3 Lower Level Cognition Pretest

Figure 11. Subscale 3 Lower Level Cognition Posttest

Conclusion

The preliminary psychometric properties of the CCI were reported in this chapter. Extensive expert review in the construction and modification of the CCI as well as use of empirical measures such as point-biserial correlations, discrimination indices, and the KR 20 procedure, established the validity of the CCI. Reliability was demonstrated by a statistically significant correlation between the first and second test administrations and consistent group performance across the instrument as evidenced by a high KR20 score of .91. The test dependability on the CDI was .99. For the study reported here, the CCI was shown to be a valid and reliable, criterion-referenced instrument to measure composite cognition in a sample of military nurses involved in combat casualty care.

Chapter V

Discussion

The purpose of this study was to develop an instrument to measure a newly conceptualized construct “composite cognition” formulated to explain the cognitive and learning processes related to the care of combat casualties using specific conditions seen in combat, and to examine its psychometric properties to establish preliminary reliability and validity. In this chapter, the development of the instrument, pilot testing, methodological issues, limitations, implications for nursing, and future recommendations for research will be presented.

Instrument Development

The conceptual framework for this study was informed from the theoretical perspectives of Bloom’s taxonomy, critical thinking theory, and the nursing process (Johnson, 2005). In addition, Krathwohl’s (2002) revised taxonomy was incorporated while still retaining the six more widely recognized original taxonomic terms/categories. The CCI measures the three subscales of composite cognition, which consists of three elements: lower-level cognition, higher-level cognition, and critical thinking cognition. Seventy-five questions were developed based on scenarios using conditions seen in combat: hypovolemic shock, tension pneumothorax, and cardiac tamponade.

Expert Review

A panel of experts was assembled to develop and review the CCI and the DDI. These experts consisted of four active or retired military RNs and two civilian RNs who had extensive experience in critical and trauma care, teaching, and test construction/instrument development. Experts were from different areas of the United States: West, South, and Mid-West. Contact was primarily via email, although some experts were able to meet face-to-face. Use of email facilitated exchange of information and return of data (See Appendix F for the data form sent to the expert panel.)

All reviewers were familiar with Bloom's taxonomy and critical thinking theory, the frameworks for this study, although most were unfamiliar with Krathwohl's (2002) revised version of Bloom's taxonomy. There was some discussion among the experts on current modes of treatment for combat casualty care. Two investigators attended a Tactical Casualty Care Course (TCCC) conducted by one of the experts.

Item Development and Validity

Items were modified based on expert feedback and returned for review until there was 100% agreement on the actual content and relevancy of the test items, and congruency with the cognitive levels and objectives. This established content validity by using multiple methods of evaluation.

One of the important functions of an instrument is to measure the attribute, or construct, of interest. In the pilot testing of the CCI, construct validity was by expert consensus on the content and constructs being measured on the instrument and subscales. With a sample size of 30, the use of a known-groups design to measure construct validity

was not feasible. Later testing using educational interventions with a larger sample size will allow for a known-groups comparison where participants will either have received or not received, the educational intervention. A larger sample size will also allow comparisons and correlations on the basis of educational levels and experience.

Item Analysis

An extensive assessment of the test items was conducted, both before the pilot administration of the instrument using experts, and after the pilot, when the data were analyzed and experts were again consulted based on initial review of the data after the first data analysis. This assessment included evaluation of the aforementioned item subscale/objective congruence and empirical item-analysis measures: item difficulty, item discrimination, readability, and reliability. Use of experts was ongoing throughout the entire process including after pilot testing.

Item Discrimination.

In a multiple-choice question with four choices and one correct answer, there is a 25% chance of guessing the answer correctly, impacting the validity of the discrimination measures (Osterlind, 2005). Two commonly used measures, point-biserial correlation and discrimination index, were used to assess item discrimination because of the dichotomous nature of the answers (i.e., correct or incorrect).

In evaluating the discrimination indices, some items with negative discrimination were retained based on expert review. Experts and investigators felt that these were crucial knowledge questions that will be addressed through future educational interventions. Brown (2001, p. 15) supported the use of common sense when evaluating empirical data: "...remember that item analysis statistics, like the r_{pbi} , are only tools that

can help you in selecting the best items for a ... test, but they should never be used to replace the common sense notions involved in developing sound...test items.”

Readability.

Readability using the Flesch Reading Ease Score is based on average sentence length and average number of syllables per word. Flesch (1948) stated that measurement of word and sentence length is a measure of complexity and, indirectly, levels of abstraction. Using sentence length as a parameter may have yielded false results due to the number of sentence fragments involved in multiple-choice questions. The number of syllables per word would be expected to be relatively high in a document using medical, nursing, and technical terms.

Thus, stating an expected score of greater than 80 was unrealistic for the type of technical, scholarly writing on the CCI. Indeed, Flesch classified scores between 80-90 as being consistent with “pulp-fiction”. This is clearly not the writing style on the CCI which reflected physiology, diagnoses, and treatment. The actual score of 34 was within the expected range of 30-50 for “academic” writing (Flesch, 1948, p. 230).

Test Dependability/Internal Consistency Reliability.

Test dependability implies that, given an equivalent test, test-takers will achieve approximately the same score. This coefficient is calculated using the top one-third and the bottom one-third scores. A high dependability coefficient of .99 was calculated for the CDI. More items on the test increase dependability as the test is then more representative of the test-takers’ knowledge (Osterlind, 2004). The scores on the subscales, although high, were expectedly lower than on the whole instrument as there were fewer items on each subscale, effectively making the subscales shorter tests.

Internal consistency reliability was calculated using a KR 20, which, according to Waltz, Strickland, and Lenz (2005), is appropriate for use in criterion-referenced instruments with dichotomous variables. Although frequently used to measure internal consistency, Cronbach's alpha was inappropriate for use in an instrument with dichotomous variables (Waltz, Strickland, and Lenz, 2005).

Pilot Administration of the Composite Cognition Instrument

The 75-item CCI and the DDI were administered to 32 military nurses with test administrations being two weeks apart. There was concern that the longer 75-question instrument would result in participant fatigue or boredom, particularly after the second administration. After reading and signing the informed consent (participants received a copy), participants received an explanation on the purpose of the study and instructions on how to use the scoring sheet, which was provided to them along with #2 pencils. At the second administration, the same instructions were given on filling out the answer sheet. No directions or explanations were given on the content of the test.

Sample Population

Thirty-two participants were recruited from all branches of the military and included RNs from the Army, Air Force, and Navy. The Marines use RNs from the Navy so they were not directly represented in the study. Two of the participants were eliminated from data run two because of missing data on their forms, reducing the number of participants to 30, the minimum needed to conduct the study.

Because this was a convenience sample, there were more representatives from the Army as they were the most available at the time the study was being conducted. Future studies should attempt to have a broader representation from other branches of the

military. There was approximately a two-to-one ratio of males to females in the study. Nurses with six or more years of experience outnumbered those with five or less years almost three-to-one. Seventeen of the 30 participants were RNs with associate's degrees. Another area for consideration was post-graduate certifications. Some nurses (47%) had received various types of critical-care certifications while others had not had any post-RN critical-care courses. Purposeful leveling of future samples for these and other characteristics would allow for better representation and more sophisticated statistical analyses of the data.

One of the concerns of the investigator was that participants who scored low on the instrument would have negative feelings about their own knowledge. While some of the participants reported that the test was difficult; others said they felt it was mostly basic knowledge. These comments indicated various levels of familiarity with the content on the test which was reflected in the wide range of scores. This clearly shows a need for future study on how best to educate nurses who may be practicing in stressful situations in which they are uncertain of their own knowledge levels and ability to practice safe and effective patient care.

After one of the second test administrations, a participant expressed concern to the investigator that, as a pediatric nurse, she would be sent unprepared to a combat area. Other nurses from non-critical care areas expressed similar concerns. Still others said that they had been to combat areas where they were expected to practice outside of their areas of expertise, as with an obstetric nurse working in critical care. All expected to be deployed overseas within six months. Many participants thanked the investigator for conducting the study and felt that it was an important step toward strengthening their

educational preparation prior to being deployed to combat areas. Still others asked if they could get their scores on the test. The researcher explained that the tests were deidentified and personal data would not be available but offered to contact them after the study was completed to discuss the results and their implications with anyone who was interested.

Demographic Data Instrument

Item #82 asked if the participant had ever been deployed to a combat zone; six participants (20%) answered yes while 22 (77%) answered no. There was one missing answer. The next item, #83, asked for the total months deployed. On this item, 47% responded with the number of months they had been deployed, a clear mismatch with the 20% positive response from item #82 (See Table 9). An explanation for this may lie in the wording of the items. Item #82 asked for deployment to a combat zone while item #83 asked for total months of deployment. Responders may have been deployed to non-combat zones overseas. Revision of item #83 to reflect the number of months deployed to a *combat* zone is necessary. It may be desirable to ask even more detailed questions as to the area where the nurse actually worked while in combat, for example, flight nursing, battalion aid station, forward hospital, and so forth.

No answers were received for item #87 on the DDI. On review, this item seemed confusing as it asked for a description of work experience not covered in another multiple-choice question. Some participants had asked about the question and if they had to fill it out. They were told that they could fill it out if they wanted but they did not have to. Another explanation for not receiving answers could have been tester fatigue as it was the last item on the test. This item needs to be revised prior to future administration.

Data Analysis

Data from the pilot study were analyzed using item analysis measures, descriptive statistics, correlations, and frequencies. In addition to the test, subscales one, two, and three, representing the three cognitive levels, were also analyzed using descriptive statistics, correlations, and frequencies. There was a high .99 test dependability; test-retest reliability, as measured by a Pearson r , was a significant .890. Correlations between the subscales were also statistically significant: .713 for Subscale 1, Critical Thinking Cognition, .770 for Subscale 2, Higher-Level Cognition, and .556 for Subscale 3, Lower-Level Cognition (See Tables 7 and 8 for correlation data).

The standard deviations for the instrument and the subscales were large on both the pretest and the posttest (standard deviations ranged from 15.68 on subscale 1/pretest to 21.67 on subscale 2/posttest). (See Tables 10 and 11 for frequency data using percentages.) This was due, in part, to the wide range in the scores on the instrument; scores ranged from 24.7% to 86.3% on the pretest and 26% to 90.4% on the posttest. In addition to the difference in education and experience, this may have reflected different cognitive levels of the participants, that is, thinking at a lower level or a higher level or critical thinking.

Limitations of the Study

The primary limitation of this study was in the sample size. With the elimination of two participants because of incomplete data, the minimum acceptable sample size of 30 was used to conduct the study. This precluded the use of more sophisticated analytic strategies to examine relationships between variables.

Other issues were related to the small, non-randomized sample. Because this was a sample of convenience, most of the participants were reserve-duty nurses. Other potentially confounding factors included experience, educational levels, and post-RN certifications. Future studies should attempt to explore these factors by having a large enough sample to analyze them.

Recruitment was difficult. Many active-duty nurses were being rapidly deployed; it was challenging to find nurses who were physically present and available for two test administrations, even two weeks apart. In fact, two weeks was seen as the maximum time to test and retest as nurses were often leaving to go to combat areas. This resulted in most of the sample being comprised of reserve-duty RNs, who were available for slightly longer periods of time.

Finally, another limitation of the study is the lack of generalizability in a criterion-referenced instrument. Due to the contextual nature of this instrument—studying composite cognition related to combat casualty care—it may be difficult to apply to other populations. The lack of generalizability is seen as rationale for developing more costly, less contextual, norm-referenced instruments (Adams, Whitlow, Stover, & Johnson, 1996).

Implications for Nursing and Areas for Future Research

Developing the new construct, composite cognition, based on the familiar frameworks of Bloom's taxonomy and the nursing process, provides an easily accessible contribution to the state of the science in nursing, particularly in the areas of cognition, teaching, and learning. Validation of the CCI brings important information to the body of knowledge for teaching combat casualty care. This instrument will be used in a future

study to evaluate the effects of different types of educational programs for preparing military combat nurses to care for critically ill patients in a combat area.

Future research needs to be directed towards testing the instrument again with a larger sample using educational interventions for additional validity and reliability testing. As part of a larger study, the CCI can then be used to evaluate different educational interventions used for teaching military nurses who may be deployed to combat areas. Although not directly generalizable to other populations due to its contextual nature, the CCI may be used as a framework for the development of instruments for use with other populations.

Conclusions

In an arena where non-critical-care nurses may be sent to combat areas, it is important to support them with superior education and training. As one part of that equation, it is important to develop new and valid instruments for measuring the effectiveness of that education and training. This study established the reliability and validity of the CCI, an instrument based on Bloom's taxonomy, the nursing process, critical thinking theory, and a new construct, composite cognition. The Composite Cognition Instrument for Nursing Care of Combat Casualties (CCI) provides a mechanism for evaluating educational interventions used for teaching military nurses who may soon be caring for soldiers and civilians in combat zones.

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Appendix A

Research Participant's Consent Form

A Composite Cognition Instrument for Nursing Care of Combat Casualties

Patricia Hanes, PhD(c), MSN, MAED, RN is a doctoral student in the Hahn School of Nursing and Health Science at the University of San Diego. You are invited to participate in a research project she is conducting for the purpose of exploring composite cognition in military nurses involved in combat casualty care.

The project will involve taking a test that asks questions about nursing care of combat casualties. Filling out the test will take about 60 minutes and also will include some questions about you, such as your age, rank, years in nursing, and critical care experience. The test will be administered at a location convenient to you two times, two weeks apart. Participation is entirely voluntary and you can refuse to answer any question and/or quit at any time. Should you choose to quit, no one will be upset with you and your information will be destroyed right away. If you decide to quit, nothing will change about your access to resources like health care. There will be no effect on your evaluation or rank, and it will not be reported to your superiors.

The information you give will be analyzed and studied in a manner that protects your identity. That means that a code number will be used and that your real name will not appear on any of the study materials. All information you provide will remain confidential and locked in a file cabinet in the researcher's office for a minimum of five years before being destroyed.

There may be a risk that taking the test may make you feel tired. Remember, you can stop the test at any time you feel tired or for any other reason. Another risk is that you might feel some negative feelings, like anxiety or how effective you feel as a nurse, from filling out the form. If you have these feelings and would like to talk to someone about them, you can call the Mental Health Hotline at the base where you are stationed. You can also call The Center for Health Care Services Crisis Line at 1-800-316-9241.

The benefit to participating will be in knowing that you helped nurses, educators, psychologists, etc.) learn how to better care for soldiers and civilians in combat and

peacetime situations, potentially saving many lives. You will receive a certificate of participation in a research study to keep for your files.

If you have any questions about this research, please contact Patricia Hanes at 626-233-4008; email: phanes@apu.edu or Dr. Cynthia Connelly at the University of San Diego 619-260-4548; email: connellyc@sandiego.edu.

I have read and understand this form, and consent to the research it describes to me. I have received a copy of this consent form for my records.

Signature of Participant

Date

Name of Participant (Printed)

Signature of Principal Investigator

Date

Appendix B

Cover Letter for Participants

Dear Nurse:

Military nurses are required to make complex decisions every day in the course of caring for severely injured soldiers and civilians in combat zones. In a stressful and dangerous practice arena, it is imperative that nurses be able to make swift and accurate life-and-death decisions for patients with multiple, severe, traumatic injuries not often seen in civilian practice. It is important, then, to identify the cognitive and learning processes necessary to acquire the knowledge and skills to make these crucial nursing judgments.

The purpose of this study is to develop a valid and reliable way to measure how nurses learn these skills. This will enable us to create better, more thorough, and relevant training programs prior to deployment. You will receive this letter, two consent forms, a demographic questionnaire, the test, and an answer sheet.

Would you please take a few minutes of your precious time to help us help military nurses? Please read and sign the consent form and keep a copy for yourself; there is more information on the research in that document. Then go ahead and fill out the Demographic Data Form and the test. You do not need to sign your name. Finally, return all three items to the researcher. That's all there is to it!

Your participation is crucial to the success of this study and may result in lives saved through better training. I hope you will enjoy having this opportunity to participate in a research study,

Thank you for the gift of your valuable time.

Cordially,

Patricia Hanes, PhD(c), MSN, MAED, RN
Doctoral Candidate, University of San Diego
Hahn School of Nursing and Health Science

Appendix C

Composite Cognition Instrument

Ver A Participant number _____ Pretest _____ Posttest _____

Composite Cognition for Nursing Care of Combat Casualties

Multiple Choice

Please do not write on the test. Choose the BEST answer. On the attached answer sheet (SCAN-TRON) please fill in the bubble corresponding to the correct letter of your answer. Thank you.

- _____ 1. A patient who is in hypovolemic shock may have a normal blood pressure because of an increase in:
- a. Heart rate and vasoconstriction
 - b. Stroke volume and a decrease in peripheral resistance
 - c. Heart rate and vasodilation
 - d. Stroke volume and vasodilation
- _____ 2. The type of shock MOST often seen on the battlefield is:
- a. Anaphylactic
 - b. Septic
 - c. Cardiogenic
 - d. Hypovolemic
- _____ 3. The first parameter to change in hypovolemic shock is MOST likely a (an):
- a. Decrease in blood pressure
 - b. Decrease in pulse pressure
 - c. Increase in pulse
 - d. Increase in respirations
- _____ 4. A patient who has suffered a hemorrhage secondary to a blast injury that occurred 45 minutes ago is being treated with a solution of Hextend. The best indicator that the treatment is effective would be:
- a. Heart rate has decreased from 130 to 100
 - b. Blood pressure has increased from 100/82 to 110/90
 - c. Urine output has increased from 15 ml/hour to 20 ml/hour
 - d. Respiratory rate has decreased from 28 to 24
- _____ 5. A patient has active bleeding from an abdominal injury. The first priority is to:.
- a. Assess the airway
 - b. Stop the bleeding
 - c. Start two IVs with large bore needles
 - d. Administer oxygen

- ____ 6. You suspect that a patient has a tension pneumothorax or hypovolemic shock. Which of the following would MOST strongly suggest a tension pneumothorax?
- Flattened jugular veins
 - Deviated trachea toward the affected lung
 - Deviated trachea toward the unaffected lung
 - Distended jugular veins
- ____ 7. Which of the following parameters would be MOST indicative of successful treatment of a tension pneumothorax?
- BP changes from 98/60 to 104/78
 - BP changes from 160/96 to 100/72
 - Increased tympani over affected lung
 - Crackles over affected lung diminish
- ____ 8. Which blood pressure is MOST likely found in a 23 year old male soldier with a tension pneumothorax?
- 180/30
 - 120/20
 - 70/50
 - 45/20
- ____ 9. A 22-year old soldier states, "I am having trouble breathing!" after sustaining multiple small shrapnel wounds to the left lateral chest wall. You suspect that he has a tension pneumothorax. The MOST effective treatment is:
- Needle thoracostomy on affected side
 - Jaw thrust to maintain airway
 - High flow, high pressure oxygen administration
 - Tracheal intubation
- ____ 10. The MOST fundamental reason for the symptoms seen in a patient with a tension pneumothorax is:
- Loss of positive intrapleural pressure
 - Mediastinal shift
 - Need for immediate insertion of chest tube
 - Increase in positive intrapleural pressure
- ____ 11. The BEST indication that a patient has a tension pneumothorax is a:
- "Sucking sound" as air enters the needle inserted on the affected side
 - "Whooshing sound" as air escapes the needle inserted on the affected side
 - Crepitus over affected side
 - Crackles in the affected lung
- ____ 12. You note that a soldier has an open injury to his left chest area. You suspect a tension pneumothorax. At the site of injury, you would MOST likely observe:

- a. Sucking sound on exhalation
 - b. Sucking sound on inhalation
 - c. Sound of air escaping on exhalation
 - d. Sound of air escaping on inhalation
- _____ 13. A patient has a tension pneumothorax. A needle should be inserted:
- a. Over the top of the third rib
 - b. Under the third rib
 - c. In the 5th intercostal space
 - d. Over the 5th rib
- _____ 14. Out of the following, the FIRST indication of a tension pneumothorax is:
- a. Respiratory distress
 - b. Tracheal deviation toward unaffected lung
 - c. Flattened jugular veins
 - d. Hypotension
- _____ 15. The reason for the INSERTION SITE of a needle for the treatment of a tension pneumothorax is:
- a. To avoid the blood vessels and nerves which run under the bottom of the rib
 - b. To avoid the blood vessels and nerves which run over the top of the rib
 - c. To inflate the upper lobe of the lung
 - d. To inflate the lower lobe of the lung
- _____ 16. The reason there is a change in blood pressure with a tension pneumothorax is:
- a. Venous return is impeded → cardiac output reduced
 - b. Venous return is increased → cardiac output increased
 - c. Increased contractility of heart → cardiac output increased
 - d. Decreased contractility of heart → cardiac output decreased
- _____ 17. A 27 year old soldier has a tension pneumothorax on the right side. You would auscultate:
- a. Decreased breath sounds on left side
 - b. Increased breath sounds on right side
 - c. Decreased breath sounds on right side
 - d. Increased breath sounds on left side
- _____ 18. The reason a patient with a tension pneumothorax has a change in her jugular veins is that the change in the intrathoracic pressure:
- a. Compresses the heart → decreasing venous return
 - b. Compresses the heart → increasing venous return
 - c. Increases the pressure in heart → increasing cardiac output
 - d. Decreases the pressure in heart → decreasing cardiac output
- _____ 19. Your patient has a tension pneumothorax. You expect to observe:

- a. Hyperresonance, decreased breath sounds on affected side; deviated trachea toward unaffected side
- b. Hyporresonance, decreased breath sounds on affected side; deviated trachea toward affected side
- c. Hyporresonance, increased breath sounds on unaffected side; deviated trachea toward unaffected side
- d. Hyperresonance, decreased breath sounds on affected side; deviated trachea toward affected side

____ 20. The mechanism responsible for a tension pneumothorax is:

- a. Rising intrathoracic pressure collapses the lung on affected side → mediastinal shift → compression of mediastinal vessels and uninjured lung
- b. Rising intrathoracic pressure collapses the lung on the affected side → mediastinal shift → compression of affected lung
- c. Decreasing intrathoracic pressure collapses the lung on the affected side → mediastinal shift → compression of injured lung
- d. Decreasing intrathoracic pressure collapses the lung on the unaffected side → mediastinal shift → compression of the uninjured lung

____ 21. The mechanism responsible for a tension pneumothorax is that air:

- a. Enters the pleural space on expiration
- b. Enters the pleural space on inspiration
- c. Escapes the pleural space on inspiration
- d. Escapes the pleural space on expiration

____ 22. A patient has a sucking chest wound. It would be important to apply an occlusive dressing that is taped on:

- a. All four sides to prevent air from entering pleural space on inspiration
- b. All four sides to prevent air from entering pleural space on expiration
- c. Three sides to allow air to escape the pleural space on expiration
- d. Three sides to allow air to escape the pleural space on inspiration

____ 23. In a patient with a tension pneumothorax it is MOST important to immediately implement which of the following:

- a. Obtain a chest x-ray
- b. Perform a needle decompression
- c. Apply a four-sided occlusive dressing
- d. Obtain blood gases

____ 24. Which of the following sequence represents the changes usually seen in patients with tension pneumothorax?

- a. Displacement of left ventricle → decrease stroke volume → decrease in cardiac output

- b. Displacement of left ventricle → increase in stroke volume → increase in cardiac output
 - c. Displacement of inferior vena cava → decrease in stroke volume → decrease in cardiac output
 - d. Displacement of inferior vena cava → increase in stroke volume → increase in cardiac output
- ___ 25. A patient has a pneumothorax on the right side. On assessment, you would MOST likely find:
- a. Hyperresonance on left side
 - b. Hyporresonance on right side
 - c. Hyperresonance on right side
 - d. Hyporresonance on left side
- ___ 26. Classic manifestations of cardiac tamponade include:
- a. Hypotension; jugular vein distention; distant heart sounds
 - b. Hypertension; jugular vein flattening; distant heart sounds
 - c. Hypotension; jugular vein distention; loud heart sounds
 - d. Hypertension; jugular vein flattening; loud heart sounds
- ___ 27. In a patient who has cardiac tamponade, you would expect:
- a. Heart sounds to be intensified
 - b. Heart sounds to be muffled
 - c. Pulse pressure to be widened
 - d. Pulse to be slower than normal
- ___ 28. Which of the following would indicate effective treatment of a patient with a cardiac tamponade?
- a. BP from 70/50 mm/Hg to mm/Hg 110/80
 - b. BP from 180/40 mm/Hg to 110/80 mm/Hg
 - c. Pulse from 120 to 80 beat per minute
 - d. Jugular veins flattening to normal
- ___ 29. The reason that there is a change in blood pressure in a patient with cardiac tamponade is that blood in pericardium:
- a. Compresses heart → reduces cardiac output
 - b. Compresses heart → increases stroke volume
 - c. Dilates heart → increases cardiac output
 - d. Dilates heart → decreases stroke volume
- ___ 30. A patient with cardiac tamponade would MOST likely have:
- a. Narrowed pulse pressure
 - b. Widened pulse pressure
 - c. Increased heart rate
 - d. Decreased heart rate

- ____ 31. The reason for a change in jugular veins in a patient with cardiac tamponade is:
- Venous return is enhanced
 - Catecholamines increase contractility of heart
 - Venous return is inhibited
 - Catecholamines decrease contractility of heart
- ____ 32. The reason a patient with a cardiac tamponade has a change in heart sounds is:
- Blood in pericardium intensifies sound of heart
 - Decrease in venous return reduces amount of blood in heart
 - Blood in pericardium diminishes the sound of heart
 - Increase in venous return increases amount of blood in heart
- ____ 33. The treatment for a patient with cardiac tamponade is:
- Transthoracic pacemaker insertion
 - Pericardiocentesis
 - Chest tube insertion
 - Needle thoracentesis
- ____ 34. A patient with a cardiac tamponade has blood in the pericardium which compresses the:
- Ventricle during systole → decreased cardiac output
 - Atria during diastole → reduced stroke volume → reduced cardiac output
 - Ventricle during diastole → increased stroke volume
 - Atria during systole → increased stroke volume → increased cardiac output
- ____ 35. The treatment for a patient with cardiac tamponade is to INSERT a needle:
- At 45 degree angle directed toward the tip of scapula
 - Just above the xiphoid process
 - In the suprasternal notch
 - In the 5th intercostal space midclavicular line
- ____ 36. A soldier was involved in a traffic collision and manifested a BP of 70/60, diminished heart sounds, and a thready pulse of 130. It would be MOST appropriate to administer:
- Hextend (6% Hetastarch in lactated electrolyte injection) at wide open rate
 - Mannitol at 125 ml/hr
 - Normal saline at KVO (keep vein open) rate
 - Ringer's Lactate at 1000 ml/hr
- ____ 37. While performing a pericardiocentesis it is MOST necessary to use:
- Fluoroscopy
 - Strict surgical asepsis
 - Continuous heart monitoring
 - A cardiac defibrillator/monitor

- ____ 38. A 30-yo soldier arrives to your facility with distended jugular veins, a narrow pulse pressure, and a lowered blood pressure. You note multiple uniformed PVCs (premature ventricular contractions) as appropriate treatment is implemented. The MOST appropriate interpretation is that:
- a. The pericentesis needle has entered the cardiac muscle.
 - b. The heart spasms during removal of pericardial fluid.
 - c. The inferior vena caval shift interrupts the electrical impulse conduction.
 - d. There has been a 5mm mediastinal shift.
- ____ 39. After performing pericardiocentesis, the patient:
- a. Needs no more treatment; the cardiac tamponade has been resolved.
 - b. Needs continuous reassessment and treatment of causative injury.
 - c. Must have the head of the bed elevated 45 degrees to prevent reaccumulation of pericardial fluid.
 - d. Must be cardioverted to correct dysrhythmias.
- ____ 40. Once a patient with a cardiac tamponade has appropriate treatment, her physical status should improve:
- a. After 24 hours
 - b. After 2 hours
 - c. Immediately
 - d. After 4 hours
- ____ 41. A patient has been in a bomb blast in the last 30 minutes and has shrapnel injuries to his chest, abdomen, and lower legs. He has a BP of 70/60; pulse 130 (thready); respirations of 30 and distended neck veins. Breath sounds are equal bilaterally. He says, "Help me! I am hurting." The data suggest that he MOST likely suffering from:
- a. Hypovolemic shock
 - b. Tension pneumothorax
 - c. Cardiac tamponade
 - d. Hemothorax
- ____ 42. In a patient with cardiac tamponade, an APPROPRIATE intervention is to:
- a. Insert a nasopharyngeal airway
 - b. Administer oxygen with a nonrebreather mask
 - c. Immediately defibrillate at 100 joules
 - d. Administer ASA 325 mg
- ____ 43. Cardiac tamponade occurs because:
- a. The pericardial sac is relatively rigid
 - b. The pericardial sac is flaccid
 - c. The heart is compressed
 - d. There is decreased cardiac output
- ____ 44. The MOST definitive symptom of cardiac tamponade is:

- a. Muffled heart sounds
 - b. Weak thready pulse
 - c. Tachypnea
 - d. Hypoxia
- ___ 45. You assess a patient with hypovolemic shock. You would anticipate that the pulse pressure would:
- a. Widens as cardiac output falls and blood vessels constrict
 - b. Widens as cardiac output falls and blood vessels dilate
 - c. Narrows as cardiac output increases and blood vessels dilate
 - d. Narrows as cardiac output falls and blood vessels constrict
- ___ 46. You are working with a patient in hypovolemic shock. You anticipate that there will be acid-base changes that occur in the following sequence:
- a. Hypoxia → lactic acid accumulation → metabolic acidosis
 - b. Hyperventilation → decreased carbon dioxide levels in blood → respiratory acidosis
 - c. Hyperventilation → retention of carbon dioxide levels in blood → respiratory alkalosis
 - d. Hypoventilation → retention of carbon dioxide levels in blood → metabolic acidosis
- ___ 47. Hypovolemic shock is defined as a condition resulting in a (an):
- a. Systolic BP < 90; and pulse > 100
 - b. Inadequate perfusion of cells
 - c. Systolic BP < 80, diastolic pressure < 60; pulse > 100
 - d. Aerobic metabolism of the cell
- ___ 48. The reason a patient with hypovolemic shock has confusion is due to the reduced volume of blood that results in:
- a. Reduced cardiac output → reduced perfusion to brain
 - b. Vasoconstriction of brain vessels → reduced oxygen to brain cells
 - c. Vasodilation of brain vessels → stagnation of blood in brain → hypoxia of brain cells
 - d. Reduced stroke volume → stagnation of blood → clotting in brain → hypoxia in brain cells
- ___ 49. A patient in hypovolemic shock with a blood pressure of 70/50; pulse > 120; respirations of 24 is MOST likely to have:
- a. Metabolic acidosis
 - b. Respiratory acidosis
 - c. Metabolic alkalosis
 - d. Respiratory hyperchloremia
- ___ 50. The blood pressure in a patient with hypovolemic shock may show a:

- a. Widened pulse pressure because of increased catecholamines
 - b. Widened pulse pressure because of decreased catecholamines
 - c. Narrowed pulse pressure because of decreased catecholamines
 - d. Narrowed pulse pressure because of increased catecholamines
- ___ 51. A soldier arrives at your facility with a BP of 70/52, pulse 120 weak and thready, respirations 32, and flattened jugular veins. You note he has blood over all over his uniform including front of his undershirt. He MOST likely has:
- a. Hypovolemic shock
 - b. Cardiogenic shock
 - c. Obstructive shock
 - d. Distributive shock
- ___ 52. A 25-year old patient has been diagnosed with hypovolemic shock. Upon initial assessment he is MOST likely to have:
- a. Normal blood pressure because of an increase in pulse
 - b. Low blood pressure because decreased contractility of the heart
 - c. High blood pressure because of increase in antidiuretic hormone
 - d. Low blood pressure because of a decrease in angiotensin
- ___ 53. A patient with hypovolemic shock may have:
- a. Sympathetic stimulation → vasoconstriction to cerebral and coronary vessels
 - b. Sympathetic stimulation → little effect on cerebral and coronary vessels
 - c. Parasympathetic stimulation → vasodilatation to cerebral and coronary vessels
 - d. Parasympathetic stimulation → little effect on cerebral and coronary vessels
- ___ 54. The sequence that occurs in hypovolemic shock is low volume of blood which leads to a decrease in glomerular filtration which leads to:
- a. Decrease in renin → decrease in angiotensin → vasodilatation
 - b. Decrease in renin → increase in angiotensin → vasoconstriction
 - c. Increase in renin → decrease in angiotensin → vasodilatation
 - d. Increase in renin → increase in angiotensin → vasoconstriction
- ___ 55. A patient with hypovolemic shock would MOST likely demonstrate:
- a. Capillary refill > 2 seconds
 - b. Capillary refill < 2 seconds
 - c. Pulse oximetry < 90 %
 - d. Pulse oximetry > 97%
- ___ 56. The reason that a nasogastric tube may be inserted in a patient with hypovolemic shock is to:

- a. Determine if there is blood in the stomach
 - b. Administer fluids and medications
 - c. Decompress the stomach
 - d. Lavage with iced saline
- ___ 57. A patient arrives at your facility with a BP of 92/52, pulse 120 weak and thready, respirations 32, and flattened jugular veins. You note he has blood over all over his uniform including front of his undershirt. He verbalizes responses appropriately when you ask his name and where he is. It would be MOST important at this time to:
- a. Insert a nasogastric tube to prevent aspiration
 - b. Insert an indwelling catheter to assess perfusion to kidney by urinary output
 - c. Administer oxygen by nasocannula at 6 liters per minute
 - d. Administer oxygen with a nonrebreather at 12 liters per minute
- ___ 58. You assess a patient with hypovolemic shock. You order a number lab tests including blood glucose. You anticipate that the findings will show:
- a. Hyperglycemia because of increased catecholamines
 - b. Hypoglycemia because of decreased catecholamines
 - c. Hyperglycemia because of increased aldosterone levels
 - d. Hypoglycemia because of decreased aldosterone levels
- ___ 59. Which of the following would indicate the effectiveness of treatment of a patient in hypovolemic shock:
- a. BP from 96/70 to 100/70
 - b. Pulse from 128 to 82
 - c. Respirations from 32 to 28
 - d. Urinary output from 0 to 12 ml/hour
- ___ 60. You assess that a patient has a carotid pulse, but you cannot palpate a brachial or radial pulse. You should interpret these findings to indicate a blood pressure of at least:
- a. 60 mm Hg
 - b. 70 mm Hg
 - c. 80 mm Hg
 - d. 90 mm Hg
- ___ 61. Blood pressure is determined by:
- a. Cardiac output times peripheral vascular resistance
 - b. Stroke volume plus cardiac output
 - c. Cardiac output plus peripheral resistance
 - d. Heart rate times stroke volume
- ___ 62. The skin color of a patient with hypovolemic shock may change because:
- a. Catecholamines cause vasoconstriction reducing blood flow to the skin
 - b. Catecholamines cause vasodilatation increased blood flow to the skin
 - c. Angiotensin causes vasodilatation reducing blood flow to the skin

- d. Angiotensin causes vasoconstriction increasing blood flow to the skin
- ___ 63. The reason that a patient with hypovolemic shock manifests a change in urinary output is that:
- a. ADH is increased → reduction in urinary output
 - b. ADH is inhibited → reduction in urinary output
 - c. Catecholamines are increased → increase in urinary output
 - d. Catecholamines are decreased → decrease in urinary output
- ___ 64. You have a patient with hypovolemic shock. You order a blood glucose and anticipate that it will be:
- a. Elevated because catecholamines promote glycogenolysis
 - b. Diminished because catecholamines inhibit glycogenolysis
 - c. Elevated because angiotensin promotes glycogenolysis
 - d. Diminished because angiotensin inhibits glycogenolysis
- ___ 65. Your goal for the treatment for a patient with hypovolemic shock should be a:
- a. Systolic pressure of at least 120 mm Hg
 - b. Diastolic pressure of at least 80 mm Hg
 - c. Systolic between 86-90 mm Hg
 - d. Diastolic between 60-79 mm Hg
- ___ 66. The fluid of choice for a patient who is in hypovolemic shock is:
- a. Hextend
 - b. Normal saline
 - c. D5W
 - d. D50W
- ___ 67. A patient with abdominal bleeding comes to your facility in Iraq. You assess that he is in hypovolemic shock. You note that the abdominal dressing is saturated with a blood. After reassessing the patient it is then important to:
- a. Change the dressing
 - b. Reinforce the dressing
 - c. Apply pressure to the abdomen
 - d. Place patient in Trendelenberg position
- ___ 68. You have a patient in hypovolemic shock who arrives your facility with a pulse oximeter reading of 85%, BP 86/78, pulse 126; respirations 32. You should first:
- a. Administer IV fluids in two sites using large bore needles
 - b. Assess adequacy of airway and administer oxygen
 - c. Place patient in reverse Trendelenberg position
 - d. Administer Hextend
- ___ 69. The MINIMUM acceptable urinary output for a patient with hypovolemic shock who is being successfully treated is:

- a. 30 ml per hour
- b. 15 ml per hour
- c. 10 ml per hour
- d. 100 ml per hour

70. During the first hour after injury, an untreated patient with hypovolemic shock would MOST likely exhibit:

- a. Hypotension; tachycardia; tachypnea
- b. Bradycardia; peripheral vasodilatation; altered mental status
- c. Cognitive orientation; peripheral vasoconstriction; bradycardia
- d. Jugular vein flattening; bradypnea; tachycardia

71. You are caring for an injured soldier in the field. You assess that he has a cardiac tamponade. Which of the following is true?

- a. It is essential to use sterile technique as the risk for infection is high
- b. Continuous drainage is unexpected and provides a route for infection
- c. It is MOST important to perform the procedure using what you have available
- d. Do not apply suction to the syringe as it may cause collapse of the pericardial sac

72. You have a patient with a cardiac tamponade. You are performing a pericardiocentesis and note the following on monitor:

You should implement the following:

- a. Administer lidocaine IV
- b. Completely withdraw the needle
- c. Withdraw the needle slightly until normal rhythm resumes
- d. Continue with the pericardiocentesis

73. You assess a patient who has hypovolemic shock. His blood pressure is 110/60. The reason for his blood pressure is that:

- a. Stroke volume increases which decreases cardiac output
- b. Heart rate increases which maintains normal cardiac output
- c. Peripheral resistance decreases which maintains blood pressure
- d. Catecholamines decrease stroke volume and peripheral resistance

____ 74. Which is true regarding COMPENSATION relative to hypovolemic shock?

- a. Peripheral resistance increases and stroke volume decreases
- b. Peripheral resistance and heart rate increase
- c. Stroke volume decreases which decreases cardiac output
- d. Cardiac output increases and peripheral resistance decrease

____ 75. Which of the following is true relative to blood pressure in shock?

- a. Elevated heart rate and stroke volume increase cardiac output
- b. Increased peripheral resistance decreases blood pressure
- c. Decreased cardiac output and peripheral resistance decrease blood pressure
- d. Increased stroke volume and decreased peripheral resistance increase blood pressure

Composite Cognition for Nursing Care of Combat Casualties

Answer Section

MULTIPLE CHOICE

1. ANS: A
Shock: Higher level
2. ANS: D
Shock: Lower level
3. ANS: C
Shock: Lower level
4. ANS: A
Shock: Critical Thinking
5. ANS: A
Shock: Critical Thinking
6. ANS: C
Pneumothorax: Higher level/Critical thinking
7. ANS: A
Pneumothorax: Critical Thinking
8. ANS: C
Pneumothorax: Lower
9. ANS: A
Pneumothorax: Critical Thinking
10. ANS: D
Pneumothorax: Critical Thinking
11. ANS: B
Pneumothorax: Critical Thinking
12. ANS: B
Pneumothorax: Critical Thinking
13. ANS: A
Pneumothorax: Lower level
14. ANS: A
Pneumothorax: Lower level
15. ANS: A
Pneumothorax: Higher
16. ANS: A
Pneumothorax: Higher
17. ANS: C
Pneumothorax: Lower
18. ANS: A
Pneumothorax: Higher
19. ANS: A
Pneumothorax: Lower
20. ANS: A
Pneumothorax: Higher
21. ANS: B
Pneumothorax: Higher
22. ANS: C

- Pneumothorax: Lower
23. ANS: B
Pneumothorax: Critical thinking/Higher level
 24. ANS: C
Pneumothorax: Higher
 25. ANS: C
Pneumothorax: Critical Thinking
 26. ANS: A
Cardiac tamponade: Lower
 27. ANS: B
Cardiac tamponade: Lower
 28. ANS: A
Cardiac tamponade: Critical Thinking
 29. ANS: A
Cardiac tamponade: Higher
 30. ANS: A
Cardiac tamponade: Lower
 31. ANS: C
Cardiac tamponade: Higher
 32. ANS: C
Cardiac tamponade: Higher
 33. ANS: B
Cardiac tamponade: Lower
 34. ANS: B
Cardiac tamponade: Higher
 35. ANS: A
Cardiac tamponade: Critical Thinking
 36. ANS: C
Cardiac tamponade: Lower
 37. ANS: C
Cardiac tamponade: Critical Thinking
 38. ANS: A
Cardiac tamponade: Critical Thinking
 39. ANS: B
Cardiac tamponade: Critical Thinking
 40. ANS: C
Cardiac tamponade: Critical Thinking
 41. ANS: C
Cardiac tamponade: Critical Thinking
 42. ANS: B
Cardiac tamponade: Lower level
 43. ANS: A
Cardiac tamponade: Higher
 44. ANS: A
Cardiac tamponade: Lower
 45. ANS: D
Cardiac tamponade: Critical Thinking/Higher
 46. ANS: A

- Shock: Higher
47. ANS: B
Shock: Lower level
48. ANS: A
Shock: Higher
49. ANS: A
Shock: Critical Thinking/Higher
50. ANS: D
Shock: Higher
51. ANS: A
Shock: Critical Thinking
52. ANS: A
Shock: Critical Thinking/Higher
53. ANS: B
Shock: Higher
54. ANS: D
Shock: Higher
55. ANS: A
Shock: Lower
56. ANS: B
Shock: Critical Thinking
57. ANS: D
Shock: Critical Thinking
58. ANS: A
Shock: Critical Thinking/Higher
59. ANS: B
Shock: Critical Thinking
60. ANS: A
Shock: Lower level
61. ANS: A
Shock: Higher
62. ANS: A
Shock: Higher
63. ANS: A
Shock: Higher
64. ANS: A
Shock: Critical Thinking/Higher
65. ANS: C
Shock: Critical Thinking
66. ANS: A
Shock: Lower
67. ANS: B
Shock: Critical Thinking
68. ANS: B
Shock: Critical Thinking
69. ANS: A
Shock: Lower
70. ANS: A

- Shock: Lower
71. ANS: C
Cardiac tamponade: Critical Thinking
72. ANS: C
Cardiac tamponade: Critical Thinking
73. ANS: B
Shock: Critical Thinking
74. ANS: B
Shock: Higher
75. ANS: A
Shock: Higher

Appendix D

Demographic Data Form

A Composite Cognition Instrument for Nursing Care of Combat Casualties

Demographic Data Sheet

Please answer the following questions on your answer sheet:

76. What is your age now?
- a. 18-25
 - b. 26-35
 - c. 36-45
 - d. 46 and older
77. What is your gender?
- a. Female
 - b. Male
78. What is your current military rank?
- a. 01
 - b. 02
 - c. 03
 - d. 04
 - e. 05 or above
79. What is your branch of the military?
- a. Air Force
 - b. Army
 - c. Navy
80. How many years have you been a registered nurse?
- a. Less than 1 year
 - b. 1-5 years
 - c. 6-10 years
 - d. 11 years or more
81. How many years have you been a military nurse?
- a. Less than 1 year
 - b. 1-5 years
 - c. 6-10 years
 - d. 11 years or more
82. Have you ever been deployed to a combat zone?
- a. Yes

- b. No

If you answered "yes" to question 82, please answer the next question. If no, skip to question 84.

83. How many months TOTAL were you deployed?

- a. 6 months or less
- b. 7-12
- c. 13-18
- d. 19-24
- e. 25 or more

84. Did you have any prior experience in healthcare, as an RN or in another position, before becoming a military nurse?

- a. Yes
- b. No

85. What degree(s) do you have (please select all that apply)?

- a. Associate degree or diploma in nursing
- b. Bachelor's degree in nursing
- c. Master's degree in nursing
- d. Master's in another field
- e. Doctoral degree

86. Do you have any of the following training or certifications (please select all that apply)?

- a. A formal post-RN critical care course (civilian or military)
- b. Certified Emergency Nurse (CEN)
- c. Certified Critical Care Nurse (CCRN)
- d. Trauma Nursing Care Course (TNCC)
- e. Tactical Casualty Care Course (TCCC)

Please answer the following questions on THIS sheet.

87. Please describe your overall work experience not covered in question #84.

Thank you very much for your time and expertise. If there is anything else you would like us to know, please feel free to make comments in the space below or on the back of this paper if necessary.

59th Medical Wing (Wilford Hall Medical Center)
 Institutional Review Board (IRB)
 59th Clinical Research Squadron
 Protocol Support/MSRP/(210) 292-7143
 2200 Bergquist Dr, Bldg 4430, Lackland AFB, TX 78236-5300
 Federal Wide Assurance #FWA00001750 and DoD Assurance #50007

FINAL EXEMPT PROTOCOL APPROVAL

23 Sep 05

Expedited Approval Date: 16 Sep 05

Principal Investigator: Dr Arthur Johnson/59 CRES

Protocol Reference Number: FWH20050174E

Protocol Title: "Educational Intervention on Combat Trauma Care"

1. Your AFI 40-402 EXEMPT PROPOSAL received expedited review on behalf of the WHMC Institutional Review Board by the Commander, Clinical Research Squadron on 16 Sep 05. Your study was approved as written and may now begin.
2. The Clinical Research Squadron (59 CRES/MSR) Commander must be notified immediately of any additional information, or changes to the protocol. All amendments to the protocol must be reviewed and approved by the MSR Commander prior to their inception.
3. It is the Commander's decision that this study will be terminated as of 15 Sep 06 unless you submit a status report, using the template provided on your research disk. Your first status report, which is a request for continuation of the study, will be due to the Protocol Office no later than 1 Aug 06. A status report will be due every 11 months thereafter, in order for the MSR Commander to approve continuance of the study for another year. Upon completion of your study you must submit a final report.
4. If applicable, when you are ready to order supplies and/or equipment for your protocol, please contact SSgt Malinda Bell at 292-7141 or 292-6813 for coordination. **YOU ARE NOT AUTHORIZED TO USE YOUR SECTION'S O&M FUNDS.**

BECKY ACKERMAN
 Protocol Assistant

File this and any other IRB correspondence in your study binder

RECEIVED
 9/29/05

THE GENEVA FOUNDATION

Commitment Statement of an Unaffiliated Investigator to Institutional Human Subject Protection Policies and IRB Oversight

Unaffiliated Investigator Agreement

Name of Institution with the Federalwide Assurance (FWA): The Geneva Foundation

Applicable FWA #: 00008155

Unaffiliated Investigator's Name: Jeffrey
Conroy

Specify Research Covered by This Agreement: "Effects of Educational Intervention
on Combat Trauma Care"

- (1) The above-named Unaffiliated Investigator has reviewed: 1) *The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research* (or other internationally recognized equivalent; see B1 of FWA Terms for institutions outside the United States); 2) the U.S. Department of Health and Human Services (DHHS) regulations for the protection of human subjects at 45 CFR 46 (or other internationally recognized equivalent, see B3 of FWA Terms for institutions outside the United States); and 3) the Federalwide Assurance (FWA) referenced above.
- (2) The Investigator understands and hereby accepts the responsibility to comply with the standards and requirements stipulated in the above documents and to protect the rights and welfare of human subjects involved in research conducted under this Agreement.
- (3) The Investigator will comply with all other National, State, or local laws or regulations that may provide additional protection for human subjects.
- (4) The Investigator will abide by all determinations of the IRB/IEC designated under the above Assurance and will accept the final authority and decisions of the IRB/IEC,

including but not limited to directives to terminate participation in designated research activities.

- (5) The Investigator will complete any educational training required by the Institution and/or the IRB/IEC prior to initiating research covered under this Agreement.
- (6) The Investigator will report promptly to the IRB/IEC any proposed changes in the research conducted under this Agreement. The investigator will not initiate changes in the research without prior IRB/IEC review and approval, except where necessary to eliminate apparent immediate hazards to subjects.
- (7) The Investigator will report immediately to the IRB/IEC any unanticipated problems involving risks to subjects or others in research covered under this Agreement.
- (8) The Investigator will obtain, document, and maintain records of informed consent from each subject or the subject's legally authorized representative as required under DHHS and FDA regulations (or other international or national equivalent) and stipulated by the IRB/IEC.
- (9) The Investigator acknowledges and agrees to cooperate in the IRB/IEC's responsibility for initial and continuing review, record keeping, reporting, and certification. The Investigator will provide all information requested by the IRB/IEC in a timely fashion.
- (10) In conducting research involving FDA-regulated products, the Investigator will comply with all applicable FDA regulations and fulfill all investigator responsibilities (or investigator-sponsor responsibilities, where appropriate), including those described at 21 CFR 312 and 812.
- (11) The Investigator will not enroll subjects in research under this Agreement prior to its review and approval by the IRB/IEC.
- (12) Emergency medical care may be delivered without IRB/IEC review and approval to the extent permitted under applicable Federal regulations and State law. However, data and information obtained as a result of emergency medical care may not be included as part of federally-supported or -conducted research.
- (13) This Agreement does not preclude the Investigator from taking part in research not covered by the Agreement.
- (14) The Investigator acknowledges that he/she is primarily responsible for safeguarding the rights and welfare of each research subject, and that the subject's rights and welfare must take precedence over the goals and requirements of the research.

Investigator Signature: _____ Date _____

Name: _____ Degree(s): _____

(Last) (First) (Middle Initial)

Address: _____ phone #: _____

(City) (State/Province) (Zip/Country)

FWA Institutional Official (or Designee): _____ Date _____

Name: S. Troy Christensen Institutional Title: Executive Director
(Last) (First) (Middle Initial)

Address: P.O. Box 98687 phone #: 253-383-1398

Lakewood WA 98405/

USA
(City) (State/Province) (Zip/Country)

Appendix F

Expert Review of the Composite Cognition Instrument

Composite Cognition Instrument Questions—Objectives for Expert Review

Dear Colleague:

As part of a larger research project funded by the TriService Research Nursing Initiative, and for my dissertation, I am developing an instrument to measure composite cognition in military nurses who perform combat casualty care. You have been sent this questionnaire because you have consented to be an expert evaluator for the development of this instrument. Your timely participation is crucial to the development of a valid and reliable instrument and I very much appreciate the generous sharing of your time and expertise.

By your participation, I will be able to develop an instrument that will assist, ultimately, in military nurses being able to administer more efficient, accurate, and timely care to soldiers and civilians injured in combat areas. For clarity and for ease of writing comments, I have left a large amount of space on each page. I hope you enjoy the opportunity to be a part of this research project (and my dissertation) and again, thank you so very much for helping. Please feel free to contact either Dr. Don Johnson or me if you have any questions or concerns.

Cordially,

Patricia Hanes, PhD(c), MSN, MAED, RN
Co-Investigator
Doctoral Student, University of San Diego
Hahn School of Nursing and Health Science
phanes@apu.edu
telephone: 626-233-4008

A. Don Johnson, PhD, RN
Primary Investigator
Professor, Azusa Pacific University
School of Nursing, Azusa, CA
arthurjohnson@apu.edu
telephone: 210-849-7364

Composite Cognition Instrument Questions—Objectives for Expert Review

Purpose

The purpose of this research is to develop an instrument to measure composite cognition in military registered nurses relative to combat casualty care, defined as those “concepts and skills inherent in the care of patients who have common injuries found in a wartime situation” (Johnson, 2005, p.5). The Composite Cognition Instrument (CCI) will be an instrument with approximately 60 total items in three subscales: lower-level cognition, higher-level cognition, and critical thinking cognition.

Definition of Composite Cognition

Definitions

Composite cognition.

Composite cognition consists of three subscales: higher-level cognition, lower-level cognition, and critical thinking cognition.

Lower-level cognition.

Lower-level cognition is comprised of the basic levels of thinking: Remembering (Knowledge) and Understanding (Comprehension) (Bloom, 1956; Krathwohl, 2002). Thinking at the lower cognitive level requires the ability to recall facts and discern meanings.

Higher-level cognition.

Higher-level cognition refers to advanced levels of thinking which includes one or all of the following: Apply (Application), Analyze (Analysis), Evaluate (Evaluation), and Create (Synthesis) (Bloom, 1956; Krathwohl, 2002). Thinking at this level requires the ability to use theories, rules, concepts, laws, principles, and knowledge.

Critical thinking cognition.

Critical thinking refers to the ability to use the components of the nursing process: Assessment, planning, intervention, and evaluation.

Review of the Composite Cognition Instrument (CCI)

Objectives

Lower Level	Higher Level	Critical Thinking
1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade	3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade	4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade		

Directions for Expert Reviewer

Explanation of Scales:

Answer Agreement: The correct answer follows each question and is italicized. Please indicate whether you agree or disagree with that answer and mark in the space provided. If you think another answer is correct or if there is an additional answer, please indicate that answer. Please make any comments following the question section.

Survey Objectives: Questions fall into the lower level, higher level, or critical thinking category by fulfilling one of the stated objectives. After reading each question, please circle the objective which *best* applies to that particular test item. For example, does the item ask the test-taker to *describe* or *explain*? Questions that ask to describe are lower level while those that ask to explain are higher level.

Relevancy: How relevant do you think this question is to its major topic area of pneumothorax, hypovolemic shock, or cardiac tamponade? Each test item addresses only ONE of these areas. Please circle your choice on the scale following each question: very relevant, relevant, not very relevant, not at all relevant.

DIRECTIONS: Each item set contains three (3) elements for you to assess. After reading the test item and answer, please complete the questions that follow: **A. Answers:** Please indicate with an “X” whether you agree or disagree with the stated answer. If you disagree with the answer, please circle whether you think the answer is *different* or if it is an *additional* answer and give the letter of the correct or additional answer. **B. Objectives:** Please indicate with an “X” which objective BEST applies to the test item. **C: Relevancy:** How relevant is this test question to the topic of pneumothorax, hypovolemic, or cardiac tamponade?

Test Item 1:

A patient who is in hypovolemic shock may have a normal blood pressure because of an increase in:

- heart rate and vasoconstriction*
- heart rate and vasodilation
- stroke volume and vasodilation
- stroke volume and a decrease in peripheral resistance

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

- Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

- Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

- Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 2:

The type of shock most often seen on the battlefield is:

- a. anaphylactic
- b. septic
- c. cardiogenic
- d. *hypovolemic*

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____

Relevant _____

Not very relevant _____

Not at all relevant _____

Test Item 3:

The first parameter to change in hypovolemic shock is MOST likely a (an):

- d. decrease in blood pressure
- e. decrease in pulse pressure
- f. *increase in pulse***
- g. increase in respirations

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____

Relevant _____

Not very relevant _____

Not at all relevant _____

Test Item 4:

A patient who has suffered a hemorrhage secondary to a blast injury that occurred 45 minutes ago is being treated with an intravenous solution of Ringer's Lactate. The BEST indicator that the treatment is effective would be:

- a. *heart rate has decreased from 130 to 100*
- b. blood pressure has increased from 100/82 to 110/90
- c. urine output has increased from 15 ml/hour to 20 ml/hour
- d. respiratory rate has decreased from 28 to 24

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ **Relevant** _____ **Not very relevant** _____ **Not at all relevant** _____

Test Item 5: A patient has active bleeding from an abdominal injury. The first priority is to: <ul style="list-style-type: none"> a. <i>assess the airway</i> b. stop the bleeding c. start two IVs with large bore needles d. administer oxygen 			
A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____			
B. Objectives: Is this a _____ Lower Level Question 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade _____ Higher Level Question 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade _____ Critical Thinking Question 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade			
C. Relevancy: How relevant is test item to topic? Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____			

Test Item 6:

You suspect that a patient has a tension pneumothorax or hypovolemic shock. Which of the following would MOST strongly suggest a tension pneumothorax?

- a. flattened jugular veins
- b. deviated trachea toward the affected lung
- c. *deviated trachea toward the unaffected lung*
- d. distended jugular veins

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a
Lower Level Question

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 7:

Which of the following parameters would be MOST indicative of successful treatment of a pneumothorax?

- a. *BP changes from 98/60 to 104/78*
- b. pulse ox changes from 92 % to 97%
- c. increased tympani over affected lung
- d. crackles over affected lung diminish

A. Answer Correct? Agree Disagree Additional/Different Correct Answer (indicate & use letter)?

B. Objectives: Is this a
Lower Level Question

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant

Relevant

Not very relevant

Not at all relevant

Test Item 8:

Which blood pressure is MOST likely found in a 23 year old male soldier with a tension pneumothorax?

- a. 180/30
- b. 120/20
- c. **70/50**
- d. 45/20

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____

Relevant _____

Not very relevant _____

Not at all relevant _____

Test Item 9:

A 22-year old soldier states, "I am having trouble breathing!" You assess that he has a tension pneumothorax. The MOST effective treatment is:

- a. *needle decompression on affected side*
- b. jaw thrust to maintain airway
- c. high flow, high pressure oxygen administration
- d. tracheal intubation

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a
Lower Level Question

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 10:

The most fundamental reason for the symptoms seen in a patient with a tension pneumothorax is:

- d. loss of positive intrapleural pressure
- e. mediastinal shift
- f. need for immediate insertion of chest tube
- g. *increase in positive intrapleural pressure***

A. Answer Correct? Agree Disagree Additional/Different Correct Answer (indicate & use letter)?

B. Objectives: Is this a
Lower Level Question

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant

Relevant

Not very relevant

Not at all relevant

Test Item 11:

The BEST indication that a patient has a tension pneumothorax is a:

- a. “sucking sound” as air enters the needle inserted on the affected side
- b. *“whooshing sound” as air escapes the needle inserted on the affected side*
- c. crepitus over affected side
- d. crackles in the affected lung

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ **Relevant** _____ **Not very relevant** _____ **Not at all relevant** _____

Test Item 12:

You note that a soldier has an open injury to his left chest area. You suspect that he has a pneumothorax. At the site of injury, you would MOST LIKELY observe:

- a. sucking sound on exhalation
- b. *sucking sound on inhalation*
- c. sound of air escaping on exhalation
- d. sound of air escaping on inhalation

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 13:

A patient has a tension pneumothorax. A needle should be inserted:

- a. *over the 2nd intercostal space*
- b. under the 2nd intercostal space
- c. over the 5th intercostal space
- d. under the 5th intercostal space

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 14:

The FIRST indication of a tension pneumothorax is:

- a. cyanosis
- b. *tracheal deviation toward unaffected lung***
- c. distended jugular veins
- d. hypotension

A. Answer Correct? Agree Disagree Additional/Different Correct Answer (indicate & use letter)?

B. Objectives: Is this a
Lower Level Question

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?
Very relevant **Relevant** **Not very relevant** **Not at all relevant**

Test Item 15:

The reason for the insertion site of a needle for the treatment of a tension pneumothorax is:

- a. *to avoid the blood vessels and nerves which run under the bottom of the rib*
- b. to avoid the blood vessels and nerves which run over the top of the rib
- c. to inflate the upper lobe of the lung
- d. to inflate the lower lobe of the lung

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____

Relevant _____

Not very relevant _____

Not at all relevant _____

Test Item 16:

The reason there is a change in blood pressure with a tension pneumothorax is:

- a. *venous return is impeded* → *cardiac output reduced*
- b. venous return is increased → cardiac output increased
- c. increased contractility of heart → cardiac output increased
- d. decreased contractility of heart → cardiac output decreased

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a
Lower Level Question

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 17:

A 27 year old soldier has a tension pneumothorax on the right side. You would auscultate:

- decreased breath sounds on left side
- increased breath sounds on right side
- decreased breath sounds on right side***
- increased breath sounds on left side

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a
Lower Level Question

- Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____

Relevant _____

Not very relevant _____

Not at all relevant _____

Test Item 18:

The reason a patient with a tension pneumothorax has a change in her jugular veins is that the change in the intrathoracic pressure:

- a. *compresses the heart → decreasing venous return*
- b. compresses the heart → increasing venous return
- c. increases the pressure in the heart → increasing cardiac output
- d. decreases the pressure in the heart → decreasing cardiac output

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a
Lower Level Question

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 19:

Your patient has a tension pneumothorax. You expect to observe:

- a. *hyperresonance, decreased breath sounds on affected side; deviated trachea toward unaffected side*
- b. hyporresonance, decreased breath sounds on affected side; deviated trachea toward affected side
- c. hyporresonance, increased breath sounds on unaffected side; deviated trachea toward unaffected side
- d. hyperresonance, decreased breath sounds on affected side; deviated trachea toward affected side

A. Answer Correct? Agree Disagree Additional/Different Correct Answer (indicate & use letter)?

B. Objectives: Is this a
Lower Level Question

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant **Relevant** **Not very relevant** **Not at all relevant**

Test Item 20:

The mechanism responsible for a tension pneumothorax is:

- a. *rising intrathoracic pressure collapses the lung on affected side → mediastinal shift → compression of uninjured lung*
- b. rising intrathoracic pressure collapses the lung on the affected side → mediastinal shift → compression of affected lung
- c. decreasing intrathoracic pressure collapses the lung on the affected side → mediastinal shift → compression of injured lung
- d. decreasing intrathoracic pressure collapses the lung on the unaffected side → mediastinal shift → compression of the uninjured lung

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a
Lower Level Question

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 21:

The mechanism responsible for a tension pneumothorax is that air:

- a. enters the pleural space on expiration
- b. enters the pleural space on inspiration**
- c. escapes the pleural space on inspiration
- d. escapes the pleural space on expiration

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ **Relevant** _____ **Not very relevant** _____ **Not at all relevant** _____

Test Item 22:

A patient has a sucking chest wound. It would be important to apply an occlusive dressing that is taped on:

- a. all four sides to prevent air from entering pleural space on inspiration
- b. all four sides to prevent air from entering pleural space on expiration
- c. *three sides to allow air to escape the pleural space on expiration*
- d. three sides to allow air to escape the pleural space on inspiration

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a**Lower Level Question**

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 23:

In a patient with a tension pneumothorax it is most important to immediately:

- a. obtain a chest x-ray
- b. perform a needle decompression**
- c. apply a four-sided occlusive dressing
- d. obtain blood gases

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____

Relevant _____

Not very relevant _____

Not at all relevant _____

Test Item 24:

Which of the following sequence represents the changes usually seen in patients with tension pneumothorax?

- displacement of left ventricle → decrease in stroke volume → decrease in cardiac output
- displacement of left ventricle → increase in stroke volume → increase in cardiac output
- displacement of inferior vena cava → decrease in stroke volume → decrease in cardiac output*
- displacement of inferior vena cava → increase in stroke volume → increase in cardiac output

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a
Lower Level Question

- Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 25:

A patient has a pneumothorax on the right side. On assessment, you would MOST likely find:

- a. hyperresonance on left side
- b. hyporesonance on right side
- c. **hyperresonance on right side**
- d. hyporesonance on left side

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 26:

Classic manifestations of cardiac tamponade include:

- a. *hypotension; Jugular vein distention; distant heart sounds*
- b. hypertension; jugular vein flattening; distant heart sounds
- c. hypotension; jugular vein distention; loud heart sounds
- d. hypertension; jugular vein flattening; loud heart sounds

A. Answer Correct? Agree Disagree Additional/Different Correct Answer (indicate & use letter)?

B. Objectives: Is this a
Lower Level Question

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant

Relevant

Not very relevant

Not at all relevant

Test Item 27:

In assessing a patient who has cardiac tamponade, you would expect:

- a. heart sounds to be louder than normal
- b. heart sounds to be muffled**
- c. pulse pressure to be widened
- d. pulse to be slower than normal

A. Answer Correct? Agree Disagree Additional/Different Correct Answer (indicate & use letter)?

B. Objectives: Is this a

Lower Level Question

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant

Relevant

Not very relevant

Not at all relevant

Test Item 28:

Which of the following would indicate effective treatment of a patient with a cardiac tamponade?

- BP from 70/50 mm/Hg to mm/Hg 110/80***
- BP from 180/40 mm/Hg to 110/80 mm/Hg
- pulse from 120 to 80 beat per minute
- jugular veins flattening to normal

A. Answer Correct? Agree Disagree Additional/Different Correct Answer (indicate & use letter)?

B. Objectives: Is this a
Lower Level Question

- Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant

Relevant

Not very relevant

Not at all relevant

Test Item 29:

The reason that there is a change in blood pressure in a patient with cardiac tamponade is that blood in pericardium:

- a. *compresses heart → reduces cardiac output*
- b. compresses heart → increases stroke volume
- c. dilates heart → increases cardiac output
- d. dilates heart → decreases stroke volume

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a
Lower Level Question

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 30:

A patient with cardiac tamponade would most likely have:

- a. *narrowed pulse pressure*
- b. widened pulse pressure
- c. increased heart rate
- d. decreased heart rate

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 31:

The reason for a change in jugular veins in a patient with cardiac tamponade is:

- a. venous return is enhanced
- b. catecholamines increase contractility of heart
- c. *venous return is inhibited*
- d. catecholamines decrease contractility of heart

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 32:

The reason a patient with a cardiac tamponade has a change in heart sounds is:

- a. blood in pericardium intensifies sound of heart
- b. decrease in venous return reduces amount of blood in heart
- c. *blood in pericardium reduces the sound of heart*
- d. increase in venous return increases amount of blood in heart

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 33:

The treatment for a patient with cardiac tamponade is:

- a. transthoracic pacemaker insertion
- b. pericardiocentesis**
- c. chest tube insertion
- d. needle thoracentesis

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____

Relevant _____

Not very relevant _____

Not at all relevant _____

Test Item 34:

A patient with a cardiac tamponade has blood in the pericardium which compresses the:

- a. *ventricle during systole → decreased cardiac output*
- b. atria during diastole → reduced stroke volume → reduced cardiac output
- c. ventricle during diastole → increased stroke volume
- d. atria during systole → increased stroke volume → increased cardiac output

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a
Lower Level Question

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 35:

The treatment for a patient with cardiac tamponade is to insert a needle:

- a. *at a 45 degree angle directed toward the tip of the scapula*
- b. just above the xiphoid process
- c. in the suprasternal notch
- d. in the 5th intercostal space midclavicular line

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 36:

A soldier was involved in a traffic collision and manifested a BP of 70/60, diminished heart sounds, a thready pulse of 130. It would be MOST appropriate to administer:

- Hextend (6% Hetastarch in Lactated Electrolyte Injection) at wide open rate
- Mannitol at 125 ml/hr
- normal saline at “keep vein open” (KVO) rate
- Ringer’s lactate at 1000 ml/hr*

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

- Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

- Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

- Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 37:

While performing a pericardiocentesis it is MOST necessary to use:

- a. fluoroscopy
- b. strict surgical asepsis
- c. *continuous heart monitoring*
- d. a cardiac defibrillator/monitor

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 38:

Improper placement of the needle into *cardiac muscle* during a pericardiocentesis may result in:

- a. PEA (pulseless electrical activity)
- b. intractable myocardial pain
- c. *premature ventricular contractions*
- d. complete heart block

A. Answer Correct? Agree Disagree Additional/Different Correct Answer (indicate & use letter)?

B. Objectives: Is this a
Lower Level Question

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant **Relevant** **Not very relevant** **Not at all relevant**

Test Item 39:

A 30-yo soldier arrives to your facility with distended jugular veins, a narrow pulse pressure, and a lowered blood pressure. You note multiple uniformed PVCs (premature ventricular contractions) as appropriate treatment is implemented. The MOST appropriate interpretation is that:

- a. *the pericentesis needle has entered the cardiac muscle*
- b. the heart spasms during removal of pericardial fluid.
- c. the inferior vena caval shift interrupts the electrical impulse conduction.
- d. there has been a 5mm mediastinal shift

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a
Lower Level Question

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 40:

After performing pericentesis, the patient:

- a. needs no more treatment; the cardiac tamponade has been resolved.
- b. *needs continuous reassessment and treatment of causative injury***
- c. must have the head of the bed elevated 45 degrees to prevent reaccumulation of pericardial fluid.
- d. must be cardioverted to correct dysrhythmias.

A. Answer Correct? Agree Disagree Additional/Different Correct Answer (indicate & use letter)?

B. Objectives: Is this a

Lower Level Question

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant **Relevant** **Not very relevant** **Not at all relevant**

Test Item 41:

Once a patient with a cardiac tamponade has appropriate treatment, her physical status should improve:

- a. after 24 hours
- b. after 2 hours
- c. *immediately*
- d. after 4 hours

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 42:

A patient has been in a bomb blast in the last 30 minutes and has shrapnel injuries to his chest, abdomen, and lower legs. He has a BP of 70/60; pulse 130 (thready); respirations of 30 and has distended neck veins. He says, "Help me! I am hurting." The data suggest that he MOST likely suffering from:

- a. hypovolemic shock
- b. tension pneumothorax
- c. *cardiac tamponade*
- d. hemothorax

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a**Lower Level Question**

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 43:

In a patient with cardiac tamponade, an appropriate intervention is to:

- a. insert a nasopharyngeal airway
- b. administer oxygen with a nonrebreather mask**
- c. immediately defibrillate at 100 joules
- d. administer ASA 325 mg

A. Answer Correct? Agree Disagree Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____

Relevant _____

Not very relevant _____

Not at all relevant _____

Test Item 44: Cardiac tamponade occurs because: a. <i>the pericardial sac is relative rigid</i> b. the pericardial sac is flaccid c. the heart is compressed d. there is decreased cardiac output			
A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____			
B. Objectives: Is this a _____ Lower Level Question 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade _____ Higher Level Question 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade _____ Critical Thinking Question 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade			
C. Relevancy: How relevant is test item to topic? Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____			

Test Item 45: The MOST definitive symptom of cardiac tamponade is: a. <i>muffled heart sounds</i> b. weak thready pulse c. tachypnea d. hypoxia			
A. Answer Correct? Agree Disagree Additional/Different Correct Answer (indicate & use letter)?			
B. Objectives: Is this a _____ Lower Level Question 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade _____ Higher Level Question 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade _____ Critical Thinking Question 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade			
C. Relevancy: How relevant is test item to topic? Very relevant Relevant Not very relevant Not at all relevant			

Test Item 46:

You assess a patient with hypovolemic shock. You would anticipate that the pulse pressure would:

- widen as cardiac output falls and blood vessels constrict
- widen as cardiac output falls and blood vessels dilate
- narrow as cardiac output increases and blood vessels dilate
- narrow as cardiac output falls and blood vessels constrict***

A. Answer Correct? Agree Disagree Additional/Different Correct Answer (indicate & use letter)?

B. Objectives: Is this a

Lower Level Question

- Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant **Relevant** **Not very relevant** **Not at all relevant**

Test Item 47:

You are working with a patient with hypovolemic shock. You anticipate that there will be acid-base changes that occur in the following sequence:

- a. *hypoxia* → *lactic acid* → *metabolic acidosis*
- b. hyperventilation → decreased carbon dioxide levels in blood → respiratory acidosis
- c. hyperventilation → retention of carbon dioxide levels in blood → respiratory alkalosis
- d. hypoventilation → retention of carbon dioxide levels in blood → metabolic acidosis

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a
Lower Level Question

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____

Relevant _____

Not very relevant _____

Not at all relevant _____

Test Item 48:

Hypovolemic shock is defined as a condition resulting in a (an):

- a. systolic BP < 90; and pulse > 100
- b. *inadequate perfusion of cells***
- c. systolic BP < 80, diastolic pressure < 60; pulse > 100
- d. aerobic metabolism of the cell

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 49:

The reason a patient with hypovolemic shock has confusion is there is reduced volume of blood that results in:

- a. *reduced cardiac output → reduced perfusion to brain*
- b. vasoconstriction of brain vessels → reduced oxygen to brain cells
- c. vasodilation of brain vessels → stagnation of blood in brain → hypoxia of brain cells
- d. reduced stroke volume → stagnation of blood → clotting in brain → hypoxia in brain cells

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a
Lower Level Question

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 50:

A patient with hypovolemic shock with a blood pressure of 70/50; pulse > 120; respirations of 24 is MOST likely to have:

- a. *metabolic acidosis*
- b. respiratory acidosis
- c. metabolic alkalosis
- d. respiratory hyperchloridemia

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 51:

The blood pressure in a patient with hypovolemic shock may have:

- a. widened pulse pressure because of increased catecholamines
- b. widened pulse pressure because of decreased catecholamines
- c. narrowed pulse pressure because of decreased catecholamines
- d. *narrowed pulse pressure because of increased catecholamines*

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 52:

A soldier arrives at your facility with a BP of 70/52, pulse 120 weak and thready, respirations 32, and flattened jugular veins. You note he has blood over all over his uniform including front of his undershirt. He MOST likely has:

- a. *hypovolemic shock*
- b. cardiogenic shock
- c. obstructive shock
- d. distributive shock

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a
Lower Level Question

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 53:

A 25-year old patient has been diagnosed with hypovolemic shock. Upon initial assessment he IS MOST likely to have:

- a. *normal blood pressure because of an increase in pulse*
- b. low blood pressure because of decreased contractility of the heart
- c. high blood pressure because of an increase in antidiuretic hormone
- d. low blood pressure because of a decrease in angiotensin

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a
Lower Level Question

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 54:

A patient with hypovolemic shock may have:

- a. sympathetic stimulation → vasoconstriction to cerebral and coronary vessels
- b. *sympathetic stimulation → little effect on cerebral and coronary vessels***
- c. parasympathetic stimulation → vasodilation to cerebral and coronary vessels
- d. parasympathetic stimulation → little effect on cerebral and coronary vessels

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 55:

The sequence that occurs in hypovolemic shock is: Low volume of blood which leads to a decrease in glomerular filtration which leads to:

- a. decrease in renin → decrease in angiotensin → vasodilatation
- b. decrease in renin → increase in angiotensin → vasoconstriction
- c. increase in renin → decrease in angiotensin → vasodilatation
- d. *increase in renin → increase in angiotensin → vasoconstriction*

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____

Relevant _____

Not very relevant _____

Not at all relevant _____

Test Item 57:

The reason that a nasogastric tube may be inserted in a patient with hypovolemic shock is to:

- determine if there is blood in the stomach
- administer fluids and medications
- relieve gastric distention*
- lavage with iced saline

A. Answer Correct? Agree Disagree Additional/Different Correct Answer (indicate & use letter)?

B. Objectives: Is this a
Lower Level Question

- Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant

Relevant

Not very relevant

Not at all relevant

Test Item 58:

A patient arrives at your facility with a BP of 92/52, pulse 120 weak and thready, respirations 32, and flattened jugular veins. You note he has blood over all over his uniform including front of his undershirt. He verbalizes responses appropriately when you ask his name and where he is. It would be MOST important at this time to:

- a. insert a nasogastric tube to prevent aspiration
- b. insert an indwelling catheter to assess perfusion to kidney by urinary output
- c. administer oxygen by nasocannula at 6 liters per minute
- d. *administer oxygen with a nonrebreather mask at 12 liters per minute*

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a
Lower Level Question

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 59:

You assess a patient with hypovolemic shock. You order a number of lab tests including blood glucose. You anticipate that the findings will show:

- a. *hyperglycemia because of increased catecholamines*
- b. hypoglycemia because of decreased catecholamines
- c. hyperglycemia because of increased aldosterone levels
- d. hypoglycemia because of decreased aldosterone levels

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a
Lower Level Question

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 60:

Which of the following would indicate the effectiveness of treatment of a patient with hypovolemic shock:

- a. BP from 96/70 to 100/70
- b. pulse from 128 to 82**
- c. respirations from 32 to 28
- d. urinary output from 0 to 12 ml/hour

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____

Relevant _____

Not very relevant _____

Not at all relevant _____

Test Item 61:

You assess that a patient has a carotid pulse, but you cannot palpate a brachial or radial pulse. You should interpret these findings to indicate a blood pressure of at least:

- a. 60 mm Hg
- b. 70 mm Hg
- c. 80 mm Hg
- d. 90 mm Hg

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a
Lower Level Question

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 62:

Blood pressure is determined by:

- a. *cardiac output times peripheral vascular resistance*
- b. stroke volume plus cardiac output
- c. cardiac output plus peripheral resistance
- d. heart rate times stroke volume

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____

Relevant _____

Not very relevant _____

Not at all relevant _____

Test Item 63:

A patient with hypovolemic shock may change the color of the skin because:

- a. *catecholamines cause vasoconstriction reducing blood flow to the skin*
- b. catecholamines cause vasodilatation increasing blood flow to the skin
- c. angiotensin causes vasodilatation reducing blood flow to the skin
- d. angiotensin causes vasoconstriction increasing blood flow to the skin

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____

Relevant _____

Not very relevant _____

Not at all relevant _____

Test Item 64:

The reason that a patient with hypovolemic shock manifests a change in urinary output is that:

- a. *ADH is increased → reduction in urinary output*
- b. ADH is inhibited → reduction in urinary output
- c. catecholamines are increased → increase in urinary output
- d. catecholamines are decreased → decrease in urinary output

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a
Lower Level Question

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 65:

You have a patient with hypovolemic shock. You order a blood glucose and anticipate that it will be:

- a. *elevated because catecholamines promote glycogenolysis*
- b. diminished because catecholamines inhibit glycogenolysis
- c. elevated because angiotensin promotes glycogenolysis
- d. diminished because angiotensin inhibits glycogenolysis

A. Answer Correct? Agree Disagree Additional/Different Correct Answer (indicate & use letter)?

B. Objectives: Is this a
Lower Level Question

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant

Relevant

Not very relevant

Not at all relevant

Test Item 66:

You goal for the treatment for a patient with hypovolemic shock should be a:

- a. systolic pressure of at least 120 mm Hg
- b. diastolic pressure of at least 80 mm Hg
- c. *systolic pressure between 86-90 mm Hg*
- d. diastolic pressure between 60-79 mm Hg

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____

Relevant _____

Not very relevant _____

Not at all relevant _____

Test Item 67:

The intravenous fluid of choice for a patient who is in hypovolemic shock is:

- a. *Ringer's lactate*
- b. normal saline
- c. D5W
- d. D50W

A. Answer Correct? Agree Disagree Additional/Different Correct Answer (indicate & use letter)?

B. Objectives: Is this a
Lower Level Question

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant

Relevant

Not very relevant

Not at all relevant

Test Item 68:

A patient with abdominal bleeding comes to your facility in Iraq. You assess that he is in hypovolemic shock. You note that the abdominal dressing is saturated with a blood. It is important at this time to:

- a. change the dressing
- b. reinforce the dressing**
- c. apply pressure to the abdomen
- d. place patient in Trendelenberg position

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a**Lower Level Question**

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ **Relevant** _____ **Not very relevant** _____ **Not at all relevant** _____

Test Item 69:

You have a patient in hypovolemic shock who arrives your facility with a pulse oximeter reading of 85%, BP 86/78, pulse 126; respirations 44. You should FIRST:

- a. administer IV fluids in two sites using large bore needles
- b. administer oxygen**
- c. place patient in reverse Trendelenberg position
- d. administer Hextend

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ **Relevant** _____ **Not very relevant** _____ **Not at all relevant** _____

Test Item 70:

A female soldier in hypovolemic shock will probably have a (an):

- a. ***increase in aldosterone***
- b. decrease in antidiuretic hormone (ADH)
- c. decrease in angiotensin
- d. increase in Follicle Stimulating Hormone (FSH)

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ **Relevant** _____ **Not very relevant** _____ **Not at all relevant** _____

Test Item 71:

The MINIMUM acceptable urinary output for a patient in hypovolemic shock who is being successfully treated is:

- a. *30 ml per hour*
- b. 15 ml per hour
- c. 10 ml per hour
- d. 100 ml per hour

A. Answer Correct? Agree Disagree Additional/Different Correct Answer (indicate & use letter)?

B. Objectives: Is this a
Lower Level Question

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant

Relevant

Not very relevant

Not at all relevant

Test Item 72:

During the first hour after injury, a patient with hypovolemic shock would MOST likely exhibit:

- a. ***hypotension; tachycardia; tachypnea***
- b. bradycardia; peripheral vasodilation; altered mental status
- c. cognitively oriented; peripheral vasoconstriction; bradycardia
- d. jugular vein flattening; bradypnea; tachycardia

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a
Lower Level Question

- 1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
- 2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

- 3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

- 4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 73:

You are caring for an injured soldier. You assess that he has a cardiac tamponade. Which of the following is true?

- a. it is essential to use sterile technique for procedures as the risk for infection is high
- b. continuous drainage is unexpected and provides a route for infection
- c. *it is most important to perform the procedure using what you have available*
- d. do not apply suction to the syringe as it may cause collapse of the pericardial sac

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a
Lower Level Question

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

Higher Level Question

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

Critical Thinking Question

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade

C. Relevancy: How relevant is test item to topic?

Very relevant _____ Relevant _____ Not very relevant _____ Not at all relevant _____

Test Item 74:

You have a patient with a cardiac tamponade. You are performing a pericardiocentesis and note the following on monitor:

You should implement the following:

- d. administer lidocaine IV
- e. completely withdraw the needle
- f. *withdraw the needle slightly until normal rhythm resumes***
- g. continue with the pericardiocentesis

A. Answer Correct? Agree _____ Disagree _____ Additional/Different Correct Answer (indicate & use letter)? _____

B. Objectives: Is this a

_____ **Lower Level Question**

1. Describe signs & symptoms of hypovolemic shock, pneumothorax, cardiac tamponade
2. Identify correct treatment for hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Higher Level Question**

3. Explain the mechanism of hypovolemic shock, pneumothorax, cardiac tamponade

_____ **Critical Thinking Question**

4. Apply the nursing process (assessment, planning, implementation, evaluation) to patient with hypovolemic shock, pneumothorax, cardiac tamponade			
C. Relevancy: How relevant is test item to topic?			
Very relevant	Relevant	Not very relevant	Not at all relevant

Please answer this short set of wrap-up questions by making an "X" in the spaces provided. Thank you!

1. This survey was comprehensive related to the topic of <i>pneumothorax</i> .			
Strongly agree	Agree	Somewhat Disagree	Strongly Disagree
2. This survey was comprehensive related to the topic of <i>hypovolemic shock</i> .			
Strongly agree	Agree	Somewhat Disagree	Strongly Disagree
3. This survey was comprehensive related to the topic of <i>cardiac tamponade</i> .			
Strongly agree	Agree	Somewhat Disagree	Strongly Disagree

- Are there any additional questions that need to be asked?
- Thank you very much for your time and expertise. Please make any additional comments here and on the back of the page(s).

References

- Bloom, B. (1956). *Taxonomy of educational objectives: Handbook I: Cognitive domain*. New York: David McKay Co.
- Johnson, A.D. (2005). *The Effects of CD ROM and Human Patient Simulator Education on Combat Trauma Nurses' Cognition and Performance*. Unpublished research proposal, Triservice Nursing Research grant application.
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