



Variables associated with performance of aseptic technique by perioperative nurses during the intraoperative period
by Anne Marie Burnett

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Nursing
Montana State University
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Abstract:

Historically, nurses have been heralded as guardians of asepsis and protectors of the patient from infection. Nosocomial infection is one of the quality indicators for acute care settings developed by the American Nurses' Association (1995). Infection control by nurses is a desirable patient outcome affected by aseptic technique. The purpose of this study was to identify the variables associated with the performance of aseptic technique by perioperative nurses during the intraoperative period. Specific aims of this study were to describe the perioperative nurses' basic nursing education and experience level in a perioperative setting and to relate these variables to knowledge level of aseptic technique.

A nonexperimental descriptive survey with quantitative and qualitative components was used as the research design for this study. The instrument was divided into three sections. The first section included demographic information. The second section was a knowledge test of aseptic technique. The third section was a qualitative open-ended structured question asking the nurses to describe the variables contributing to a break in aseptic technique if such a break occurred by them within the last 3 months. Surveys were distributed to 110 perioperative Registered Nurses practicing in the intraoperative phase of the traditional operating setting in four hospitals from three cities in Montana.

The response rate was 33% to Sections I and II of the survey and 6% to Section III of the survey. A possible relationship was demonstrated between knowledge scores and the internal environmental variable of the Baccalaureate basic nursing education. The highest number of responses for perception of environmental variables contributing to breaks in aseptic technique were supply/equipment failure and stress.

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by

Anne Marie Burnett

A thesis submitted in partial fulfillment
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of

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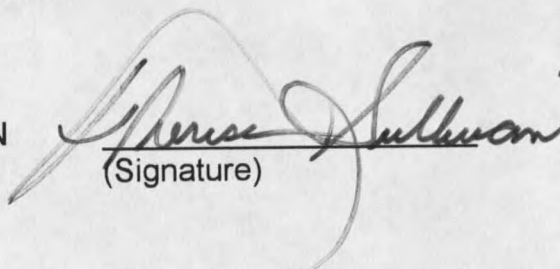
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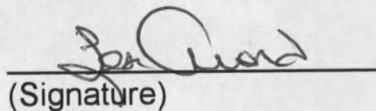
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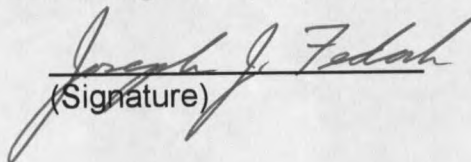
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VITA

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ABSTRACT

Historically, nurses have been heralded as guardians of asepsis and protectors of the patient from infection. Nosocomial infection is one of the quality indicators for acute care settings developed by the American Nurses' Association (1995). Infection control by nurses is a desirable patient outcome affected by aseptic technique. The purpose of this study was to identify the variables associated with the performance of aseptic technique by perioperative nurses during the intraoperative period. Specific aims of this study were to describe the perioperative nurses' basic nursing education and experience level in a perioperative setting and to relate these variables to knowledge level of aseptic technique.

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The response rate was 33% to Sections I and II of the survey and 6% to Section III of the survey. A possible relationship was demonstrated between knowledge scores and the internal environmental variable of the Baccalaureate basic nursing education. The highest number of responses for perception of environmental variables contributing to breaks in aseptic technique were supply/equipment failure and stress.

CHAPTER 1

INTRODUCTION

Healthcare professionals have increasingly become concerned with defining and measuring the variables contributing to patient outcomes (Ortona et al., 1987). The American Nurses Association (ANA) has developed nursing's quality indicators for acute care settings. Two of these indicators are nosocomial infection rates and nurse staff satisfaction. These indicators are used to highlight the linkage between nursing actions and patient outcomes (Nursing Quality Indicators, 1997). Infection control is a desirable patient outcome affected by aseptic technique. Nurse staff satisfaction affects decision making skills which affect patient outcomes.

"The reparative process which Nature has instituted and which we call disease has been hindered by some want of knowledge or attention, in one or in all of these things, and pain, suffering, or interruption of the whole process sets in" (Nightingale, 1869, p. 5). "Florence Nightingale believed nursing's primary focus was to alter the physical environment to place the human body in the best possible condition for the reparative processes of nature to occur" (Chin & Kramer, 1991, p. 45). The physical environment included ventilation and warming; health of houses (pure air, pure water, efficient drainage,

cleanliness, light); petty management; noise; variety; food; bedding; and chattering hopes and advices (Nightingale, 1869). When Nightingale arrived to the Crimean War, the death rate among soldiers was 42% and within four months, reduced to 2% primarily due to her reforms in preventing the spread of disease. "Her ideas were the origin for "fever nursing", which consisted of barrier and sanitary practices adopted by the schools of nursing and hospitals in the United States by the turn of the century" (Larson, 1989, p. 96).

Results of a study by Jarvis (1996) indicate in the United States about two million nosocomial infections occur annually resulting in substantial morbidity, mortality and costs. In this study (Jarvis, 1996), surgical site infections were estimated to extend the patient's hospitalization by seven to 8.2 days. The estimated cost for each of these surgical site infections was \$2,734. The negative patient outcome of infection has been the subject of several open heart surgery studies in which increased costs and length of stay have been associated (Boyce, Potter-Bynoe, Dziobek, 1990; Evans, 1993).

To identify the variables affecting infection control, the ANA and the Association of Operating Room Nurses (AORN) have identified nursing research priorities. The ANA (1995, p. 1) has identified a priority regarding the following: "Minimize or prevent behaviorally and environmentally induced health problems that compromise the quality of life and reduce productivity". The AORN Nursing Research Committee also has identified several priorities

including some specifically related to aseptic technique. One priority by AORN (1996, p. 2) addresses the behavior of aseptic technique: "Level of knowledge regarding handling of sterile items-the level of acceptance vs. compliance".

The outcome, infection control, and the process, aseptic technique, are desirable for the patients, healthcare professionals and the institutions they serve. The Centers for Disease Control (CDC) has indicated that education in the prevention of infection through the identification of risk factors should decrease the incidence of nosocomial infections among patients in hospitals by 10% by the year 2000 (Goldrick, Gruendemann, & Larson, 1993). Studies of variables associated with aseptic technique are needed for administrators, educators, researchers, and clinicians who can provide the resources to improve performance.

Problem Statement

"All individuals involved in surgical interventions have a responsibility to provide and maintain a safe environment. Adherence to aseptic practices aids in fulfilling this responsibility. Aseptic practices are implemented preoperatively, intraoperatively, and postoperatively to minimize wound contamination" (Association of Operating Room Nurses, Inc., 1997, p. 215). There are various practice settings in which perioperative nurses practice including traditional operating rooms, ambulatory surgery units, obstetrical

units, physicians' offices, cardiac catheterization suites, endoscopy suites, radiology departments, and all other areas where operative and other invasive procedures may be performed. All patients in these areas are affected by the performance of aseptic technique. The maintenance of aseptic technique directly affects the positive patient outcome of infection control.

Implications for nursing are seen from the perspective of both the individuals and the discipline. The interface between the two is based on the assumption that nursing is a practice discipline; thus, its theory base can best be described and tested in the arena of care. Practice disciplines consist of varied interventions (processes) for different situations (outcomes). Verifying a relationship between a nursing intervention (maintenance of aseptic technique) and the factors contributing to performance will add to the body of knowledge regarding nursing interventions affecting patient outcomes. Nursing interventions which are scientifically sound and are documented contribute to the impact of nursing care.

Purpose

The purpose of this study was to identify the variables associated with the performance of aseptic technique by perioperative nurses during the intraoperative period. Specific aims of this study were to describe perioperative nurses' basic Registered Nurse (RN) nursing education and

experience level in a perioperative setting and relate these variables to knowledge level of aseptic technique. Perceived environmental variables which may contribute to breaks in aseptic technique were also described.

Definition of Terms

The following operational definitions were employed in the development of this study:

1. Basic RN nursing educational preparation was completion of a nursing program in the following: Associate Degree (AD), Diploma, Baccalaureate of Science (BSN).
2. Experience level included years in current role, total years in a perioperative setting, frequency of continuing education (CE) offerings available in the perioperative setting, and total length of orientation to the perioperative setting.
3. Knowledge level was operationalized by the score obtained from the Questionnaire Section II (Appendix I).
4. Environmental variables were internal and external variables affecting and being affected by the participant at any time (Neuman, 1995).
5. Aseptic technique was "... methods by which contamination with microorganisms is prevented" (Atkinson & Fortunato, 1996, p. 185).
6. Break in aseptic technique was transmission of microorganisms from

patient to patient and from inanimate objects to patients and vice versa (Atkinson & Fortunato, 1996).

7. Infection was "... invasion of the body by pathogenic microorganisms and the reaction of tissues to their presence and to toxins generated by the organisms" (Atkinson & Fortunato, 1996, p. 186).

8. Invasive procedures were " ... those in which the body is entered (eg., by use of a scalpel, tube, device, ionizing or nonionizing radiation, or any other invasion) and which protective reflexes or self-care abilities are potentially compromised" (Association of Operating Room Nurses, Inc., 1997, p. 79).

9. Perioperative was "surrounding the operative and other invasive experience (ie, before, during, and after)" (Association of Operating Room Nurses, Inc., 1997, p. 79).

10. Perioperative nurse was a

registered nurse who, using the nursing process, designs, coordinates, and delivers care to meet the identified needs of patients whose protective reflexes or self-care abilities are potentially compromised because they are having operative or other invasive procedures. Perioperative nurses apply knowledge of the procedure and the patient's intraoperative experience throughout the patient's care continuum. The perioperative nurse assesses, diagnoses, plans, intervenes, and evaluates the outcome of interventions based on criteria that support a standard of care targeted toward this specific population. The perioperative nurse addresses the physiological, psychological, sociocultural, and spiritual responses of the individual that have been caused by the prospect or performance of the invasive procedure (Association of Operating Room Nurses, Inc., 1997, pp. 78-79).

11. Intraoperative was " ... the time begins when the patient is transferred to the operating room bed and ends when he or she is admitted to the postanesthesia area" (Association of Operating Room Nurses, Inc. 1997, p. 302).

Conceptual Framework

This study was based on the conceptual model for nursing designed by Betty Neuman (1995). The Neuman Systems Model is based on open systems thinking. "Neuman's model is a holistic view of the client system, including individuals, groups, communities, and society" (Fawcett, 1989, p. 170).

Neuman (1995) described the person in the model as the client/client system composed of physiological, psychological, sociocultural, developmental, and spiritual variables. The person in the model could be the patient or the nurse. The variables comprise the central core of the model or the internal variables of the system. The physiological variable refers to the body's structures and processes; the psychological variable refers to mental processes and relationships; the sociocultural variable refers to social and cultural processes; the developmental variable refers to the developmental stages of life; and the spiritual variable refers to aspects of spirituality.

For purposes of this study, the patient and the nurse (Figure 1) each have a central core composed of the internal variables. The central core is

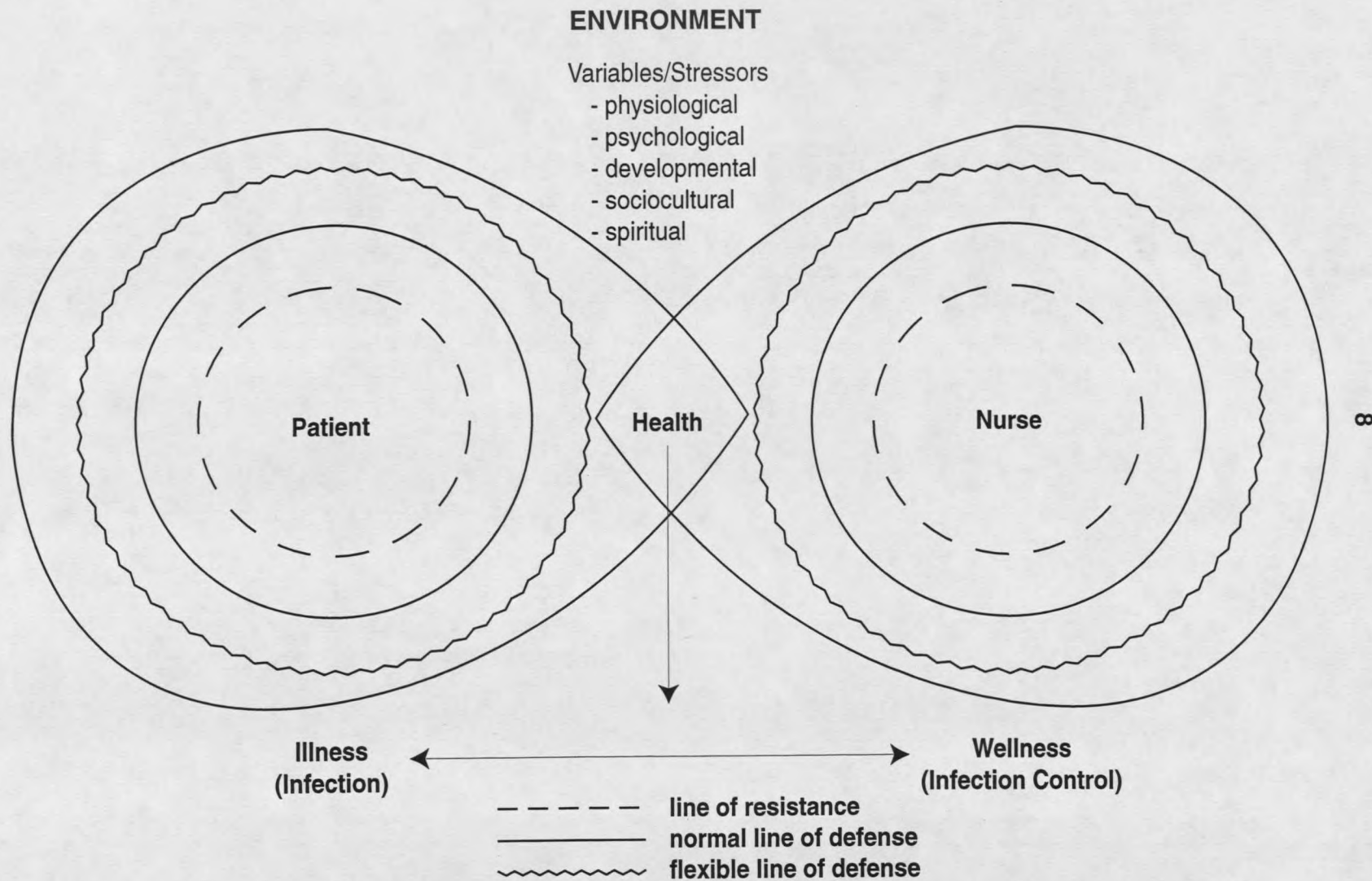


Figure 1 - Burnett's adaptation of the Neuman Systems Model (1995).

surrounded by the lines of resistance. These are involuntarily activated when a stressor invades the normal line of defense. The lines of resistance contain internal factors which support the central core and normal line of defense, such as mobilization of white blood cells. If the lines of resistance are effective, the system can survive; if they are ineffective, death may occur. The next outermost ring is the normal line of defense. It reflects the system's usual or normal state of wellness. It may expand or contract to reflect enhanced wellness or a diminished state of wellness. This ring is developed over time through adaptation of the system to its environment. The outermost ring is the flexible line of resistance. It tries to prevent invasion of stressors to the system. As it expands, greater protection is provided; as it contracts the less protection is provided and the more vulnerable the system becomes to the stressors to the system. The line of resistance, normal line of defense, and flexible line of defense assist the system in adapting and coping to the stressors affecting infection control.

Environment is described as the internal and external forces surrounding the client/client system. The relationship between the client/client system and the environment is reciprocal. This means the client/client system and its environment each affect the other. In this study, the relationship of the patient and the caregiver were collaborative because each person is affected by each other and their environment.

Neuman (1995) also identified three types of environments. The first, internal environment, consists of the forces contained within the boundaries of the client/client system. The external environment is the forces existing outside the client/client system. The third, created environment, is developed by the client subconsciously and encompasses the internal and external environments.

Neuman (1995) further classified the environment into three different stressors. Intrapersonal stressors are contained within the client/client system and include forces such as conditioned and autoimmune responses. For this study, intrapersonal stressors could include hunger, physical and mental fatigue, physical or mental disease, stressor to values and beliefs. The second stressors are interpersonal which are in the external environment and occur at the boundary of the client/client system and the inner external environment. They include forces such as role expectations and communication. The third stressor, extrapersonal, occur at the boundary of the client/client system and the outer external environment. They include forces such as financial concerns or social policies.

Health is equated with wellness which is the condition of optimal stability of the system. In this study, health is portrayed as an overlapping of the environment between the patient and the nurse (Figure 1). Each system (patient and nurse) affects either's environment including health. Neuman

(1995) also described wellness on a continuum with wellness at one end and illness at the other. In the Burnett Adaptation of the Neuman Systems Model (Figure 1), wellness is depicted as infection control (or the lack of infection) and illness is depicted as infection. Reconstitution occurs after the system's reaction to a stressor. If reconstitution does not occur, death does.

Nursing is described as being concerned with the variables affecting a client/client system's response to stressors. A nursing process with three categories was developed. The first, nursing diagnosis, includes identifying, assessing, classifying, and evaluating the interactions between the physiological, psychological, sociocultural, developmental, and spiritual variables of the client/client system. In this study, the perioperative nurse's judgement may rely on his/her own physiological, psychological, sociocultural, developmental, and spiritual variables affecting the nurse's decision making. Depending on whether the nurse's system is in a state of wellness or experiencing some state of stress may affect decision making skills when applying aseptic technique principles in the care of the surgical patient. Because the two systems (client and nurse) interact with each other, the nurse's decisions affect the outcome of infection control in the perioperative arena.

The second step of the nursing process is formulation of nursing diagnosis negotiated with the client for desired changes. This step formulates

the goals and the interventions to achieve the desired outcomes.

The third step is nursing outcomes with three possible intervention modalities. They are primary prevention, secondary prevention, and tertiary prevention.

CHAPTER 2

LITERATURE REVIEW

Two specific areas of literature have been identified for review in this study. Review of the environmental variables between the patient and the nurse is represented in the first area. The environmental variables consist of internal and external variables. Internal variables consists of all forces or interactive influences internal to or contained within the boundaries of the system (Neuman, 1995). External variables are forces or interactive influences external to or existing outside the system (Neuman, 1995). Infection control is a part of the health concept of the Neuman model (1995) and is reviewed as the second area. This area is represented by aseptic technique by perioperative nurses. These areas are selected to provide background information about the variables associated with job performance and specifically the performance of aseptic technique by perioperative nurses during the intraoperative period.

Environment

Many variables relating to the environment have been identified in reviewing the literature. Environmental variables are internal and external variables affecting and being affected by the person at any time (Neuman, 1995). The person can be represented by the patient or the nurse. These

variables can also be stressors to the person or the system. The following studies examine the variables/stressors and the system's reaction to it. Some of these variables/stressors are perceived by the person (nurse) as having some degree of control over the environment (internal). Other variables are perceived by the person as having no control which contributes to feelings of powerlessness over their environment (external).

Internal

Knowledge level has been associated with job performance. Knowledge level includes basic RN nursing education completed and functioning cognition (knowledge comprehension). Basic nursing education completed includes: Associate degree (AD), Diploma degree, or Bachelor of Science degree (BSN). Some studies have focused on new graduate nurses and their education level (DeBack & Mentkowski, 1986; Thiele, Holloway, Murphy, Pendarvis & Stucky, 1991). In the DeBack & Mentkowski (1986) study, nurses with a BSN degree demonstrated more nursing competencies when compared with their AD or diploma colleagues. Results also suggest that education promotes a broader range of abilities than does experience. Thiele, Holloway, Murphy, Pendarvis & Stucky (1991) studied perceived and actual decision making by novice BSN students. In their (Thiel, et al.) findings, novices' decision making was characterized by random choice and the overselection of cues rather than by deliberate and thoughtful consideration of the total situation. The discussion

included a suggestion of the establishment of perceived and actual performance levels. These levels provide a means to determine improvement and progress as the novice student moves toward the cognitive skill development of clinical expertise. The amount of education best distinguished top and medium performers from poor performers in a study by McCloskey and McCain (1988). The top performers had 4.17 years of education and the medium performers had 4.15 years of education where the poor performers had 3.02 years of education. Tyler & Ellison (1994) examined occupational stress in four areas of nursing. One of these areas was nursing in elective surgery. Their study revealed nurses with advanced educational training perceived higher levels of stress. Studies of the long term impact of education on experienced nurses, especially perioperative nurses, who have been "in the field" and knowledgeable enough about their roles and institutions are limited (Crow & Taylor, 1983a, 1983b; Kasal, 1984, 1985; DeBack & Mentkowski, 1986; Fernsebner, 1986).

Functioning cognition is another variable of knowledge level. Henry & Holzemer (1993) conducted a descriptive, correlational study of 68 Registered Nurses (RN). Each subject completed four instruments: a nationally standardized cognitive examination, a self evaluation of expertise, and two computer based clinical simulations which demonstrated a relationship them. The scores on the cognitive exam and self evaluation were moderately high

(84%). Scores on the clinical simulations were low. The evidence indicated that clinical simulations may be useful as an adjunct to other methods of evaluation. The findings support the continued use of verbalization (oral or written) of cognitive processes as a strategy to examine clinical decision making. A significant lack of research exists about nursing's measure of cognition and the association of job performance.

Certain personality factors have been related to job performance. In the Peacock and O'Shea (1984) study of Occupational Therapists, the largest effect on the job performance rating was desirability. The scale (Personality Research Form E) tapped a need for social approval and acceptance, and the belief that this can be attained by means of culturally acceptable and appropriate behavior. In a study (Langford & Harmon, 1987) involving 97% female and 3% male operating room nurses, a different result was found. Of 266 subjects, 62% reported a high score of a good sense of self esteem. These nurses also displayed a tendency toward assertiveness and interpersonal traits. A comparison of the self esteem scores revealed androgynous (high score on the masculine and feminine scales) or masculine traits in gender identity have higher levels of self esteem. The personality characteristics studied were similar to the general population of adult females.

Subjective stress is another internal variable. A study by Packard and Motowidlo (1987) which included operating room nurses identified stress from

two main sources: characteristic of the work place and characteristic of the worker. Correlations between job satisfaction and performance scores ranged from 0.18 ($p < 0.05$) to 0.29 ($p < 0.01$). Job satisfaction correlated with frequency of stressful events -0.22 ($p < 0.01$), with intensity of stressful events -0.18 ($p < 0.05$), with subjective stress -0.27 ($p < 0.01$), with anxiety -0.16 ($p < 0.05$), with hostility -0.41 ($p < 0.01$), and with depression -0.55 ($p < 0.01$). As staffs perceive identified stress inducing events to occur with relatively high frequency, nurses will experience feelings and symptoms of stress. Also nurses with certain personal characteristics, Type A behavior patterns and fear of a negative evaluation, seemed more likely to encounter stressors with greater frequency. When such persons, likely to regard events as stressful, work in areas they perceive to be fairly rich in environmental stressors, they experience high levels of stress. One consequence of perception of environment is lower job satisfaction and another is lower performance ratings.

Two studies were reviewed to explore the relationship of hardiness, stress and burnout in nurses. In the Simoni & Paterson (1997) study, nurses with greater hardiness reported less stress burnout than did those with less hardiness. In the analysis, the lowest burnout scores were encountered among nurses with greater hardiness who used direct active coping behavior. In another study (Collins, 1996), the relation of work stress, hardiness, and burnout among nurses also was examined. Collins (1996) concluded that the

greater one's personality hardiness the less job stress and the greater one's personality hardiness the less burnout.

Porac, Ferris, & Fedor (1983) conducted a study to explore the relationship between perceived job performance, causal attributions, employee affect, and expectations for a day's work of full time nurses. Nurses were asked to explain their job performance by using eight causal categories and to rate their performance satisfaction and their expectations for future performance. Perceived performance was positively related to ratings for three causal variables: job skill, usual work pace, and coworkers. For affect rating, a significant correlation was recorded between job skill and satisfaction. Another study, by Birnbaum and Somers (1986), suggests before one enters the organization, one has clear preference patterns regarding the work role. Favorable job attitudes result to the extent that preferred tasks can be carried out. Differences in job attitudes among image subcultures (professional, bureaucratic, traditional, or utilitarian) were detected. Post hoc comparisons indicated utilitarians ($x=2.62$) were less job involved than professionals ($x=2.73$), traditionals ($x=2.94$), or bureaucrats ($x=3.01$). Additionally, differences in expectations for rewards among image subcultures were observed. Post hoc comparisons indicated that utilitarians ($x=2.77$) had significantly lower expectations for rewards than did traditionals ($x=3.11$). Professionals ($x=3.02$) and bureaucrats ($x=3.05$) overlapped the higher and

lower groupings. These findings suggest that organizational demands require minimally acceptable performance from all organizational members. However, the study also suggested that when performance of nonpreferred tasks is required, that is, when organizational and personal preferences conflict, work is perceived as less involving, though work is performed adequately. For professionals, job involvement is negatively correlated with job performance for those facets of performance with a high dirty work component. Dirty work included: feeding or assisting patients with meals; make beds; order and put away supplies; transport patients and run errands; and sort, file, and assemble patients medical records. As expected, this pattern did not emerge for traditionals, bureaucrats, or utilitarians. As hypothesized, expectations for rewards were negatively correlated with those tasks that are not patient linked (teaching and counseling, recording skills, leading staff, self development, and research aptitude) for traditionals, but not for the other three image subcultures.

Some studies described reactions to job stress of nurses and other hospital workers. Seago's (1996) research indicates that occupations that are high strain jobs arouse stress hormones and are those in which employees have little job control or must complete psychologically demanding tasks, such as those under time pressure. Barak, et al. (1996) evaluated the prevalence of smoking, alcohol consumption, and use of hypnotics, anxiolytics, and antacids.

Job stress among nursing personnel was reported by 39.7% and was correlated with smoking ($p < .05$). Of the sample of female nurses working at least one year, almost 50% were smokers, 19.1% used antacids and 6.1% consumed alcohol regularly. A phenomenological study (Smith, Droppleman, & Thomas, 1996) was conducted of female RN's. They were asked to describe work related experiences of anger. Their perception was of being under assault in a hostile environment therefore being the recipients of scapegoating, disrespectful treatment, and lack of support. Anger was their weapon to defend or advocate for patients or self, as well to attack others including self. Another study (Leveck & Jones, 1996) found important issues related to working conditions and the practice environment for nurses. Units where nurses perceived a participative management style reported higher levels of group cohesion and lower levels of job stress. The participative management style also explained the nurses' perception of job satisfaction. Nurses employed on medical-surgical units perceived higher levels of job stress than nurses employed on other types of specialty units. This study also supports the conclusions of Brooks, Wilkinson, Bott, & Taunton (1993). Brooks, et al. (1993) results indicated that situational support variables (autonomy, control over practice, group cohesion, substantive exchange, manager consideration) correlated inversely with job stress.

External

Experience has also been attributed to affecting job performance.

McCloskey and McCain (1988) did an exploratory analysis of newly employed nurses. Results indicated different variables affected different types of performance. The amount of experience was the best predictor of critical care skills. Years of RN experience were related significantly to several types of performance: highest to critical care performance, then to leadership skills, and then to planning/evaluation. Years of total experience, a measure that included experience as a Licensed Practical Nurse and an aide, were the best predictors of critical care skills but did not correlate to anything else.

Experience is also concerned with on the job training which includes orientation and continuing education. Studies of nursing orientation varied in relation to the benefit of utilizing preceptors (Mongold, 1987; McCloskey & McCain, 1988; Weaver, 1992). In the study by McCloskey and McCain (1988), the use of a preceptor during the first few months on the job related only moderately to the performance of critical care skills measured at twelve months. Preceptors were identified as affecting decreased turnover rate for orientees. Also, research found nurses who had a thirteen-week internship were not rated better performers than were those who had a seven-week orientation. Mongold (1987) reported nurses without OR experience gained entry level knowledge and skills and veteran nurses who serve as preceptors

gained recognition for their expertise, enhanced self esteem, and career growth. Weaver (1992) reported the use of multiple preceptors in the operating room did not work out well. When an orientee was subjected to several different preceptors with several different teaching styles and ways of doing things, the orientee became confused and the educational process lagged. This created low self esteem between the new nurses and a decrease in their acceptance level by the more experienced staff members. Clearly, limited data is available related to the question of level of education as a differentiating variable for nurse performance needs further study, and level of education needs to be considered in relation to years of experience.

Participation in CE has been claimed to be strongly associated with increased job performance in respiratory therapy and engineering (Buckley, 1984; Morris, 1979). In the Buckley study (1984) the data of respiratory therapists were analyzed to determine the linear relation between continuing education hours and performance level. A high positive linear correlation was noted with a high level of confidence ($p < .01$). The study concluded that there exists a relationship between education and job performance. Another conclusion was that those practitioners who perform well are also those who make more effort to participate in CE activities. In the Morris (1979) study, relationships were measured on objective data and not on attitudes or opinions. A retrospective study was conducted with 396 engineers

participating. The study concluded: (a) non credit technical CE is measurably effective in leading to increased compensation, (b) non credit technical CE was significantly more effective than credit technical CE, (c) non academic instructors are capable of doing an effective job of teaching, (d) non credit technical CE courses offered away from the place of employment can successfully affect performance. A limitation of the study was there were no relationships described between continuing education and job performance. The study assumed a causal relationship but none was demonstrated. A significant lack of research exists about nursing's continuing education and the association of job performance.

Support from family/significant other also affects job performance. Tyler & Ellison (1994) study of occupational stress found nurses living with a partner or who were married experienced fewer stress symptoms than those without. Nurses with children experienced less stress dealing with patients and their families than those without children.

Sources of stress can also be affected by a lack of support systems. Three studies (Frisch, Dembeck, & Shannon, 1991; Morano, 1993; Snape & Cavanagh, 1993) also reported major sources of stress for head nurses and nurses were lack of resources, including nursing staff, work load and powerlessness.

Dealing with perceived stressful events also affect job performance. Snape & Cavanagh (1993) reported dealing with aggressive behavior and being exposed to life and death situations among children as major stressful events. Finnis, Robbins, & Bender (1993) studied the prevalence of sexual harassment of nursing staff. They reported 60% experienced some form of sexual harassment on at least one occasion. The results showed that the predominant experience occurred on the wards to female nursing staff, by male patients, often while bathing patients. Several external variables have been attributed to organizational elements affecting job performance. The first, acuity level of patients, was determined to be a factor in a study by McCloskey and McCain (1988). As more patients were more acutely ill, nurses performed more critical care skills and fewer teaching skills, and their performance ratings reflected their practice.

The second factor, leadership skills of the head nurse, was also determined to be a factor by the McCloskey and McCain (1988) study. Feedback skills correlated moderately with satisfaction with the supervisor. The results also indicated that the expectations and actions of the head nurses are important for the satisfaction and performance of their staff members.

Studies examining the patterns and effect of shift work and on call time is the third factor (Closkey & McCain, 1988; Coffey, Skipper, & Jung, 1988; Skipper, Jung, & Coffey, 1990; Snape & Cavanagh, 1993; Smithers, 1995).

Shiftwork was demonstrated to disrupt the normal synchronization of the worker's circadian rhythm, resulting in lowered worker alertness, speed, efficiency, productivity, and safety. Nurses on rotating shift schedules were rated lower by their supervisors in terms of job performance, motivation, and patient care than were nurses on mixed (non-rotating) shifts (Coffey, Skipper, & Jung, 1988; Skipper, Jung, & Coffey, 1990). The rotating shift nurses reported a higher level of job related stress than any of the other shifts. The rotating shift was attributed to be the most stress producing for nurses, since they must interact with a different group of people on each shift they work, making it more difficult to establish good working relationships. Further, it is difficult to deal with the unique procedures and routines of different units at different times (Coffey, Skipper, & Jung, 1988). Smithers (1995) reported the main effects of on call work as fatigue and a reduction in performance. These in turn were reported to contribute to sleep difficulties, meal irregularity, and negative quality of off call time. Another study (Snape & Cavanagh, 1993) reported the most frequent occurring stressors as working unsocial hours and dealing with fluctuations in workload. Although research has been reported on the various factors associated with job performance of nursing and other disciplines, a limited number have reported the effects on aseptic technique. An extensive review of the literature revealed no research has been reported as it relates to perioperative nurses which is the purpose of this study.

Health

Aseptic Technique by Perioperative Nurses

Extensive literature search revealed no research studies regarding perioperative registered nurses and aseptic technique. Limited studies exist about operating room personnel and aseptic technique. The study by Crow and Taylor (1983a, 1983b), utilized the structured observation method by one of the researchers. Five areas of operating room nursing techniques were evaluated during one type of procedure focusing on the performance of both the scrub and circulating nurses. Thirty-six cases involving twenty-nine different scrub nurses and seven circulating nurses were studied during the preoperative and intraoperative periods. In the first area studied (OR team preparation), the most common infraction was the nurses did not completely cover their hair with the surgical cap. In the second area, scrub procedure, the most common infraction was lack of attention to the logical method of scrubbing. The third area was infractions during surgery. Touch contamination occurred frequently in the sterile field. The scrub nurses' most frequent infractions included changing levels of sterility, leaning on the Mayo stand, and turning their backs on the sterile field. Circulating nurses frequently risked contamination by being within one foot of the sterile field and leaning over the sterile field. The most frequent infraction of the fourth area (handling sterile items and gowning) was not checking the expiration date of sterile

items. The most common room preparation infraction (fifth area) was overhead lights were not cleaned, table wheels were not pushed through the housekeeping disinfectant, and the arm rest of the OR table was not cleaned. It was also noted there were more infractions in the third cases of the day (37.3%) than the second and more infractions in the second cases of the day (20.2%) than in the first. Two patients out of the thirty-six developed wound infections for clean wounds. Limitations in the study may be due to subject reactivity thereby affecting reliability and validity of the observations by the researcher.

Kasal's (1984, 1985) study was a descriptive survey utilizing a questionnaire modified from the Crow and Taylor (1983b) study. A random sample of 200 Association of Operating Room Nurses (AORN) members from 119 cities was surveyed. The five areas evaluated were the same as the Crow and Taylor study (1983b). The respondents were categorized by demographic variables and asked to categorize variables, within the five areas, as a major or minor infraction. The results were then tabulated with a two-thirds majority about whether the respondents agreed or disagreed the variables were a major or minor infraction. The frequency tabulation analysis showed that out of fifteen separate infractions identified as occurring most frequently, only five were considered major sources of contamination by a two-thirds majority. These five were: circulating nurse does not wash before each case, expiration

date of sterile item not checked, wrapped sterile item dropped on floor then used, cap does not cover hair properly, and mask worn improperly. The results of the data analysis showed the respondents were unable to agree that an infraction was a major or minor source of contamination with a two-thirds majority in twenty-two out of fifty-six infractions. Nursing education was attributed to be significant in one area which dealt with room preparation. Almost two-thirds (63%) of the associate degree graduates, and over half (57%) of the diploma graduates put more emphasis on the wheels of the furniture not pushed through a disinfectant than did the baccalaureate graduates. Twenty-two percent of the baccalaureate graduates thought this was a major infraction. Limitations in this study may be due to the relative small percentage (55%) of respondents (N=110).

A third related study, by Fernsebner (1986), was done during a mock surgery to identify infractions in aseptic techniques. In the study, thirty-one of the forty-four infractions, related to infractions of aseptic technique, were used due to time constraints. Of the thirty-one infractions, no one identified all of the infractions and some infractions other than the planned ones occurred also. In analyzing the data, the number of infractions identified increased with years of experience in the OR. Also, nurses with nursing diplomas scored higher than those with associate degrees or bachelor degrees in nursing. Diploma graduates were also cited as having the most years of experience. The most

significant identified infractions reported in order were: mask worn improperly, cap did not cover hair, gown not tied correctly at neck or not wrapped around, and unsterile person leaned over sterile field.

Differences in the three studies were reported. Kasal (1984, 1985) identified the type of nursing education and length of formalized operating room rotation as significant. Crow and Taylor (1983a, 1983b) indicated no relationship among age, experience, and education. Fernsebner (1986) indicated a possible relationship between level of education preparation and years of experience.

Similarities were also identified in the three studies. All of the studies reported the most common breaks in technique as surgical caps not worn properly and jewelry worn. As their final recommendations, Crow & Taylor (1983a, 1983b) and Kasal (1984, 1985), implicated the role of education, orientation, and place of employment as areas needing further study.

The prior research has been either focused on observation by the researcher or by rank ordering the most frequently perceived breaks in technique by operating room nurses of other operating room nurses. No available research has focused on the description of each perioperative nurse's characteristics and variables related to aseptic technique performance which is the focus of this study.

CHAPTER 3

METHODS

Design

A nonexperimental descriptive survey with quantitative and qualitative components was used as the research design for this study. The purpose of a descriptive survey design is to describe the prevalence or incidence of a phenomenon. It is a design which involves collecting information from a variety of persons who resemble the total population of interest. The purpose of this study was to describe the environmental variables associated with the performance of aseptic technique by perioperative nurses during the intraoperative period. Questionnaires were the method used to gather data from the purposive sample recruited for the study. Although a limitation of the purposive sample is the available subjects that might be atypical of the population with respect to the phenomena being studied, the flexibility of the design provides the best method of gathering in-depth, real life subject matter.

Sample

The target population from which the purposive sample was drawn consists of perioperative Registered Nurses (RN's) practicing in the intraoperative phase of the traditional operating setting in four hospitals from

three cities in Montana. These four hospitals were selected because they had greater than 200 beds, greater than 800 personnel employed (American Hospital Association, 1996-1997), and greater than five traditional operating rooms. A sample size was composed of the available, willing participants from the target population. The available number of participants was 110 RN's employed in these four hospitals in the traditional operating room setting. Written permission from the organization in which the nurses are employed was obtained from each facility's institution review board and/or designated representative. Anonymity and confidentiality were assured and nurses meeting the eligibility criteria were selected for the sample. The sample size was congruent with the purpose of the study (describing the variables associated with performance of aseptic technique by perioperative nurses during the intraoperative period), the homogeneity of the phenomenon being studied (complete enumeration of all elements in the population is not possible), and the proposed study design (nonexperimental study design). A nonprobability sampling procedure was been selected because there is no assurance that each element has an equal probability of selection.

Criteria for eligibility was RN's who currently work in the perioperative setting as scrub and/or circulators during the intraoperative period in a traditional operating room setting. This included RN's not immediately

available due to scheduled work, different shifts, vacation, illness, or float pool nurses. Licensed practical nurses and scrub technicians were not included.

Instruments

The instrument was divided into three sections. These sections relate to the purpose and aims of this study. The first two sections lend themselves to quantitative analysis. The first section includes demographic information and addresses the aims of basic RN nursing educational preparation and experience level in a perioperative setting. The second section was a knowledge test of aseptic technique addressing the aim of knowledge level. The third section was a qualitative open-ended structured question addressing the aims of internal and external environmental variables affecting breaks in aseptic technique (Appendix I).

1. Section I: Demographic questions for background data collection, prepared by this researcher, for the total sample included age; gender; married/significant other; children; basic and highest RN nursing educational preparation completed; current role; years in current role; total years in a perioperative setting; and total length of orientation to a perioperative setting and frequency continuing education (CE) offerings available in the perioperative setting.

2. Section II: The knowledge test of aseptic technique was administered by the Questionnaire, Section II (Appendix I). Permission was been granted by the National Certification Board: Perioperative Nursing, Inc. to use the test questions and answers (Appendix B). The instrument (Appendix I, Section II) contains ten items which quantitatively measure aseptic technique. No test-retest reliability was reported.

3. Section III: The nurses were asked to answer an open-ended structured question, prepared by this researcher, of internal and external environmental variables associated with breaks in aseptic technique. The open-ended question was used to obtain the broadest possible understanding of the phenomenon that can be elicited. Open-ended items are flexible and offer the possibility of exploring the depths of the respondent's answer. The question was developed from the review of the literature, this researcher's experience, and input from a panel of operating room nurse experts. The question asked the nurse to describe the variables contributing to a break in aseptic technique, if the break in aseptic technique occurred within the last three months.

Threats to the reliability and validity of the quantitative portion of Section I have not been established or reported. The demographic information required for the Questionnaire is consistent with other instruments collecting demographic information.

Threats to the reliability and validity of the quantitative portion of Section II are not available from the National Certification Board: Perioperative Nursing, Inc. (NCB: PNI). Content validity has been established by the nature of the process of submitting test questions to the NCB: PNI. Voluntary members of AORN who are also nationally certified in operating room nursing (CNOR) submit potential questions to NCB: PNI. CNOR members are considered experts in perioperative nursing. After submitting their questions, a review panel of NCB: PNI nurses select questions for the certification exam. The questions in Section II of the Questionnaire (Appendix I) are questions selected by the NCB: PCI panel of nurses to measure aseptic technique for the certification exam for operating room nurses.

Threats to the reliability of the qualitative portion of the instrument (Section III) included (1) the researcher's status position, (2) the participant choice, (3) the social situation and conditions under which data are collected, and (4) the methods of procedures (Woods & Catanzaro, 1988). Specific procedures for controlling the researcher's status position for this study included identifying this researcher's role in the research setting, and describing the content and development of the researcher's role as the study evolved. To control the threat of participant choice, a contact person for each hospital was encouraged to recruit participants nonselectively and the characteristics and decision processes involved in their choice to participate

were described. The contact people were operating room nurses, not included in the sample, who volunteered to distribute questionnaires for this researcher. The social situation conditions were controlled by delineating the context (social, physical, and interpersonal) in which the data was generated. For the methods of procedure, the researcher reported precisely and thoroughly the strategies used to collect, analyze, and report data. This researcher performed the theoretical coding and the instrument was phrased in low inference descriptors in concrete, precise terms.

Threats to the validity of qualitative research include: (1) history and maturation, (2) observer effects, (3) selection and regression, and (4) mortality. To control for history and maturation, the use of constant comparative analysis and discrepant-case analysis was used to distinguish maturation effects from effects of intervening phenomena. Observer effects were controlled by independent corroboration from multiple participants, discrepant-case analysis, and observation. The data was presented in relation to this researcher's position and relationships. For control of selection and regression, the participants were recruited who met the purposive sampling criteria. Commonly assumed meanings were questioned, discrepant-case analysis was used and the data was compared across the sampling categories. Mortality control was emphasized in the written explanation and questionnaire by reminding the participants that they were the experts and their input is

valued. The researcher also provided consistent follow up in information about the ongoing study.

Procedure

For the purpose of establishing content validity of Section III of the Questionnaire (Appendix I), a panel of experts, four nationally certified perioperative nurses, were used. The experts were not included in the sample and did not hold supervisory positions in the settings being used. In the first draft of the Questionnaire, Section III included two questions. After reviewing the feedback from the experts, Section III was changed to one question. The question removed from the Questionnaire asked the participants to describe their breaks in aseptic technique within the last three months. This question was removed because it was not related to the purpose of this study. This researcher analyzed their input and revised the survey accordingly. The survey was ready to be completed by the participants.

Approval was gained by the Human Subjects Committee of the Montana State University College of Nursing (Appendix C). Access to the target population was gained through prior arrangement and written permission of each of the four facilities' review boards and/or employers (Appendices D & E). After the study was approved, the contact person of each hospital was contacted by telephone and the script (Appendix F) and written explanation

(Appendix H) was read to them. These were mailed to each contact person along with a flyer (Appendix G), the questionnaires, and stamped self addressed envelopes at the time of the survey. The flyer was printed with brightly colored ink and was used to advertise the survey. The script, from this researcher, was designed to provide consistency in their roles. The script included: the contact person's role; the procedure to distribute the packets; and phone numbers of the investigator and thesis advisor. The written explanation with the purpose; target population; and risk/benefits of the study; and the names, addresses, phone numbers of the researcher and thesis advisor were provided and any questions of the contact person answered. The questionnaire and written explanation were printed on brightly colored paper and stacked near the flyer for distribution.

Data were collected using questionnaires distributed by this researcher to each contact person. Approximately three-four days after the packets (script, flyer, written explanations, questionnaires, and self addressed stamped envelopes) were mailed, each contact person was recontacted by telephone to determine whether the mailing was received.

All potential participants meeting the study criteria were contacted by the contact person and asked to participate and complete all of the questions. A packet containing the written explanation, the questionnaire, and a self addressed, stamped envelope were given to each potential participant during

working hours. The contact person distributed the packets during working hours when it was suitable to complete the survey for the potential participants and the agency. The participant could chose to complete the survey during off hours when it was convenient for them. The role of the contact person was to announce the study to the potential participants and make the packets available for them.

Completion of the questionnaire implied consent. The participants were asked to complete the survey on their own without the aid of other resources (ie, books, videos, or other people). The participant was asked to complete the questionnaire during the time allotted and mail it to the researcher the same day. Completed questionnaires were mailed to this researcher in the self addressed, stamped envelopes provided. Each contact person received a letter thanking everyone who participated and a summary of the results. The letter also included this researcher's name and phone number for any subjects who needed to contact this researcher. The letter and summary were posted by the contact person on a bulletin board in each agency's Operating Room where the staff communicates with each other.

Data Analysis

Analysis proceeded in three phases: (1) a descriptive analysis was used to describe the sample on the demographic section of the questionnaire,

(2) descriptive and inferential statistics were used to describe the ordinal scores of the knowledge test of aseptic technique related to environmental variables, and (3) content analysis was used for the open-ended question.

Phase one was a descriptive analysis of the demographic section of the questionnaire. This included age; gender; married/significant other; children; basic and highest RN nursing educational preparation completed; current role; years in current role; total years in a perioperative setting; total length of orientation to a perioperative setting; and frequency of CE offerings available in the perioperative setting.

Phase two used descriptive and inferential statistics of the knowledge test section of the questionnaire. This included the mode, median, frequency distribution, range, and analysis of variance.

Phase three used manifest content analysis of the open-ended question section. The answers to the question were described by reviewing the textual material for words, phrases, descriptors, and terms central to job performance of aseptic technique by perioperative nurses. The text was divided into units of meaning and quantified according to certain rules. In addition to categories, explicit coding and scoring instructions was established with a list of key words and examples of how to apply the criteria. The categories and coding instructions were tested by this researcher. Deductively generated codes (variables) were derived from the literature and this researcher's insight before

approaching the data to be analyzed. This approach simplified the process of calculating intercoder reliability. It also allowed counting the number of responses in each category. The unit of analysis was determined as the identification of patterns evolved. Constant comparative analysis was used to determine other factors that may appeared to be, but were not, part of the logical chain. The final step in drawing and verifying conclusions was making conceptual coherence. This linked together the findings of the study to overarching propositions that accounted for the how and why of the performance of aseptic technique by perioperative nurses (Woods & Catanzaro, 1988).

Protection of Human Subjects

Access to the target population was gained through prior arrangement and written approval with each of the four hospitals' review boards and/or designated representatives. Following written approval of the Human Subjects Review Committee of the College of Nursing, Montana State University, the contact person was contacted by this researcher and a script was provided which described their role and the process. The script reinforced their role as the access point between this researcher and the potential participants.

The contact person was responsible for identifying potential participants at their agency of the survey, notifying them of the survey, posting the Flyer

and making the packets available during the data collection period. This included nurses not immediately available due to scheduled work, different shifts, vacation, illness, or float pool nurses. The contact person made available the packets during working hours when it was suitable to complete the survey for the potential participants and the agency. The participant may have also chosen to complete the survey during off hours when it was convenient for them. The contact person was not present during completion of the questionnaire.

All eligible participants were asked to participate in the study. Each participant was provided a packet containing a written explanation of the study, the questionnaire, and a self-addressed, stamped envelope. Refusal to participate in the study would not jeopardize their job security. Completion of the questionnaire denoted implied consent. Participating in this study would not represent a risk to them or their job, but it may have been an inconvenience because of the time needed to answer the questions. It took approximately thirty minutes to complete. They may have withdrawn from the study any time without penalty and without change in any relationship they have with their employer or Montana State University College of Nursing. Written approval by their hospital was given to this researcher to conduct this survey and completion of the survey, during working hours, was also granted. Participation was optional and could have been discontinued any time.

The participants in the study were informed that while this study did not directly benefit them, the information provided could assist nurses and other healthcare providers in identifying and improving specific patient outcomes as they relate to job performance.

To assure anonymity, each participant was asked not to write their names or addresses on the survey or the return envelope. To further assure anonymity, the packets did not have code numbers.

To assure confidentiality, the surveys are stored in a locked file by the Montana State University College of Nursing for five years. Secondly, the information from the questionnaires was only shared with this researcher's thesis committee. Thirdly, the participants were not specifically identified in any reports stemming from this study because only the data obtained from the group as a whole was published. Participants were not differentiated by site and only grouped together as a whole.

The expected completion date of the study was provided along with this researcher's and thesis advisor's names and phone numbers to answer questions during the data collection period. A letter and summary of the results was mailed to each hospital's contact person for this survey and posted on a bulletin board in their Operating Room. The letter also included this researcher's name and phone number for any subjects who needed to contact this researcher.

CHAPTER 4

DATA ANALYSIS

The purpose of this study was to identify the variables associated with the performance of aseptic technique by perioperative nurses during the intraoperative phase. Specific aims of this study were to describe the perioperative nurses' basic Registered Nurse (RN) nursing education and experience level in a perioperative setting and relate these variables to knowledge level of aseptic technique. Perceived environmental variables which may contribute to breaks in aseptic technique were also described.

The Questionnaire (Appendix I) and data analysis are presented in three sections. The first section of the questionnaire included demographic information which described the basic RN nursing educational preparation and experience level for nurses working in a perioperative setting. The demographic information included: age, gender, married/significant other present, children present, basic and highest RN nursing educational preparation completed, current role, years in current role, total length of years in a perioperative setting, total length of orientation in a perioperative setting and frequency of continuing education (CE) offerings available in the perioperative setting. The second section of the questionnaire is a test of knowledge of aseptic technique which utilized a ten item questionnaire to

address the aim of knowledge level. The third section of the questionnaire was a qualitative open-ended structured question addressing the aim of perceived environmental variables which may contribute to breaks in aseptic technique.

The first area of data analysis utilized a descriptive analysis of the sample from the demographic section of the questionnaire. The second area of data analysis used descriptive and inferential statistics to describe the ordinal scores of the knowledge test of aseptic technique related to environmental variables. Internal variables included basic and highest RN nursing educational preparation and knowledge level. External variables included years in current role, total years in a perioperative setting, frequency of CE offerings available in the perioperative setting, and total length of orientation in the perioperative setting. Content analysis was used for evaluation of the answers to the open-ended question of Section III of the Questionnaire (Appendix I).

Descriptive Analysis

The sample consisted of surveys returned from thirty-six perioperative nurses. One hundred ten surveys were distributed to four hospitals in Montana for a response rate of 33%. The age ranges are in Table 1.

Table 1

Frequency and Percentage Comparison of Age (N = 36)

Age range	f	P
20-29	2	5.6
30-39	8	22.2
40-49	17	47.2
50-59	8	22.2
60 +	1	2.8

Of the 36 respondents, the largest percentage were in the 40-49 age range (47%). The 20-29 and 30-39 age ranges had a combined percentage of 28%. The 50-59 and 60+ age ranges had a similar combined percentage of 25%.

The gender frequency and percentage is in Table 2.

Table 2

Frequency and Percentage Comparison of Gender (N = 36)

Gender	f	P
Male	5	13.9
Female	31	86.1

Five males (14%) and 31 (86%) females responded to the Questionnaire.

Presence of a married/significant other is in Table 3.

Table 3

Frequency and Percentage of Married/Significant Other Present (N = 36)

Answer	<u>f</u>	<u>P</u>
Yes	27	75
No	9	25

Nine respondents (25%) were not in the married/significant other category while twenty-seven (75%) were in the married/significant other category.

Table 4 identifies whether or not the respondents have children.

Table 4

Frequency and Percentage with Children (N = 36)

Answer	<u>f</u>	<u>P</u>
Yes	29	80.6
No	7	19.4

Respondents with children totaled 29 (81%) compared to 7 (19%) without children.

The frequency and percentage comparison of basic and highest nursing education is shown in Table 5.

Table 5

Frequency and Percentage Comparison of Nursing Education (N = 36)

Preparation	Basic		Highest	
	<u>f</u>	<u>P</u>	<u>f</u>	<u>P</u>
Diploma	10	28	10	28
Associate	10	28	9	25
Baccalaureate	16	44	16	44
Master's	--	--	1	3

Nursing education from basic preparation to highest preparation differed only in the Associate and Master's levels. Diploma and Associate degree categories combined to compose the greatest percentage of the basic (56%) and highest (53%) education sample. The Baccalaureate and Master's combined to total 44% of basic and 47% of the highest degree categories.

In Table 6, the current role of the respondents is shown.

Table 6

Frequency and Percentage of Current Role (N = 36)

Current role	<u>f</u>	<u>P</u>
Staff nurse	31	86.1
Educator	1	2.8
Manager/Director	4	11.1

Staff nurses accounted for the greatest number of respondents (86%).

Manager/director's and educators combined for 14% of the respondents.

In Table 7, a comparison of length of years in current position vs. total length of years in the perioperative setting is depicted.

Table 7

Frequency and Percentage Comparison of Length of Time in the Perioperative Setting

Years	Current role (N = 36)		Total (N = 34)	
	f	P	f	P
Less than 1	4	11	1	3
1-5	11	30	6	17
6-10	10	28	5	14
11-15	7	19	5	14
16-20	2	6	9	25
21-25	2	6	8	22

Greater than two-thirds (69%) of the respondents have been in their current position 10 years or less. In the total years in the perioperative setting category, approximately one-third (34%) have been in the perioperative setting 10 years or less.

The length of orientation to the perioperative setting is shown in Table 8.

Table 8

Frequency and Percentage of Length of Orientation to the Perioperative Setting (N = 36)

Length of time	f	P
< 1 month	6	16.7
1 month-5 months	23	63.9
6 months-1 year	7	19.4

Six (17%) of the respondents had an orientation of less than one month to the perioperative setting and seven (19%) respondents' orientation was six months to one year. Twenty-three (64%) of the respondents had an orientation to a perioperative setting in the one to five month category.

The frequency of CE offerings available are shown in Table 9.

Table 9

Frequency and Percentage of Frequency of Continuing Education Offerings Available (N = 36)

Frequency	f	P
< 1/month	13	36.1
1-2/month	13	36.1
3-4/month	8	22.2
> 4/month	2	5.6

Thirteen participants (36%) responded that CE offerings are available less than one CE offering per month. Another thirteen respondents (36%) reported one to two CE's available per month. Eight (22%) of the respondents had three to four CE's available per month and two (6%) of the respondents reported greater than four CE's available per month.

Descriptive and Inferential Statistics

The results of the survey are analyzed using descriptive and inferential statistics and are further divided into three sections. The first section describes the ordinal scores of the knowledge test of aseptic technique represented by Section II of the Questionnaire (Appendix I). The second section relates the ordinal scores of the knowledge test with the internal and external environmental variables of education and experience. A parametric one-way analysis of variance (ANOVA) was utilized in the third section which identifies possible relationships between the scores on the Questionnaire, Section II (Appendix I) and specific environmental variables. These variables included basic and highest nursing education, years in current role, total years in the perioperative setting, frequency of CE offerings available in the perioperative setting, and total length of orientation to the perioperative setting.

Scores

The potential knowledge score range of the questionnaire was between zero and ten. Ten was the highest possible score on Section II of the Questionnaire (Appendix I). In Table 10, the frequency distribution and percentile are indicated according to the score obtained on the knowledge test of Section II of the Questionnaire (Appendix I).

Table 10

Frequency and Percentage of Knowledge Scores (N = 36)

Score	f	P
4	2	6
5	4	11
6	8	22
7	9	25
8	5	14
9	6	17
10	2	6

The range of knowledge scores by the respondents was from four to ten with a mean, median, and mode of seven correct responses and standard deviation of 1.6.

A comparison of the range of knowledge scores by nursing preparation is in Table 11.

Table 11

Range of Knowledge Scores Compared with Nursing Education (N = 36)

Preparation	Basic		Highest	
	Minimum Score	Maximum Score	Minimum Score	Maximum Score
Diploma	5	9	5	9
Associate	4	9	4	9
Baccalaureate	6	10	4	10
Master's	--	--	9	9

In the basic nursing education category, the group with the highest minimum (6) and maximum (10) scores was the Baccalaureate prepared RN. In the highest nursing education category, the Baccalaureate prepared RN had the highest score of 10.

Relationship of Knowledge Scores to Environmental Variables

The environmental variables are internal and external. The internal variable is education including basic and highest nursing educational preparation. External environmental variables include years in current role, total years in the perioperative setting, frequency of CE offerings available in the perioperative setting and total length of orientation to the perioperative setting.

The knowledge scores were obtained from the Questionnaire, Section II (Appendix I). The range of scores was from four to ten with a mean, median, and mode of seven correct responses. In Table 12, the frequency and mean of the knowledge scores to the environmental variables are identified.

Table 12

Frequency and Mean of Environmental Variables to Knowledge Scores
(N = 36)

Variables	Scores	
	<u>f</u>	<u>M</u>
Internal		
Basic Nursing Education		
Diploma	10	6.7
Associate	10	6.1
Baccalaureate	16	7.8
Highest Nursing Education		
Diploma	10	6.7
Associate	9	6.3
Baccalaureate	16	7.5
Master's	1	9.0
External		
Years in Current Role		
0-5	15	7.2

6-10	10	7.1
>11	11	6.7
Total Years in Perioperative Setting		
0-5	7	7.0
6-15	10	6.6
>16	19	7.3
Continuing Education Availability/Month		
<1/month	13	6.53
1-2/month	13	6.77
3-4/month	8	7.75
>4/month	2	9.0
Length of Orientation to the Perioperative Setting		
<1 month	6	5.7
1-5 months	23	7.3
6 months-1 year	7	7.1

The internal environmental variable is nursing education. In Table 12, a comparison of basic and highest nursing education preparation to knowledge scores is depicted. The range of means for basic and highest educational preparation were between 6.1 and 9.0. The rank order of the means for highest nursing education from highest to lowest score was Master's, Baccalaureate, Diploma, Associate degree. The Baccalaureate RN mean

scores for basic (7.8) and highest (7.5) nursing education were above the overall mean 7.0. The Master's RN mean score (9.0) for the highest nursing education category was also higher than the overall mean (7.0).

The relationship of knowledge scores to four external environmental variables is described. These variables are length of experience in current role, total length of experience in the perioperative setting, frequency of CE offerings available in the perioperative setting, and total length of orientation in the perioperative setting.

The first two external environmental variables are length of experience in current role and total length of experience in the perioperative setting. Results of this analysis reflect a higher mean score (7.2 and 7.1) in the current role groups with ten years or less of experience as compared to those with eleven or more years of experience in their current role (6.7). Total length of experience in the perioperative setting range of means was between 6.6 and 7.3. The lowest mean (6.6) was in the 6-15 years range while the highest mean (7.3) was in the greater than 16 years range.

The third external environmental variable was frequency of CE offerings available in the perioperative setting. The mean scores increased in relation to the increase in frequency of CE offerings available per month. The mean scores respondents with CE offerings available greater than three a month (7.75 and 9.0) were greater than the overall mean knowledge score of 7.0

Length of orientation to the perioperative setting is the fourth external environmental variable. The range of the mean scores compared with length of orientation was between 5.7 and 7.3. The highest mean score (7.3) was in the one-five month range. The mean scores for orientation greater than one month (7.3 and 7.1) were greater than the overall mean (7.0).

Table 13 identifies possible relationships between the knowledge scores and the environmental variables of basic and highest nursing education, current role, years in current role, total years in the perioperative setting, frequency of CE offerings available in the perioperative setting, and total length of orientation in the perioperative setting.

Table 13

Analysis of Variance for Knowledge Scores and Variables Associated with Performance of Aseptic Technique by Perioperative Nurses During the Intraoperative Period (N = 36)

Variable	Variance Source	df	MS	F	p
Nursing Education					
Basic	Between subjects	2	9.77	4.64	.017*
	Within subjects	33	2.10		
Highest	Between subjects	3	4.29	1.80	.166
	Within subjects	32	2.38		
Years in current role					
	Between subjects	5	1.17	.42	.831

Within subjects	30	2.77		
Total years in Perioperative Setting				
Between subjects	6	.75	.26	.952
Within subjects	29	2.91		
Continuing Education Available/Month				
Between subjects	3	5.31	2.33	.093
Within subjects	32	2.28		
Length of Orientation to the Perioperative Setting				
Between subjects	2	6.78	2.97	.065
Within subjects	33	2.28		

Note. * $p < .05$.

A possible relationship was demonstrated between knowledge scores and the internal environmental variable of basic nursing education ($p=.017$). The next highest probability values were frequency of CE offerings available in the perioperative setting ($p=.093$) and length of orientation to the perioperative setting ($p=.065$) although a relationship was not demonstrated. A relationship was not demonstrated in highest nursing education ($p=.166$), total years in current role ($p=.831$) and total years in the perioperative setting ($p=.952$).

Content Analysis

This content analysis section contains the analysis of the responses to the open-ended question in Section III of the Questionnaire (Appendix I). The open-ended structured question asked the nurse to describe the variables contributing to a break in aseptic technique if s/he performed a break within the last three months.

Of the thirty-six respondents to the survey, sixteen or 44% responded to the question in Section III. Five (31%) of the sixteen respondents marked nonapplicable. Four (25%) of the sixteen respondents described breaks in aseptic technique that had been observed in others rather than themselves. Thus, seven (44%) of the sixteen respondents to the open-ended question or 19% of the total respondents described variables contributing to the break in aseptic technique they performed.

In Table 14, the seven respondents' answers have been categorized into internal and external environmental variables. The data reflects the number of responses per category and describes some of these responses.

Table 14

Categories of Variables Contributing to Breaks in Aseptic Technique (n = 7)

Category	# of Responses	Description
Internal		

Lack of knowledge	1	"Failure of scrub and circulator to identify compromised wrap."
Physical limitations	1	"My fingers aren't always that nimble."
Stress	3	"I was trying to go too fast." "Rushed to open supplies." "Need for speed-turnover time."
External		
Supply/equipment failure	4	"Slice in the sterile wrap of basin set went undetected." "In opening a steripeel pouch, the package tore."
Space inadequate	2	"Touched someones sleeve because of closeness and large amount of equipment in room."
Lack of experience	1	"I don't scrub often."

For the internal variables, there was a total of five responses. The greatest number of responses for an internal variable occurred in the stress category (3).

The external variable responses totaled seven which was greater than the internal variable total of five. The category with the greatest number of

responses in the external variables was in the supply/equipment failure category (4).

CHAPTER 5

DISCUSSION, RECOMMENDATIONS, AND CONCLUSIONS

Discussion

The purpose of this study was to identify the variables associated with the performance of aseptic technique by perioperative nurses during the intraoperative phase. Specific aims of this study were to describe perioperative nurses' basic Registered Nurse (RN) nursing education and experience level in a perioperative setting and relate these variables to knowledge level of aseptic technique. Perceived environmental variables which may contribute to breaks in aseptic technique were also described.

This study was based on the conceptual model for nursing designed by Betty Neuman (1995) and adapted by this researcher in 1997 (Figure 1). In this study, the person was the nurse and this study examined his/her affect on a patient outcome (infection control). The nurse in the model is the system composed of physiological, psychological, sociocultural, developmental, and spiritual variables. These variables comprise the central core or the internal variables of the system. The environment is described as the internal and external forces surrounding the system. The relationship of the patient and the nurse are collaborative because each person is affected by each other and their environment.

In this study, the factors associated with the performance of aseptic technique by perioperative nurses during the intraoperative phase were identified after an extensive literature review. These factors were divided into internal and external variables. Internal variables are the central core of the person and are perceived by the person (nurse) as having some degree of control over the environment. The internal variable examined in this paper was knowledge which includes basic and highest RN nursing educational preparation completed. External variables are perceived by the person as factors in the environment over which the person has no control. These variables contribute to feelings of powerlessness by the person. In this study, the external variables included length of time in current role, total length of time in a perioperative setting, frequency of continuing education (CE) offerings available in the perioperative setting, and total length of orientation in the perioperative setting.

Demographic Information

The 40-49 age group composed the greatest percentage (47%) of the respondents. This was comparable to data from the ANA (Malone & Marullo, 1997) which reports the RN population continues to age and "Among those employed in nursing the average age was 42.3 years" (Malone & Marullo, 1997, p. 5). Data from the AORN (1998) reports the greatest number of members in the age range 41-50 years at 43.5%.

Thirty-one (86%) female nurses and five (14%) male nurses responded to the survey. This was in contrast to data from the ANA (Malone & Marullo, 1997) which reports 5.4% men and 94.6% women RN's were employed in the United States. Ninety-four percent of the AORN members were female compared to six percent male (AORN, 1998).

Staff nurses accounted for the greatest number of respondents (86%). Manager/director's and educators combined for 14% of the respondents. The AORN (1998) reported 57% of its membership were staff nurses and 31% were in the administrator and educator categories.

In this survey, 75% of the respondents were in the married/significant other category. Eighty percent of the respondents reported having children.

Internal Variable

Internal variables are composed of the central core of the person (nurse). These include physiological, psychological, sociocultural, developmental, and spiritual variables. An internal variable identified for this study was nursing education. Basic and highest nursing education preparation were examined. In this study, the Diploma and Associate (AD) degree categories combined to compose the greatest percentage of the basic (56%) and highest (53%) nursing education sample. The respondents' with a Baccalaureate (BSN) or Master's degree together made up 44% of the basic nursing education and 47% of the highest nursing education degree

categories. The ANA (Malone & Marullo, 1997) reported of the RN's employed in nursing, 58.4% had either a Diploma or AD highest nursing degree. The BSN accounted for 31.8%, Master's degree 9.1%, and Doctorates accounted for 0.6% of the total for highest nursing degree. The AORN (1998) reported 55% of its membership are either Diploma or AD nurses, 27% BSN, 3% Master's prepared, and .03% with a Doctorate in nursing. Although the sample for this study was small, the comparison of the Diploma and AD nurses' percentages between this study and the national percentages were similar. The BSN percentage was higher than the national percentages and the Master's and Doctoral degrees lower than the national averages. The high percentage of BSN nurses within the hospitals studied may be explained by the fact the upper division BSN nursing campuses of a major state university are also located in the same cities in Montana. In this study, no Doctoral prepared nurses responded to the survey.

External Variables

External variables are the forces existing outside the person (nurse). These variables are outside of the central core of the nurse and are perceived by the nurse as having no control over the environment. External variables are influenced by the surrounding environment. The external environmental variables identified for this study were length of time in current role, total length

of time in the perioperative setting, frequency of CE offerings available in the perioperative setting, and total length of orientation to the perioperative setting.

Relationship of Knowledge Scores to Environmental Variables

In the Burnett's Adaptation of the Neuman's System Model (Figure 1), the central core of the nurse is composed of internal variables. The internal variable examined in this paper was knowledge which included knowledge scores and basic and highest RN nursing educational preparation completed. The central core is surrounded by the lines of resistance which are involuntarily activated when a stressor invades the normal line of defense. These stressors are external variables outside of the central core. In this study, the external variables were represented by length of experience in current role, total length of experience in the perioperative setting, frequency of CE offerings available, and total length of orientation in the perioperative setting.

A possible relationship was demonstrated with knowledge scores and the internal environmental variable of basic nursing preparation ($p = .017$). The BSN (7.5) and Master's (9.0) highest nursing education preparation mean scores were above the mean of 7.0. These findings suggest knowledge scores may increase with higher nursing educational preparation and verifies the earlier finding that the amount of education best distinguished top and medium performers from poor performers (McCloskey & McCain, 1988).

A relationship between knowledge scores and the external environmental variables of length of time in current position ($p = .831$) and total length of time in the perioperative setting ($p = .952$) was not demonstrated. The findings in this study did not support the findings of McCloskey and McCain (1988) which concluded that years of RN experience were related significantly to several types of performance such as critical care performance, leadership skills, and planning/evaluation and the amount of years of total experience (including LPN and aide experience) was the best predictor of critical care skills. In their opinion (McCloskey & McCain, 1988), experience should be considered a type of education.

Another possible relationship exists with knowledge scores and the external variable of frequency of CE offerings available in the work setting ($p = .093$). The mean scores increased in relation to the increase in frequency of CE offerings available per month. These findings suggest knowledge scores may increase with an increase in the frequency of CE offerings available per month. This also verifies an earlier finding (Buckley, 1984) concluding a high positive linear correlation between continuing education hours and performance level.

A possible relationship occurred between knowledge scores and the external environmental variable of length of orientation to the perioperative setting ($p = .065$). In this study, the mean scores (7.3 and 7.1) were greater

than the overall mean of 7.0 for orientations greater than one month. It was difficult to compare this study with the McCloskey and McCain (1988) study because the time periods of the studies varied. In the McCloskey and McCain (1988) study, nurses who had a thirteen week internship were not rated better performers than those who had a seven week orientation. In this study, the time periods were as follows: less than one month, one to five months, and six months to one year. Because the time periods were not divided into weeks or months, a comparison between the two studies cannot be analyzed.

Perceived Environmental Variables

Neuman (1995) further classified the environment into three different stressors. These stressors are intrapersonal, interpersonal and extrapersonal. In the Burnett's adaptation of the Neuman's System Model (Figure 1), health was portrayed as an overlapping of the environment between the patient and the nurse. Each system (patient and nurse) affects either's environment including health and may impose stressors. The perioperative nurse's judgement may rely on his/her own internal variables affecting his/her decision making. Depending on whether the nurse's system is in a state of wellness or experiencing some state of stress may affect decision making skills when applying aseptic technique principles in the care of the surgical patient. Because the two systems (patient and nurse) interact with each other, the

nurse's decisions affect the outcome of infection control in the perioperative arena.

In the review of the literature, several internal and external environmental variables were identified. Internal variables included basic RN nursing education, knowledge comprehension, personality characteristics, job satisfaction, stress, hardiness, and perceived role by themselves and others. External variables included experience, length of orientation, continuing education, support from family/significant other, support from supervisors/peers, and support from organization.

One of the aims of this study was to describe perceived environmental variables which may contribute to breaks in aseptic technique. Section III of the Questionnaire (Appendix I) asked the respondent to describe the variables contributing to the break in aseptic technique if s/he had performed a break within the last three months. Seven of the thirty six respondents answered Section III. The low response rate to Section III may have been due to the lack of knowledge of the definition of a break in aseptic technique. Another explanation may have been reluctance on the part of the respondents to admit a break in aseptic technique. The responses were categorized as internal or external environmental variables. These categories were further broken down into common themes. The internal category themes and number of responses included lack of knowledge (1), physical limitations (1), and stress (3). The

external category themes and number of responses included supply/equipment failure (4), space inadequate (2), and lack of experience (1). The greatest number of responses were in the external category (7) and, specifically, the supply/equipment theme (4). The greatest number of responses for the internal category was three in the stress theme. Interestingly, other studies (Crow & Taylor, 1983a, 1983b; Kasal 1984,1985; Fernsebner, 1986) did not identify either of these themes (supply/equipment failure and stress) contributing to breaks in aseptic technique as significant in their studies.

There were no responses to the following identified internal and external environmental variables from the review of the literature. The internal variables not identified by the respondents were personality characteristics and job satisfaction. External variables not identified by the respondents included length of orientation, continuing education, support from family/significant other, and support from supervisor/peers.

Limitations

Limitations regarding this study included the sample, instrument, methodology, and lack of mandatory CE's for the state of Montana. The sample was small, purposive and voluntary. The available subjects may have been atypical of the population with respect to the phenomenon studied, therefore, generalizations cannot be made beyond the study sample. On the

demographic portion (Section I) of the instrument, Question 10 asked about the total length of orientation to the perioperative setting. The categories in Section I were too broad to be interpreted. Also in Section I, Question 11 asked about the frequency of CE offerings available. The question should have asked about actual CE's taken rather than those made available. Another limitation regarding the instrument was Section II of the Questionnaire (Appendix I) which had no test-retest reliability reported. In the methodology, a contact person from each hospital was used to recruit participants in order to control for the threat of participant choice. Selected individuals (contact persons) identified potential participants who met the study's criteria and were to distribute the packet during a specified time period in an accessible location for the participants. The data collection relied on the contact person fulfilling their role as a contact person between the participants and the researcher. The last limitation is the state of Montana does not require mandatory CE's for licensure so the availability of CE offerings may have been limited due to lack of demand.

Implications

The Burnett's Adaptation to the Neuman's System Model (Figure 1) depicts the relationship of the central core (internal variables) and the environment (external variables). By further exploring the relationship of the

internal and external variables, it increases the body of knowledge of nursing and its relationship to patient outcomes.

The findings in this study indicate there is a possible relationship between knowledge of aseptic technique and basic RN nursing educational preparation. This finding relates a nursing intervention (aseptic technique) with a positive patient outcome (infection control) by helping to promote a safe environment for the patient. Knowledge in these findings is valuable for administrators, educators, researchers, and clinicians who can provide the resources to improve performance. Administrators can provide structure to support providing the best human resources for patient care by communicating a mission, vision and values; job descriptions; policies and procedures; financial support for training and education; and policy making at the state and national levels. Educators can assess the needs of staff and their organization and provide education based on the needs. Researchers can continue to verify relationships between nursing interventions and the factors contributing to performance. Clinicians can continue assess their own learning needs and to seek out avenues to increase their knowledge. Identifying the variables and barriers affecting patient outcomes and educating leaders in healthcare may also significantly reduce patients' lengths of stay and costs.

Recommendations

This study was limited to a sample of perioperative nurses in selected hospitals in Montana. Duplication of this research is needed among different groups of nurses, regions and different sizes and types of hospitals and healthcare settings.

Regarding the instrument, the demographic section needs revisions on the questions regarding total length of orientation in the perioperative setting and frequency of CE offerings available in the perioperative setting as identified. Section II of the Questionnaire (Appendix I) needs test-retest reliability which can be accomplished by repeating the study. The use of an instrument with known reliability and validity may yield different results. Research of different environmental variables affecting knowledge needs to be further examined.

Further research is needed, specifically, about the relationship of knowledge scores and environmental variables among all nursing groups. Globally, verifying a relationship between a nursing intervention and the factors contributing to the performance will add to the body of knowledge regarding nursing interventions affecting patient outcomes. Nursing interventions which are scientifically sound and are documented contribute to the impact of nursing care.

Conclusion

This study described the perioperative nurses' basic RN nursing education, knowledge level of aseptic technique, and experience level in a perioperative setting. The highest frequencies occurred in the following environmental variables: 40-49 years old age range, female, married, with children, BSN degree for basic and highest nursing education, staff nurse, 1-5 years in current role, in the perioperative setting for 16-20 years, 0-2 CE offerings available per month, 1-5 months of orientation in the perioperative setting.

This study also related identified environmental variables to the knowledge score of aseptic technique. The highest mean scores of the knowledge test related to the environmental variables occurred in the following: BSN for basic nursing education level, Master's prepared for highest nursing education level, 0-5 years in current role, greater than 16 years in the total years in the perioperative setting, greater than 4 CE offerings available per month, and 1-5 months of orientation to the perioperative setting.

A description of the perceived environmental variables which may contribute to breaks in aseptic technique was also reported in this study. The environmental variables were categorized as internal and external. The greatest number of responses for the internal category was stress.

Supply/equipment failure received the greatest number of responses for the external category.

Positive patient outcomes cannot be adequately addressed by focusing on one part of the person's being. Accomplishing positive outcomes can be accomplished by applying models such as Burnett's Adaptation of the Neuman's System Model (Figure 1) by focusing on the "whole" instead of part of the person. Encompassing the variables of physiological, psychological, developmental, sociocultural and spiritual focuses on the "whole" being. The findings in this study indicated a possible relationship between the internal variables of knowledge of aseptic technique and basic RN nursing educational preparation. Relating these nursing interventions with a positive patient outcome (infection control) helps promote a safe environment for the patient. Depending on whether the person's system is in a state of wellness or experiencing some state of stress may affect decision making skills. Continued research in the area of nursing interventions affecting patient outcomes is needed to optimize patients' health.

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APPENDICES

APPENDIX A

LETTER OF TRANSMITTAL TO NCB: PNI

September 8, 1997

President
National Certification Board: Perioperative Nursing, Inc.
2170 South Parker Road, Suite 295
Denver, CO
80231

Dear President:

My name is Anne Burnett and I am a graduate nursing student enrolled at Montana State University-Great Falls Extended Campus pursuing a Master's degree in Nursing. I have also been a member of AORN for the past seventeen years and currently am a member and editor of the Nurse Educator/Clinical Nurse Specialist Specialty Assembly.

I am currently working on my thesis "Factors effecting Aseptic Technique of Perioperative Personnel". In this study, I plan to collect demographic information, measure the participant's knowledge of aseptic technique, and ask them what factors they think may contribute to deviations in aseptic technique. As I have searched for a tool for measuring aseptic technique, I discovered the Test Questions in Chapter 10 "Establish and Maintain a Sterile Field" (pp. 143-144) in the NCB:PCI Study Guide Third Edition. I am requesting permission to use the Test Questions and Answers as the tool for my study. I am also interested in analyzing any data or reports gathered from NCB: PNI regarding aseptic technique or infection control from nurses who have taken the certification exam. I would also be interested in the reliability and validity statistics regarding the certification exam or, if possible, the infection control section.

In addition to the personal gain for furthering my own studies, there are gains for NCB: PNI as well. By utilizing the Test Questions from the Study Guide, the study will further increase the validity and reliability of the tool. I am also willing to share the data and results with NCB: PNI. The AORN Nursing Research Committee has also identified as a priority "aseptic practice-level of knowledge regarding handling of sterile items-the level of acceptance vs. compliance". This thesis will provide direction for quality improvement activities to promote positive patient outcomes and, perhaps, promote the use of qualified nurses in the perioperative arena. I look forward to your response.

Sincerely,



Anne M. Burnett, RN, CNOR
915 Ave. C NW
Great Falls, MT
59404
406-455-5271 (W)
406-452-9454 (H)
406-455-4967 (F)

APPENDIX B

LETTER OF RESPONSE FROM NCB: PNI

**National Certification Board: Perioperative Nursing, Inc.**

2170 South Parker Road • Suite 295 • Denver, Colorado 80231

(303) 369-9566 • (888) 257-2667(CNOR)

FAX (303) 695-8464 • <http://www.ncbpni.org>

September 19, 1997

Anne Burnett, RN, CNOR
915 Avenue C NW
Great Falls, MT 59404

Dear Ms. Burnett:

I am writing, on behalf of the Certification Board Perioperative Nursing, in response to your request for permission to use the test questions on page 143 and 144 of the *CNOR Study Guide 3rd Edition* for your Master's thesis. We are happy to grant you that permission.

You also stated you were interested in analyzing data gathered by CBPN regarding aseptic technique. We have no data that we could share with you in this area. However, I am enclosing an article on certification that may help you pursue other avenues. You may also want to contact AORN at (800) 755-2676. They may have data in this area, although it would not necessarily be related to the certified individual. You may, however, be able to purchase labels for certified and non-certified nurses to conduct your own survey.

Best wishes on your thesis.

Sincerely,

Pamela S. Gibson, MA (M)(B)
Deputy Executive Director

Enclosure

Accredited by the American Board of Nursing Specialties (ABNS)

APPENDIX C

PERMISSION LETTER FROM HUMAN SUBJECTS COMMITTEE

MONTANA STATE UNIVERSITY-COLLEGE OF NURSING



College of Nursing

Main Campus
Sherrick Hall
P.O. Box 173560
Bozeman, MT 59717-3560
Phone (406) 994-3783
Fax (406) 994-6020

Billings Campus
Campus Box 574
MSU • Billings
Billings, MT 59101
Phone (406) 657-2912
Fax (406) 657-1715

Great Falls Campus
2800 11th Ave. South
Suite 4
Great Falls, MT 59405
Phone (406) 455-5610
Fax (406) 454-2526

Missoula Campus
32 Campus Drive
Missoula, MT 59812-8238
Phone (406) 243-6515
Fax (406) 243-5745

April 24, 1998

Anne Burnett, BSN, RN, CNOR
Graduate Student
Montana State University
College of Nursing
Great Falls Campus

Dear Anne,

I have received your latest proposal to the College's Human Subjects Committee. Since you did send all of the materials to me, I did assume that you were agreeing to an expedited review by the Chair.

I have completed the review and find that you have met the requirements of the committee in the areas of our concerns. I do suggest that now that you have added that subjects are to call you personally for a copy of the results (if they desire) that you have introduced the possibility of a threat to loss of confidentiality as they will have to give you their name and address for the results to be sent. I strongly suggest that you just send a brief copy of the results to each agency operating room in the study and let people read it as they wish and so state within your script and informed consent and proposal.

I will forward permission for you to conduct your study to the office of the Associate Dean and your Chair.

Best wishes with the completion of your thesis.

Sincerely,

A handwritten signature in cursive script, appearing to read "Daryl T. Ries".

Daryl T. Ries, Ph.D., R.N.
Chair, Human Subjects Committee

cc: Dr. Marcia Gragert
Professors S. Hovey & L. O'Conner
Members of the HSRC

APPENDIX D
LETTER OF REQUEST TO HOSPITALS

May 15, 1998

To: _____

From: Anne Burnett, RN, CNOR
Graduate Nursing Student
College of Nursing, Montana State University, Great Falls Campus
2800 11th Ave. South, Suite 4
Great Falls, MT 59405

Re: Variables Associate with Performance of Aseptic Technique by
Perioperative Nurses During the Intraoperative Period

Dear: _____:

I am requesting written permission from your hospital to conduct the above survey with Registered Nurses in your Operating Room Department during the week of June 1-June 7. The written permission letter is enclosed for your review and signature. Also, in the space provided on the letter, indicate the number of Registered Nurses who work only in the intraoperative phase of your Operating Room department. This number will assist in planning for packets needed for distribution in your department and for a baseline data analysis.

Also enclosed is a summary of the proposal which includes the purpose; description of subjects; description of the procedure; description of the risks and benefits; and description of procedure to maintain confidentiality of the data.

Please return the permission letter in the enclosed self addressed stamped envelope to me by Friday, May 22.

Thank you for your participation in this study. Please call me or my thesis advisor at the numbers listed below for any questions.

Sincerely,

Investigator: Anne M. Burnett, RN, CNOR
406-455-5271

Thesis Advisor: Marcia Gragert, RN, PhD, Assistant Professor
406-455-5619

APPENDIX E
PERMISSION LETTER FROM HOSPITALS

PERMISSION LETTER

Re: Survey-Variables Associated with Performance of Aseptic Technique by
Perioperative Nurses During the Intraoperative Period

I, _____, as a designated
representative of _____ Hospital, give my permission to
Anne Burnett, RN, CNOR, Graduate Nursing Student of Montana State
University, Bozeman, Montana to conduct the above survey of Registered
Nurses in our Operating Room department. The procedure for collecting the
data will include distributing and completing the surveys during work hours
when it is suitable for the potential participants and your hospital.

Number of Registered Nurses: _____

Signature

Date

APPENDIX F
SCRIPT

June 1, 1998

Dear _____:

Thank you for participating as a contact person in this study: Variables Associated with Performance of Aseptic Technique by Perioperative Nurses during the Intraoperative Period. Included in this package for you is this letter, a written explanation, and flyer . The flyer is provided for you to post along with the packets in an accessible, convenient area for the participants to pick them up. Also included in this package are the packets for the participants in the study. The packet for each participant contains a written explanation, questionnaire, and self-addressed stamped envelope.

As we discussed in our previous conversations, your role is an access point between myself and the potential participants. Your responsibility will be to identify potential participants at your hospital who meet the study's criteria. Criteria for eligibility are registered nurses who currently work in the perioperative setting as scrubs and/or circulators during the intraoperative period in a traditional operating room setting. Licensed practical nurses and scrub technicians will not be included.

Another responsibility will be to distribute the packets during the data collection period of June 1-June 5. This includes nurses not immediately available due to scheduled work, different shifts, vacation, illness, or float pool nurses. Written permission has been granted by yourself to distribute the packets during working hours when it is suitable to complete the survey for the potential participants and your hospital. The participant may also choose to complete the survey during off hours when it is convenient for them. Please remind the participants to read the written explanation, complete all the questions on the survey, and to contact either myself or my thesis advisor for any other questions. After distributing the packets to the participants, please allow the participants to complete the questionnaire without your presence.

The study is expected to be completed by December 1998. At the completion of the study, a letter will be sent thanking the participants and include the

phone number's of myself and my thesis advisor. You will also be asked to post the letter and summary of the results on a bulletin board in your OR department where the participants communicate with each other. Copies of the entire thesis will be available at each Montana State University library for review by the participants should they so desire.

Please contact either myself, the investigator, and/or my thesis advisor at the phone numbers listed below to answer questions you may have regarding the study.

Investigator: Anne M. Burnett, RN, BSN, CNOR, Graduate Nursing Student
Montana State University, College of Nursing, Great Falls Campus
406-455-5271

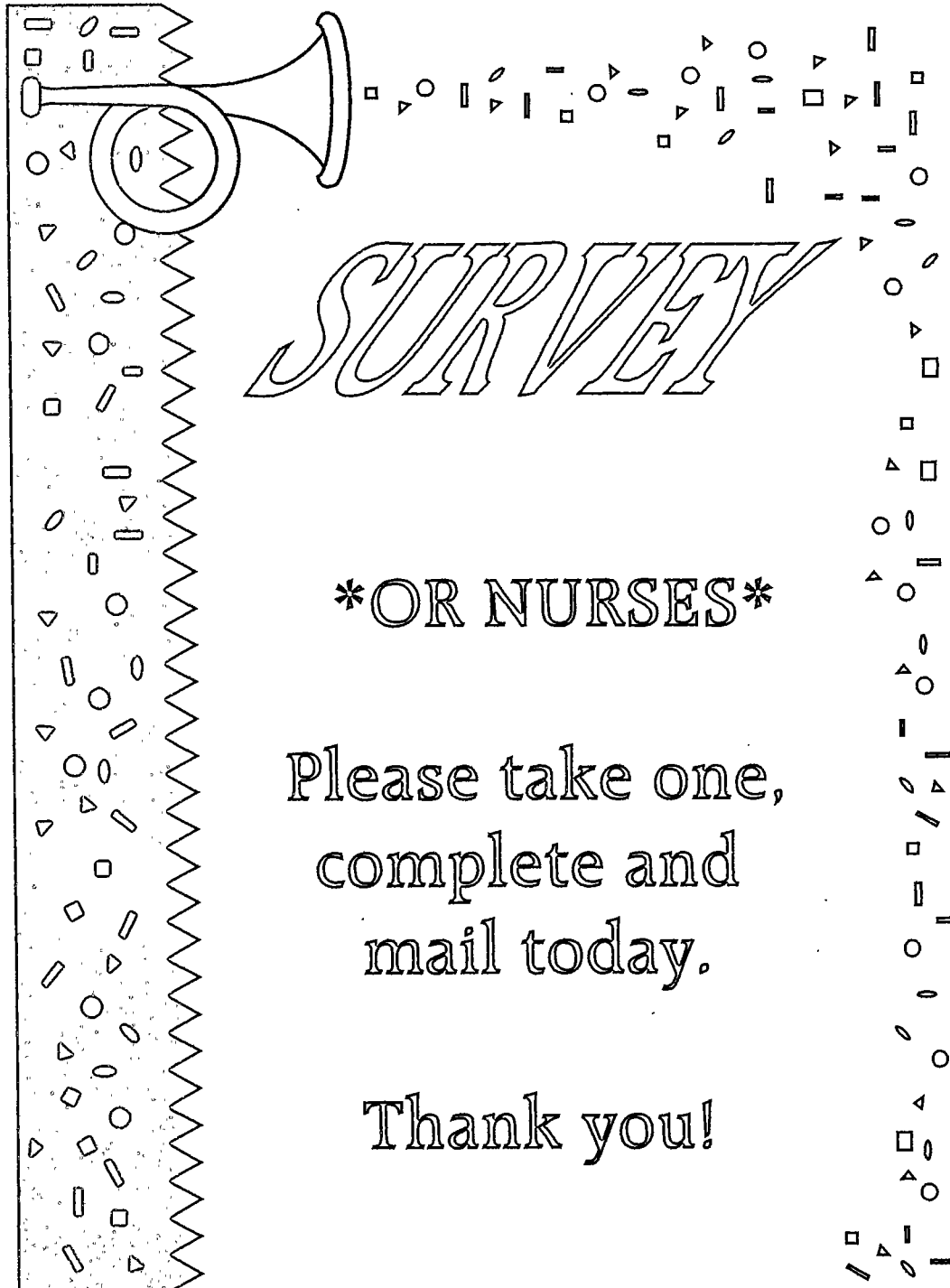
Thesis Advisor: Marcia Gragert, RN, PhD, Assistant Professor
Montana State University, College of Nursing, Great Falls Campus
406-455-5619

Your contribution is greatly appreciated and I thank you.

Sincerely,

Anne M. Burnett, RN, BSN, CNOR

APPENDIX G
FLYER



APPENDIX H
WRITTEN EXPLANATION

WRITTEN EXPLANATION
FOR
PARTICIPATION IN HUMAN RESEARCH
MONTANA STATE UNIVERSITY

Thesis title: Environmental variables associated with performance of aseptic technique by perioperative nurses during the intraoperative period.

You are being asked to participate in a nonexperimental descriptive study to describe the prevalence or incidence of a phenomenon. Knowing the variables associated with the performance of aseptic technique are needed for administrators, educators, clinicians, and researchers who can provide resources to improve performance and ultimately effect, positively, patient outcomes. This study is of no direct benefit to you; however, as the experts, the information you provide could assist nurses and other healthcare providers in identifying and improving specific patient outcomes as they relate to job performance.

You were selected as a possible subject in this study because you are a perioperative registered nurse currently working in the intraoperative phase of a traditional operating room setting within the state of Montana.

The questionnaire asks questions regarding demographics, knowledge of aseptic technique, and an open-ended question as they relate to the perioperative setting. Completion of the questionnaire denotes implied consent. Participating in this study will not represent a risk to you or your job, but it may be an inconvenience because of the time needed to answer the questions. It will take approximately thirty minutes to complete. You may withdraw from the study any time without penalty and without change in any relationship you have with your employer or Montana State University College of Nursing. Written approval by your hospital has been given to this researcher to conduct this survey. Therefore, completion of the survey, during working hours, has also been granted. Participation is optional and may be discontinued any time.

Complete the survey independently either at work or on your own time without the aid of other resources (ie, books, videos, or other people). Please do not write your name or address on the questionnaire or the return envelope. Answer all of the questions on the survey in the time allotted; place in the stamped, addressed envelope; seal; and mail to this researcher today.

You will not be specifically identified in any reports stemming from this study because only the data obtained from the group as a whole will be published. Participants will not be differentiated by site and only grouped together as a whole.

At the completion of the study, a letter and summary of the results will be sent to your hospital's contact person for this survey and posted on a bulletin board in your Operating Room. The letter will include this researcher's name and phone number for any subjects who need to contact this researcher. Copies of the entire thesis will be available at each Montana State University library for review.

This study is expected to be completed December 1998. Please contact either the researcher and/or the instructor at the phone numbers listed below to answer questions you may have regarding the study. Thank you in advance for your participation.

Researcher: Anne M. Burnett, RN, BSN, CNOR, Graduate Nursing Student
Montana State University, College of Nursing, Great Falls
Campus
406-455-5271

Instructor: Marcia Gragert, RN, PhD, Assistant Professor
Montana State University, College of Nursing, Great Falls
Campus
406-455-5619

APPENDIX I
QUESTIONNAIRE

Section I

Please choose one answer and circle your response.

1. Age
 - a. 20-29 years old
 - b. 30-39 years old
 - c. 40-49 years old
 - d. 50-59 years old
 - e. 60 years or older
2. Gender
 - a. Male
 - b. Female
3. Married/Significant other
 - a. Yes
 - b. No
4. Children
 - a. Yes
 - b. No
5. Basic nursing educational preparation
 - a. Diploma
 - b. Associate degree (AD)
 - c. Baccalaureate of Science (BSN)

6. Highest nursing degree attained
 - a. Diploma
 - b. Associate
 - c. Baccalaureate
 - d. Master's
 - e. Doctorate
7. Current role
 - a. staff nurse
 - b. educator/staff development
 - c. manager/director
 - d. other (please specify)
8. Years in current role
 - a. less than 1
 - b. 1-5
 - c. 6-10
 - d. 11-15
 - e. 16-20
 - f. 21-25
 - g. 26 or greater

9. Total years in perioperative setting

- a. less than 1
- b. 1-5
- c. 5-10
- d. 11-15
- e. 16-20
- f. 21-25
- g. 26 or greater

10. Total length of orientation to perioperative setting

- a. less than 1 month
- b. 1 month-5 months
- c. 6 months-1 year
- d. greater than 1 year

11. Frequency of continuing education offerings available in current position

- a. less than 1/month
- b. 1-2/month
- c. 3-4/month
- d. greater than 4/month

Section II

Please circle the correct response.

1. During the preoperative assessment, a patient reports an allergy to shellfish and to IVP contrast media. Based on this information, the preoperative nurse should recognize the need to prep with:
 - a. a substitute antimicrobial agent
 - b. a mild detergent
 - c. the surgeon's preference
 - d. a povidone solution
2. The correct protocol for self gowning and gloving of relief members for a surgical team is to:
 - a. open a sterile gown and gloves on separate surface using aseptic technique
 - b. open a sterile gown and gloves on the back table and have the incoming team member function independently
 - c. permit the scrub nurse to gown and glove the incoming team member
 - d. use the gown and gloves on the back table as a cost effective measure

3. While observing surgery, a medical student who is wearing unsterile surgical attire accidentally brushes against the first assistant's sleeve. In this situation, the perioperative nurse's immediate action should be to:
 - a. tell the first assistant to stop operating and to change into a sterile gown
 - b. call attention to the break in aseptic technique and obtain a sterile sleeve for the first assistant
 - c. tell the medical student to be more careful and to change into a sterile gown
 - d. reprimand the medical student for carelessness and for inattention to the sterile field

4. According to the AORN Recommended Practices, OR attire worn by the OR team should be changed:
 - a. at the conclusion of each case
 - b. when it is visibly soiled or wet
 - c. upon leaving the OR
 - d. at the conclusion of a contaminated case

5. After the OR has been set up for a laminectomy procedure and the patient has arrived in the holding area, the surgery is delayed 2 hours. In accordance with aseptic principles, the perioperative nurse should:
 - a. close the OR door until the patient is brought in
 - b. set up the OR again, using new supplies
 - c. refer to the established policy of the JCAHO
 - d. cover the sterile supplies, using good aseptic technique

6. Which of the following perioperative nursing interventions is most effective for reducing the possibility of contamination of the sterile field?
 - a. consider the gown cuff to be sterile during surgical cases
 - b. the surgical team should handle drapes as little as possible
 - c. sterile drapes should be placed on furniture and equipment
 - d. use the double glove method for operating room personnel
7. Halfway through a bilateral lower extremity debridement and skin graft on a patient with third degree burns, the surgeon requests that the drapes be repositioned farther apart to achieve better surgical access. According to AORN Recommended Practices, the perioperative nurse's most appropriate action is to:
 - a. provide a sterile drape to widen the field
 - b. notify the surgeon that once the drapes are moved, they become unsterile
 - c. place small sterile drapes over the sites uncovered by the repositioning
 - d. use sterile towels to drape the edges of the original drapes
8. The moist internal environment of breathing tubes, connectors, and bags of anesthesia equipment can serve as which of the following for microorganisms?
 - a. portal of entry
 - b. vector
 - c. reservoir
 - d. carrier

9. Upon discovering a hole in his/her glove during a surgical procedure, the perioperative nurse should:
 - a. inspect the glove carefully to determine whether integrity has been lost
 - b. change gloves using the closed glove method
 - c. change gloves using the open gloved method
 - d. place another glove over the compromised glove
10. During an operative procedure, the gloves worn by a perioperative nurse working within the sterile field become contaminated. In removing these gloves, the circulating nurse avoids pulling the cuff of the gown over the nurse's hand, because the:
 - a. new glove may be torn in the process
 - b. stockinette cuff can become contaminated during removal of the glove
 - c. cuff could be easily torn in the removal process
 - d. stockinette cuff is considered unsterile

Section II reprinted with permission from the National Certification Board: Perioperative Nursing, Inc., CNOR Study Guide (1996) 3rd edition, pp. 143-144.

Section III

1. If you performed a break in aseptic technique within the last three months, describe the variables contributing to the break in aseptic technique.

APPENDIX J
ANSWER SHEET SECTION II

1. a
2. a
3. b
4. b
5. b
6. b
7. b
8. c
9. c
10. d

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Nursing Inc., CNOR Study Guide (1996) 3rd edition, pp. 143-144

MONTANA STATE UNIVERSITY - BOZEMAN



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