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**Identification and clinical validation of defining characteristics of
the nursing diagnosis alteration in tissue perfusion: Peripheral**

Oglesby, Sandra Anne/Allen, M.S.

The University of Arizona, 1993

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IDENTIFICATION AND CLINICAL
VALIDATION OF DEFINING CHARACTERISTICS
OF THE NURSING DIAGNOSIS ALTERATION IN TISSUE
PERFUSION: PERIPHERAL

by

Sandra Anne/Allen Oglesby

A Thesis Submitted to the Faculty of the
COLLEGE OF NURSING
In Partial Fulfillment of the Requirements
For the Degree of
MASTER OF SCIENCE
IN NURSING
In the Graduate College
THE UNIVERSITY OF ARIZONA

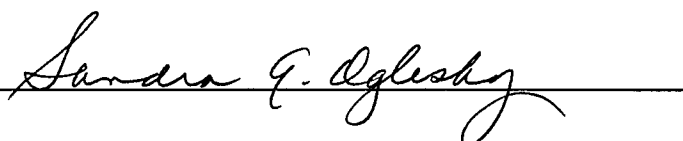
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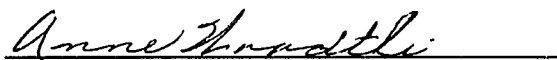
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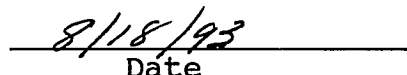


APPROVAL BY THESIS DIRECTOR

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My thanks to my thesis chair, Dr. Anne Woodtli, for her support and direction. She helped make a dream a reality. My thanks to the other members of my thesis committee, Dr. Rose Gerber and Dr. Alice Longman. My thanks to Dr. Ann Quill. My thanks to my Division Chair, Dr. Sara Stark, who gave me a job and allowed and encouraged me to conduct this study.

DEDICATION

For my family: Richard, Michael, Melanie, Jason, Daniel, Pearl, Abednigo, and Shellie, without whose support this could never have been done. For all my students '89-'93, but especially Spring '93. For the Nursing Faculty at Cochise College.

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ABSTRACT

This descriptive study used the Diagnostic Content Validity (DCV) and the Clinical Diagnostic Validation (CDV) models proposed by Fehring (1986) to clinically identify and validate the defining characteristics for Alteration in Tissue Perfusion: Peripheral. The Peripheral Vascular Assessment Tool (PVAT) was designed as the data collection tool; the DCV of the PVAT was 0.75. Twenty subjects, 18 years old and older, were selected from a population who were admitted as in-patients in one rural southwestern hospital. Data were collected through patient interviews, independent nurse assessment, and review of medical records. The CDV score for the validated tool was 0.62. No major defining characteristics and six minor defining characteristics were clinically validated. Differences in defining characteristics were found in the subjects with arterial occlusive disease and those with venous occlusive disease. Findings are applicable to nursing practice and research.

CHAPTER 1

INTRODUCTION

The occurrence of occlusive disease of the extremities is difficult to estimate because many of those affected accommodate to the compromised perfusion by life-style changes and do not enter the health care system. However, the incidence of problems with both arterial and venous peripheral perfusion has been increasing over the last 10 years (Fahey, 1988; Graham & O'Keefe 1988). Over half a million peripheral vascular surgical procedures were performed in 1983, an increase of 50 percent in five years (Graham & O'Keefe, 1988).

The purpose of nursing is to facilitate the health of people (Newman, 1984). The nursing process, a problem solving process, is an orderly, systematic way to determine the individual's health status (Yura & Walsh, 1987). The initial phase of the nursing process is assessment, and the approach to assessment of the client must be systematic and holistic (Guzzetta & Dossey, 1983) to assure the success of the subsequent phases of diagnosis, planning, implementation, and evaluation. Assessment of the client and communication of the assessment to other nurses and health care team members are of primary importance in ensuring efficient and effective care.

The use of nursing diagnosis has become a primary method by which the nurse communicates assessment of the patient's

responses to both psychosocial and physiological health problems. In fact, the American Nurses' Association, in its Social Policy statement describes nursing diagnosis as the "clinical judgment about the responses of an individual, family or community to actual and potential health problems or life processes, which provides the basis for selection of nursing interventions to achieve outcomes for which the nurse is accountable" (Ninth Conference of the North American Nursing Diagnosis Association, 1990, p. 65).

The nursing diagnosis, Alteration in Perfusion: Peripheral, was first identified in 1980 at the Fourth National Conference for the Classification of Nursing Diagnosis where it evolved from the previous diagnosis, interruption in circulation, developed in 1975 (Kim & Moritz, 1982). Findings from nursing research have identified impaired circulation (Suhayda & Kim, 1984), altered peripheral circulation (Kim, Amoroso, Gulanick, Moyer, Parsons, Scherubel, Stafford, Suhayda, Yocum, 1982; Kim, Amoroso-Seritella, Gulanick, Moyer, Parsons, Scherbe, Stafford, Suhayda, Yocum, 1984), altered circulatory integrity (Miaskowski, Spangenberg & Garofallou, 1984), and alteration in circulation (Hubalik & Kim, 1984) as problems that nurses identify and treat. A number of signs and symptoms associated with alteration in perfusion have been identified (Kim & Moritz, 1984). They et al. (1984), recommend further validation of the clinical signs and symptoms present in

patients with alteration in peripheral circulation. However, an extensive review of the literature indicated no reported studies conducted for the purpose of validating the defining characteristics of the nursing diagnosis Alteration in Tissue Perfusion: Peripheral in patients with occlusive disease of the extremities. Defining characteristics are the clinical signs and symptoms which delineate the presence of a nursing diagnosis.

If valid defining characteristics of the nursing diagnosis, Alteration in Tissue Perfusion: Peripheral, are identified, nurses can better communicate, plan and implement appropriate nursing interventions, and evaluate outcomes of care for patients with compromised peripheral perfusion. Identification of valid defining characteristics would provide empirical evidence on which nurses could base their assessment and interventions to provide effective nursing care for those people affected by altered peripheral tissue perfusion.

PURPOSE

The purpose of this study was to identify and clinically validate the defining characteristics associated with the nursing diagnosis, Alteration in Tissue Perfusion: Peripheral, in adult subjects with arterial or venous occlusive disease.

CONCEPTUAL ORIENTATION

This study is based on the conceptual orientation provided by the concept of nursing diagnosis within the construct of

the nursing process. The diagnosis Alteration in Tissue Perfusion: Peripheral, and its defining characteristics are incorporated within this orientation and are depicted in Figure 1.

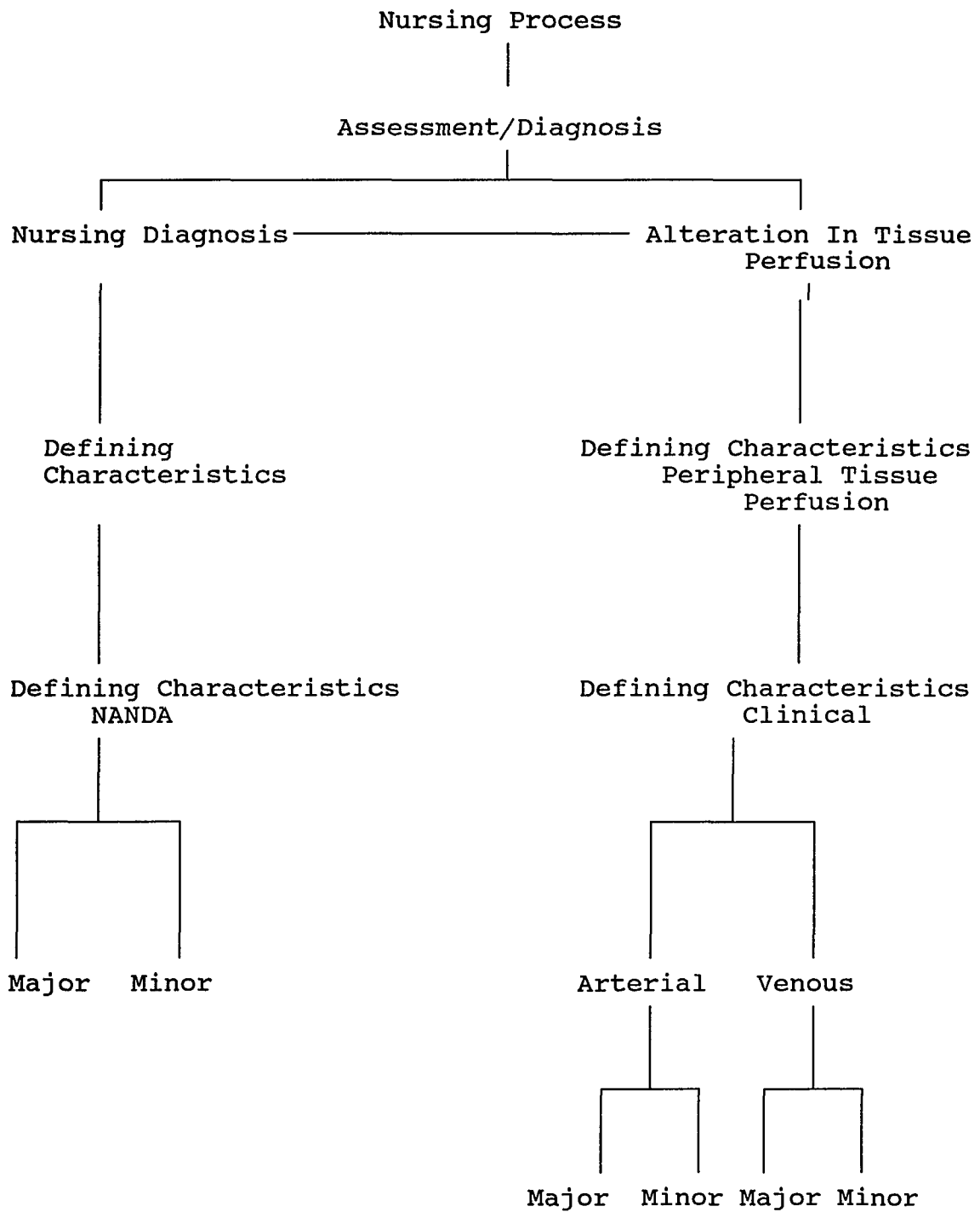


Figure 1. Conceptual Framework: Within the Nursing Process the Assessment/Diagnosis Phase for the Nursing Diagnosis: Alteration in Tissue Perfusion: Peripheral.

NURSING PROCESS

Gordon (1987) stated that the nursing process is a method of problem identification and solution. Carpenito (1992) supported Gordon's belief by stating that nurses use systematic observational and problem-solving techniques to identify the client's status. The nursing process is the method by which this is achieved. Yura and Walsh (1987) called the nursing process the core and essence of nursing. They described it as an orderly, systematic way to determine the client's health status by identifying problems, formulating a plan, implementing the plan, and evaluating the extent to which that plan is effective in promoting optimum wellness and resolving the identified problems.

The nursing process is variously identified as a four-, five-, or six-step process. While Yura and Walsh (1987) identified four steps: assessment, plan, implementation, and evaluation, they implied that once nurses have investigated and agreed on nursing diagnosis nomenclature, nursing diagnosis will precede the planning step. Lash (1978), Avant (1979), Guzzetta and Dossey (1983), and Carpenito (1992) recognize assessment, nursing diagnosis, planning, intervention, and evaluation as the five steps that make up the nursing process. Gordon (1987) identified six steps: assessment, diagnosis, outcome projection, planning, intervention, and outcome evaluation.

While there is a lack of consensus regarding the number of steps in the nursing process, there is agreement that nursing diagnosis is an integral part of the nursing process. It is the phase in which the nurse uses the problem-solving process to arrive at a clinical judgment regarding the cluster of signs and symptoms observed in or expressed by the client. The nurses' diagnostic statement is the judgement or conclusion drawn from client assessment. Therefore, the nursing diagnostic statement describes the responses of the client, psychosocial or physiological, and provides direction for planning, implementation, and evaluation of nursing care.

NURSING DIAGNOSIS

Nursing diagnosis was first described in 1953 by Fry; there have been numerous definitions over the last 39 years. The North American Nursing Diagnosis Association (NANDA) recognizes four different definitions. However, the definition accepted for clinical testing at the ninth conference was:

"A clinical judgment about individual, family or community responses to actual and potential health problems/life processes. Nursing diagnosis provides the basis for selection of nursing interventions to achieve outcomes for which the nurse is accountable" (Ninth Conference of the Classification of Nursing Diagnosis, 1990, p. 65)

According to Gordon (1976), the structural definition of a nursing diagnosis must include three essential components: the health problem statement, the etiology statement (related factors), and the cluster of signs and symptoms or defining

characteristics statement. The first component, or problem statement, is a label which describes the health problem of the client. It is expressed in clear concise terms which represent a cluster of signs and symptoms (Gordon, 1987).

The statement of etiology or related factors is the second component of the nursing diagnostic statement. Carpenito (1992) states that the etiology component identifies the clinical and personal situations that are able to change the health status or influence the problem development of a client. These situations may be psychosocial, physiological, treatment related, situational, or maturational.

The final component of the nursing diagnostic statement consists of the clinical signs and symptoms, or defining characteristics, of the health problem. Defining characteristics are the clinical criteria which validate that a specific health problem is present. Defining characteristics can be both subjective and objective. Major defining characteristics are the clinical criteria which must be present to validate a specific diagnosis. The minor characteristics are clinical criteria which are present in many but not all of the clients to whom the diagnostic label is applied (Carpenito, 1992).

For a nursing diagnosis to be considered valid, the defining characteristics associated with the diagnosis must also be valid. Thus, the cluster of defining characteristics

must be observed in the client for whom a diagnosis is made. If a cluster of defining characteristics occurs and can be identified in the empirical setting, then the defining characteristics are considered valid (Fehring, 1987). Gordon addresses the problem of clinical validation of nursing diagnoses (1984, 1987b) by emphasizing the need for more validation studies of defining characteristics.

The problem statement component of the nursing diagnosis Alteration in Tissue Perfusion: Peripheral was first accepted by the National Conference of Nursing Diagnoses in 1980. It was defined as: "the state in which an individual experiences a decrease in nutrition and oxygenation at the cellular level due to a deficit in capillary blood supply" (McLane, 1985, p. 484). Gordon (1989) defines it as "chronic deficit in blood supply to a part relative to metabolic needs" (p. 138). Five etiologies are listed by Gordon (1989) and Kim, McFarland and McLane (1987). The five etiologies associated with Alteration in Tissue Perfusion: Peripheral are: interruption of arterial flow, interruption of venous flow, exchange problems, hypovolemia, hypervolemia.

Interruption of arterial and venous flow, etiologies associated with altered peripheral tissue perfusion, are caused by arterial and venous occlusive diseases. Several pathophysiological conditions can cause hypovolemia, hypervolemia, and exchange problems.

In summary, the nursing process is the core and essence of nursing (Yura & Walsh, 1987). Incorporated within the nursing process is the nursing diagnostic process. The outcome of the nursing diagnostic process is the nursing diagnostic statement which is made up of three components: the problem, the etiology, and the defining characteristics. For a nursing diagnosis to be valid, defining characteristics, which nurses use to formulate the nursing diagnostic statement, must be valid indicators of the problem.

PROBLEM STATEMENT

Many individuals experience health problems that result in the nursing diagnosis, Alteration in Tissue Perfusion: Peripheral. These problems may be the result of arterial and venous occlusive disease. Nurses caring for these clients in a variety of settings need empirical data on which to base a plan of care. Nursing diagnoses, which are the outcomes of the assessment phase of the nursing process, provide the basis for selection of nursing interventions. If nursing diagnoses are to be effective communication tools and the bases for planning of care, they must be valid. For a nursing diagnosis to be valid, the defining characteristics must be identified and validated in the clinical setting.

No published nursing research findings related to the nursing diagnosis Alteration in Tissue Perfusion: Peripheral were found in an extensive literature review. The defining

characteristics associated with the nursing diagnosis Alteration in Tissue Perfusion: Peripheral have not been validated through clinical study. Therefore, the problem investigated in this study was the identification and clinical validation, by nurses, of the defining characteristics present in adult clients experiencing an Alteration in Tissue Perfusion: Peripheral.

RESEARCH QUESTIONS

This study was designed to answer the following research questions.

1. What is the valid cluster of defining characteristics associated with the nursing diagnosis: Alteration in Tissue Perfusion: Peripheral in adult clients with arterial and venous occlusive disease?
2. What are the major defining characteristics of the nursing diagnosis: Alteration in Tissue Perfusion: Peripheral?
3. What are the minor defining characteristics of the nursing diagnosis: Alteration in Tissue Perfusion: Peripheral?
4. What are the differences, if any, between defining characteristics identified for

clients with arterial occlusive disease and those with venous occlusive disease?

5. What is the perceived degree of importance of each valid defining characteristic in formulating the nursing diagnosis, Alteration in Tissue Perfusion: Peripheral?

DEFINITION OF TERMS

For the purposes of this study, the following terms were defined.

Alteration in Tissue Perfusion: Peripheral: the physiological state in which an individual experiences or is at risk for experiencing a temporary or a chronic decrease or deficit in blood supply to a peripheral area relative to metabolic need (Carpenito, 1992; Gordon 1989). This is operationally defined as the physician documented presence of arterial or venous occlusion present in adult clients who are experiencing an alteration in peripheral tissue perfusion and for whom the nursing diagnosis, Alteration in Tissue Perfusion: Peripheral was made.

Defining characteristics: "clinical criteria that validate the presence of a diagnostic category...either a sign or a symptom expressed or observed in the person with the response" (Carpenito, 1989, p. 15). These are operationally defined as signs and symptoms in the client with the nursing

diagnosis, Alteration in Tissue Perfusion: Peripheral with an individual weighted item score ≥ 0.50 using Fehring's (1987) clinical diagnostic validity (CDV) model.

Major defining characteristics: "signs and symptoms...that must be present in order to validate a particular diagnosis" (Carpenito, 1989, p. 15). This was operationally defined as signs or symptoms with an individual weighted item score of 0.80 or more using Fehring's (1987) CDV model.

Minor defining characteristics: "signs and symptoms that appear to be present in many but not all individuals to whom the diagnosis could be applied" (Carpenito, 1989, p. 15). This was operationally defined as any signs or symptoms with an individual weighted item score of equal to or less than 0.79 but greater than or equal to 0.50 using Fehring's (1987) CDV model.

Nursing process: the problem solving process consisting of five phases: assessment, diagnosis, plan, intervention, and evaluation, which nurses use as a systematic way to determine health care status of a client. For the purposes of this study, the assessment and diagnosis phases of the process will be used for data collection and analysis.

Nursing diagnosis: "a clinical judgment about individual, family or community responses to actual and potential health problems/life processes. Nursing diagnosis

provides the basis for selection of nursing interventions to achieve outcomes for which the nurse is accountable" (Ninth Conference of the Classification of Nursing Diagnosis, 1990, p. 65). This was operationally defined as Alteration in Tissue Perfusion: Peripheral.

Valid cluster: the group of major and minor defining characteristics which indicates the clinical presence of a specific diagnostic category, Alteration in Tissue Perfusion: Peripheral. This was operationally defined as all major and minor defining characteristics with an individual weighted item score equal to or greater than 0.50 using Fehring's (1987) CDV model.

SIGNIFICANCE OF THE STUDY

Nursing diagnoses are names given to clinical judgments made by nurses that focus on human responses to health problems (Kritek, 1985). For nurses to have a common frame of reference to facilitate communication and plan care, nursing diagnoses and their defining characteristics must be clinically validated. Valid nursing diagnoses facilitate communication and provide an empirical base on which nurses assess, diagnose, plan, implement, and evaluate nursing care,

The clinical validation of every NANDA approved nursing diagnosis is important to nursing theory, nursing practice, and nursing research (Fehring, 1987; Gordon & Sweeney, 1970; Newman, 1984; Roy, 1975). The defining characteristics of the

nursing diagnosis, Alteration in Tissue Perfusion: Peripheral have not been clinically validated. Nurses care for many clients with the problem of altered peripheral tissue perfusion. The findings from this study will contribute to the development of a research base for accurate assessment of clients with alterations in tissue perfusion resulting from arterial and venous occlusion. Accurate assessment of patients with alteration in tissue perfusion can enable nurses to more effectively plan, implement, evaluate, and document their care.

SUMMARY

The incidence of health problems as a result of arterial and venous occlusive disease and alterations in peripheral perfusion has been increasing over the last 10 years. Nurses can better deliver care for patients with arterial and venous occlusive disease using nursing diagnoses which are clinically validated. The purpose of this descriptive study was to identify and clinically validate the major and minor defining characteristics of the nursing diagnosis, alteration in peripheral tissue perfusion. The conceptual orientation of this study was based on the concept of nursing diagnosis within the nursing process. The significance of the study to nursing is related to empirical validation of the defining characteristics associated with the nursing diagnosis, Alteration in Tissue Perfusion: Peripheral which can provide

nurses with research based-data on which to more effectively assess, plan, implement, evaluate, and document their care.

CHAPTER 2

LITERATURE REVIEW

INTRODUCTION

A review of the relevant literature related to the nursing process, nursing diagnosis, the nursing diagnosis: Alteration In Tissue Perfusion: Peripheral, and validation of nursing diagnosis is provided in this chapter. The pathophysiology associated with the nursing diagnosis, Alteration of Tissue Perfusion: Peripheral is also discussed.

NURSING PROCESS

One of the earliest references to the nursing process is found in Orlando's (1961) first book, The Dynamic Nurse Patient Relationship. She defined three phases of the process in terms of interpersonal relationships as: "1) the behavior of the patient, 2) the reaction of the nurse and 3) the nursing actions which are designed for the patient's benefit" (p. 36). While the phases of the process are not the same as those accepted today, the essence of the process was similar. In 1967, a faculty group at the College of Nursing at Catholic University, which included Yura and Walsh (1967), identified the phases of the process as assessing, planning, implementing, and evaluating. Yura and Walsh's (1967) book was the first published reference to the four phases of the nursing process. Since that time the nursing process has

become the "core and essence of nursing" (Yura & Walsh, 1988, p. 1).

Beginning in the mid-1970s, a number of people had identified a fifth phase, nursing diagnosis, as the step following assessment (Aspinall, 1976; Avant, 1979; Bloch, 1974; Carpenito, 1983; Guzzetta & Dossey, 1983; Lash, 1978; Mundinger & Jauron, 1975; Roy, 1975). Gordon (1987) distinguished six steps: assessment, diagnosis, outcome projection, planning, intervention, and outcome evaluation. Although Yura and Walsh (1988) still describe only four phases in the process with nursing diagnosis as the final step in the assessment phase, they imply that when nurses have researched and agreed on nursing diagnosis nomenclature, nursing diagnosis will follow the assessment phase. There is general agreement that the nursing process is a systematic problem solving process which is basic to nursing practice (Moritz, 1982). Lash (1978) stated that the nursing process has furnished nurses with a uniform model for practice, which strengthens the scientific nature of the profession. In summary, there is agreement that the nursing process is composed of at least four major phases: assessment or data collection, culminating in a nursing judgement or diagnosis, plan of care, implementation of that care, and constant evaluation of the outcomes of care and re-evaluation of the complete process.

NURSING DIAGNOSIS

The term nursing diagnosis was first used 40 years ago by McManus (1950). Fry (1953) identified five areas of interest for nursing diagnosis based on patient needs. Abdellah (1957) published a definition for nursing diagnosis, and, in 1960, a list of 21 nursing problems. However, it was not until 1973 that the need to identify the nurse's role in the clinical setting led Gebbie and Lavin, two faculty members of St. Louis University, to begin a unified effort to identify and develop nursing diagnoses. They called the First National Conference on Classification of Nursing Diagnoses, which led to the formation of the National Conference Group on classification of Nursing Diagnoses (Gordon, 1984).

Participants in the first conference in 1973 inductively derived diagnostic labels by retrospective empirical identification of patient problems encountered in the practice of nurses attending the conference (Gebbie, 1984). A National Task Force was appointed to continue development in nursing diagnosis between conferences. The members accepted responsibility for work in three areas: information dissemination and exchange, educational activities, and research and development (Gordon, 1984).

Nursing theorists participated in the first conference. However, in 1978, initiated by Roy (1984), a formal group of theorists began to work on the development of a conceptual

scheme to provide an organizing framework for the work of the conference. This parallel inductive and deductive development of nursing diagnosis continued in subsequent conferences.

The conference group has continued with biennial national conferences, as well as more frequent regional conferences. At the 1980 conference, Gordon (1984) stated that eventually research studies would be required for defining new diagnoses and revising existing diagnoses. In 1984, the name of the group was changed to the North American Nursing Diagnosis Association (NANDA) because of the interest exhibited in nursing diagnosis outside the United States. The first Nursing Diagnosis Taxonomy, based on the Unitary Man concept, was accepted at the Seventh National Conference in 1986 (NANDA, 1986).

The American Nurses' Association used the term nursing diagnosis in its definition of nursing in 1980 (1980). Shoemaker (1984), using the Delphi technique, formulated one of the most complete definitions of nursing diagnosis. Carpenito presented (1987) five potential definitions of nursing diagnosis. The North American Nursing Diagnosis Association (NANDA) recognized four definitions of nursing diagnosis until the 9th conference in 1990 (NANDA, 1990). However, for the purposes of this study, nursing diagnosis was defined as:

"A clinical judgment about individual, family or community responses to actual and potential health problems/life processes. Nursing diagnosis provides the basis for selection of nursing interventions to achieve outcomes for which the nurse is accountable" (Ninth Conference on the Classification of Nursing Diagnosis, 1990, p. 65).

Matthews and Gaul (1979) stated that nursing diagnoses are the result of a cognitive process, and that this process involves making a judgment based on knowledge. As a process, it involves the collection, analysis, and synthesis of clinical data (Gordon, 1979). Nursing diagnosis is seen as the logical end product of nursing assessment, preceded by validation of data and followed by a care plan (Mundinger & Jauron, 1975). It is an integral part of the nursing process. For the purposes of this study, nursing diagnosis is accepted as the second phase in a five phase nursing process.

Nursing diagnosis is the conclusion nurses reach on the basis of analysis and synthesis of the clinical data collected during assessment. The observed facts and the appropriate related knowledge of the nurse are synthesized into a concise statement of the client's health problem (Bircher, 1975).

Kim (1986) stated that one of the reasons nursing diagnosis is so important to the nursing profession is that it furnishes the language which is **uniquely** nursing. It provides a method of describing nursing, a language to express the phenomena of the art and science of nursing and a method by

which the expansion of the scientific base of nursing can be accomplished (Kim, 1986). Lash (1978) viewed nursing diagnosis as a route to accountability and autonomy. Gordon (1987) stated that nursing diagnosis provides the structure for knowledge development within nursing science; a method to communicate with those outside the nursing profession, such as third-party payers, and a focus for clinical research. Warner (1983) added that the benefits of nursing diagnosis include standardized communication among nurses, a definition of nursing practice, and a potential basis for theory generation.

The most evident immediate benefits to practicing nurses are the identification and documentation of nursing's unique knowledge and language and the direct implications for nursing interventions. The problem, etiology, and signs and symptoms (PES) design gives nurses a standardized way to describe client health problems, contributing factors and clusters of signs and symptoms. Using the PES format, the problem statement is the NANDA nursing diagnosis which describes the actual state of the client's health (Carpenito, 1989). Situations (clinical or personal) that either influence the development or cause the problem are the contributing factors or etiology (Carpenito, 1989). The statement of defining characteristics is the cluster of signs and symptoms that are empirically observed in the client (Carpenito, 1989). The etiology and the defining characteristics provide the evidence

or verification for the problem statement. It is the combination of these two components of a nursing diagnosis statement that guide the choice of appropriate nursing interventions and nursing care for patients with that nursing diagnosis. The nursing diagnosis, Alteration in Tissue Perfusion: Peripheral was the focus of the study.

ALTERATION IN TISSUE PERFUSION: PERIPHERAL**Pathophysiology**

There are five etiologies listed by Gordon (1989) and Kim, McFarland and McLane (1987) for the nursing diagnostic statement, Alteration in Tissue Perfusion: Peripheral. These are interruption of arterial flow, interruption of venous flow, exchange problems, hypovolemia, and hypervolemia. Of these five, interruption of arterial flow and interruption of venous flow contribute to the peripheral vascular problems considered in this study.

The primary cause of interruption in arterial flow is arterial occlusive disease (West, 1986). While atherosclerosis, an obstructive disease, is the most common arterial disease to which almost half of the deaths in the United States and Europe are attributable (Guyton, 1986), there are a number of other arterial obstructive diseases such as arteritis, Raynaud's syndrome, compartment syndrome, compression syndrome, and hyperviscosity syndromes (Fahey, 1988). Arterial obstructions prevent free flow of blood through the vessels to the tissues. The primary function of this flow of blood is delivery of oxygen and nutrients to the tissues (West, 1986). Decreased flow results in decreased perfusion of the tissues (Ganong, 1981).

Deep vein thrombosis, a venous occlusive problem causing interruption of venous flow, is reported to have 2.5 million

occurrences annually (Hubner, 1986). Interruptions in venous flow take a longer time to cause decreased perfusion than do arterial flow interruptions (West, 1986). The increase in interstitial fluid caused by venous occlusions interferes with nutrient exchange (West, 1986). A plethora of medical conditions and treatments leave people at risk for deep vein thrombosis. The person with deep vein thrombosis is at great risk for thromboembolism, a state in which a thrombus has become free floating in the circulating blood. It is estimated that approximately 50,000 persons die annually from emboli that have become lodged in the lungs; 600,000-700,000 others have non-fatal embolic episodes (Fahey, 1988). According to Ganong (1981), thromboses are major medical problems and are prone to occur when blood flow is sluggish; for example, in the veins of the calf after operations or delivery. Sluggish flow can also result from immobilization of a limb (Fahey, 1988). The slow flow allows the small amounts of normally circulating clotting factors to accumulate instead of being washed away (Guyton, 1986). Thrombosis can develop spontaneously as a complication of varicosities or after trauma (Fahey, 1988). In addition, atherosclerosis frequently leads to thrombosis because of roughened surfaces of the blood vessels (Guyton, 1986).

Nursing Diagnosis

Standardization of nursing knowledge and language is provided through clinical validation of the defining characteristics of individual nursing diagnoses. The label was accepted in 1975 as circulation, interruption of; in 1978 as circulation, interruption of tissue perfusion, chronic abnormal. The nursing diagnosis label, Alteration in Tissue Perfusion: Peripheral was accepted at the 1980 national conference. The nursing diagnosis, labeled in one of several forms other than the present label, of Alteration in Tissue Perfusion: Peripheral, was found in five studies in patients with cardiovascular problems (Hubalik & Kim, 1984; Kim, et al., 1980; Kim, et al., 1984; Suhayda & Kim, 1984; Miaskowski, Spangenberg & Garofallou, 1984).

Two metropolitan teaching hospitals were the site of a study by Kim et al. (1980). The purpose of Kim's study was to identify nursing diagnoses in hospitalized adult patients with cardiovascular diseases. Four clinical nurse specialists were paired with 18 randomly selected staff nurses to form an assessment team. None of the staff nurses was experienced in the identification or use of nursing diagnosis. The clinical nurse specialists prepared and presented a videotaped orientation to the study. Following the orientation, staff nurses took part in a one-hour practice session. After the session, the interrater agreement on two case studies among

the staff nurses and clinical nurse specialists was 97 percent. The 38 patient sample was randomly selected from critical care and general medical-surgical populations. The assessment teams used a coded packet containing an assessment guide, a list of approved nursing diagnoses and worksheets to record the diagnoses, etiology, signs and symptoms, orders and interventions. The clinical nurse specialists performed their independent assessments within six hours of the assessment by the staff nurses (Kim, et al., 1980).

A total of 36 different nursing diagnoses was identified. Twelve of these diagnoses were identified more than three times establishing consensual validity and reliability. Decreases in cardiac output and alteration in coronary circulation were each identified 10 times. Alteration in electrolytes and alteration in peripheral circulation were each identified six times (Kim, et al., 1980).

The same group of researchers repeated this study in 1984 with a randomly selected patient sample of 158 subjects with cardiovascular disorders in critical care and general medical-surgical settings (Kim, et al., 1984). The randomly selected nurses had a minimum of one year's experience identifying and using nursing diagnoses. The same standardization procedures used in the earlier study were followed. The interrater agreement was again 97 percent. The coded packet was the same with the addition of a question regarding the clinical

relevancy of the nursing diagnoses identified. Only 32 patients (20% of the sample) were reassessed by the clinical nurse specialists after the staff nurse assessment. Defining characteristics for the 10 most frequently identified nursing diagnoses by the staff nurses were reported in this study. Alteration in peripheral circulation was the seventh most frequently identified nursing diagnosis. The defining characteristic most frequently associated with alteration in peripheral circulation was indication of peripheral vascular dysfunction, which was clinically defined as: circulatory impairment, decreased peripheral pulses, leg ulcer, previous arterial surgery, intermittent claudication, altered peripheral circulation, vein grafts for coronary artery bypass surgery, amputee, and sensory impairment.

Indicators of hypothermia was the second most frequent defining characteristic associated with altered peripheral circulation. It was clinically defined as: pallor, cool skin, decreased body temperature, change in body temperature, skin temperature change, and skin color change. The report of the study concludes with a recommendation for further validation of defining characteristics for each nursing diagnosis (Kim, et al., 1984).

In a study of nursing diagnoses in patients with heart failure by Hubalik and Kim (1984), surveys in which a clinical congestive heart failure situation was described were

distributed to critical care nurses during three different phases of data collection. The purpose was to identify nursing diagnostic terms associated with interdependent interventions within the scope of nursing practice and to identify their clinical relevancy for nursing practice. Surveys, in which a patient with congestive heart failure was described and in which specific etiologies, defining characteristics and interventions were defined, were distributed to critical care nurses. Expert critical care nurses were sampled in the first and third collection phases. A random selection of 225 critical care staff nurses was sent surveys in phase two. In the first phase, 23 nursing diagnostic labels were identified; the second most frequently identified label was alteration in circulation. No definition of the labels was reported. In the second phase, the nursing diagnosis label alteration in circulation was selected 43 percent of the time, but was not one of the six most frequently identified labels. Kim and Hubalik (1984) recommended more testing and clinical validation of the labels described in the study.

A retrospective chart audit of 50 randomly selected medical and surgical charts in a large metropolitan hospital was conducted by Suhayda and Kim (1984) to evaluate the documentation of the nursing process in critical care and to identify the most commonly documented patient problems. Of

the problem categories, impaired function was one of the two most frequently identified. Within this category, circulatory problems were identified in 76 percent of the cases.

Miaskowski, Spangenberg and Garofallou (1984) conducted a retrospective chart study in a large metropolitan hospital to gather baseline data on nursing diagnoses during the initial implementation of a nursing diagnosis project. A group of 155 medical-surgical charts was chosen from a cross section of nursing units within the hospital. Alteration in circulatory integrity, which was not defined in the report, was the fourth most frequently used nursing diagnosis. The authors stated the defining characteristics must be identified and clinically tested.

Although an extensive literature review was conducted, no published studies on the nursing diagnosis, Alteration in Tissue Perfusion: Peripheral, as it was accepted at the 1980 National Conference, were found. Of the five studies related to alteration in tissue perfusion that were reviewed, one identified defining characteristics. Further clinical validation of either the nursing diagnostic labels or defining characteristics of those labels was recommended in four studies.

VALIDATION

Gordon and Sweeney (1979) introduced and described three models for identifying and validating nursing diagnosis. The

three models are: the retrospective identification model, the clinical model, and the nurse identification model.

The retrospective identification model uses previous experience of nurses. Nurses verbalize descriptions of health problems they have treated in their practice. Sample selection is based on years of experience, clinical specialty, knowledge of nursing diagnosis, and geographic distribution of the nurse subjects. The subjects in the sample are directed to identify specific diagnoses and intervention, working within a specified framework (Gordon & Sweeney, 1979). The advantage of this model is feasibility of achieving consensus from a large, representative sample. The disadvantage is in the potential that the sample of nurses is too heterogeneous (Gordon & Sweeney, 1979).

The clinical model uses verbal data from nurses involved in direct observation of patients or written data from patient charts obtained in the clinical setting. The selection of the sample, the health problem, and the age group to be studied are major considerations in the design used in the clinical setting. Heterogeneity of nurse-data collectors must be minimized through training. As assessment tool, guideline for diagnostic categories, protocols for entering and discharging patients from the study and a data collection format are necessary for use of the clinical model (Gordon & Sweeney, 1979). The advantages of using the clinical model include

feasibility of large samples, incorporation of exploratory designs, and increase in content validity (Gordon & Sweeney, 1979). The disadvantages of the clinical method are training time necessary to achieve interrater reliability and the potential loss of wide geographic representation and randomization (Gordon & Sweeney, 1979).

The nurse validation model is used to determine whether a predetermined cluster of defining characteristics attributed to a nursing diagnostic label is actually associated with that label in the clinical setting (Gordon & Sweeney, 1979). Gordon and Sweeney described two methods of nurse validation: expert panel and the independent assessment of patients by nurses. The expert panel design requires that nurses with expertise in both nursing and defining characteristics review the data collected by another group of nurses in order to obtain consensual validity. The nurse validation model is subject to the same potential loss of geographic representation and randomization as the clinical model. The nurse validation model has the same advantages as the clinical model with the addition of simplification of data collecting procedures possible in the two nurse validation designs (Gordon & Sweeney, 1979).

Fehring (1986) proposed two validation models. The diagnostic content validation (DCV) model and the clinical diagnostic validity models (CDV) are based on Gordon and

Sweeney's methodology (Fehring, 1986). They provide standardization procedures and practical methodologies that enable the researcher to validate nursing diagnoses and their defining characteristics without using the large sample sizes and geographic representation required in Gordon and Sweeney's models.

The DCV model uses a predetermined list of defining characteristics of the nursing diagnosis being studied. Expert opinions are then obtained "...on the degree to which each defining characteristic is indicative of a given diagnosis" (Fehring, 1987, p. 626). A weighted response tool is used. Ensuring that there is a sufficient number of expert nurses is the disadvantage of this method (Fehring, 1987).

The CDV model is used to validate the nursing diagnosis being studied by obtaining evidence of the occurrence associated with the nursing diagnosis (Fehring, 1978). The advantage of this model is that as few as two nurses can collect data using the same tool with a predetermined number of patients. Incorporated into the CDV model is a method to establish an estimation of interrater reliability (Fehring, 1987). Fehring (1987) emphasized the importance of using a NANDA nursing diagnosis, NANDA defining characteristics augmented by characteristics identified in a search of the literature, and expert nurses as data collectors.

SUMMARY

The nursing process was introduced in 1967 and has become the quintessence of nursing. It is a five-phase problem solving process. The term, nursing diagnosis, the second phase of the process, was first used in 1950. In 1973, the National Conference Group on Classification of Nursing Diagnosis began retrospectively developing nursing diagnoses using an inductive method. A nursing diagnosis is the concise synthesis of the conclusion reached on the basis of analysis and synthesis of clinical data collected during patient assessment. Nursing diagnosis provides a uniquely nursing frame of reference for communication of nursing assessment with direct implications for nursing care. The nursing diagnosis statement is composed of three parts: the problem, etiology, and defining characteristics. The nursing diagnosis label of Alteration in Tissue Perfusion: Peripheral was accepted for clinical testing by the National Conference for Classification of Nursing Diagnoses in 1980. At this time, there are no published studies in which the defining characteristics of Alteration in Tissue Perfusion: Peripheral have been validated. The pathophysiology of two of the etiologies associated with altered peripheral tissue perfusion was presented: interruption of arterial flow and interruption of venous flow. Gordon and Sweeney (1979) introduced three models for validation of nursing diagnosis. Fehring (1986)

refined these models to standardize procedures and increase practicality of the methodology. The two models, described by Fehring, diagnostic content validity and clinical diagnostic validity, were presented.

CHAPTER 3

METHODOLOGY

The study design, setting and sample and protection of human subjects are presented in this chapter. The data collection instrument, data collection procedure and data analysis plan are described.

DESIGN

A descriptive research design was used to identify and clinically validate major and minor defining characteristics for the nursing diagnosis, Alteration in Tissue Perfusion: Peripheral, in adult patients with the medical diagnosis of arterial or venous obstruction. Fehring's (1987) Clinical Diagnostic Validity model was used to calculate weighted ratios for each defining characteristic.

The following research questions were identified:

- 1) What is the valid cluster of defining characteristics associated with the nursing diagnosis: Alteration in Tissue Perfusion: Peripheral in adult clients with arterial and venous occlusive disease?
- 2) What are the major defining characteristics of the nursing diagnosis: Alteration in Tissue Perfusion: Peripheral?
- 3) What are the minor defining characteristics of the nursing diagnosis: Alteration in Tissue Perfusion: Peripheral?

- 4) What are the differences, if any, between defining characteristics identified for clients with arterial occlusive disease and those with venous occlusive disease?
- 5) What is the perceived degree of importance of each valid defining characteristic in formulating the nursing diagnosis, Alteration in Tissue Perfusion: Peripheral?

SAMPLE AND SETTING

The convenience sample consisted of 20 adults who were experiencing peripheral perfusion problems and were hospitalized in a rural Southwestern private community hospital. The subjects included in the study met the following criteria:

1. were 18 years of age or older.
2. had a documented medical diagnosis of peripheral vascular disease, phlebitis or deep vein thrombosis on the medical record.
3. were English speaking.

The study was conducted at one hospital in a rural southwestern community. The private, community hospital with 55 inpatient beds, was representative of other small private hospitals in rural communities in the Southwest. This hospital may not be representative of large hospitals in urban areas or in rural areas in other geographic locations.

Patients in the medical, surgical, and the intensive care unit were invited to participate in this study.

PROTECTION OF HUMAN SUBJECTS

The study received approval of the Human Subjects Committees at the clinical site and at the University of Arizona, ensuring the protection of subjects' rights while participating in this study (Appendix A, p. #115).

Anonymity of respondents and confidentiality of data were ensured by using code numbers. Subjects signed a consent form which included a description of the purpose of the study, selection criteria, standard treatment, procedure, risks, benefits, confidentiality and cost to the patient (Appendix B, p. #117).

INSTRUMENT

The Peripheral Vascular Assessment Tool (PVAT), a measurement tool developed by the researcher, was used for data collection (Appendix C, p. #120). The PVAT consisted of 24 items. Three items contained subcategories of signs and symptoms; therefore, the PVAT consisted of a total of 29 potential subjective and objective defining characteristics representing signs and symptoms, identified through a literature search and the author's clinical experience. All the NANDA identified defining characteristics, associated with Alteration in Tissue Perfusion: Peripheral (NANDA, 1990) with the exception of two, lack of lanugo hair, and blood pressure

changes in the affected limb, were included in the tool. Lack of lanugo hair was excluded because it was applicable only to infants. Blood pressure changes in the affected limb was excluded because taking a blood pressure on the affected limb is potentially harmful to a patient with peripheral occlusive disease. One open-ended item provided opportunity to document signs and symptoms identified clinically and not included among the 29 characteristics not listed on the PVAT. The literature search resulted in a final list of potential defining characteristics taken from Carpenito (1992), Gordon (1989), Kim, McFarland and McLane (1987), Wagner (1986) and Taggart (1977). Most of the characteristics on the PVAT were identified in several of the sources. Demographic data, which included age, sex, marital status and primary medical diagnosis, were recorded on the demographic section of the PVAT and were obtained from the medical record.

Nominal and interval level data were recorded on the PVAT. The rating of the presence or absence of the items resulted in collection of nominal data. A five item Likert type scale, used by the nurses assessing the importance of the defining characteristic to formulation of the nursing diagnosis in each subject, resulted in a summed score which generated interval level data (Burns & Grove, 1987).

CONTENT VALIDITY

Fehring's (1987) diagnostic content validity (DCV) model was used to establish content validity for the measurement tool. Fehring's refinement of Gordon and Sweeney's (1979) models was chosen because of its practicality in quantifying nominal data and its successful use in other nursing diagnosis studies (Fadden, Fehring & Kenkel-Rossi, 1987; Kelly, 1989; Levin, Krainovitch & Mitchell, 1989; Norris & Kunes-Connel, 1985). This method enables the researcher to quantify the content validity index that was first described by Waltz and Bausell (1981).

The steps of the DCV model used in this study were:

1. A panel of 10 expert nurses rated each of the items of the PVAT in relation to how characteristic they were of the nursing diagnosis, Alteration in Tissue Perfusion: Peripheral, on a scale from 1 to 5 with 1: not at all characteristic; 2: very little characteristic; 3: somewhat characteristic; 4: quite characteristic; 5: very characteristic.
2. Weighted ratios were calculated for each item as follows: a rating of 5=1.00; 4=0.75; 3=0.50; 2=0.25; 1=0. All of the weights assigned for each item were summed; the total weight was then divided by 10 to represent the

total number of responses by the 10 expert panel members. In this manner a weighted ratio was obtained for each item.

3. The items with a weighted ratio of less than 0.50 were not retained.
4. The DCV score for the total instrument was obtained by summing the weighted ratio scores for each of the 29 items and calculating a mean score by dividing the summed weight by 29.

The content validation panel for the PVAT consisted of 10 experts in medical surgical nursing. They were considered as such because of their clinical expertise and medical-surgical/cardiovascular nursing knowledge. The panel consisted of four master's candidates, four master's prepared nurses, and two doctorally prepared nurses with medical-surgical experience.

To ensure the clarity of each defining characteristic each expert panel member rated each item for clarity on a dichotomous scale of "yes" or "no" in addition to the DCV above. If any item had been rated as not clear by any rater, it would have been revised and resubmitted to the panel. No item was rated unclear.

INTERRATER RELIABILITY

The assessment of patients utilizing the PVAT generates both nominal and interval data. The investigator and a master's prepared nurse with medical-surgical experience functioned as raters for this study. To establish initial interrater reliability estimates, three patients were independently assessed and the PVAT independently completed by the two nurse raters. The scores for each item on the PVAT were compared. To establish interrater reliability for the nominal data generated by the dichotomous scale on the total instrument, the number of agreements was divided by the total number of possible agreements (Burns & Grove, 1987). A 90% agreement rate was pre-established as an acceptable level of interrater reliability (Burns & Grove, 1987).

Interrater reliability for the Likert scale component of the instrument for the interval data was achieved by dividing the number of agreements by the total number of possible agreements. A 90% rate was considered to be an acceptable level to establish interrater reliability (Burns & Grove, 1987).

Prior to the data collection, three patients were assessed to establish an acceptable level of interrater reliability. If the 90% interrater agreement was not achieved with the assessment of a subject, additional review and discussion of the PVAT by the two raters were conducted.

DATA COLLECTION PROCEDURE

The nurse investigator and two nurse-raters assessed subjects for this study. The first nurse-rater became ill early in the study and was replaced by a second nurse-rater. Four subjects assessed by the investigator and the first nurse-rater were included in the study. The second nurse-rater assessed 16 subjects with the investigator for inclusion in this study.

Both the investigator and the second nurse-rater identified patients who met criteria for inclusion in the study. Once a patient was identified as a potential subject, the investigator explained the study and invited the patient's participation. Written permission from the patient was obtained on the informed consent form (Appendix B, p. #117). The investigator recorded the demographic data from the medical record on the PVAT and assigned a code number to the subject.

To decrease disruption for the subjects, both raters independently and simultaneously assessed the patient, completing the dichotomous portion of the PVAT. Subsequently, each rater independently indicated the degree of importance of each of the items (sign or symptom) that was present to the formulation of the nursing diagnosis, Alteration in Tissue Perfusion: Peripheral. The Likert type scale used to measure the degree of importance of the item to the formulation of the

nursing diagnosis consisted of five options as follows: 1= not at all important; 2= not very important; 3= somewhat important; 4= quite important; 5= very important (Kelly, 1989). The completed instruments were then placed in an envelope on the nursing unit and collected by the investigator.

DATA ANALYSIS PLAN

Fehring's (1987) clinical diagnostic validity (CDV) model has been used in several validation studies of nursing diagnoses (Fadden, Fehring & Kenkel-Rossi, 1987; Kelly, 1989; Levin, et al., 1989; Norris & Kunes-Connel, 1985). The CDV model was used to generate quantifiable data from the nominal data categorized on the PVAT. The CDV methodology provides a mean individual CDV score for each item and a total instrument score.

The steps of the CDV model are:

1. Two clinical experts observed and assessed patients who met the criteria for inclusion in the study.
2. The clinicians determined whether items listed on the PVAT were present or absent in the subject.

3. The mean individual CDV scores were calculated for each item. The mean individual CDV score is a weighted item score and is used to ascertain whether the sign or symptom represented by the item is either a major or a minor defining characteristic. It is calculated by the following formula:

$$R = \frac{A}{A+D} \times \frac{\frac{F_1}{N} + \frac{F_2}{N}}{2}$$

Where	A	=	Number of agreements
	D	=	Number of disagreements
	F ₁	=	Frequency of the characteristics observed by the first observer
	F ₂	=	Frequency of the characteristics observed by the second observer
	N	=	Number of subjects observed
	R	=	Mean individual CDV score

4. Items with mean CDV scores less than 0.50 were discarded.
5. Items were considered major defining characteristics if their mean CDV score was 0.80 or more.
6. Items were considered minor defining characteristics if their mean CDV score was 0.50-0.79.

7. The total CDV score was obtained by summing the mean individual CDV scores for each item and then averaging the sum to obtain the total instrument score (Fehring, 1986).

The items were weighted to prevent an item which has high interrater agreement but is infrequently observed from achieving a high score. Items with mean individual scores of less than 0.50 were discarded. All items with mean individual CDV scores of 0.50 or higher were considered to be clinically valid (Fehring, 1986). Items were ranked according to the individual CDV score.

Data Analysis Plan for Research Questions

What is the valid cluster of defining characteristics associated with the nursing diagnosis Alteration in Tissue Perfusion: Peripheral in adult clients with arterial and venous occlusive disease? All items on the PVAT achieving a CDV score of 0.50 or greater were considered to be a part of the valid cluster of defining characteristics associated with the this nursing diagnosis.

What are the major defining characteristics of the nursing diagnosis Alteration in Tissue Perfusion: Peripheral? All items on the PVAT achieving a CDV score of 0.80 or greater were considered to be major defining characteristics of this nursing diagnosis.

What are the minor defining characteristics of the nursing diagnosis Alteration in Tissue Perfusion: Peripheral? All items on the PVAT achieving a CDV score between 0.50 and 0.79 were considered to be minor defining characteristics of this nursing diagnosis.

What are the differences, if any, between defining characteristics identified for clients with arterial occlusive disease and those with venous occlusive disease? The subjects were separated into two groups: those with arterial occlusive disease, and those with venous occlusive disease. The CDV formula was then used to rate each of the 29 items on the PVAT for the subjects in each group. The scores obtained were used to assess which items received scores of 0.50 or greater, those which achieved a score of 0.80 or greater, those which received a score between 0.50 and 0.79, and what the differences between the items for each group were.

What is the perceived degree of importance of each valid defining characteristic in formulating the nursing diagnosis, Alteration in Tissue Perfusion: Peripheral? To answer this question, the Likert scale used to assess the importance of a specific defining characteristic to the formulation of the nursing diagnosis produced interval data. The ratings of the items on the tool observed in subjects by each rater were averaged to obtain a mean for the degree of importance for each item. Items were ranked from highest to lowest according

to their mean degree of importance. The degree of importance of each item was compared to the mean clinical diagnostic validity score of the item. The purpose of the comparison was to examine whether the items ranked as very important/important were clinically validated and identified as either major or minor defining characteristics.

SUMMARY

A descriptive design was used to identify and clinically validate the major and minor defining characteristics for the nursing diagnosis, Alteration in Tissue Perfusion: Peripheral in adult patients with arterial and venous obstruction. The convenience sample of 20 adult subjects had a medical diagnosis of peripheral vascular disease, phlebitis, or deep vein thrombosis. The measures for the protection of human subjects were described. The data collection tool was developed from a literature search and the author's clinical experience. Content validation was accomplished using Fehring's (1986) Diagnostic Content Validity methodology. Procedures for determining interrater reliability were described. Methods for data collection and the data analysis plan using Fehring's (1987) Clinical Diagnostic Validity model was described.

CHAPTER 4
RESULTS OF DATA ANALYSIS

INTRODUCTION

The purpose of this study was to identify and clinically validate the defining characteristics associated with the nursing diagnosis, Alteration in Tissue Perfusion: Peripheral in adult subjects with arterial or venous occlusive disease. In this chapter, a description of the population sample, diagnostic content validity of the assessment tool, and findings related to the clinical validation of a cluster of defining characteristics is presented.

CONTENT VALIDITY

The Peripheral Vascular Assessment Tool (PVAT) was developed to identify and quantify subjective and objective defining characteristics of the nursing diagnosis Alteration in Tissue Perfusion: Peripheral. The PVAT was a compilation of items representing actual or potential defining characteristics associated with the nursing diagnosis, Alteration in Tissue Perfusion: Peripheral identified by the North American Nursing Diagnosis Association (NANDA), a nursing literature search, and the clinical experience of the investigator. These items represent signs and symptoms frequently present in patients with arterial or venous occlusive disease.

To establish content validity of the tool, Fehring's (1986) Diagnostic Content Validity methodology was employed. The PVAT was distributed to 10 experts in medical-surgical nursing. Content validity of the PVAT was established as described in Chapter 3. A five point Likert type scale ranging from a rating of 1, not at all characteristic to a rating of 5, very characteristic was used by the panel of experts to rate the diagnostic content validity of the items representing potential subjective and objective defining characteristics. The scale rating was converted for analysis as follows: a) 1=0.00, b) 2=0.25, c) 3=0.50, d) 4=0.75, e) 5=1.00.

All the items received a minimum Diagnostic Content Validity (DCV) score of equal to or greater than 0.50 and were retained for testing. Although there were 24 items, three items had from two to four subcategories. Therefore, a total of 29 potential defining characteristics were included in the PVAT. The PVAT included five items representing subjective defining characteristics and 24 items representing objective defining characteristics.

The mean diagnostic content validity (DCV) ratings for the five items representing subjective defining characteristics and the 24 PVAT items representing objective defining characteristics are presented in Table 1. The total instrument mean DCV score for the nursing diagnosis

Alteration in Tissue Perfusion: Peripheral was 0.75. This mean DCV score exceeds the criteria of 0.60 recommended by Fehring (1986) for validation of a nursing diagnosis.

Table 1

Diagnostic Content Validity Scores of the Items Representing Subjective and Objective Defining Characteristics of the Nursing Diagnosis: Alteration Tissue Perfusion: Peripheral (N=20)

Subjective Item	Score
1. Verbalizes claudication	.85
2. Verbalizes pain with rest	.78
3. Describes pain as "aching"	.80
4. Verbalized slow healing of lesions on affected extremity	.83
5. Verbalizes paresthesias of affected extremity:	
a. numbness	.78
b. tingling	.73
c. burning	.73
d. deadening	.65
Objective Item	Score
6. Slow healing of lesions of affected extremity	.88
7. Pallor of affected extremity	.85
8. Cyanosis of affected extremity	.85
9. Reactive hyperemia	.75
10. Rubor-redness of affected extremity	.75
11. Pale on elevation and color does not return on lowering the leg	.72
12. Blue or purple skin when extremity is dependent	.83
13. Affected extremity warmer than unaffected extremity	.55
14. Affected extremity cooler than unaffected extremity	.88
15. Shiny skin on affected extremity	.83
16. Capillary refill greater than 3 seconds in affected extremity	.68
17. Edema of affected extremity	.68
18. Loss of motor function in affected extremity	.53

- | | | |
|-----|---|-----|
| 19. | Trophic tissue changes in affected extremity: | |
| | a. hard, slow growing, thick brittle nails on affected extremity | .80 |
| | b. loss of hair on affected extremity | .75 |
| 20. | Round scars covered with atrophied skin on affected extremity | .58 |
| 21. | Gangrene of affected extremity | .80 |
| 22. | Diminished or absent arterial pulses on affected extremity | .93 |
| 23. | Bruits in affected extremity | .68 |
| 24. | Ulceration in affected extremity: | |
| | a. round smooth edges at ulcer area | .60 |
| | b. large irregular edges surrounded by areas of hyperpigmentation on affected extremity | .70 |

*Note. 0.00=Not at all characteristic; 0.25=not very characteristic; 0.50=somewhat characteristic; 0.75=quite characteristic; 1.00=very characteristic

CLINICAL DIAGNOSTIC VALIDITY (CDV) SCORES

In this study, Fehring's (1986) Clinical Diagnostic Validity (CDV) model was used. The individual CDV score and the total CDV score for all items were calculated. The following formula was used to calculate the individual CDV score for each defining characteristic.

$$R = \frac{A}{A+D} \times \frac{\frac{F_1}{N} + \frac{F_2}{N}}{2}$$

Where

A	=	Number of agreements
D	=	Number of disagreements
F1+	=	Frequency of characteristics observed by the first observer
F2	=	Frequency of characteristics observed by the second observer
N	=	Number of subjects observed
R	=	Individual CDV score

The mean CDV scores for each item representing the subjective and objective defining characteristics of the PVAT is displayed in Table 2.

To determine the total CDV score for the nursing diagnosis as a whole, the mean CDV scores of the clinically validated defining characteristics (those whose mean score was greater than or equal to 0.50) were summed and then averaged. The total CDV score for the nursing diagnosis Alteration in Tissue Perfusion: Peripheral as measured by the PVAT was 0.62. This score meets the 0.60 criteria recommended by Fehring (1986) for validation of a nursing diagnosis.

DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

The sample consisted of 20 subjects selected from a population of patients admitted to a private rural southwestern community hospital with a medical diagnosis of peripheral vascular disease, phlebitis or deep vein thrombosis. Description of the sample by gender, admitting medical diagnosis, marital status, and age are presented in Table 3.

Venous occlusive disease accounted for 65% of the subjects. Thirteen (55%) subjects were admitted with the medical diagnosis of deep vein thrombosis. Thrombophlebitis was the admitting diagnosis for 10% (two) of the subjects. The third medical diagnosis, PVD, accounted for five (25%) of the subjects. Nearly half (45%) of the subjects were married, and about one-third (35%) were widowed.

Numbers of subjects were nearly equal in gender; 55% (n=11) of the subjects were male and 45% (n=9) were female. The ages ranged from 22 to 82, the mean age of the subjects was 61 years (S.D.=16.65) with a mode of 74 years. Only two subjects were in their twenties and 35% of the subjects were below the age of 60. Thus the majority of subjects were between 61 and 79 years of age.

INTERRATER RELIABILITY

The investigator and two clinical nurse experts assessed a total of two patients to attain an initial estimate of

interrater reliability of 93%. After four subjects were assessed by both the investigator and the expert, the first clinical nurse expert was unable to continue in the study because of illness. The second clinical nurse expert, a Master's prepared nurse and doctoral candidate in education, joined the study. Two clients were assessed to attain an initial estimate of interrater reliability of 95%.

Table 2

Clinical Diagnostic Validation Scores for the Items on the
PVAT Representing Subjective and Objective Defining
Characteristics (N=20)

	Subjective	Score
1.	Verbalizes claudication	.18
2.	Verbalizes pain with rest	.53
3.	Describes pain as "aching"	.38
4.	Verbalized slow healing of lesions on affected extremity	.35
5.	Verbalizes paresthesias of affected extremity:	.60
	a. numbness	
	b. tingling	.30
	c. burning	.20
	d. deadening	.30
	Objective	Score
6.	Slow healing of lesions of affected extremity	.28
7.	Pallor of affected extremity	.08
8.	Cyanosis of affected extremity	.18
9.	Reactive hyperemia	.00
10.	Rubor-redness of affected extremity	.58
11.	Pale on elevation and color does not return on lowering the leg	.10
12.	Blue or purple skin when extremity is dependent	.38
13.	Affected extremity warmer than unaffected extremity	.64

14. Affected extremity cooler than unaffected extremity	.00
15. Shiny skin on affected extremity	.25
16. Capillary refill greater than 3 seconds in affected extremity	.04
17. Edema of affected extremity	.66
18. Loss of motor function in affected extremity	.18
19. Trophic tissue changes in affected extremity:	.35
a. hard, slow growing, thick brittle nails on affected extremity	
b. loss of hair on affected extremity	.10
20. Round scars covered with atrophied skin on affected extremity	.08
21. Gangrene of affected extremity	.10
22. Diminished or absent arterial pulses on affected extremity	.63
23. Bruits in affected extremity	.00
24. Ulceration in affected extremity:	.15
a. round smooth edges at ulcer area	
b. large irregular edges surrounded by areas of hyperpigmentation on affected extremity	.00

Note. Individual CDV score of = or > 0.80 qualifies as a major defining characteristic; ≥ 0.79 to ≥ 0.50 qualifies as a minor defining characteristic (Fehring, 1987).

Table 3

Characteristics of Subjects by Age, Sex, Medical Diagnosis and Marital status (N=20)

Category	Frequency	Percentage
Gender		
Male	11	55%
Female	9	45%
	<hr/> 20	
Medical Diagnosis		
Deep Vein Thrombosis	13	65%
Thrombophlebitis	2	10%
Peripheral Vascular Disease	5	25%
	<hr/> 20	
Marital Status		
Married	9	45%
Single	3	15%
Divorced	1	5%
Widowed	7	35%
	<hr/> 20	
Age		
21-40	2	10%
41-60	5	25%
61-79	12	60%
>80	1	5%
	<hr/> 20	

The second nurse expert and the investigator assessed 16 subjects to complete the total study of 20 subjects. The most frequent disagreements among all three raters were the degree of importance of each item to the formulation of the diagnosis. The investigator and the second clinical nurse expert consistently discussed refinement of the assessment method and the use of the PVAT.

Assessment of the subjective items on the PVAT was obtained from patient interview information. Subjects were asked to describe both current symptoms and the initial symptoms that caused them to seek medical attention. Both the verbal information from the subject regarding current status of symptoms and the initial symptoms were considered when completing the subjective assessment items of the PVAT. If the client stated that s/he had entered the hospital with edema of the affected extremity, and this information could be verified with the nurse caring for the client and the medical record; edema of the affected extremity was identified as present, even though the edema had resolved at the time of the client interview and assessment.

The nurse raters rarely disagreed concerning the presence of objective and subjective items on the PVAT. More frequently disagreement concerned the degree of importance of the signs and symptoms in making the nursing diagnosis. It became clear as the study progressed that the differences

observed in subjects with a venous or arterial medical diagnosis affected the decision about the degree of importance of each item.

Calculations of the interrater reliability values among the three raters for each observed item on the PVAT for all 20 subjects were completed. The percent of agreement ranged from 93-100% between the investigator and the first clinical nurse expert on the first four subjects included in the study and the percent of agreement between the investigator and the second clinical nurse expert for remaining the 16 subjects ranged between 93-100%; they reached 100% agreement 40% of the time.

RESEARCH QUESTIONS

To guide the presentation of the results of data analysis, findings related to each research questions are reported.

RESEARCH QUESTION ONE:

What is the valid cluster of defining characteristics associated with the nursing diagnosis: Alteration in Tissue Perfusion: Peripheral in adult clients with arterial and venous occlusive disease? Mean CDV scores of ≥ 0.50 were used to determine the cluster of clinically valid defining characteristics. Table 4 displays the six clinically validated defining characteristics for the nursing diagnosis Alteration of Tissue Perfusion: Peripheral.

RESEARCH QUESTION TWO

What are the major defining characteristics of the nursing diagnosis: Alteration in Tissue Perfusion: Peripheral? Fehring (1987) recommended that in order for any

Table 4

The Cluster of Clinically Validated Defining Characteristics for Clients With Either Venous or Arterial Occlusive Disease (N=20)

Defining Characteristic	CDV Score
1. Edema of affected extremity	.66
2. Affected extremity warmer than unaffected extremity	.65
3. Diminished or absent arterial pulses on affected extremity	.63
4. Verbalizes numbness (paresthesias) of affected extremity	.60
5. Rubor-redness of affected extremity	.58
6. Verbalizes pain of extremity with rest	.53

Note. Individual CDV score of = or > 0.80 qualifies as a major defining characteristic; ≥ 0.79 to ≥ 0.50 qualifies as a minor defining characteristic (Fehring, 1987).

defining characteristic to qualify as a major defining characteristic it should have an individual CDV score of ≥ 0.80 . No individual item scored higher than 0.66, therefore, no major defining characteristic was validated. However, if the four subjective defining characteristics concerned with some form of pain ("verbalizes claudication," "verbalizes pain with rest," "describes pain as aching," and "verbalizes burning [paresthesias] of affected extremity") were combined, and each report of any one of these four items was used as a report of "pain" the CDV for the item "pain" was 0.85.

Table 5 presents the items representing subjective and objective defining characteristics ranked from highest to lowest according to their mean CDV scores. No item representing subjective or objective defining characteristics achieved a mean individual CDV score of 0.80 or above. Therefore, no major subjective or objective defining characteristics were identified.

RESEARCH QUESTION THREE

What are the minor defining characteristics of the nursing diagnosis: Alteration in Tissue Perfusion: Peripheral? Fehring (1987) recommended that any defining characteristic with an individual CDV score

Table 5

Ranking of Items on the PVAT Representing Subjective and Objective Defining Characteristics According to Individual CDV Scores (N=20)

Subjective Item	Score
1. Verbalizes numbness (paresthesias) of affected extremity	.60
2. Verbalizes pain of extremity with rest	.53
3. Describes pain of extremity as "aching"	.38
4. Verbalizes slow healing of lesions on affected extremity	.35
5. Verbalizes tingling (paresthesias) of affected extremity	.30
6. Verbalized deadening (paresthesias) of affected extremity	.30
7. Verbalized burning (paresthesias) of affected extremity	.20
8. Verbalizes claudication	.18
Objective Item	CDV Score
1. Edema of affected extremity	.66
2. Affected extremity warmer than unaffected extremity	.65
3. Diminished or absent arterial pulses on affected extremity	.63
4. Rubor-redness of affected extremity	.58
5. Blue or purple skin when extremity dependent	.38
6. Trophic tissue changes: hard, slow growing, thick nails on affected extremity	.35
7. Slow healing of lesions of affected extremity	.28
8. Shiny skin on affected extremity	.25

9.	Cyanosis of affected extremity	.18
10.	Loss of motor function in affected extremity	.18
11.	Ulceration: round smooth edges at ulcer edge in affected extremity	.15
12.	Pale on elevation and color does not return on lowering leg	.10
13.	Loss of hair on affected extremity	.10
14.	Gangrene of affected extremity	.10
15.	Pallor of affected extremity	.08
16.	Round scars covered with atrophied skin on affected extremity	.08
17.	Affected extremity cooler than unaffected extremity	.04
18.	Capillary refill greater than 3 seconds in affected extremity	.04
19.	Reactive hyperemia	.00
20.	Bruits in affected extremity	.00
21.	Ulceration: large irregular edges surrounded by areas of hyperpigmentation on affected extremity	.00

Note. Individual CDV score of = or > 0.80 qualifies as a major defining characteristic; ≥ 0.79 to ≥ 0.50 qualifies as a minor defining characteristic (Fehring, 1987).

between ≥ 0.79 and ≥ 0.50 be considered as a minor defining characteristic. A mean CDV score between 0.50 and 0.79 was calculated for two of the seven items representing subjective defining characteristics. Therefore, two subjective defining characteristics were clinically validated as minor defining characteristics, "verbalizes numbness of affected extremity" and "verbalizes pain of extremity at rest." Table 5 presents the items representing subjective and objective defining characteristics ranked from highest to lowest according to their mean CDV scores. Of the 21 items representing objective defining characteristics four items achieved a mean CDV score of between ≥ 0.79 to ≥ 0.50 : "edema of affected extremity," "affected extremity warmer than unaffected extremity," "diminished or absent arterial pulses on affected extremity," and "rubor-redness of affected extremity." Therefore, four objective defining characteristics qualified as minor defining characteristics. In summary, six minor defining characteristics were clinically validated for the nursing diagnosis, Alteration in Tissue Perfusion: Peripheral.

RESEARCH QUESTION FOUR

What are the differences, if any, between defining characteristics identified for clients with arterial occlusive disease and those with venous occlusive disease?

Venous Occlusive Disease

Table 6 presents the ranking of the subjective and objective defining characteristics according to their mean CDV score for the 15 clients medically diagnosed with diagnosed venous occlusive disease. The mean CDV score of one subjective item, "verbalizes pain with rest," was greater than 0.50. No mean CDV was greater than 0.80. One objective defining characteristic achieved a mean CDV score of greater than 0.80, "affected extremity warmer than unaffected extremity". Three, "edema of affected extremity," "rubor-redness" of affected extremity," and "diminished or absent arterial pulses on affected extremity," achieved a mean CDV score between 0.50 and 0.79. In summary, for 15 subjects with venous occlusive disease, one major defining characteristic and four minor defining characteristics were validated. Table 7 presents the five clinically validated defining characteristics in clients who had a medical diagnosis of venous occlusive disease (deep vein thrombosis or thrombophlebitis).

Table 6

Ranking of the Items Representing Subjective and Objective
Defining Characteristics in Clients with Diagnosed Venous
Occlusive Disease According to CDV Scores (N-15)

Subjective	CDV Score
1. Verbalizes pain with rest	.67
2. Verbalizes numbness (paresthesias) of affected extremity	.47
3. Verbalizes tingling (paresthesias) of affected extremity	.33
4. Describes pain as "aching"	.31
5. Verbalizes burning (paresthesias) of affected extremity	.27
6. Verbalizes slow healing of lesions on affected extremity	.20
7. Verbalizes deadening (paresthesias) of affected extremity	.13
8. Verbalizes claudication	.11
Objective	Score
9. Affected extremity warmer than unaffected extremity	.80
10. Edema of affected extremity	.74
11. Rubor-redness of affected extremity	.64
12. Diminished or absent arterial pulses on affected extremity	.50
13. Blue or purple skin when extremity is dependent	.40
14. Shiny skin on affected extremity	.20
15. Loss of motor function in affected extremity	.20
16. Trophic changes in affected extremity: hard, slow growing, thick brittle nails on affected extremity	.20

17. Cyanosis of affected extremity	.13
18. Slow healing of lesions of affected extremity	.11
19. Pallor of affected extremity	.06
20. Pale on elevation and color does not return on lowering leg	.06
21. Round scars covered with atrophied skin on affected extremity	.05
22. Reactive hyperemia	.00
23. Affected extremity cooler than unaffected extremity	.00
24. Capillary refill greater than 3 seconds in affected extremity	.00
25. Trophic tissue changes in affected extremity: loss of hair on affected extremity	.00
26. Gangrene of affected extremity	.00
27. Bruits in affected extremity	.00
28. Ulceration in affected extremity: round smooth edges at ulcer area	.00
29. Ulceration in affected extremity: large irregular edges surrounded by areas of hyperpigmentation on affected extremity	.00

Note. Individual CDV score of = or > 0.80 qualifies as a major defining characteristic; ≥ 0.79 to ≥ 0.50 qualifies as a minor defining characteristic (Fehring, 1987).

Arterial Occlusive Disease

Table 8 presents the ranking of the items representing subjective and objective defining characteristics according to their mean CDV score for the five clients with the diagnosis arterial occlusive disease. The mean CDV score of three subjective defining characteristics, "verbalizes numbness (paresthesias) of affected extremity," "verbalizes deadening (paresthesias) of affected extremity," and "verbalizes slow healing of lesions on affected extremity," was greater than 0.80. One, "describes pain as 'aching'," was between 0.50 and 0.79. Three objective defining characteristics, "diminished or absent arterial pulses on affected extremity," "slow healing of lesions of affected extremity," and "trophic tissue changes in affected extremity: hard, slow growing, thick brittle nails on affected extremity," achieved a mean CDV score of greater than 0.80. One item, "ulceration in affected extremity: round smooth edges at ulcer area," attained a mean score between 0.50 and 0.79. Table 9 shows the seven clinically validated defining characteristics in clients who presented with a medical diagnosis of arterial occlusive disease (peripheral vascular disease).

RESEARCH QUESTION FIVE

What is the perceived degree of importance of each valid defining characteristic in formulating the nursing diagnosis, Alteration in Tissue Perfusion: Peripheral?

Degree of Importance of Defining Characteristics

The degree of importance of an item was rated by the investigator and the expert clinical nurse each time the item was judged to be present. The degree of importance was rated on a five point Likert-type scale that ranged from a value of 1, not at all important to a value of 5, very important. These rankings were converted for calculation as follows: a) 1=0.00, b) 2=0.25, c) 3=0.50, d) 4=0.75, e) 5=1.00.

Table 10 compares the mean ratings of the degree of importance of each of the items. Because of acceptable levels of interrater reliability of both nurse Rater 1 and 2, their ratings are combined and compared to that of the investigator.

Table 7

The Cluster of Clinically Validated Defining Characteristics
in Clients With Venous Occlusive Disease (N=15)

Defining Characteristic	CDV Score
1. Affected extremity warmer than unaffected extremity	0.80
2. Edema of affected extremity	0.74
3. Verbalizes pain of extremity with rest	0.67
4. Rubor-redness of affected extremity	0.64
5. Diminished or absent arterial pulses on affected extremity	0.50

Note. Individual CDV score of = or > 0.80 qualifies as a major defining characteristic; ≥ 0.79 to ≥ 0.50 qualifies as a minor defining characteristic (Fehring, 1987).

Table 8

Ranking of Subjective and Objective Defining characteristics
of Clients Diagnosed with Arterial Occlusive Disease According
to Individual CDV Scores (N-5)

	Subjective	Score
1.	Verbalizes numbness (paresthesias) of affected extremity	1.00
2.	Verbalizes deadening (paresthesias) of affected extremity	0.80
3.	Verbalized slow healing of lesions on affected extremity	0.80
4.	Describes pain as "aching"	0.60
5.	Verbalizes claudication	0.18
6.	Verbalizes tingling (paresthesias) of affected extremity	0.20
7.	Verbalizes pain with rest	0.15
8.	Verbalizes burning (paresthesias) of affected extremity	0.00
	Objective	Score
1.	Diminished or absent arterial pulses on affected extremity	1.00
2.	Slow healing of lesions of affected extremity	0.80
3.	Trophic tissue changes in affected extremity: hard, slow growing, thick brittle nails on affected extremity	0.80
4.	Ulceration in affected extremity: round smooth edges at ulcer area	0.60
5.	Pallor of affected extremity	0.40
6.	Cyanosis of affected extremity	0.40
7.	Rubor-redness of affected extremity	0.40
8.	Shiny skin on affected extremity	0.40

9.	Edema of affected extremity	0.40
10.	Trophic tissue changes in affected extremity: loss of hair on affected extremity	0.40
11.	Gangrene of affected extremity	0.40
12.	Blue or purple skin when extremity is dependent	0.33
13.	Pale on elevation and color does not return on lowering leg	0.20
14.	Affected extremity warmer than unaffected extremity	0.20
15.	Capillary refill greater than 3 seconds in affected extremity	0.20
16.	Loss of motor function in affected extremity	0.20
17.	Round scars covered with atrophied skin on affected extremity	0.20
18.	Affected extremity cooler than unaffected extremity	0.15
19.	Reactive hyperemia	0.00
20.	Bruits in affected extremity	0.00
21.	Ulceration in affected extremity: large irregular edges surrounded by areas of hyperpigmentation on affected extremity	0.00

Note: Individual CDV score of = or > 0.80 qualifies as a major defining characteristic; ≥ 0.79 to ≥ 0.50 qualifies as a minor defining characteristic (Fehring, 1987).

Table 9

The Cluster of Defining Characteristics with a CDV Equal to or greater than 0.50 in Clients With Arterial Occlusive Diseasee (N=5)

Defining Characteristic	CDV Score
1. Verbalizes numbness (paresthesias) of affected extremity	1.00
2. Diminished or absent arterial pulses	1.00
3. Verbalizes slow healing of affected extremity	0.80
4. Verbalizes deadening (paresthesias) of affected extremity	0.80
5. Slow healing of lesions of affected extremity	0.80
6. Trophic tissue changes: hard, slow growing, thick brittle nails of affected extremity	0.80
7. Ulceration: round smooth edges at ulcer edge in affected extremity	0.60

Note. Individual CDV score of = or > 0.80 qualifies as a major defining characteristic; ≥ 0.79 to ≥ 0.50 qualifies as a minor defining characteristic (Fehring, 1987).

Table 10

Comparison of the Mean Scores of Degree of Importance to the
Nursing diagnosis Alteration in Tissue Perfusion: Peripheral
According to the Nurse Raters and the Investigator

Subjective Item	Raters Mean Score	Investiga tor Mean Score
1. Verbalizes claudication	0.70	0.75
2. Verbalizes pain with rest	1.00	0.98
3. Describes pain as "aching"	0.84	0.83
4. Verbalized slow healing of lesions on affected extremity	0.61	0.62
5. Verbalizes paresthesias of affected extremity:	0.68	0.68
a. numbness		
b. tingling	0.75	0.75
c. burning	0.60	0.60
d. deadening	0.80	0.80
Objective Item		
6. Slow healing of lesions of affected extremity	0.66	0.64
7. Pallor of affected extremity	0.59	0.75
8. Cyanosis of affected extremity	0.60	0.69
9. Reactive hyperemia		none presented
10. Rubor-redness of affected extremity	0.69	0.69
11. Pale on elevation and color does not return on lowering the leg	0.38	0.38
12. Blue or purple skin when extremity is dependent	0.80	0.89

13.	Affected extremity warmer than unaffected extremity	0.96	0.96
14.	Affected extremity cooler than unaffected extremity	0.80	1.00
15.	Shiny skin on affected extremity	0.60	0.60
16.	Capillary refill greater than 3 seconds in affected extremity	0.25	0.25
17.	Edema of affected extremity	0.93	0.93
18.	Loss of motor function in affected extremity	0.47	0.50
19.	Trophic tissue changes in affected extremity:	0.49	0.49
	a. hard, slow growing, thick brittle nails on affected extremity		
	b. loss of hair on affected extremity	0.63	0.63
20.	Round scars covered with atrophied skin on affected extremity	0.25	0.37
21.	Gangrene of affected extremity	0.38	0.38
22.	Diminished or absent arterial pulses on affected extremity	0.82	0.85
23.	Bruits in affected extremity		none presented
24.	Ulceration in affected extremity:	0.67	0.67
	a. round smooth edges at ulcer area		
	b. large irregular edges surrounded by areas of hyperpigmentation on affected extremity	0.75	0.75

*Note. 0.00=Not at all important; 0.25=not very important; 0.50=somewhat important; 0.75=quite important; 1.00=very important

The subjective item representing the defining characteristic "verbalizes pain at rest" received a degree of importance rating of 0.99 and 0.98, ranking it at very important to the raters in determining the nursing diagnosis Alteration in Tissue Perfusion: Peripheral. Three other items representing subjective defining characteristics were ranked at 0.75 or above, making them quite important in formulating the nursing diagnosis. The other five items representing subjective defining characteristics were ranked between 0.50 and 0.74, somewhat important in degree of importance.

"Edema of affected extremity" was ranked at 0.93. "Affected extremity cooler than unaffected extremity" was ranked at 0.96 by both raters. Therefore, these two items representing objective defining characteristics were considered very important in making the nursing diagnosis Alteration in Tissue Perfusion: Peripheral. Four other items representing objective defining characteristics were rated at 0.75 to 0.93, quite important in selecting the nursing diagnosis. Eleven of the remaining items representative of objective defining characteristics achieved a ranking between 0.50 and 0.74, rating them at somewhat important in making the nursing diagnosis. One of the items representing the defining characteristic "trophic changes: hard, slow growing, thick

brittle nails on affected extremity," was ranked as somewhat important (0.49) by both raters.

The grand mean for each item was calculated by averaging the mean ratings of the degree of importance, of each nurse rater. The mean CDV score of each of the clinically validated characteristics was then compared with the grand mean.

Table 11 shows the means of the nurse raters for the 23 items representing defining characteristics that were rated somewhat important (0.50) or higher. Included in the table is one item: trophic tissue changes: hard, slow growing, thick brittle nails on affected extremity, which received a mean of 0.49. Thirteen items received a mean between 0.49 and 0.74, interpreted as being somewhat important to quite important. Seven were rated from 0.75 to 0.92, quite important, in formulating the nursing diagnosis alteration in Tissue Perfusion: Peripheral. Three items representing defining characteristics with a grand mean of 0.93 to 1.0 were considered very important in making the diagnosis being studied: "verbalizes pain with rest," "affected extremity warmer than unaffected extremity," and "edema of affected extremity."

Table 12 presents the comparison between the grand mean of the nurse raters' evaluation of the degree of importance for the six clinically validated defining characteristics and the mean CDV scores.

SUMMARY

The results of data analysis were presented in Chapter 4. The Diagnostic Content Validity scores and the Clinical Diagnostic Validity scores of each item in the Peripheral Vascular Assessment Tool were described. The total Clinical Diagnostic Validity score of the PVAT was 0.62. The total Diagnostic Content Validity of the PVAT was .75. The analysis by age, medical diagnosis, gender, and marital status of the sample (N=20) was presented. Six minor defining characteristics were identified. The individual CDV scores of the subjects with venous disease and the subjects with arterial disease were also described. The mean evaluations of the degree of importance of the assessed objective and subjective defining characteristics for each of the raters were also reported.

Table 11Mean Degree of Importance of Items on the PVAT N=20)

Items Representing Defining Characteristics	Mean
1. Verbalizes pain with rest	0.99
2. Affected extremity warmer than unaffected extremity	0.96
3. Edema of affected extremity	0.93
4. Affected extremity cooler than unaffected extremity	0.88
5. Blue or purple skin when extremity is dependent	0.85
6. Describes pain as "aching"	0.84
7. Diminished or absent arterial pulses on affected extremity	0.84
8. Verbalizes deadening (paresthesias) of affected extremity	0.80
9. Ulceration in affected extremity large irregular edges surrounded by areas of hyperpigmentation on affected extremity	0.75
10. Verbalizes tingling (paresthesias) of affected extremity	0.75
11. Rubor-redness of affected extremity	0.69
12. Verbalizes numbness (paresthesias) of affected extremity	0.68
13. Pallor of affected extremity	0.67
14. Ulceration in affected extremity round smooth edges at ulcer area	0.67
15. Slow healing of lesions of affected extremity	0.66
16. Cyanosis of affected extremity	0.65

17.	Trophic tissue changes: loss of hair on affected extremity	0.63
18.	Verbalizes slow healing of lesions on affected extremity	0.62
19.	Verbalizes burning (paresthesias) of affected extremity	0.60
20.	Shiny skin on affected extremity	0.60
21.	Verbalizes claudication	0.50
22.	Loss of motor function of affected extremity	0.50
23.	Trophic tissue changes: hard, slow growing, thick brittle nails on affected extremity	0.49

*Note: 0.00=Not at all important; 0.25=not very important; 0.50=somewhat important; 0.75=quite important; 1.00= very important

Table 12

Comparison of the Mean of the Degree of Importance and
the Mean CDV score of the Clinically Validated
Defining Characteristics

Defining Characteristic	Item Mean Degree of Importance ^a	Item Mean CDV Score ^b
1. Edema of affected extremity	0.93	0.66
2. Affected extremity warmer than unaffected extremity	0.96	0.65
3. Diminished or absent arterial pulses on affected extremity	0.84	0.63
4. Verbalizes numbness (paresthesias) of affected extremity	0.68	0.60
5. Rubor-redness of affected extremity	0.69	0.58
6. Verbalizes pain of extremity with rest	0.99	0.53

^a0.00=Not at all important; 0.25=not very important; 0.50=somewhat important; 0.75=quite important; 1.00=very important

^bIndividual CDV score of = or > 0.80 qualifies as a major defining characteristic; ≥ 0.79 to ≥ 0.50 qualifies as a minor defining characteristic (Fehring, 1987).

CHAPTER 5

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

INTRODUCTION

The purpose of this descriptive study was to identify and clinically validate the defining characteristics of the nursing diagnosis Alteration in Tissue Perfusion: Peripheral. In this chapter, a discussion of the findings of this study and their significance to nursing theory, practice and research is presented. Conclusions, limitations and recommendations for further nursing research are discussed.

DISCUSSION OF FINDINGS

Sample

The sample consisted of 11 men and nine women and, as such, was somewhat different than population norms; there are slightly more women than men in the general population. The distribution of medical diagnoses of the subjects included in the sample was skewed. Fifteen subjects (75%) had confirmed venous occlusive disease, while five (25%) had arterial occlusive disease. It is difficult to define the exact percentage of population experiencing occlusive diseases because many accommodate to the disease process (Fahey, 1988) and, therefore, it is not possible to determine the distribution of venous and arterial occlusive disease within the total population. The presenting signs and symptoms of the two pathological processes are not the same; therefore,

the fact that three-quarters of the sample demonstrated venous occlusive disease needs to be considered when examining the findings.

Content Validity: Diagnostic Content Validity and Clinical Diagnostic Validity

The Peripheral Vascular Assessment Tool (PVAT), which consisted of 29 items representing potential defining characteristics associated with the nursing diagnosis, Altered Tissue Perfusion: Peripheral, was developed from the North American Nursing Diagnosis Association's (NANDA) list of defining characteristics, a literature search, and the investigator's clinical experience. The tool was examined for content validity using Fehring's (1986) Diagnostic Content Validity (DCV) model. The total DCV score was 0.75, exceeding Fehring's recommended criteria of 0.60 for a content valid tool. On the basis of the DCV score and individual item scores, all 29 items were retained for clinical testing.

The 29 items representing potential defining characteristics were used as the clinical basis for assessment of 20 subjects. Fehring's (1986) Clinical Diagnostic Validity (CDV) model was used to determine the clinical validity of each of the 29 potential defining characteristics. The CDV for the clinically validated defining characteristics was 0.62, exceeding Fehring's recommended criteria of 0.60 for clinical validation of the total instrument.

Research Questions

Research question number one: What is the valid cluster of defining characteristics associated with the nursing diagnosis: Alteration in Tissue Perfusion: Peripheral in adult clients with arterial or venous occlusive disease? Six defining characteristics achieved a CDV score of ≥ 0.50 as a result of assessment and data analysis using the CDV model. These six defining characteristics met the criteria Fehring suggested for acceptance as clinically validated minor defining characteristics (.50-.79). The six defining characteristics compose the first clinically validated cluster of defining characteristics associated with the nursing diagnosis: Alteration in Tissue Perfusion: Peripheral.

Only one of the six validated defining characteristics is included in the NANDA defining characteristics: "diminished or absent arterial pulses." The NANDA listing identified "diminished arterial pulses" a major defining characteristic, as critical to making the nursing diagnosis. NANDA also includes temperature changes, but specified cold extremities. The findings of this study validated "affected extremity warmer than unaffected extremity." A possible explanation for the finding is the large number of subjects with venous occlusive disease. In venous occlusive disease warmer extremities, rather than findings of both warmer or colder affected extremities, are related to the pathophysiological

process in venous obstruction as contrasted to the pathophysiological outcomes of arterial occlusion. The disease process, venous or arterial, largely determines most of the assessment findings. The NANDA defining characteristics seem to reflect primarily assessment findings in arterial occlusive disease. In summary, one of the six clinically validated defining characteristics in this study is included in the NANDA defining characteristics of the nursing diagnosis: Alteration in Tissue Perfusion: Peripheral.

The second research question: What are the major defining characteristics of the nursing diagnosis Alteration in Tissue Perfusion: Peripheral? No characteristics were identified as major defining characteristics (≥ 0.80) for the total sample of clients with either venous or arterial occlusive disease. However, it is noted that by combining the four subjective defining characteristics concerned with pain and measuring the concept of pain as one item yields a CDV score of 0.85, suggesting the need for further evaluation of pain in some form as a major defining characteristic of the nursing diagnosis.

Claudication is identified as a subjective defining characteristic by NANDA. Other literature (Carpenito, 1992) identifies other types of pain as well as claudication: aching, pain at rest. The findings of this study suggest

that expanding the definition of pain would could lead to its validation as a major defining characteristic.

The third research question: What are the minor defining characteristics of the nursing diagnosis Alteration in Tissue Perfusion: Peripheral? There were six characteristics which received an individual CDV score between ≥ 0.50 and ≤ 0.79 . They met the criteria suggested by Fehring (1986) for clinical validation as minor defining characteristics. These defining characteristics are: "edema of affected extremity," "affected extremity warmer than unaffected extremity," "diminished or absent arterial pulses on affected extremity," "verbalizes numbness (paresthesias) of affected extremity," "rubor-redness of affected extremity," and "verbalizes pain of extremity with rest."

Only one of these defining characteristics is identified by NANDA as associated with the nursing diagnosis: Alteration in Tissue Perfusion: Peripheral. "Diminished or absent arterial pulses" is associated with arterial occlusive disease. It was found in all five subjects with arterial occlusive disease and in eight of the 15n subjects with venous occlusive disease, suggesting it is associated with both pathophysiologic problems. The remaining five validated defining characteristics are commonly associated with venous occlusive disease. The larger number of subjects with venous disease influenced these findings. In summary, six minor

defining characteristics were clinically validated, one of which is identified by NANDA.

The fourth research question: What are the differences, if any, between the defining characteristics identified in clients with venous occlusive disease and those with arterial occlusive disease? The clinically validated defining characteristics "diminished or absent arterial pulses on affected extremity," "verbalized numbness (paresthesias) of affected extremity," and "verbalized pain of extremity with rest" were the only three defining characteristics identified in clients with both arterial and venous occlusive disease. The other three clinically validated characteristics were encountered in clients with venous occlusive disease exclusively.

In the 15 clients with venous occlusive disease one item representing a defining characteristic, "affected extremity warmer than unaffected extremity," achieved an individual CDV score of 0.80, meeting Fehring's (1986) criteria of ≥ 0.80 suggested for major defining characteristics. While none of these defining characteristics are identified by NANDA, Carpenito (1992), Herman (1986), and Wagner (1986), as well as the clinical experience of the investigator, identify these defining characteristics with venous tissue perfusion problems. Throughout the study from the literature search to develop the tool to the DCV scores, it has appeared that many

nurses view Alteration in Tissue Perfusion: Peripheral as an arterial problem. The finding of this descriptive study demonstrates that it is clearly also a venous problem.

In the much smaller group of five clients with arterial occlusive disease, six characteristics achieved a score of 0.80 or greater. They were: "verbalizes numbness (paresthesias) of affected extremity": 1.0; "diminished or absent arterial pulses": 1.0; "verbalizes slow healing of affected extremity": 0.80; "verbalizes deadening (paresthesias) of affected extremity": 0.80; "slow healing of lesions of affected extremity": 0.80; "trophic tissue changes: hard, slow growing, thick brittle nails on affected extremity": 0.80.

Paresthesias of the affected limb: "numbness" and "deadening" were not identified by NANDA as defining characteristics for the nursing diagnosis under study. They were identified in other literature (Carpenito, 1992; Kim, et al., 1984) and the investigator's clinical experience. The other four items are identified by NANDA as associated with the diagnosis under study. Although the number of clients in the study is too small (five) to draw any conclusions, these defining characteristics need to be considered in assessing for the nursing diagnosis Alteration in Tissue Perfusion: Peripheral in the client with arterial occlusive disease. In summary, since most of the defining characteristics

identified by NANDA are associated with arterial disease, further research is needed to better identify defining characteristics associated with venous occlusive disease.

Analysis of the results relating to the fourth research question concerning the differences between defining characteristics in clients with venous occlusive disease and those with arterial occlusive disease revealed obvious differences. It is recommended that a minimum of 11 items representing defining characteristics be retained for further testing because of their individual CDV scores when considering the clients with arterial occlusive disease or the clients with venous occlusive disease separately. Only two of the 11 received a CDV score higher than 0.50 in the total sample, as well as in both the venous group and the arterial group: "diminished or absent arterial pulses on affected extremity" and "verbalized pain of extremity with rest." Three other items representing defining characteristics had a $CDV \geq$ score 0.50 in the venous occlusive group, and six other items representing defining characteristics with a $CDV \geq$ 0.50 in the arterial occlusive group. The differences in the cluster of potential defining characteristics for the client with Alteration in Tissue Perfusion: Peripheral may be related to the pathophysiological etiology of the occlusive problem. As a result these 11 items need to be retained and subjected to further testing on other populations. To further

clarify any differences between the clusters of defining characteristics for clients with venous occlusive disease and those with arterial occlusive disease, separation of the potential defining characteristics into venous and arterial clusters is recommended. The cluster can then be used as a basis for assessment in subsequent studies.

Because of the differences in the number of subjects with venous occlusive disease and arterial occlusive disease and the differences in the identified characteristics for the venous and arterial groups, it is possible that more of the nonvalidated items representing defining characteristics should be retained on the PVAT for further study. Kim, et al. (1984) found "cool skin" to be a defining characteristic of alteration in peripheral circulation. The item on the PVAT "affected extremity cooler than unaffected extremity," ranked as quite important in degree of importance in selecting the nursing diagnosis Alteration in Tissue Perfusion: Peripheral (mean = 0.88) in this study. Its diagnostic content validity was 0.88; however, its diagnostic clinical validity score was 0.00 in this study. Clinical findings in the study did not confirm the results reported by Kim (1984). Therefore, the potential defining characteristic of "affected extremity cooler than unaffected extremity" needs to be further tested in a larger population of clients with vascular occlusive disease before removing it from the PVAT.

The fifth question: What is the perceived degree of importance of the defining characteristics in formulating the nursing diagnosis, Alteration in Tissue Perfusion: Peripheral? The nurse raters judged three clinically validated defining characteristics to be very important. The subjective defining characteristic "verbalizes pain with rest" and the objective defining characteristics "affected extremity warmer than unaffected extremity" and "edema of affected extremity with rest" were rated as very important by the raters with mean scores ranging from .93 to .99. One clinically validated defining characteristic was judged to be quite important with a mean score of 0.84: "diminished or absent arterial pulses on affected extremity." The remaining two clinically validated defining characteristics: "verbalizes numbness (paresthesias) of affected extremity," (0.68) and "rubor-redness of affected extremity" (0.69) were judged to be somewhat important. Six items representing defining characteristics included on the PVAT were judged by the nurse raters to be quite important in making the nursing diagnosis Alteration in Tissue Perfusion: Peripheral; 11 items representing defining characteristics were considered to be somewhat important by the nurse raters in making the nursing diagnosis Alteration in Tissue Perfusion: Peripheral. Twenty-three of the 29 items included on the PVAT that were considered to be at least somewhat important and all

the clinically validated defining characteristics were judged to be at least somewhat important when making the nursing diagnosis.

The small sample and the large number of venous occlusive disease subjects in relation to the number of arterial occlusive disease subjects may account for the finding that 23 items included on the PVAT were considered to be at least somewhat important, while only six items were validated as defining characteristics. In a small rural hospital, frequently clients with major arterial problems are transferred to larger urban hospitals. The health state of clients with venous problems is often less acute and they may be appropriately cared for in a rural community hospital. This acuity factor may have influenced the composition of the convenience sample and, therefore influenced the findings of this study. The belief that tissue perfusion problems are primarily arterial may have been a factor in the judgement of both the expert panel validating the tool and the nurse investigator's assessment of subjects.

There were no recorded field notes. Both nurse raters found the PVAT to be inclusive when assessing the 20 clients included in this study.

CONCLUSIONS

In this small sample, six minor defining characteristics for the nursing diagnosis Alteration in Tissue Perfusion:

Peripheral were validated clinically. The DCV score of 0.77 for the complete PVAT tool exceeded the criteria of 0.60 (Fehring, 1986) for validation of the NANDA nursing diagnosis. The CDV score of 0.62 for the clinically validated defining characteristics exceeded the criteria of 0.60 (Fehring, 1986) for validation of the NANDA nursing diagnosis.

In the only study found that identified defining characteristics of the original NANDA nursing diagnosis: alteration in peripheral circulation, Kim, et al. (1984) found decreased peripheral pulses, leg ulcer, intermittent claudication, sensory impairment, pallor, cool skin, skin temperature changes, and skin color changes in the 30 subjects with that diagnosis. In this study, "diminished or absent arterial pulses on affected extremity" received a DCV score of .93 and a CDV score of .63 in the 20 subject sample. However, in the five subject sample (arterial occlusive disease), it received a CDV score of 1.00. The item "ulceration in affected extremity" was separated into two components. "Round smooth edges at ulcer area" scored .60 (DCV) and 15 (CDV) in the total sample, and .58 in the smaller arterial group. The second component "large irregular edges surrounded by areas of hyperpigmentation on affected extremity" received .70 (DCV) and .00 (CDV) respectively. "Verbalizes claudication" received a DCV score of .85 and CDV score of .18 in the 20 subject sample. Sensory changes had four subcategories:

"numbness" scoring .78 (DCV) and .60 (CDV), validating it as a minor defining characteristic; "tingling" scoring .73 (DCV) and .30 (CDV); "burning" scoring .73 (DCV) and .20 (CDV); and "deadening" scoring .65 (DCV) and .30 (CDV) in the total sample, with an .80 (CDV) in the five subject arterial sample. The item "pallor of extremity" scored .85 DCV and .08 CDV. Skin temperature changes consisted of two items on the PVAT. "Affected extremity warmer than unaffected extremity" scored .55 (DCV) and .65 (CDV), validating it as a minor defining characteristic in this study. "Affected extremity cooler than unaffected extremity" scored .88 (DCV) and .00 (CDV). Skin color changes consisted of four items on the PVAT including "pallor". "Cyanosis of affected extremity" scored .85 DCV and .18 CDV. "Rubor-redness of affected extremity" scored .75 (DCV) and .58 (CDV), validating it as a minor defining characteristic in this study. "Blue or purple skin when extremity is dependent" scored .83 (DCV) and .38 (CDV).

In summary, the findings of this study support four of the findings of the Kim, et al. (1984) study. "Diminished or absent arterial pulses," "numbness of affected extremity," (paresthesias or sensory changes) "affected extremity warmer than unaffected extremity," (temperature changes) and "rubor-redness of affected extremity" (skin color changes) were each validated as minor defining characteristics. "Deadening of affected extremity" a second sensory change was validated in

the small arterial group. Obviously, large numbers of subjects with venous disease influenced the findings. Therefore, further study is needed to better identify defining characteristics in clients with arterial disease and to increase knowledge of defining characteristics in clients with venous disease.

LIMITATIONS

The limitations of this study are as follows:

1. The convenience sample size of 20 subjects prevents generalizability.
2. The skewed sample of 15 venous occlusive subjects and five arterial occlusive subjects may have biased the results to reflect venous occlusive disease.
3. Subjective defining characteristics clinical diagnostic validity may have been biased by ability of subject to call events accurately.

RECOMMENDATIONS

The PVAT needs to be revised to reflect the findings of this study. The four subjective defining characteristics concerning pain may need to be combined into one subjective characteristic. The 11 items including the six clinically validated defining characteristics listed in Table 13 need to be included for further testing. Because of the descriptive nature of this study, the small convenience sample and the

large number of subject with venous occlusive disease, it is important not to prematurely exclude potential defining characteristics.

All of the items representing defining characteristics in the original Peripheral Vascular Assessment Tool received a DCV score of .50 or greater, meeting the criteria for either minor (.50-.79) or major (.80-1.00) defining characteristics and validating the assessment tool. The nurse raters judged 23 of the 29 defining characteristics to be at least somewhat important in making the nursing diagnosis. Therefore, it is also recommended that all 23 of the items judged at least somewhat important in making the nursing diagnosis (Table 11, p.84) be retained in the revised PVAT for further testing. In summary, the items representing signs and symptoms of pain need to be combined. The PVAT needs to be reduced from 29 to 23 items and tested further.

Retaining of the revised PVAT to be re-tested using Fehring's (1986) CDV model with larger samples is also recommended. To achieve a wider geographic representation, a regional or national sample is recommended. In addition, the revised PVAT needs to be re-evaluated for validity and reliability in other subjects. Following testing the revised PVAT with nursing experts, the testing should expand to professional nurses caring for clients with peripheral tissue perfusion problems.

The etiology for the nursing diagnosis Alteration in Tissue Perfusion: Peripheral has been established by NANDA. Because findings of this study included differences in defining characteristics in subjects with arterial or venous occlusive disease, it is recommended that two additional

Table 13

The Cluster of Eleven Defining Characteristics Retained for Assessment With Clients With the Nursing Diagnosis Alteration in Tissue Perfusion: Peripheral

Defining Characteristic	Combined CDV Score	Arterial CDV Score	Venous CDV Score
1. Edema of affected extremity	0.66	—	0.75
2. Affected extremity warmer than unaffected extremity	0.65	—	0.80
3. Diminished or absent arterial pulses on affected extremity	0.63	1.0	0.50
4. Verbalizes numbness (paresthesias) of affected extremity	0.60	1.0	—
5. Rubor-redness of affected extremity	0.58	—	0.64
6. Verbalizes pain of extremity with rest	0.53	0.60	0.67
7. Trophic tissue changes: hard, slow growing, thick brittle nails on affected extremity	0.35	0.80	—
8. Verbalizes deadening (paresthesias) of affected extremity	0.30	0.80	—
9. Slow healing of lesions of affected extremity	0.28	0.80	—
10. Verbalizes slow healing of affected extremity	0.20	0.80	—
11. Ulceration: round smooth edges at ulcer edge in affected extremity	0.15	0.60	—

Note. Individual CDV score of = or > 0.80 qualifies as a major defining characteristic; ≥ 0.79 to ≥ 0.50 qualifies as a minor defining characteristic (Fehring, 1987).

validation methods be used. Fehring's (1986) etiological correlation ratings (ECR) model may be used to indicate the etiology's (venous or arterial) ability to predict the existence of a nursing diagnosis. The differential diagnostic validation (DDV) model can be used to differentiate between levels of the same diagnosis and to differentiate between closely related diagnoses (Fehring, 1987). It is recommended that both of these models be used to determine whether differentiation between the two forms of altered peripheral tissue perfusion is appropriate and, if so, what that differentiation might be.

SIGNIFICANCE TO NURSING

Nursing diagnoses are names given to clinical judgments made by nurses that focus on human responses to health problems (Kritek, 1985). This study, by contributing to the clinical validation of a NANDA nursing diagnosis, helps provide a part of the common frame of reference nurses must have to facilitate communication and plan care. Findings of this study contribute to nursing theory by expanding the knowledge basis of the nursing diagnosis Alteration in Tissue Perfusion: Peripheral. With the use of two previously tested validation models (CDV, DCV), this study provides evidence to support the clinical validation of the nursing diagnosis Alteration in Tissue Perfusion: Peripheral. A new nursing assessment tool, the PVAT, was designed, content validated,

the study were identified. The recommendations for further study were presented. The significance to nursing theory, practice and research of this research were summarized.

and clinically tested with more than 90% percent of agreement among raters. After recommended revision, the PVAT can be used for initial assessment of patients with alterations in tissue perfusion. With the use of a valid and reliable assessment instrument, nurses can effectively plan, implement, evaluate, and document their care. This study has increased the body of nursing research related to a specific nursing diagnosis. It has provided beginning evidence that the nursing diagnosis Alteration in Tissue Perfusion: Peripheral may need to be subcategorized into two levels: arterial and venous. Further research is needed to determine whether the diagnosis is made up of two subcategories or is two separate diagnoses with separate clusters of defining characteristics. Finally, findings have validated six minor defining characteristics which were present in at least 80% of all subjects. In summary, findings of this study have contributed to expanding nursing theory and research related to Alteration In Tissue Perfusion: Peripheral, and has provided and improved base for nursing practice.

SUMMARY

In Chapter 5, a discussion of the significant finding of this study was presented. The Diagnostic Clinical Validity and Clinical Diagnostic Validity of the PVAT were discussed. Findings related to the five research questions were discussed. Conclusions were presented and the limitations of

APPENDIX A

Human Subjects Committee Approval



August 20, 1990

Sandra A. Oglesby, B.S.N., R.N.
c/o Anne Woodtil, Ph.D.
College of Nursing
Arizona Health Sciences Center

RE: A90.118 THE IDENTIFICATION AND CLINICAL VALIDATION OF THE
DEFINING CHARACTERISTICS OF THE NURSING DIAGNOSIS ALTERATION
IN TISSUE PERFUSION: PERIPHERAL

Dear Ms. Oglesby:

We received the revised consent form for your above cited project. The procedures to be followed in this study pose no more than minimal risk to participating subjects. Regulations issued by the U. S. Department of Health and Human Services [45 CFR Part 46.110(b)] authorize approval of this type project through expedited review procedures, with the condition(s) that subjects' anonymity be maintained. Although full Committee review is not required, a brief summary of this project procedures is submitted to the Committee for their endorsement and/or comment, if any, after administrative approval is granted. This project is approved for a period of one year effective 20 August 1990.

The Human Subjects Committee (Institutional Review Board) of the University of Arizona has a current assurance of compliance, number M-1233, which is on file with the Department of Health and Human Services and covers this activity.

Approval is granted with the understanding that no further changes or additions will be made either to the procedures followed or to the consent form(s) used (copies of which we have on file) without the knowledge and approval of the Human Subjects Committee and your College or Departmental Review Committee. Any research related physical or psychological harm to any subject must also be reported to each committee.

A university policy requires that all signed subject consent forms be kept in a permanent file in an area designated for that purpose by the Department Head or Comparable authority. This will assure their accessibility in the event that university officials require the information and the principal investigator is unavailable for some reason.

Sincerely,

William F. Denny, M.D.
Chairman
Human Subjects Committee

WFD:rs

cc: Departmental/College Review Committee

APPENDIX B
Patient Consent Form

Sandra A. Oglesby, RN
College of Nursing, University of Arizona

CONSENT FORM

Project Title: Identification and Clinical Validation of the Nursing
Diagnosis Altered Tissue Perfusion: Peripheral

I AM BEING ASKED TO READ THE FOLLOWING MATERIAL TO ENSURE THAT I AM INFORMED AS TO THE NATURE OF THIS RESEARCH STUDY AND OF HOW I WILL PARTICIPATE IN IT, IF I CONSENT TO DO SO. SIGNING THIS FORM WILL INDICATE THAT I HAVE BEEN SO INFORMED AND THAT I GIVE MY CONSENT. FEDERAL REGULATIONS REQUIRE WRITTEN INFORMED CONSENT PRIOR TO PARTICIPATION IN THIS RESEARCH STUDY SO THAT I CAN KNOW THE NATURE AND THE RISKS OF MY PARTICIPATION AND CAN DECIDE TO PARTICIPATE OR NOT PARTICIPATE IN A FREE AND INFORMED MANNER.

Purpose

I am being invited to voluntarily participate in the above titled research project. The purpose of this project is to study how well a list of symptoms fits my medical condition. This may help nurses take better care of patients who have blood circulation problems in either the legs or the arms.

Selection Criteria

I have been invited to participate because I am 18 years old or older, I have a medical diagnosis of peripheral vascular disease, phlebitis or deep vein thrombosis on the medical record (blood circulation problems in the legs or arms), and I am English speaking.

Standard Treatment (s)

My decision to participate or not participate in this research project will not affect the standard treatment available to me.

Procedure

If I agree to participate, I will be asked to agree to the following while I am hospitalized:

1. Allow an examination of approximately ten minutes with two nurses checking my extremities (arms or legs) by sight and touch for swelling, color, motion and temperature.
2. Answer five questions about the symptoms of my blood circulation problem.
3. Permit the two nurse investigators to examine my medical records.

Risks

There are no known risks involved in my participating in this research project.

Benefits

There are no known benefits to be derived from my participation in this research project.

Confidentiality

My name will not be used in any report of this study. My case will be given a number and only the number will be used in any future publication of this study. Only the two nurse investigators and the research project chairman will have access to the information I give.

Costs

There will be no monetary costs to me and I will not be paid for participation in this study. The examination will take no longer than

ten minutes of my time.

Authorization

Before giving my consent by signing this form, the method, inconveniences, risks, and benefits have been explained to my and my questions have been answered. I understand that I may ask questions at any time and that I am free to withdraw from the project at any time without causing bad feelings or affecting my medical care. My participation in this project may be ended by the investigator or by the sponsor for reasons that would be explained. New information developed during the course of the research project as it becomes available. I understand that this consent form will be filed in an area designated by the Human Subjects Committee of the College of Nursing of the University of Arizona with access restricted to the principal investigator, Sandra A. Oglesby, or authorized representative of the Nursing department. I understand that I do not give up any of my legal rights by signing this form. A copy of this form will be give to me.

Subject's Signature

Date

Guardian (if necessary)

Investigator's Endorsement

I have carefully explained to the subject the nature of the above project. I hearby certify that to the best of my knowledge the person who is signing this consent form understands clearly the nature, demands, benefits, and risks involved in his/her participation. A medical problem or language or educational barrier has not precluded this understanding.

Signature of Investigator

Date

APPENDIX C

Peripheral Vascular Assessment Tool

Sandra A Oglesby
Instrument No. _____
Sandra A. Oglesby
College of Nursing
Home Phone-459-6759

ALTERED PERIPHERAL TISSUE PERFUSION

Circle the appropriate number beside each sign/symptom that indicates whether the sign/symptom is: 1) not at all important, 2) very little important, 3) somewhat important, 4) quite important, 5) very important, in an individual with alteration in peripheral tissue perfusion. Please indicate whether the symptom is present in the yes/no column which appears before each characteristic.

Age _____
Sex _____
Marital Status _____
Medical diagnosis _____

Subjective symptoms

Is the symptom present?

Yes/No

() () 1.	Verbalizes claudication*	1	2	3	4	5
() () 2.	Verbalizes pain of extremity with rest	1	2	3	4	5
() () 3.	Describes pain of extremity as "aching"	1	2	3	4	5
() () 4.	Verbalizes slow healing of lesions on affected extremity	1	2	3	4	5
() () 5.	Verbalizes paresthesias: of affected extremity:					
	a. numbness	1	2	3	4	5
	b. tingling	1	2	3	4	5
	c. burning	1	2	3	4	5
	d. deadening	1	2	3	4	5

Objective signs

() () 6.	Slow healing of lesions of affected extremity	1	2	3	4	5
() () 7.	Pallor of affected extremity	1	2	3	4	5
() () 8.	Cyanosis of affected extremity	1	2	3	4	5
() () 9.	Reactive hyperemia*	1	2	3	4	5
() () 10.	Rubor-redness of affected extremity	1	2	3	4	5
() () 11.	Pale on elevation and color does not return on lowering leg	1	2	3	4	5
() () 12.	Blue or purple skin when extremity is dependant	1	2	3	4	5
() () 13.	Affected extremity warmer than unaffected extremity	1	2	3	4	5

*Definitions: claudication is verbalized by description of pain in the muscles brought on by exercise and relieved by rest.
 reactive hyperemia is considered present when a reddened skin area on an affected extremity does not return to normal color when pressure is removed in less than three seconds.

ALTERATION IN TISSUE PERFUSION: PERIPHERAL 2

Is the symptom present?

Yes No

- | | | | | | |
|---|---|---|---|---|---|
| () () 14. Affected extremity cooler than unaffected extremity | 1 | 2 | 3 | 4 | 5 |
| () () 15. Shiny skin on affected extremity | 1 | 2 | 3 | 4 | 5 |
| () () 16. Capillary refill greater than 3 seconds in affected extremity | 1 | 2 | 3 | 4 | 5 |
| () () 17. Edema of affected extremity | 1 | 2 | 3 | 4 | 5 |
| () () 18. Loss of motor function in affected extremity | 1 | 2 | 3 | 4 | 5 |
| () () 19. Trophic tissue changes in affected extremity | | | | | |
| a. hard, slow growing, thick brittle nails on affected extremity | 1 | 2 | 3 | 4 | 5 |
| b. loss of hair on affected extremity | 1 | 2 | 3 | 4 | 5 |
| () () 20. Round scars covered with atrophied skin on affected extremity | 1 | 2 | 3 | 4 | 5 |
| () () 21. Gangrene of affected extremity | 1 | 2 | 3 | 4 | 5 |
| () () 22. Diminished or absent arterial pulses on affected extremity | 1 | 2 | 3 | 4 | 5 |
| () () 23. Bruits in affected extremity | 1 | 2 | 3 | 4 | 5 |
| () () 24. Ulceration in affected extremity: | | | | | |
| a. round smooth edges at ulcer area | 1 | 2 | 3 | 4 | 5 |
| b. large irregular edges surrounded by areas of hyperpigmentation on affected extremity | 1 | 2 | 3 | 4 | 5 |

25. Other: _____

APPENDIX D
Hospital Approval



300 El Camino Real • Sierra Vista, Arizona 85635 • (602) 458-4641

FAX (602) 458-2268
125

September 17, 1990

Sandra Ogelsby, RN, BSN
10 N.E. James Drive
Sierra Vista, Arizona 85635

Dear Sandra:

Sierra Vista Community Hospital grants you permission to carry out the research "Identification and Clinical Validation of the Defining Characteristics of the Nursing Diagnosis; Alteration in Tissue Perfusion; Peripheral". Perimeters and permissions as described in your proposal are acceptable with the addition of communication with the patient's physician.

Sincerely,

A handwritten signature in cursive script that reads "Alice M. Chait".

Alice M. Chait, RN, MSN
Associate Administrator
Patient Care Services

AMC/mjm

cc: D. Decker

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