



The effects of a cardiac pacemaker on the self-concept of children using the Piers-Harris Childrens self-concept scale  
by Raymone Jeanine Annau

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

Approximately 1 to 2% of all permanent pacemakers implanted annually in the United States are in pediatric clients (Smith, 1990). The physiological effects of a pacemaker have been well documented, while a paucity of literature is available on the psychological and psychosocial effects.

Neuman's System Model and Erik Erikson's theory of self-concept were used as the theoretical framework for this study. The aim of this study was to evaluate the self-concept of children with pacemakers age 10 to 19 years. The study was conducted from October 1994 to March 1995.

The participants were identified by their cardiologists for inclusion in the study. A sample of 20 was obtained with participants residing in Idaho, Montana, and Utah. The Piers-Harris Children's Self-Concept Scale (PHCSCS), a self-report questionnaire, was used as the research tool.

Findings from the study revealed the sample group scored statistically significantly higher on the PHCSCS than the normative sample  $p=0.0008$ . In the current sample boys scored higher than girls, but this finding was not statistically significant.

Implications for nurses from this study include assessment and education of the client and family with a focus on wellness and the promotion of health. Unique opportunities exist for nurses working with these clients. Nurses need to address their educational offerings at the developmental level of their clients.

Further studies are indicated to examine the self-concept of children with pacemakers, as more children receive pacemakers and at an earlier age.

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APPROVAL

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This thesis has been read by each member of the thesis committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

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Date

May 9, 1995

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This work is dedicated to my parents,  
Eugene F. and Lillian M. Annau.

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ABSTRACT

Approximately 1 to 2% of all permanent pacemakers implanted annually in the United States are in pediatric clients (Smith, 1990). The physiological effects of a pacemaker have been well documented, while a paucity of literature is available on the psychological and psychosocial effects.

Neuman's System Model and Erik Erikson's theory of self-concept were used as the theoretical framework for this study. The aim of this study was to evaluate the self-concept of children with pacemakers age 10 to 19 years. The study was conducted from October 1994 to March 1995.

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Implications for nurses from this study include assessment and education of the client and family with a focus on wellness and the promotion of health. Unique opportunities exist for nurses working with these clients. Nurses need to address their educational offerings at the developmental level of their clients.

Further studies are indicated to examine the self-concept of children with pacemakers, as more children receive pacemakers and at an earlier age.

## CHAPTER 1

## INTRODUCTION

Cardiac pacemakers have been in use since the 1960s. One to two percent of all the pacemakers (pulse generators) are implanted in children (Smith, 1990). Pacemakers are devices used to regulate the heart's electrical conduction system. The most common use for a pacemaker in children is congenital complete heart block or complete heart block as a result of surgery for congenital cardiac anomalies. Technical advances, primarily reduction in the size of pacemakers, have increased the use of pacemakers in pediatric clients. Numerous studies have been done with pediatric participants regarding physiological changes with a pacemaker. Other studies addressing psychosocial attitudes or adjustments of self-concept have been done with pediatric clients diagnosed with chronic diseases, that is, diabetes mellitus, asthma, and cerebral palsy. Limited investigations evaluating self-concept have been conducted with pediatric clients with a pacemaker.

### Problem statement

The problem under investigation in this study was to determine if a pacemaker has an effect on the self-concept of children ages 10 to 19 years using the Piers-Harris Children's Self Concept Scale, PHCSCS, (Piers, 1984).

### Purpose

The purpose of this study was to describe what effects, if any, a cardiac pacemaker has on the self-concept of children ages 10 to 19 years, using the PHCSCS. The PHCSCS is an 80 item yes or no answer questionnaire, specifically designed for use with children ages eight to 19 years. The participants were identified by their cardiologist(s) for inclusion in the study. The parent(s)/guardian(s) were asked to sign a consent form which was returned to the researcher (Appendix C). All participants received an assent form (Appendix C). Answer forms were coded to assure each participant had consent and/or had consented to participate in the study. Participation was strictly voluntary and a participant could withdraw at anytime. The study posed no harm to the participant or to participant families. Children with Down's Syndrome, multiple birth defects, or developmental delays were excluded from the study. A sample of 20 was thought to be representative of pediatric clients

with pacemakers for comparison to Piers and Harris's original group. Piers and Harris studied 1,183 children grades four through 12 from a single school district in Pennsylvania. The primary differences this researcher identified were geographic and possible cultural differences. The PHCSCS was used by Long & Hamlin (1988) specifically to look at cultural considerations with Native American children. A review of other cultures by Long & Hamlin (1988) showed no clear indication of low self-concept being related to ethnicity. Rather, relevance of scores seemed more related to environment than ethnicity.

#### Theoretical framework

Neuman's System Model (1982, 1995), originally introduced by Betty Neuman in 1972 and Erik Erikson's theory of development (1950), are integrated for the theoretical framework of this study. In the researcher's opinion, both Neuman and Erikson view the individual as being unique with the environment producing effects which add to the uniqueness of the developing individual. These views are congruent with these two theorists.

"The Neuman Systems Model is based on two major components: stress and the reaction to stress" (Neuman, 1995, p. 22). The goal of the Neuman Systems Model is

maintenance of the client/client system. The client/client system is identified as being unique. Each response of a system part is studied and understood as it relates to the stability of the whole. A wholistic approach to client stabilization, with a dynamic interrelationship of five variables ( physiological, psychological, developmental, sociocultural and spiritual), is the core of the Neuman Systems Model. Each of these variables are ideally "functioning harmoniously or stable in relation to both internal and external environmental stressor influences" (Neuman, 1995, p. 22).

Neuman (1995) bases her systems model on ten assumptions:

1. Although each individual client or group as a client system is unique, each system is a composite of common known factors or innate characteristics within a normal, given range of response contained within a basic structure.
2. Many known, unknown, and universal environmental stressors exist. Each differs in its potential for disturbing a client's usual stability level or normal line of defense. The particular interrelationships of client variables-physiological, psychological, sociocultural, developmental, and spiritual-at any point in time can affect the degree to which a client is protected by the flexible line of defense against possible reaction to a single stressor or a combination of stressors.
3. Each individual client/client system has evolved a normal range of response to the environment that is regarded to as a normal line of defense, or usual wellness/stability state. It represents change over time through coping with diverse stress encounters. The normal line of defense can be used as a standard from which to measure health deviation.
4. When the cushioning, accordion-like effect of the flexible line of defense is no longer capable of protecting the client/client system against an environmental stressor the stressor breaks through the

normal line of defense. The interrelationships of variables-physiological, psychological, developmental, sociocultural, and spiritual-determine the nature and degree of system reaction or possible reaction to the stressor.

5. The client, whether in a state of wellness or illness, is a dynamic composite of the interrelationships of variables-physiological, psychological, sociocultural, developmental, and spiritual. Wellness is on a continuum of available energy to support the system in an optimal state of system stability.

6. Implicit within each client system are internal resistance factors known as lines of resistance, which function to stabilize and return the client to the usual wellness state (normal line of defense) or possibly to a higher level of stability following an environmental stressor reaction.

7. Primary prevention relates to general knowledge that is applied in client assessment and intervention in identification and reduction or mitigation of possible or actual risk factors associated with environmental stressors to prevent possible reaction. The goal of health promotion is included in primary prevention.

8. Secondary prevention relates to symptomatology following a reaction to stressors, appropriate ranking of intervention priorities, and treatment to reduce their noxious effects.

9. Tertiary prevention relates to the adjustive processes taking place as reconstitution begins and maintenance factors move the client back in a circular manner toward primary prevention.

10. The client as a system is in dynamic, constant energy exchange with the environment. (p.21)

Neuman's concept pictorially represented is a basic structure at the center with various solid and broken concentric circles around the basic structure (Fig. 1). The core or "basic structure consists of common client survival factors, as well as unique individual characteristics. It represents the basic system energy resources" (Neuman, 1995, p. 45).

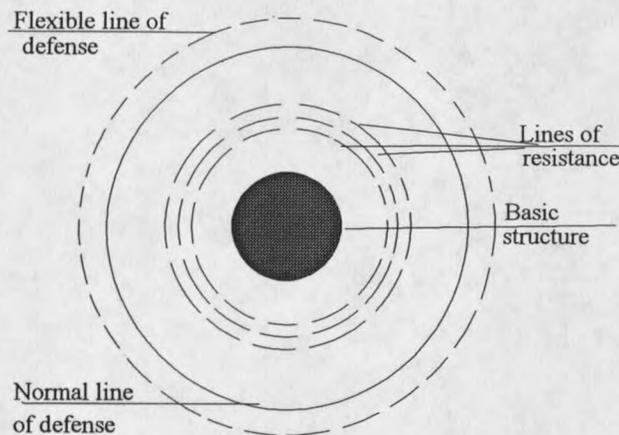


Figure 1. Client/Client System

The client/client system as defined by Neuman (1995) is:

a composite of variables (physiological, psychological, sociocultural, developmental, and spiritual), each of which is a subpart of all parts, forms the whole of the client. The client as a system is composed of a core or basic structure of survival factors and surrounding protective concentric rings. The concentric rings are composed of similar factors, yet serve varied and different purposes in either retention, attainment, or maintenance of system stability and integrity or a combination of these. The client is considered an open system in total interface with the environment. The client is viewed as a system, and the term can be used interchangeably with the client/client system. (p. 45)

The outermost ring is labeled the flexible line of defense. The function/purpose of the flexible line of defense is to protect the basic structure from stressors. Neuman (1995) views the flexible line of defense as accordion-like; "the greater the expansiveness of this line from the normal line

of defense, the greater the degree of protectiveness" (p. 46).

Stressors are any environmental factors (intrapersonal, interpersonal, or extrapersonal) which have the ability to disturb the stability of the system. "A stressor is any phenomena that might penetrate both the flexible and normal lines of defense, resulting in either a positive or negative outcome" (Neuman, 1995, p. 47). Neuman (1995) defines stressors as having negative effects called Entropy or positive effects called Negentropy. A positive effect is produced when the stressor promotes wellness and growth. A negative stressor produces an illness response.

Stressors are identified by Neuman (1995) as intrapersonal, interpersonal, and extrapersonal.

Intrapersonal stressors: Internal environmental forces occurring within the boundary of the client/client system (for example, conditioned response or autoimmune response).

Interpersonal stressors: External environmental interaction forces occurring outside the boundaries of the client/client system at proximal range (for example, between one or more role expectations or communication patterns).

Extrapersonal stressors: External environment interaction forces occurring outside the boundaries of the client/client system at distal ranges (for example, between one or more social policies or financial concerns. (p. 23)

Stressors for the pediatric client with a pacemaker may include: intrapersonal, such as the actual implantation procedure, the location of the implanted pacemaker, the resulting scar from the procedure, the awareness of a

foreign body under the skin; interpersonal, such as reaction or support of family and friends; and extrapersonal, such as the need to have pacemaker checks and evaluations. The pediatric client will usually require the pacemaker for life and will therefore experience numerous explants and implants of the devices.

All internal and external influences surrounding a client/client system are broadly defined as environment. There is a circular nature to the reciprocal relationship between the client and the environment regarding input, output, and feedback, the result being "corrective or regulative for the system" (Neuman, 1995, p.30).

Environmental forces may influence the system either negatively or positively, as well as the system influencing the environment.

All these forces, solely within the client/client system are deemed internal environment. All forces external or existing outside of the client/client system are considered the external environment. The nature and possible outcomes of environmental influences need to be identified, according to Neuman. Neuman (1995) has identified and presented another environment:

the created environment, represents an open system exchanging energy with both the internal and external environment. This environment, developed unconsciously by the client, is a symbolic expression of system wholeness. That is, it acts as an immediate or long-range safe reservoir for existence or the maintenance of system integrity expressed consciously, unconsciously, or both simultaneously. (p. 31)

The dynamic created environment represents the unconscious mobilization of all the system variables by the client. Included in the created environment are those energy factors of the basic structure which support system stability, integrity, and integration.

The purpose of the created environment "is to offer a protective coping, shield or safe arena for system function as the client is usually cognitively unaware of the host of existing psychosocial and physiological influences" (Neuman, 1995, p.31). Incorporating her five variables, Neuman (1995) cites the insulating effects a created environment can make on changes in client/client system response or possible response to environmental stressors: "the use of denial or envy (psychological), physical rigidity or muscular constraint (physical), life-cycle continuation of survival patterns (developmental), required social space range (sociocultural), and sustaining hope (spiritual)" (p.31).

Neuman (1995) believes:

all basic structure factors and system variables influence and are influenced by the created environment, which is developed and maintained through binding energy in varying degrees of protectiveness; at any given place or point in time or over time, it may be necessary to change a situation or the self to cope with threat. The following environmental typology is now established for the Neuman Systems Model:  
 Internal environment-intrapersonal in nature  
 External environment-inter- and extrapersonal in nature  
 Created environment-intra-, inter-, and extrapersonal in nature. (p.31).

The normal line of defense, according to Neuman (1995), is "an adaptation level of health developed over

time and considered normal for a particular individual client or system; it becomes a standard for wellness - deviance determination" (p. 46). "It is the result of previous behavior, defining the stability and integrity of the system and its ability to maintain them. Influencing factors are the system variables, coping patterns, lifestyle factors, developmental and spiritual influences, and cultural considerations" (Neuman, 1995, p. 30). The normal line of defense, as seen in Figure 1, is the outer solid line which encircles the inner lines of resistance. The line is representative of what the client has become. The normal line of defense is dynamic, in that it expands and contracts over time. The normal line of defense is also dynamic "in terms of its ability to become and remain stabilized to deal with life stresses over time, thus protecting the basic structure and system integrity" (Neuman, 1995, p. 30). In the pediatric client the developmental stage and the influencing factors impact the stability of the normal line of defense. The pediatric client is more in the process of establishing the normal line of defense where as the adult client is focused on maintaining the line of defense. When dealing with pediatric clients and their families, "all Neuman model variables are considered with particular emphasis on developmental and sociocultural variables" (Neuman, 1995, p. 153). By addressing cultural variables, Neuman (1995) believes nurses facilitate trust in the health

care system, thereby improving compliance and decreasing alienation of the family. When a child is admitted to the hospital, the stability of the flexible and normal lines of defense are threatened for both the child and the family. The hospital setting and the providers are unfamiliar and can be frightening. The response of the hospitalized child will be dependent upon culture, age, and developmental level.

In the researcher's practice, when evaluating the pacemaker of the pediatric clients, various measures are employed to facilitate care and reduce the stressors of the procedure. Parents or care givers are encouraged to be with the client. The client is often asked to hold the programming head over the pacemaker; this gives them a sense of control. The family and client are given information to promote health retention specifically addressing the importance of routine pacemaker checks and the avoidance of contact sports. In Neuman's Model (1995) each plan of nursing care has inherent measures to promote growth and development, safety, exercise, nutritional health and the development of self-concept.

Lines of resistance are activated following penetration of the normal line of defense by environmental stressors. System integrity of the basic structure and normal line of defense is supported or protected by known and unknown internal resource factors of these lines of resistance.

"Effectiveness of the lines of resistance in reversing the reaction to stressors allows the system to reconstitute; ineffectiveness leads to energy depletion and death"

(Neuman, 1995, p. 30).

The basic structure has individual factors which are common to all organisms, "that is, normal temperature range, genetic structure, response pattern, organ strength or weakness, ego structure and knowns or commonalities"

(Neuman, 1995, p.28). Neuman's five variables are considered to occur simultaneously in each client concentric circle.

Neuman (1995) describes the five variables as follows:

"Physiological refers to bodily structure and function, psychological refers to mental processes and relationships, sociocultural refers to combined social and cultural functions, developmental refers to life developmental processes, and spiritual refers to spiritual belief influence" (p. 28). The following is an adaptation of Neuman's Conceptual Model for a pediatric pacemaker client.

Table 1

Pediatric Pacemaker Client Conceptual Model.

Variables	Intrapersonal	Interpersonal	Extrapersonal
Developmental	Age Education Gender Cognitive abilities Self-concept	Initiation and maintenance of relationships related to developmental stage	Development affected by disabilities

Table 1 Continued

Pediatric Pacemaker Client Conceptual Model.

Variables	Interpersonal	Intrapersonal	Extrapersonal
Physiological	Self-concept implantation site Risk factors -age -weight -development	Nosocomial infections	Effects of Safety/environmental factors -Mechanical -Electrical -Thermal -Chemical -Additional restrictive equipment
Psychologic	Powerlessness Fear Denial Anxiety Depression Past psychiatric illness Self-concept	Support System -Family -Friends -Nurse/Pt interactions -Dependency on care giver	Hospitalization/ Environment overload -Noise -Lights -Temperature -Odors -Colors
Sociocultural	Values Self-concept Cultural impact -pain management Risk behaviors -contact sports Insurance coverage	Language barriers Financial issues Locus of control Parental loss of ideal child Role expectations changed	Lack of education regarding activity Lack funds to pay hospitalization Guardianship related to court
Spiritual	Beliefs -altered -awareness of life & death -beliefs interfere with traditional medical care -Hope/hopelessness Self-concept	Family differences in beliefs	Lack of spiritual support Overload of spiritual influence

Prevention as intervention is a model used by Neuman (1995) and provides an intervention typology. Intervention

may begin at anytime a stressor is identified or suspected. Primary prevention as intervention is described "as wellness retention, that is, to protect the client system normal line of defense or usual wellness state by strengthening the flexible line of defense" (Neuman, 1995, p. 33). A variety of strategies may be utilized for health promotion including the reduction of risk factors or prevention of stressors. According to Neuman (1995), primary prevention should be considered concomitantly with secondary and tertiary preventions as interventions.

When primary prevention fails or is not provided, a reaction may occur leading to secondary prevention as intervention. In secondary prevention, intervention is used as wellness attainment and would provide treatment for existing symptoms. The goal of secondary prevention as intervention "is to provide appropriate treatment of symptoms to attain optimal client system stability or wellness and energy conservation" (Neuman, 1995, p. 34).

Secondary prevention as intervention attempts to stabilize the client by using internal and external client resources to strengthen the internal lines of resistance, thereby reducing the reaction. Death occurs if secondary prevention as intervention fails to reconstitute the client. "Reconstitution is identified as beginning at any point following treatment; it is determined energy increase related to the degree of reaction" (Neuman, 1995, p.34-35).

The reconstitution level may stabilize the client above, below or equal to the usual wellness level or the normal line of defense prior to the illness.

Conservation of client system energy and maintenance of an optimal wellness level by existing supporting strengths is the goal of tertiary prevention as intervention. Tertiary prevention as intervention may be initiated in client reconstitution whenever some degree of system stability has occurred following treatment. In tertiary prevention as intervention, reconstitution depends on the client resources ability to "prevent further stressor reaction or regression; it represents a dynamic state of adjustment to stressors and integration of all necessary factors toward optimal use of existing resources for client system stability or wellness maintenance" (Neuman, 1995, p. 35).

Primary prevention as intervention are those interventions utilized for health promotion. An example of a stressor which breaks through the flexible and normal lines of defense, thereby threatening the lines of resistance, would be an infection at the site of the pacemaker implantation. The body responded in primary prevention as intervention with an increase in white blood cells and antibodies to fight the infection. Secondary prevention as intervention would be the treatments used by health care professionals to promote healing, reduce swelling and pain, and to combat the organism responsible for the infection.

Tertiary prevention as intervention could begin with secondary or primary prevention. Tertiary prevention includes education of client and care giver(s) to recognize signs and symptoms of infection, steps taken to prevent infection, and those interventions that can be effective in maintaining wellness or reconstitution. If reconstitution fails as a result of ineffective secondary prevention as intervention, the client will succumb to the infection and die.

A major set of variables within Neuman's model is development. A major component of development is the formation of the self-concept. The researcher has chosen to utilize the theories of Erik Erickson (1950) as the foundation theorist for self-concept development. Emotional growth and development include the development of self-concept. Self-concept is the idea of self acquired in childhood (Berger, 1984). The sense of self as a separate entity from the mother (Berger, 1984) gradually appears over the first two years of life. Erik Erikson, according to Berger (1984), has the most encompassing psychoanalytical view on the development of self-concept. Erikson (1950) refers to the stages of development as crises. A crisis is a "challenge to the ego that requires a change in perspective" (DiCaprio, 1983, p. 211). The ego crisis for school age is industry versus inferiority and identity versus role confusion is the ego crisis for adolescence. The three

phases of a crisis are: 1) Immature phase- crisis occurs in a mild form, before the critical phase; 2) Critical phase- the most intense phase of the crisis facing the ego; and 3) Resolution phase- the intense phase is resolved and the ego is strengthened (Erikson, 1950). Even resolved crises may reappear in later stages and in dissimilar ways.

Some problems or crises occur repeatedly during one's life. Erikson discriminates between the immature, critical and resolution phases of these problems. For a child the problem or crisis of Identity is in its Immature phase, but reaches a critical phase during adolescence. If the Identity crisis is satisfactorily handled, it remains in resolution in later stages of development.

Erikson assigned tasks to his stages of development. These tasks are adaptable to various cultures and are similar to the ritualizations of a culture. Ritualizations are "recurring patterns of behavior characteristic of a particular society" (DiCaprio, 1983, p. 177). Each stage, when mastered, serves as a building block for the next stage. To understand the development of a healthy personality, Erikson (1950) states, we need to remember the Epigenetic Principle. The Epigenetic Principle states there is a *ground plan* for anything that grows and out of this plan, the parts ascend in a predetermined fashion until the whole unit is a functioning body.

Psychology lays the *ground plan* as it were for the

developmental path by which each of us becomes a distinct personality. Erikson defines the components, and their sequence, necessary for the development of mental health.

The individual with a healthy personality progresses to school age, mastering crises and attaining virtues through this mastery. The ego strength or virtue for this stage is competence. Competence can be viewed as the possession of valued skills and success in society as related to our competencies. The work of childhood should be play, where the child learns to master the pleasure of play and eventually shares the joys of the work. The work of childhood or play is industry or building things. The child learns to produce things and earns or wins approval by positive responses from parents, care givers, teachers or peers. These positive responses foster and reinforce the virtue of competence. Through mastery and attainment of competence, the child will achieve the task of learning a skill. This follows Erikson's cross cultural ritualizations, that the task of learning a skill holds true for any child regardless of their culture. Erikson's augmentation of ritualization is a valuable asset in defining his Eight Stages of Man, while incorporating cultural values.

Socially, school age is a decisive stage with development of "a first sense of division of labor and of equality of opportunity" (Erikson, 1950, p. 93). If this stage of development is not positive, the child may exhibit

signs of inadequacy and inferiority (Erikson, 1950). This may well be the time when the child discovers that race, religion, economic status or family background will determine social worth, rather than ability or willingness to learn, resulting in lasting harm to the sense of identity. Erikson (1950) has labeled the ritualization of school age as formality. Formality refers to effective ways of doing culturally accepted things.

The virtue or ego strength of adolescence is fidelity, the ability to make and keep commitments and promises (Ryckman, 1993). The significant task is the establishment of a philosophy of life (DiCaprio, 1983). The adolescent faces many physical changes with growth spurts and the maturational changes of puberty, which may lead to very difficult periods of adjustment. Often the adolescent is more concerned with the opinions of peers than parents. The need for peer approval can overwhelm the adolescent, resulting in a turning away from parents.

Adolescence is a time when the realization of a "sense of ego identity" is understood (Erikson, 1950, p. 94). The ritualization of adolescence is ideology. "Ideology represents the commitment of an individual to a particular, culturally approved set of beliefs and values" (DiCaprio, 1983, p. 212), which is the beginning of the adolescents' definition of a philosophy of life. Much turmoil surrounds the adolescent. Physical growth spurts and developmental

processes exert tremendous physical changes in the individual, adding to the existing emotional instability of adolescence.

Neuman's theory as a nursing model looks at an individual as the resulting integration of a behavior composite, biological system, and an organism at a stage of development which leads to a comprehensive picture of an individual. The interaction of the physiological, psychological, sociocultural, developmental and spiritual variables determine an individuals' response to a stressor. Erikson's theory recognizes the effects of society, which may be viewed as internal and external environment, on the developing personality. Erikson viewed the individual through stages of development. Through the application of Neuman's theory of stressors on the individual, in conjunction with an understanding of Erikson's stages of development, the impact on the individual can be defined. A stressor does not necessarily evoke a negative or illness response, but can promote growth or wellness when a positive effect is produced.

Neuman's System Model (1995) states that nursing assessment and intervention should include an assessment of all knowledge factors which influence a client's perceptual field. The client and care giver should both validate the significance of the stressor and the significance should lead to actions for resolution. Primary prevention as

intervention should strengthen the client's flexible line of defense. This may be accomplished through education and desensitization to stressors or by strengthening individual resistance factors. Based on client assessment, covert or potential stressors are identified and possible or actual reactions are defined. The nurse and client assessment is based on client experience, the meaning of the experience to the client, life-style factors, coping patterns and individual differences. Particular attention should be paid to cognitive abilities and stage of development when working with pediatric clients.

Secondary prevention as intervention identifies actual or known stressors and symptoms related to reaction to the stressors. In an assessment, the nurse and client determine the degree and nature of reaction and what resources (internal and external) are available to withstand a reaction. The client and nurse develop a rationale for goal setting. Secondary prevention is intervention as treatment. Client strengths and weaknesses are used to set priorities and related goals for the nursing diagnosis. Neuman (1995) emphasizes the optimal use of all resources (internal and external) such as: energy conservation, financial aid, and noise reduction. Priorities may be shifted as needs change with treatment. Secondary prevention or treatment may occur simultaneously with primary and tertiary prevention.

Stressors in tertiary prevention may be overt, covert

or residual. Residual stressors are those stressors which were not resolved during secondary prevention. Reactions may be classified as known residual symptoms, known stress factors or they may be hypothetical. Known residual symptoms are those symptoms which are known and remain despite intervention. Tertiary prevention as intervention following treatment identifies those factors which will maintain the lines of defense, thereby promoting maintenance of the clients optimal functioning level. These factors include the use of motivation, reality orientation, behavior modification, education/reeducation, progressive goal setting, and the use of all internal and external resources.

#### Research Hypotheses

1. Adolescents (13 to 19 years) will show a significant decrease in self-concept on the PHCSCS.

2. Children ages 10 to 13 years will not show a significant alteration in self-concept on the PHCSCS.

3. Gender will demonstrate a significant difference on the PHCSCS. Boys will be at a lower level than girls. In a study of adolescent diabetics by Hauser, Poellets, Turner, Jacobseon, Powers and Noam (1979), boys scored lower than girls on all levels of ego development and those with low ego development also scored lowest on self-esteem.

### Definitions

For the purpose of this study, the following terms will be defined.

#### Congenital complete heart block

A conduction defect of the heart resulting in a disassociation of the p waves to the QRS complex on an electrocardiogram (EKG), present at birth.

#### Pacemaker

A device implanted under the skin for the purpose of producing an electrical stimulation via an electrode (epicardial or endocardial) which results in the mechanical action of blood being pumped to the body. The pacemaker is also capable of sensing the heart's own rhythm.

#### Self-concept

Other terms often used are self-esteem, self-image, and body-image. The operational definition of self-concept of an individual (aged 10 to 19 years) is measured by the Piers-Harris Childrens' Self-Concept Scale. The theoretical definition according to Mosby's (1983) is:

the composite of ideas, feelings, and attitudes that a person has about his own identity, worth, capabilities, and limitations. Such factors as the values and opinions of others, especially in the formative years of early childhood, play an important part in the development of self-concept. (p.976)

### Delimitations

This was a convenience sample of children ages 10 to 19 years. Therefore, generalization to other age groups, or different geographic locations may be limited or inappropriate.

### Limitations

Limitations for this study are identified as:

1. Parents or guardians may affect how the participants view themselves on the PHCSCS.
2. Parents or guardians may influence the participants' decisions on the PHCSCS.
3. The participants may choose to answer the questions as they think the researcher wants them to be answered.
4. Sample size is limited.

### Significance

The significance of this study was to look critically at the self-concept of children with pacemakers and contribute to the scientific knowledge base of nursing. Technical advances have made it possible to implant pacemakers in infants. Nurses must address the unique needs of children. The development of a positive self-concept

will increase the flexible line of defense providing more protection to the child (the basic structure).

## CHAPTER 2

## LITERATURE REVIEW

Introduction

A multitude of studies have been done on the physiological effects of pacemakers, however, a paucity of literature exists on the examination of the self-concept of children with pacemakers. Pacing studies include those by Ennker, Stegmann, Luhmer, & Oelert, (1985) on the benefits and risks of pacing in children. Smith (1990) addressed the use of cardiac pacemakers in children. Sewer, Mericle, & Armstrong (1988) and Sewer, Dick, Uzark, Scott, & Bove (1989) studied the life of epicardial leads in children. DeLeon, Ilbawi, Backer, Idriss, Paul, Zales, and Benson (1990) compared epicardial pacing leads with a focus on exit block and the leads' effectiveness. Williams, Hesslein, & Kormos (1986) centered their study on exit block in children and Lawrence (1991) focused her study on bradydysrhythmias in children. Uzark, VonBargen-Mazza, and Messiter (1989) examined the self-concept of adolescents with congenital heart disease. The psychosocial responses of children to cardiac pacemakers was studied by Alpern, Uzark, and Dick (1989).

Self-esteem or self-concept needs to be studied by the health professional, as an association between low self-esteem and mental illness has been documented by research (Norris & Kunes-Connell, 1985). The lack of research led this researcher to explore the effects of a cardiac pacemaker on the self-concept of children with pacemakers.

### General Self-Concept

Self-concept is one term used to refer to how individuals see themselves in their world. Other terms, often used interchangeably, are: self-image, body-image, self-esteem and personal identity (Mosby's, 1983). Self-concept (Murray & Huelskoetter, 1987) "is learned as a consequence of meaningful interactions with others and the world" (p. 57). Sidney Jourard (1971) wrote about the "real self," believing that humans only learn to know themselves as they disclose themselves to others in their world. Jourard later developed a questionnaire to study the way a person feels about their body (body-image). Jourard believed that humans can attain health and the fullest personal development only in so far as they gain the courage to be themselves with others and develop meaningful goals. Maslow (1954) believed that the "ways in which self-esteem may be expressed and achieved are in a large part, although not entirely, culturally determined" (p. 45). Maslow (1954)

referred to self-concept as self-actualization. Multiple factors are involved in the development of self-concept. These factors include the individual's perception of self and how the individual believes he/she is perceived by significant others (Murray & Huelskoetter, 1987).

The external environment includes responses communicated to the child by significant others. A child's growth and development of self-concept is affected through the dynamic interaction with other people, the environment, and innate qualities (Maslow, 1954). Family members, teachers, and peers' responses to a child have the potential for tremendous influence on the developing child. The influence of the external factors may be negative or positive. The child may develop a negative self-concept if the influencing factors are negative. Self-concept, self-esteem, or self-image are related to the reactions of others and what one believes other people see in oneself (Cooley, 1902). The values and opinions of others, especially in the formative years, play an important part in the development of self-concept.

Schonfeld (1969) found adolescents "feel that being different implies being inferior"(p.46). The adolescent, according to Schonfeld (1969), formulates an ideal body image from lifes' experiences, perceptions, comparisons, and identifications with others, real or imagined. Cornbach's (1963) study of a self-report by adolescents defines a

healthy self-concept as: "I am adequate to do present demands upon me, and where I want to do better, I am capable of improving"(p.126).

An appropriate nursing diagnosis from the Fourth National Conference on the Classification of Nursing Diagnoses (Mosby's Medical & Nursing Dictionary, 1983) is:

Self concept, disturbance in: body image, self-esteem; role-performance, personal identity...The disturbance represents a disruption in the way one sees oneself. There are four sub-components, each with its own etiology and defining characteristics. The etiology of a disturbance in body image may be biophysical, cognitive/ perceptual, psychosocial, cultural, or spiritual in nature. Defining characteristics of a disturbance in self-esteem are an inability to accept praise or encouragement, a lack of participation in treatment and therapy, observed self-neglect, self-destructive behavior, or a lack of eye contact with others. Defining characteristics of the deficit include verbal and non-verbal responses to a real or perceived change in structure or function, a missing body part, trauma to a non-functioning part, a change in general social involvement or life style and a fear of rejection by others. (p.977)

#### Self-Concept of Children with Chronic Diseases

Brown (1985) looked at school age children with diabetes mellitus and the adequacy of their self-concept. She found 88% of 26 diabetic school age children studied had average or above average scores for adequacy of self-concept as measured by the Piers-Harris Children's Self-Concept Scale (PHSCS). The mean raw score was 64.30 with the range of the norms being from 43-70. Eighteen, or 69% of the group

studied, had scores above the 70th percentile of the standardized norms (Brown, 1985).

When two groups of same aged subjects with and without diabetes were compared by Hauser, Poellets, Turner, Jacobsen, Powers, & Noam (1979), the study revealed slightly higher levels of self-esteem of the diabetic subjects. Saucier (1984) examined self-concept in a correlational study of 64 insulin dependent diabetic children to determine if a significant relationship was present between their self-concept and self-care activities of diabetes management. Eighty-one percent of the diabetic children in her study had higher levels of self-concept than PHCSCS standardized norms (mean  $x=60.86$ , norm mean  $=51.84$ ). Sullivan's (1978) study on the self-esteem of 205 adolescent girls, 105 diabetic and 100 non-diabetic, revealed no significant difference between the two groups.

In a study of 163 diabetic children, mean age 13, the Child and Adolescent Adjustment Profile (CAAP) and the Self-Perception Profile for Children (SPPC) were used to examine self-esteem. Findings from this study demonstrated a higher level of self-esteem for the diabetic children than the same aged non-diabetic children (Hauser, Poellets, Turner, Jacobsen, Powers, & Noam, 1979).

Eighty adolescent patients with chronic diseases were studied by Seigel, Golden, Gough, Lashley, & Sacker (1990). The results showed adolescents with chronic disease had a

lower self-esteem ( $p < 0.001$ ) than their age-matched healthy controls. The group of 80 patients was comprised of 20 patients with sickle cell disease, 20 with diabetes, and 40 with asthma.

A study measuring the self-esteem of 519 adolescents of the greater Los Angeles area was done by Kellerman, Zelter, Ellenberg, Dash, & Rigler (1980). Of the 519 adolescents, 310 were physically healthy and 168 were receiving treatment for various illnesses. The study revealed no significant differences between the two groups (Kellerman, et al., 1980). However, a significant difference by sex was found, with girls lower than boys in both groups.

In a comparison study of adolescent girls and boys, aged 13-18, with a chronic illness, Offer, Ostrov, & Howard (1984) found girls ranked significantly higher than boys on the Offer Self-Image Questionnaire (OSIQ). The chronic diseases included cancer, asthma, and cystic fibrosis. Within the study, children with cystic fibrosis scored lower in self-esteem on the OSIQ, but again boys were lower than girls. The possibility exists that children see themselves in a diminished view with regard to self-image as related to the physical effects of the disease.

The self-concept of children with cystic fibrosis, who attended a summer camp, was studied by Rubin and Geiger (1991) using the Primary Self-Concept Inventory. This scale uses different forms for boys and girls. Their study of the

self-concept of children with cystic fibrosis revealed girls had a significantly higher self-concept globally in the PSCI score than the boys, with  $p < 0.05$  at the beginning of camp and  $p < 0.01$  at the end of camp. No comparison was done to a normative population.

The ability of a child to cope with a chronic illness may also be affected by the way the family copes with the illness (Pollock, 1986). A pacemaker is a chronic condition in most situations, and therefore, could be viewed in the same light as a chronic illness with regard to parental influences on the child.

#### Self-Concept of Children with Pacemakers

Uzark, Dick, and Alpern (1986) reported 15 patients, mean age 12.9, with pacemakers did not differ from the normative population of PHCSCS. However, ten of the fifteen felt "left out of things" and twelve of the fifteen tended to "worry a lot". Alpern, Uzark, and Dick (1989) did a comparison of 30 pediatric patients ages 7 to 10 with two age and sex matched groups. Thirty patients had Congenital Heart Disease (CHD) with a pacemaker, thirty had similar CHD with no pacemaker, and thirty were physically healthy with no diseases diagnosed. Their study revealed that pacemaker patients believed they were more similar to

their peers than did the healthy and non-pacemaker CHD subjects ( $p < 0.05$ ).

In another study; Uzark, VonBargen-Mazza, and Messiter (1989) looked at the self-concept of adolescents with CHD ( $M=14.6 \pm 2.7$ ) as compared to healthy counterparts ( $M=14.8 \pm 3.2$ ), demonstrating no significant difference in overall self-concept. With limited studies available for review, it is this researcher's conclusion that more research is needed to examine the psychosocial needs of children with pacemakers. This study will add to the scientific knowledge base on the self-concept of children with pacemakers. It is hoped this study will encourage further research on the self-concept of children with pacemakers. Nurses, through intervention research, need to address the strategies which will have a positive adaptation of the pacemaker within the life style of the child. Educational offerings need to be directed to the child's developmental level.

## CHAPTER 3

## METHODOLOGY

This chapter describes the methods used in this study. Sections include the study design, procedure for data collection, instrument used, and statistical analysis of data.

Study Design

This was a descriptive study designed to examine the self-concept of pediatric children with pacemakers using the Pier-Harris Childrens Self-Concept Scale (PHCSCS). The participants were categorized by age (<13 or  $\geq$ 13 years of age) and sex (male or female). Descriptive research studies "have as their main objective the accurate portrayal of the characteristics of persons, situations, or groups, and the frequency with which certain phenomena occur" (Polit & Hungler, 1991, p.643). Descriptive studies are frequently done in situations when characteristics associated with individuals are "inherently not subject to experimental control" (Polit & Hungler, 1991, p.177). The characteristic or independent variable that is a nonmanipulable variable in this study is the implanted pacemaker.

Setting

Participants were children ages 10 through 19 years, who had a permanent pacemaker. Participants were identified through the cooperation of Dr. Dennis Ruggerie, Montana Deaconess Medical Center, Great Falls, Montana and Dr. Vicki Judd at Primary Children's Medical Center in Salt Lake City, Utah (personal communication June, 1993). Participants lived within the states of Montana, Utah, and Idaho. Human subject approval was first obtained through the College of Nursing, Montana State University, Bozeman, Montana; the Montana Deaconess Medical Center, Great Falls, Montana (Appendix B); and later from Primary Children's Medical Center, Salt Lake City, Utah through Dr. Vicki Judd (personal communication October 26, 1995).

Sample

Subjects were pediatric pacemaker clients ages 10 through 19 years of age identified by their cardiologist as a potential participant. Of the twenty used in this study, 12 were  $\geq 13$  years of age and 8 were  $< 13$  years old. Six were male and six were female in the group  $\geq 13$  years of age. Five males and three females were in the age group  $< 13$ .

This was a sample of convenience, using only those who chose to participate and who returned the consent letter and

questionnaire. Subjects with multiple congenital defects, Downs syndrome, developmental delays, or those unable to read and speak the English language were excluded from the study due to the inability to complete the questionnaire.

Subjects invited to participate in the study gave their assent. In addition, parental/guardian consent for those less than 18 years of age was obtained. Subjects could withdraw at anytime. There was no risk to the subject or their family except for the inconvenience of time to complete the PHCSCS, which takes less than 30 minutes.

#### Data Collection Procedures

Following approval by the Montana State University College of Nursing Human Subjects Review Committee, the researcher contacted the Human Subjects Review Committee at Montana Deaconess and received permission to conduct the study. Dr. Vicki Judd contacted Primary Children's Medical Center for permission to access their clients (personal communication October, 26, 1995). Rob Nichols, a master's prepared registered nurse, at Primary Children's Medical Center mailed the forms to those clients he wasn't able to access at the pacemaker clinic of Primary Children's Medical Center. The forms were mailed to the participants for completion with an instruction letter, consent and assent forms. The researcher mailed the packets to those clients

identified through the pacemaker clinic at Montana Deaconess Medical Center. Time was allotted for return of the completed form. Expected participation was 50% of those asked to take part in the study. A total of 35 forms were mailed; 24 (69%) questionnaires were returned. Three of the questionnaires failed to have accompanying consent forms and one was returned blank. These forms were not used in the data analysis. There were 20 usable questionnaires which represented a 57% return rate of usable forms.

Data collection began in October and was terminated in March, 1995. Final results were compiled during March 1995. Data was analyzed using the Number Cruncher Statistical System (NCSS) computer program.

### Instrument

The tool for this research was the Piers-Harris Children's Self-Concept Scale (Appendix D). Permission to use the tool was obtained from Western Psychological Services, as a researcher has to be approved to use this tool (Appendix A). This is an 80 item yes or no questionnaire, written at the third grade reading level. The questionnaire was originally called The Way I Feel About Myself.

The PHCSCS was used as a self-administered questionnaire to collect the data. *Self-concept* is viewed

essentially phenomenological in nature. "It is not something that can be observed directly, but must be inferred from either behaviors or self-report" (Piers, 1984, p.43). Self-report, although subject to many types of distortions, is closer to the present definition of self-concept since it is a direct expression of that individual's experience of self.

Self-report was seen as the best way to collect data from this age group and sample, given the geographic locations. The questionnaires were anonymous, no names were to be written on the forms. Furthermore, many of the participants had no prior contact with the researcher. The likelihood of participant deception in these cases was reduced as they did not know the person interpreting the questionnaire.

Reliability for the PHCSCS has been well documented over the past 20 years. "Test-retest reliability coefficients for the total scale range between .65 and .81 for general public school population" and the internal consistency coefficients range from .73 to .81 (Long & Hamlin, 1988, p.43). The reports consist of means, frequencies and percentages of the demographic data. Comparison of the pacemaker group was done to the means of PHCSCS original results of 1,183 school children from one public school district in Pennsylvania (Piers, 1984). Cluster scales of the participants results are reported as they compare to the established norms of the PHCSCS. Cluster

scales of the PHCSCS look at six variables: Behavior, intellectual and school status, physical appearance and attributes, anxiety, popularity, and happiness and satisfaction. All cluster scales are rated in a positive direction of self-concept, so the higher the score the higher the self-concept within the cluster.

### Data Analysis

Descriptive statistics are appropriate for reporting this study, as a paucity of studies exist on the self-concept of children with pacemakers. Raw scores of the participants were compared to the PHCSCS normative values. Comparison of raw scores of the group was done by subgroupings using age (<13 or ≥13) and sex (male or female). These sub-groups cluster scores were compared using a T-Test.

Twenty-four questionnaires were returned. Three forms were thrown out for lack of consent from the parent/guardian. One form was returned blank and not used in the data analysis.

Data analysis was performed using the Number Cruncher Statistical System (NCSS) by Dr. Jerry Hintze. This is a computer program designed to analyze various forms of data by numerous methods.

## CHAPTER 4

## ANALYSIS AND INTERPRETATION OF DATA

In this chapter the results of the data analysis are presented and interpreted. The three hypotheses are tested and an interpretation of the results is incorporated into the report of the findings. The 0.05 level of significance was used for all tests. A computer program, Number Cruncher Statistical System (NCSS), was used for data analysis.

Data Collection

Data collection was conducted between October 1994 and March 1995. Thirty-five questionnaires were distributed and 24 were returned for a response rate of 69%. Three questionnaires were not used in the data analysis because the parental/guardian consent form did not accompany the completed forms. Of the thirty-five forms returned, one was not completed and therefore not used in the data analysis. The data analysis sample consisted of  $n=20$  for a response rate of 57%.

Description of the Sample

The average age of those responding was 13.8 years. The average age for those  $\geq 13$  was 15.25 years and for those  $< 13$  the average age was 11.6 years. Gender of the participants was 55% male ( $n=11$ ) and 45% female ( $n=9$ ). In the group  $>13$  years of age there were 12 (63%) participants (6 male and 6 female). Eight participants fell in the age group  $<13$  (37%, 5 males and 3 females). Three of the participants were from Montana with the remaining participants residing in Utah or Idaho.

Tests of the Hypotheses

Hypothesis 1 stated: Adolescents  $>13$  will show a significant decrease in self-concept on the PHCSCS. Another way of stating this is that the adolescents 13 to 19 years of age are expected to demonstrate a lower self-concept with  $p < 0.05$  when compared to the normative values of the PHCSCS. The current sample was composed of 12 children in the  $>13$  age group. Their mean total score was 61.73 compared to the PHCSCS total mean of 51.84 with  $p=0.0000$ . The  $p$  value is statistically significant for a higher self-concept from the current sample. Thus, the hypothesis is rejected.

Hypothesis 2 stated: Children ages 10 to 13 years will not show a significant alteration in self-concept on the

PHCSCS. Stated another way, the group of participants 10-13 years of age will demonstrate a statistically significant positive self-concept on the PHCSCS with  $p < 0.05$ . Eight participants of the current study were in this age group. Their mean raw score was 64.80 compared to the PHCSCS norm of 56.84 for a  $p = 0.0000$ . This  $p$  value is statistically significant showing the group <13 years of age scored higher on the PHCSCS than the normative sample of PHCSCS. The hypothesis is supported.

Hypothesis 3 stated: Gender will demonstrate a statistically significant difference on the PHCSCS. Boys will score at a lower level than girls. Restated, boys would score lower in the total raw score of the PHCSCS than the girls. The current sample mean for boys was 66.81 and for girls was 58 with  $p = 0.13$ . The  $p$  value is not statistically significant. The gross mean scores indicate the boys scored higher than the girls. The small sample size may be a factor in the lack of significance. The hypothesis is not supported in this sample.

In the Cluster scale analysis, the boys scored significantly higher than the girls on the attribute of anxiety with  $p = 0.04$ . The boys were significantly less anxious, statistically speaking, than the girls on this subscale of the PHCSCS Cluster scores (Table 2).

The total mean scores of the current sample and PHCSCS does show a statistically significant higher self-concept for the current sample with  $p=0.0008$  (Table 3).

Table 2

Gender Difference from current sample

Cluster Means & Totals of Gender Groups Two Sample T-Test			
Scale	Males (n=11) M	Females (n=9) M	p Value
Behavior	14.54	13.55	0.24
Intellectual and school status	15.27	13.11	0.10
Physical Appearance and Attributes	10.18	9.11	0.48
Anxiety	11.63	8.66	0.04
Popularity	9.45	7.22	0.12
Happiness and Satisfaction	8.9	7.88	0.37
Total	66.81	58	0.13

Table 3

Mean total scores Current Sample and PHCSCS norms

Study	Mean	SD	p
PHCSCS	51.84*	13.87	n/a
Current sample	62.85	12.37	.0008

\*PHCSCS norm value from study of 1,183 school children in Pennsylvania. PHCSCS Manual 1984, p.50.

## CHAPTER 5

## DISCUSSION, CONCLUSIONS, IMPLICATIONS, RECOMMENDATIONS

Discussion

The discussion provides an interpretation of findings from the current sample as compared to the PHCSCS norms. The purpose of this descriptive study was to determine the effects of a pacemaker on the self-concept of children 10 to 19 years of age using the Piers-Harris Children's Self-Concept Scale (PHCSCS).

The study was done by examining the current study group by age (<13 and  $\geq$ 13 years of age) and by gender (male or female). The findings in relation to the study's purpose and conceptual frameworks are summarized in this chapter. Implications for nursing and recommendations for future research are included. The theoretical frameworks used in this study were Betty Neuman's Systems Model and Erik Erikson's theory of the development of self-concept. A descriptive study was conducted, which included a convenience sample of 20. Potential participants were identified by their cardiologists. The participants resided in Idaho, Montana, and Utah. Data were collected by the researcher by mail and by Rob Nichols, R.N., M.S.N., on site at Primary Children's Medical Center, Salt Lake City, Utah

















































