

CLEAN INTERMITTENT SELF-CATHETERIZATION AND BETHANECHOL
CHLORIDE: A SELF-CARE APPROACH TO THE MANAGEMENT OF
BLADDER DYSFUNCTION FOLLOWING RADICAL
ABDOMINAL HYSTERECTOMY

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We hereby recommend that the thesis prepared under
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be accepted as fulfilling this part of the requirements for the Degree of
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TABLE OF CONTENTS

TABLE OF CONTENTS	iii
LIST OF TABLES	v
CHAPTER	
1. INTRODUCTION	1
Problem of Study	3
Justification of Problem	4
Suprapubic Drainage	5
Clean Intermittent Self-Catheterization	5
Use of a Self-Care Model	7
Conceptual Framework	9
Physiology of the Urinary Bladder	9
Micturition	9
Mechanisms of bladder defense to infection	10
Intraoperative Pathophysiology of the Urinary Bladder Associated with Radical Abdominal Hysterectomy	11
Suprapubic Catheter Drainage	13
Clean Intermittent Self-Catheterization	14
Bethanechol Chloride	15
Self-Care	16
Assumptions	17
Research Questions	19
Definition of Terms	20
Limitations	23
Summary	24
2. REVIEW OF LITERATURE	26
Nature and Management of Bladder Dysfunction following Radical Hysterectomy	27
Use of Bethanechol Chloride	30
Urinary Bladder Drainage	32
Suprapubic Catheter Drainage	32
Clean Intermittent Self-Catheterization	36
Psychosocial Considerations	44
Use of a Self-Care Model	46
Summary	48

1934

CHAPTER

3. PROCEDURE FOR COLLECTION AND TREATMENT OF DATA	50
Setting	50
Population and Sample	51
Protection of Human Subjects	52
Instrument	53
Validity	53
Reliability	54
Data Collection	54
Treatment of Data	55
4. ANALYSIS OF DATA	57
Description of Sample	57
Findings	58
Summary	66
5. SUMMARY OF THE STUDY	67
Summary	67
Discussion of Findings	69
Duration of Dysfunction	71
Early Complications	73
Urinary tract infection	73
Self-care deficit	74
Catheter malfunction	75
Calculus formation	75
Pain	76
Intolerance to bethanechol chloride	77
Late Complications	77
Conclusions and Implications	78
Recommendations for Further Study	81
APPENDIX A: CONSENT FORM	83
APPENDIX B: DATA COLLECTION INSTRUMENT	85
LIST OF REFERENCES	87

LIST OF TABLES

Table

1. Incidence of Bladder Function Recovery with Related Z Test Results	59
2. Average Time Required for Bladder Function to Return with Related T Test Results	61
3. Incidence of Early and Late Complications Among Subjects with Related Chi-Square Test Results	61
4. Incidence of Specific Early and Late Complications	62
5. Incidence of Urinary Tract Infection During Treatment with Related Z Test Results	64
6. Number of Complications Experienced Per Subject	65

CHAPTER 1

INTRODUCTION

Urinary bladder dysfunction following radical abdominal hysterectomy is a common occurrence which has been recognized for decades, but the exact nature of this dysfunction and, therefore, methods of successful management have remained unclear. Common manifestations of this condition include an impaired sense of bladder fullness, urinary retention and incomplete vesicle emptying, symptoms which reflect an interruption in sensory and motor nerve supply to the bladder. Reports of the incidence of bladder dysfunction and resumption of normal urinary elimination following radical abdominal hysterectomy have been as varied as the treatment methods which have been proposed. Frequently patients have been subjected to a prolonged period of dependence upon continuous indwelling catheter drainage, some for indefinite periods of time.

Clean intermittent self-catheterization has successfully replaced the use of indwelling catheter drainage in a

variety of conditions which exhibit sensory and motor paralytic dysfunction of the urinary bladder. Numerous complications associated with continuous indwelling catheter drainage have been eliminated with the use of clean intermittent self-catheterization. Bethanechol chloride is a pharmacologic agent which has been used clinically to stimulate contraction of the bladder in both neurogenic and non-neurogenic urinary retention which is non-obstructive in nature. Bethanechol chloride used in conjunction with clean intermittent self-catheterization has been shown to be an effective treatment method for sensory and motor paralytic bladder dysfunction resulting from injuries or lesions of the spinal cord. Because the bladder dysfunction which occurs following radical hysterectomy is also a form of sensory and motor paralysis, management with the clean intermittent self-catheterization and bethanechol chloride combination has been proposed. It has not been readily adopted, though, and suprapubic catheter drainage remains the treatment approach advocated with greater frequency.

This paper compared the effectiveness of two methods recommended for the management of postoperative bladder dysfunction associated with radical abdominal hysterectomy: (1) clean intermittent self-catheterization and bethanechol chloride, and (2) suprapubic catheter drainage. Each method

was examined for its efficacy in providing a return to normal bladder function with a low incidence of associated complications. It was proposed that if the physiologic effectiveness of the self-care program could be shown to be at least as great or greater than management with suprapubic catheter drainage, this study would provide an empirical basis for further clinical research studies on the use of the self-care approach, with nursing providing a key role in the success of such a program.

Problem of Study

Suprapubic catheter drainage is currently accepted as the preferred method of urinary drainage for the treatment of the bladder dysfunction which follows radical abdominal hysterectomy. A self-care approach using clean intermittent self-catheterization and bethanechol chloride has been proposed for the management of this intraoperative dysfunction, but its effectiveness has not been systematically compared with that of suprapubic drainage. For approximately 36 months preceeding this study all persons who underwent radical abdominal hysterectomy at the study setting were instructed in a self-care program using clean intermittent self-catheterization and bethanechol chloride for the management of postoperative bladder dysfunction. Prior to instituting the self-care approach, all bladder dysfunction

following radical hysterectomy was managed with suprapubic or urethral catheter drainage. Through a retrospective review of the medical records, this study investigated the effectiveness of the self-care program as compared with that of suprapubic catheter drainage. The specific areas investigated and compared were: (1) frequency of recovery of normal bladder function, (2) period of time in which normal function was recovered, (3) incidence of complications associated with each method of management, and (4) incidence of complications arising after normal bladder function was recovered and treatment discontinued.

Justification of Problem

The successful use of clean intermittent self-catheterization as a means for urinary bladder elimination in the face of an inability to void spontaneously or high residual urinary volumes has been documented (Champion, 1976; Lapides, Diokno, Lowe and Kalish, 1974; Lapides, Diokno, Gould and Lowe, 1976; MacGregor and Diokno, 1979; Orikasa, Koyanagi, Motomura, Kudo, Togashi, and Tsuji, 1976). Concerning management of the bladder dysfunction which is associated with radical abdominal hysterectomy, this self-care approach is a recent concept, having been first described by Seski and Diokno in 1977.

Suprapubic Drainage

Suprapubic catheter drainage is the method of bladder evacuation which has been proposed most often in recent literature for the management of this postoperative condition (Buchsbaum, 1978; van Nagell, Penny, and Roddick, 1972). Use of a suprapubic appliance places obvious physical and social restrictions on the client. There may also be psychological implications; Schilder (1950) stated that anything that is attached to the body is incorporated into the body image, particularly firm objects which are connected to the body in a rigid fashion. Reported complications associated with suprapubic catheter drainage include malfunction of the catheter or drainage system, dislodgement of the catheter from the bladder, urinary tract infection (van Nagell, et al., 1972), hematuria (Frymire, 1971), catheter obstruction (Jackson, 1969), catheter leakage, and infection at the skin incision (Kariher, Fernandez, Trometta, & Amstey, 1970).

Clean Intermittent Self-Catheterization

Opposition to clean intermittent self-catheterization as a method of urinary drainage for bladder dysfunction arising from radical hysterectomy includes arguments that the procedure increases the potential for urinary tract infection and is not feasible for most clients due to the likelihood of their inability to catheterize themselves (Buchsbaum, 1977)

or unwillingness to follow a program which calls for the "inconvenience" of frequent voiding and/or catheterization (Buchsbaum, 1978). In studies by Lapidès, et al. (1974, 1976) clean intermittent self-catheterization was found to be associated with a lower incidence of urinary tract infection over other types of urinary drainage. Certainly, noncompliance with the self-management program using clean intermittent self-catheterization and bethanechol chloride could interfere with the recovery of bladder function and/or initiate complications such as urinary tract infection and bladder decompensation. Consequently, each client's willingness and ability to assume responsibility for such a program must be carefully assessed and evaluated. Numerous reports have been published that indicate that not only adults but children are capable of successfully following a self-care approach with clean intermittent self-catheterization, which provides a basis for the assumption that a high level of psychomotor skill and/or cognitive development is not a necessary prerequisite for one to possess the ability to follow a program of self-catheterization (Altshuler, Meyer, & Butz, 1977; Geddes, 1978; Plunkett & Braren, 1979). Most authors who describe the use of self-catheterization have indicated that clients prefer such a method of management over one which uses continuous indwelling appliances and

that freedom from dependence upon continuous urinary drainage provides sufficient motivation for acceptance of and compliance with the self-management program (Altshuler, et al., 1977; Hartman, 1978; Lapidès, Diokno, Silber, & Lowe, 1972). According to Orem (1980) our society expects adults to demonstrate self-reliance and responsibility for themselves, which is a fundamental basis for using methods of management which foster independence in the client. Finally, the importance of frequent voiding habits in the prevention of urinary tract infection was proposed by Lapidès, Costello, Zierdt, & Stone (1968) and subsequent studies have supported their hypothesis (Adatto, Doebele, Galland, & Granowetter, 1979; Lalli & Lapidès, 1969; Lalli, Thornbury, & Lapidès, 1971).

Use of a Self-Care Model

The literature suggests that a self-care approach with clean intermittent self-catheterization and bethanechol chloride for the treatment of bladder dysfunction following radical abdominal hysterectomy would provide a greater degree of psychological and social benefit to the client than the use of continuous suprapubic catheter drainage. One of the basic purposes of the profession of nursing is assisting clients in gaining the highest possible degree of independence concerning their health care. Orem (1980) maintained that "nursing has as its special concern the individual's

need for self-care action and the provision and management of it on a continuous basis in order to sustain life and health, recover from disease or injury and cope with their effects" (p. 6) and that "nursing is required whenever the maintenance of continuous self-care requires the use of special techniques and the application of scientific knowledge in providing care or designing it" (p. 7). Kinlein (1977) has defined the practice of nursing as "assisting the person in his self-care practices in regard to his state of health" (p. 601). These philosophies clearly support the use of treatment programs which encourage client participation and point to the significant role that nursing plays in assisting clients in learning and maintaining activities of self-care which are affected by alterations in health status. The value of this investigation lies in the evaluation of a treatment method which would offer the person a greater degree of independence over the method currently advocated and used with greater frequency.

Conceptual Framework

Physiology of the Urinary Bladder

Micturition. The physiologic properties of micturition as described by Lapedes and Diokno (1976) are presented. Smooth muscle has the property of responding to stretch by shortening its fibers and increasing tension; in this manner extension is resisted. This property of smooth muscle occurs independently of motor nerve supply. As the urinary bladder fills with urine, tension from the smooth muscle of the bladder wall increases as the volume increases. When bladder capacity is reached, the smooth muscle fibers have been stretched to capacity and tension increases dramatically. This increase in smooth-muscle tension is detected by the sensory nerve fibers in the bladder wall, producing a voiding urge. The sensory fibers send impulses to the motor neurons, signaling them to initiate detrusor contraction and expulsion of the urine. After the urine has been expelled the smooth muscle resumes its normal resting tension.

Nerve supply to the urinary bladder consists of sensory and motor neurons which are parasympathetic in origin and located primarily in the pelvic nerve. The sensory fibers situated in the bladder wall and posterior urethra are responsible for the proprioceptive sensations of bladder

fullness and voiding urge, and the exteroceptive sensations of pain and temperature. The motor neurons which supply the detrusor muscle and posterior urethra stimulate these structures to contract and expel urine.

In the infant, the motor neurons of the urinary bladder are stimulated directly by the sensory nerve fibers. Micturition, therefore, occurs in an uncontrolled fashion until the corticoregulatory tract develops at approximately 24 months of age. Once developed, the corticoregulatory tract mediates impulses from the sensory and motor neurons, enabling contraction of the bladder to be initiated or inhibited on a voluntary basis.

Mechanisms of bladder defense to infection. Cox and Hinman, Jr. (1961) stated that the non-traumatized, non-obstructed urinary bladder is capable of ridding itself of bacteria through two mechanisms: (1) vesicle emptying, where bacteria is eliminated through the expulsion of urine, and (2) intravesicle antibacterial activity, where post-void residual bacteria is eradicated by way of host defense mechanisms such as phagocytosis, inflammatory response and antibody production. These authors asserted, therefore, that infection should not be expected to occur solely by the introduction of bacteria into the urinary tract; rather, bacteriuria should be expected to proceed to infection only

in those situations where the normal defense mechanisms of the urinary bladder are inhibited.

Intraoperative pathophysiology of the urinary bladder associated with radical abdominal hysterectomy

According to Twombly and Landers (1956), during the course of radical abdominal hysterectomy dissection of the pelvic nerve results in an interruption of the sensory and motor innervation to the urinary bladder. This denervation is partial, however, and occurs in varying degrees (Seski & Diokno, 1977). Sensory denervation interferes with the proprioceptive sensation of bladder fullness. Motor denervation is characterized by a decrease in detrusor contractile force. Consequently, following radical abdominal hysterectomy women characteristically exhibit a diminished or absent voiding urge as the bladder fills, a result of sensory denervation, and encounter difficulty in initiating micturition and/or completely emptying the bladder, a consequence of motor denervation.

A partially denervated urinary bladder has the capability of recovering normal function; however, during the recovery phase, the bladder is vulnerable to distention beyond capacity because of the individual's altered perception of bladder fullness (Green, Meigs, Ulfelder, & Curtin,

1962). Repeated or prolonged distention of the urinary bladder stresses the myogenic tone of the smooth muscle fibers of the detrusor, producing atonicity, a condition referred to as bladder decompensation (Lapides & Diokno, 1976). Even if neurologically intact, the atonic decompensated bladder is incapable of expelling urine, rendering the individual chronically dependent upon some form of artificial urinary drainage.

In addition to bladder decompensation, Lapides (1965, 1973) cited bladder overdistention as a major underlying mechanism in urinary tract infection. Overdistention of the bladder is postulated to exert pressure against the bladder wall which inhibits blood flow to the area, thereby impeding intravesical antibacterial activity. Chronic incomplete emptying of the bladder can also be a source of infection. Antibacterial vesicle defenses are capable of controlling bacterial growth in the healthy bladder that is emptied on a regular basis. However, if an inefficient emptying mechanism is present, such as that which can occur in the motor paralytic bladder, bacterial growth can exceed the antibacterial abilities of the vesicle defenses (Cox & Hinman, Jr., 1961). Management of bladder dysfunction during the recovery phase following radical hysterectomy is, therefore, aimed at avoiding overdistention of the bladder and promoting complete

vesicle emptying. In this manner, avoidance of two frequent complications, urinary tract infection and bladder decompensation, is hopefully accomplished.

Suprapubic Catheter Drainage

Suprapubic catheter drainage was introduced in the mid-1960's as an alternative to indwelling urethral catheter drainage in the postoperative gynecologic patient (Hodgkinson & Hodari, 1966; Taylor & Nickel, 1966). Prior to that time the suprapubic technique was described in the urologic literature as a method of urinary drainage reserved primarily for bladder uropathies in the male (Riches & Lond, 1943; Scorer, 1953; Walker, 1917). In 1972 van Nagell et al. introduced a modification of the suprapubic cystotomy which was specifically intended for postoperative bladder drainage in women following radical abdominal hysterectomy.

The method of postoperative suprapubic catheter drainage reviewed in this study was carried out in the manner described by van Nagell et al. and is currently regarded by many in the field of gynecologic urology as the treatment of choice in the management of bladder dysfunction associated with radical abdominal hysterectomy (Buchsbaum, 1978). At the time of the operation a cystotomy was performed. A number 18 Foley catheter was introduced through the bladder incision and the balloon inflated. The catheter was then

brought to the outside by way of a stab wound placed in lateral proximity to the midline abdominal incision and fixed to the skin with a silk suture. Straight drainage was employed. Increased patient comfort was cited by van Nagell et al. as the primary advantage of the use of suprapubic catheterization over indwelling urethral catheter drainage.

Clean Intermittent Self-Catheterization

The concept of intermittent catheterization was described by Guttman and Frankel (1966) as a sterile procedure executed by physicians and nurses. Comarr (1972) reported success with self-catheterization, maintaining sterile technique. In 1972, Lapidus, et al. proposed the use of a clean, non-sterile technique of intermittent self-catheterization by eliminating catheter sterilization, use of gloves and cleansing of the urethral meatus prior to catheter insertion. The only cleaning agents utilized in this method were hand soap and tap water, used to wash the hands prior to catheterization and to rinse the catheter between uses. Elimination of the sterile technique did not lead to an increased incidence of urinary tract infection and simplification of the procedure made its application wide-spread in a variety of situations where artificial urinary drainage was needed.

Seski and Diokno (1977) first described the use of clean intermittent self-catheterization for the treatment of bladder dysfunction following radical abdominal hysterectomy. Their experience demonstrated successful bladder rehabilitation using intermittent self-catheterization in a population of patients who had traditionally been managed with indwelling urethral or suprapubic catheter drainage. The method of self-catheterization reviewed in this investigation is based on the application of Lapedes' concept of non-sterile self-catheterization to the management of post-operative bladder dysfunction associated with radical pelvic surgery as described by Seski and Diokno (1977).

Bethanechol Chloride

Bethanechol chloride is a parasympathomimetic agent whose action on the effector cells of the postganglionic parasympathetic nervous system selectively stimulates smooth muscle contractions of the detrusor muscle. Common side effects of this drug include an increase in gastrointestinal secretion and peristalsis, peripheral vasodilatation, and increased lacrimation and diaphoresis, all manifestations of parasympathetic stimulation (Koelle, 1970).

Self-Care

Dorethea Orem's (1980) concept of self-care as it relates to the practice of nursing is presented. She defined self-care as the initiation and performance of activities by individuals on their own behalf which are concerned with the maintenance of life, health and well-being. Persons who are able to independently initiate and perform self-care functions not only have knowledge about themselves and the environment but also are aware of the appropriate action to take under the circumstances. Self-care agency, or the ability to perform self-care, develops through the learning process which is assisted by the instruction and supervision by others and by actual experience. Self-care agency, which can also be described as a person's knowledge, skills, and motivation, reflects the ability to take a conscious and deliberate self-care action to meet a specific need. In order to successfully perform activities of self-care, a person must possess the psychomotor skills necessary to initiate and maintain self-care functions as well as the cognitive skills which encompass the understanding of self-care activities and how they relate to health and disease.

Self-care demand expresses the types of purposive self-care that are required by an individual. Health-deviation self-care demand refers to self-care actions specifically

related to the regulation of conditions which deviate from normal human structure or function. These changes in the health state can fall into two categories: (1) disease derived, that is, changes that result from disease, trauma, disability and/or disfigurement, and (2) medically derived, or changes which result from the measures used in the process of medical diagnosis and/or treatment.

When the self-care demand is greater than the self-care agency, a self-care deficit is said to exist. Nursing is needed when a self-care deficit is in operation; nursing interventions are directed toward overcoming self-care deficits and enhancing and/or preventing the loss of the capacity to perform health-related self-care. Orem's self-care concept provides the nursing model upon which the self-catheterization intervention under investigation was based.

Assumptions

The following assumptions were made for this study:

1. In order to function normally from a physiologic standpoint, the urinary bladder must be neurologically intact and possess smooth muscle tone responsive to motor stimulation (Lapides & Diokno, 1976).
2. Dysfunction of the urinary bladder following radical abdominal hysterectomy results from an

intraoperative disruption in the parasympathetic nerve supply to that organ (Twombly & Landers, 1956).

3. The degree of bladder dysfunction experienced following radical abdominal hysterectomy is related to the degree of surgical dissection carried out during that procedure (Twombly & Landers, 1956).
4. A partially denervated bladder has the capability of regaining normal function if overdistention to that organ can be avoided during the recovery phase (Green, et al., 1962).
5. The healthy urinary bladder possesses antibacterial defense mechanisms which provide protection against infection (Cox & Hinman, Jr., 1961).
6. By way of its parasympathomimetic property of selective stimulation of smooth muscle contraction, bethanechol chloride has the capability of stimulating detrusor contraction in a neurologically-deficient urinary bladder (Koelle, 1970).
7. Society expects adults to be self-reliant and to assume responsibility for their own care (Orem, 1980).

8. Nursing care is required whenever an individual needs assistance in health-related self-care practices (Orem, 1980).

Research Questions

In comparing two groups of patients following radical abdominal hysterectomy, one group managed with clean intermittent self-catheterization and bethanechol chloride, and a second group managed with suprapubic catheter drainage:

1. Was there a significant difference in the number of patients who recovered normal bladder function within a 12-month period?
2. Was there a significant difference in the average period of time necessary to achieve normal bladder function?
3. Was there a significant difference in the incidence of "early complications?"
4. Was there a significant difference in the incidence of "late complications?"

Definition of Terms

The following defined terms were applicable to this investigation.

1. Normal urinary bladder function: The ability to initiate and maintain micturition with a residual urinary volume of 50 milliliters or less (Hodgkinson & Hodari, 1966).
2. Type III radical abdominal hysterectomy: A surgical procedure approached abdominally which involves, in addition to the removal of the uterus, fallopian tubes and ovaries, complete removal of the medial and lateral parametrium, ligation of the uterine artery lateral to the ureter, and excision of the upper one-half of the vagina (Rutledge, 1974).
3. Clean intermittent self-catheterization: A non-sterile procedure which is undertaken by the patient as follows:
 - a. Prior to catheterization, the patient washes her hands with soap and water.
 - b. The catheter is inserted into the urethra until a urine flow is obtained. The catheter is held in place until the bladder has been emptied, and then is removed. Cleansing of

the meatus prior to the procedure is not done and use of a lubricant is optional.

- c. Following catheterization the catheter is washed with soap and water and stored in any clean container of the patient's choosing.
- d. The bladder is emptied immediately upon arising from sleep, every three to four hours during waking hours and immediately prior to retiring to bed. Fluids are restricted two hours prior to bedtime to eliminate the necessity for catheterization during sleeping hours (Seski & Diokno, 1977).

- 4. Suprapubic catheter drainage: A surgical procedure performed in the manner described by van Nagell, et al. (1972). A number 18 silicone elastomer Foley catheter to dependent drainage is inserted in the urinary bladder by cystotomy at the time of surgery and brought out through a small skin incision placed lateral to the midline abdominal incision. The catheter is fixed to the skin with a silk suture.

5. Urinary tract infection: The presence of greater than 100,000 bacteria per milliliter of uncentrifuged urine (Kass, 1956) accompanied by clinical symptoms.
6. Urinary retention: "The accumulation of urine within the bladder because of inability to urinate." (Dorland's Illustrated Medical Dictionary, 1965.)
7. Bladder decompensation: A condition of the urinary bladder where loss of myogenic tone of the detrusor occurs resulting in an atonic state and an inability to urinate (Lapides & Diokno, 1976).
8. Early complications: Those adverse conditions which arise during treatment and are believed to be associated with the method of urinary drainage in use. Complications associated with clean intermittent self-catheterization include urinary tract infection and self-care deficit. Intolerance to the side effects of bethanechol chloride is a potential complication of the use of that drug. Complications associated with the use of suprapubic catheter drainage include urinary tract infection, catheter malfunction, spontaneous disconnection of the catheter from the bladder

(van Nagel, et al., 1972), obstructed catheter (Jackson, 1969), hematuria (Frymire, 1971), catheter leakage and infection at the abdominal incision through which the catheter is passed (Kariher, et al., 1970).

9. Late complications: Those adverse conditions associated with functioning of the urinary bladder which occur after normal bladder function is reestablished and treatment discontinued. Late complications include urinary tract infection, urinary retention, and bladder decompensation (Green, et al., 1962).

Limitations

The limitations of this investigation were recognized as being the following:

1. Because the data were collected in a retrospective fashion, the possibility of psychological basis for urinary retention was not measured but was recognized as a possible extraneous variable that was not controlled.
2. Subjects were systematically selected from intact groups rather than randomly selected, placing a limitation on the significance of the findings,

generalizability of the findings, therefore, were limited to those individuals studied.

3. Control over the definition and measurement of variables were limited by the use of existing data; availability of data were limited to those observations which were recorded.
4. Due to the retrospective nature of the study there was a general lack of control over the research setting, subjects, and variables under investigation.

Summary

Dysfunction of the urinary bladder following radical abdominal hysterectomy is a well recognized entity whose management is less well understood. The bladder is able to recover normal function but dependence upon artificial bladder drainage is usually necessary for several weeks or even months. Suprapubic catheter drainage is recommended and utilized most frequently for the treatment of this intraoperative dysfunction. Clean intermittent self-catheterization used in conjunction with bethanechol chloride has been proposed as an alternative treatment but its effectiveness has not been compared to that of the suprapubic catheter. This study sought to make that comparison by reviewing the outcome of postoperative bladder function in two groups of

patients, one managed with the self-care approach using clean intermittent self-catheterization and bethanechol chloride and the other with suprapubic catheter drainage.

The conceptual principles upon which this study was based included the physiology of micturition and bladder defense to infection, the intraoperative bladder pathophysiology associated with radical abdominal hysterectomy, the technique of suprapubic catheter drainage, the technique of clean intermittent self-catheterization, and the pharmacological properties of bethanechol chloride. Orem's (1980) concept of self-care provided the conceptual nursing model upon which this investigation was based. Assumptions for this study were drawn from the conceptual framework. The research questions were presented and terms applicable to this study defined. Limitations of this study were largely related to the use of existing data; there was a general lack of control over the availability and definition of variables.

CHAPTER 2

REVIEW OF LITERATURE

Since J. G. Clark first described the procedure in 1895, radical abdominal hysterectomy has been used as an effective surgical intervention for the treatment of carcinoma of the cervix. The unfortunate side effect resulting from this procedure has been a high degree of postoperative dysfunction of the urinary bladder. Previous investigators have described numerous approaches to the management of this problem with varying degrees of success.

This chapter presents a discussion of the relevant investigations which have been published concerning the nature and management of bladder dysfunction following radical hysterectomy, the use of parasympathomimetic agents to stimulate bladder function, and the use of two urinary drainage approaches: (1) suprapubic catheter drainage and (2) clean intermittent self-catheterization. The psychosocial considerations concerning the choice of a urinary drainage approach are also explored. Additionally, there is a discussion of the literature which addresses the concept of self-care and the role of nursing in that area of health care delivery.

Nature and Management of Bladder Dysfunction
following Radical Hysterectomy

Disturbances in micturition following radical hysterectomy are a familiar occurrence, but because the mechanism has not been well understood, most reported management approaches have been based primarily on clinical observation (Rutledge, 1974). Meigs (1944) suggested that the frequently observed micturition disturbances were caused by bladder atony, an inevitable consequence of an intraoperative interruption in vesicle motor nerve supply. Other investigators made similar observations and drew similar conclusions including the opinion that extensiveness of the surgical dissection was directly related to the severity of the bladder dysfunction manifested (Brunschwig, 1953; Douglas & Birnbaum, 1954; Thornton, 1954; Twombly & Landers, 1956). Subsequent to his earlier report, Meigs (1954) observed that if one episode of bladder overdistention was permitted to occur in the post-operative period, recovery of normal function was delayed or absent. The patient's susceptibility to overdistention was ascribed to the intraoperative loss of sensory function. As a result of these observations, Meigs (1954) recommended continuous indwelling urethral catheter drainage for at least eight weeks following surgery and until the patient demonstrated the ability to spontaneously void and empty the bladder. Because these patients were also noted to

experience a diminished voiding urge, Meigs (1954) recommended that once able to void, these individuals be instructed to empty the bladder every four hours in an effort to avoid vesicle overdistention and the consequences of decompensation and urinary tract infection.

In 1962, Green et al. reported experience with complications associated with radical abdominal hysterectomy in 623 cases. This study reported a decrease in the incidence of prolonged voiding difficulties when indwelling catheter drainage was maintained for six to eight weeks following surgery as compared with bladder drainage for seven to 14 days. The investigators reemphasized the vulnerability of the sensory paralytic bladder to overdistention and recommended that patients be directed to empty the bladder "by the clock" (p. 311).

Similar findings and recommendations were reiterated by Barclay and Roman-Lopez (1975). Using cystometry these authors demonstrated that the bladder did resume normal capacity with appropriate filling pressure following radical hysterectomy. They concurred that any atonic dysfunction observed was not a consequence of bladder denervation, as believed by previous investigators, but rather bladder decompensation arising from vesicle overdistention with loss of myogenic tone of the detrusor. Barclay and Roman-Lopez

recommended indwelling catheter drainage following radical hysterectomy until micturition could be accomplished with a residual urinary volume of 75 milliliters or less. Additionally, they emphasized the necessity for these patients to remain "bladder-conscious" to avoid overdistention and its consequences.

A study by Seski and Diokno (1977) investigated the etiology and nature of the bladder dysfunction which arises following radical hysterectomy in an effort to propose a standardized program of management. Ten subjects undergoing radical hysterectomy were evaluated pre- and postoperatively, with several observations made. The Urecholine (bethanechol chloride) denervation test as described by Lapedes, Friend, Ajemian and Reus (1962) was employed to lend support to the assumption put forth by previous investigators that some degree of denervation of the urinary bladder did occur following radical hysterectomy. Water cystometry demonstrated that bladder capacity returned to preoperative levels with normal resting pressure by six to eight weeks following surgery. Function of the urethral sphincter as observed by electromyography was not affected. In concordance with previous investigations, Seski and Diokno reported a subjective response of a diminished or absent voiding urge in all subjects. These findings indicated that a sensory and

motor paralytic dysfunction of the urinary bladder occurred following radical hysterectomy and that bladder capacity, accommodation and sphincter function were unaffected. Based on these results, the investigators recommended indwelling urethral catheter drainage for approximately two weeks after surgery followed by evaluation of voiding ability. They further asserted that all patients should be instructed to follow a program of frequent voiding and to refrain from excessive fluid intake. For those individuals who demonstrated an inability to void and/or incomplete vesicle emptying, these authors advised the administration of bethanechol chloride to stimulate detrusor contraction and clean intermittent self-catheterization to insure that the bladder was completely emptied.

Use of Bethanechol Chloride

The use of bethanechol chloride as a parasympathomimetic agent has been reported in the literature for several decades (Starr & Ferguson, 1940; Winter, 1941). Garvey, Bowman and Alsobrook (1949) and Lee (1949) described the clinical use of bethanechol chloride for the stimulation of micturition in postoperative urinary retention. Lee also used the drug to treat chronic hypotonic bladder dysfunction.

In 1963 Lapidès, Friend, Ajemian and Sonda investigated the effect of bethanechol chloride on urinary bladder contractility. The results indicated that the recommended therapeutic dosage range of oral bethanechol chloride should be increased from ten to 30 milligrams to 50 to 100 milligrams, explaining the frequently reported ineffectiveness of the drug in producing vesicle contractions. In 1964 Lapidès outlined a program using bethanechol chloride for the rehabilitation of atonic bladder dysfunction. Subsequent investigators (Bors, 1967; Ferlit, Canning, Lloyd, Cross, & Brewer, 1975; Perlash, 1975) reported clinical experience with bethanechol chloride used with intermittent catheterization for the treatment of bladder dysfunction associated with spinal cord injuries. Herr (1975) found the combination of clean intermittent self-catheterization and bethanechol chloride useful for the treatment of atonic bladder dysfunction and postoperative urinary retention.

In 1976 Diokno and Koppenhoefer delineated the types of bladder dysfunction suitable for therapy with bethanechol chloride. Included were sensory and motor paralytic bladders which demonstrated intact function of the periurethral striated muscle. Seski and Diokno (1977) recommended bethanechol chloride for the treatment of bladder dysfunction following radical abdominal hysterectomy. Using cystometry

and sphincter electromyography, these investigators demonstrated that the varying degrees of partial sensory and motor paralysis occurred following radical hysterectomy and that functioning of the periurethral striated muscle remained intact. These investigations lend support to the use of the parasympathomimetic bethanechol chloride for the treatment of disturbances in micturition following radical hysterectomy.

Urinary Bladder Drainage

Although urinary bladder catheterization is a procedure which has been known to man for centuries, the methods and instrumentation used in bladder drainage generate undying controversy among clinicians (Ingram, 1978). Urinary bladder drainage following radical hysterectomy is no exception. Numerous methods have been used with varying rates of success and associated complications. Two methods are advocated with greater frequency in recent literature: (1) suprapubic catheter drainage and (2) clean intermittent self-catheterization. A discussion of the development of both methods is presented.

Suprapubic Catheter Drainage

Prior to the 1960s suprapubic catheter drainage was used primarily by urologists in males where urinary retention

necessitated an intervention for the removal of urine. Walker (1917) outlined a technique for open suprapubic cystotomy and catheter placement which was later modified by Riches and Lond (1943), who described the use of a trocar for the introduction and placement of a number 16 Malecot catheter. In 1953 Scorer reported 150 cases using the Riches and Lond technique. Although the investigator who employed suprapubic drainage recognized a decrease in the incidence of urinary tract infection over that previously experienced with urethral catheters, the suprapubic approach was viewed by gynecologists as being too invasive to warrant its use for the management of postoperative urinary retention (Mattingly, 1970).

After Cameron (1963) suggested suprapubic catheterization using a small diameter plastic tubing introduced through a needle, gynecologists readily adopted suprapubic bladder drainage using that simplified method. Hodgkinson and Hodari (1966) reported a decrease in the incidence of significant bacteriuria in the patients managed with suprapubic drainage over those managed with urethral catheters. In addition to a reduced incidence of significant bacteriuria, these authors and others (Frymire, 1971; Hofmeister, Martens, & Strebel, 1970; Kariher et al., 1970; Taylor & Nickel, 1966) cited two major advantages to suprapubic drainage: (1) increased

patient comfort and (2) a decreased need for attention by the nursing staff.

Numerous complications associated with suprapubic catheters have been reported. Barclay and Roman-Lopez (1975) commented that they attempted suprapubic drainage in some patients following radical hysterectomy but abandoned the procedure when satisfactory drainage was not achieved. Other investigators have reported difficulties with catheter function. Scorer (1953) described catheter displacement from the bladder as the most common complication of suprapubic drainage. Catheter displacement was also reported by subsequent investigators (Donovan, Kiviat, & Clower, 1977; Frymire, 1971). Additional problems identified with suprapubic catheters were obstruction (Donovan et al., 1977; Frymier, 1971; Jackson, 1979), non-specific catheter malfunction (Hofmeister et al., 1970; Kariher, et al., 1970), insertion site cellulitis (Hofmeister et al., 1970; Kariher et al., 1970; Taylor & Nickel, 1966), urine leakage around the catheter (Kariher et al., 1970), and hematuria (Frymire, 1971).

In an early discussion of the application of postoperative suprapubic drainage in gynecologic practice, Mattingly (1970) suggested the potential usefulness of this method of drainage following radical abdominal hysterectomy. In 1972

van Nagell et al. published a report in which the suprapubic approach was compared with urethral catheter drainage following radical hysterectomy. In the suprapubic group a number 18 silicone elastomer Foley catheter was inserted into the bladder through a small incision made at the time of surgery and brought to the outside by way of stab wound placed lateral to the abdominal incision. The catheter was not removed for at least six weeks nor until postvoiding residuals were less than 50 milliliters. Of the cases managed with suprapubic drainage, there was one catheter malfunction and one displacement, both necessitating replacement with urethral catheter drainage. The incidence of urinary tract infection was 44 percent in the urethral catheter group (n=18) as compared with 23 percent in the group managed with suprapubic drainage (n=84). Because of group size disparity, the investigators made no statistical inferences, but concluded that the suprapubic approach was at least as safe and effective as the urethral catheter for postoperative bladder drainage after radical hysterectomy. The authors also remarked that the suprapubic catheter provided increased patient comfort over urethral drainage. No additional studies are available which compare the effectiveness of suprapubic catheterization with other types of postoperative bladder drainage for the management of bladder dysfunction.

following radical abdominal hysterectomy. Suprapubic drainage is recommended most frequently in the recent textbook discussions on the subject (Buchsbaum, 1978; Ingram, 1978; Mattingly, 1977).

Clean Intermittent Self-Catheterization

While suprapubic catheters were being used with greater frequency among gynecologists, urologists were using intermittent catheterization as an alternative to transurethral and suprapubic catheter drainage and the complications imposed by these methods. In a discussion of bladder care for traumatic paraplegia, Sir Ludwig Guttman (1947), a British physician, suggested sterile intermittent catheterization as a means to reduce the severe urinary tract infection and renal deterioration which was associated with indwelling urethral and suprapubic catheters. In 1966, Guttman and Frankel published an 11-year descriptive study which applied the sterile intermittent catheterization technique to 476 paraplegic and quadriplegic subjects. These investigators observed that ascending urinary tract infection, a primary cause of sepsis and death in patients managed with indwelling catheters for bladder paralysis, was greatly reduced when intermittent catheterization was instituted. The Guttman technique called for the catheterizations to be performed by a physician on males, and in the case of female

patients, by a registered nurse. The persons executing the catheterizations were scrubbed, gowned and masked. Over a sterile field, the urethral meatus was cleansed and, following lubrication with a bacteriocidal agent, the catheter was introduced with forceps.

As experience with the intermittent catheterization approach demonstrated a reduced incidence and severity of urinary tract infection as well as enhanced rehabilitation of the paralyzed bladder to a catheter-free state, the technique was soon adopted by other investigators. In a study published in 1967, Bors reported experience with the Guttman technique, replacing the physician with a male technician as the person responsible for the catheterization without a noticeable rise in the infection rate. Lindan and Bellomy (1971) altered the Guttman technique further. Persons executing the catheterizations were not scrubbed or gowned and the catheters were manipulated directly with sterile gloves as opposed to forceps. A lack of available personnel to carry out sterile intermittent catheterization prompted Comarr (1972) to teach sterile self-catheterization to those male paraplegic individuals who possessed intact motor function of the upper extremities. Self-catheterization allowed

these individuals to successfully manage bladder rehabilitation at home, and an increase in the incidence of urinary tract infection was not observed.

In 1972 Lapidès et al. introduced the concept of unsterile or clean technique of intermittent self-catheterization. The procedure was greatly simplified by replacing sterile technique with ordinary hand soap and tap water, used to wash the hands prior to catheterization and to rinse the catheter between uses. Lapidès (1965) maintained that introduction of bacteria into the bladder would not lead to infection as long as (1) the bladder was emptied frequently and (2) overdistention of the bladder was not allowed to occur.

Lapidès et al. (1972) applied the clean intermittent self-catheterization technique to patients with a wide variety of conditions which produced chronic dysfunction of the urinary bladder and, in some cases, dependence upon some form of external bladder drainage. Women were also included in this group; they were taught self-catheterization with the aid of a hand mirror to visualize the urethra. As the woman learned to locate her urethra by touch the mirror was eliminated. All women instructed in self-catheterization were able to master the procedure without difficulty. Elimination of the sterile technique did not result in infection; in many of the cases chronic infection was eliminated because the

bladder was being emptied more efficiently. Additionally, freedom from socially restrictive urinary drainage appliances and episodes of urinary incontinence enabled the subjects to lead more independent and productive lives.

Successful use of clean intermittent self-catheterization for the management of chronic bladder dysfunction was reported in subsequent investigations (Champion, 1976; Hartman, 1978; Herr, 1975; Lapidés et al., 1974, 1976; MacGregor & Diokno, 1979; Orikasa, 1976). Simplicity of the clean self-catheterization technique was demonstrated by its application to the management of bladder dysfunction in children, as indicated by several reports (Altshuler et al., 1977; Geddes, 1978; Hilwa & Perlmutter, 1978; Lyon, Scott, & Marshall, 1975; Plunkett & Braren, 1979).

In 1977, Seski and Diokno applied clean intermittent self-catheterization to patients who encountered voiding difficulties following radical hysterectomy. They recommended frequent voiding followed by self-catheterization until residual volumes were eliminated. Buchsbaum (1977) took issue with the regimen, suggesting that clean intermittent self-catheterization was not acceptable because sterility was compromised. This argument reflected a division of opinion which exists among clinicians concerning the etiology of urinary tract infection.

There is a belief among some investigators that urinary tract infections occur spontaneously in the presence of bacteriuria (Kass, Savage & Santamarina, 1965) and that significant mechanisms responsible for the introduction of bacteria into the bladder include urologic instrumentation, a short urethra in the female and sexual intercourse (Stamey, Govan & Palmer, 1965). Lapedes (1965, 1973) proposed that bacteriuria alone could not be the sole explanation for the development of urinary tract infection. He maintained that bacteriuria would proceed to infection only in the presence of an abnormality of a functional or structural nature that interfered with normal tissue resistance to the invasion of bacteria. This proposal was based on empirical data collected over many years.

Cox and Hinman, Jr. (1961) stated that there was a prevailing opinion among urologists who wrote prior to 1925 that the bladder was inherently resistant to infection. Early investigators conducted studies on animals which demonstrated that urinary tract infection could not be induced in non-traumatized, non-obstructed bladders by the introduction of bacteria (Brewer, 1911; David, 1918; Eisendrath & Schulte, 1917). Cox and Hinman, Jr. (1961) undertook a study which compared bacterial growth of organisms introduced into the bladder of human subjects with that of in vitro specimens.

Bacterial counts multiplied in the in vitro specimens, but were found to decrease in the urine of the human subjects. Urinary bladder wall vasculature in rats viewed by Mehrotra (1953) through transillumination demonstrated ischemia and stasic changes in those vessels when high intravesical pressures were induced. Specifically, prolonged stasis of blood flow in the vessels led to obstruction of the lumina by clumping erythrocytes, the end result of which was hematuria produced by extravasation of the red cells into the bladder wall. When bacteria were injected intravenously, they were noted to settle in the areas of hemorrhage. Studies by Andrioli and Lytton (1965) indicated that an increase in tissue pressure with a resultant decrease in blood flow to that area resulted in infection of the affected tissue. That overdistention of an organ results in decreased tissue perfusion and infection was demonstrated repeatedly in experiments where pressure was induced in the intestine (Boley, Agrawal, Warren, Veith, Levowitz, Treiber, Dougherty, Schwartz, & Gliedman, 1969; Lawson & Chumbley, 1940; Noer & Derr, 1949).

Lapides (1965) used these concepts in developing his theory concerning the mechanisms associated with the development of urinary tract infection. He maintained that the urinary tract was chronically exposed to bacteria for transient periods and that in a non-obstructed, non-traumatized

bladder, these organisms were irradiated through antibacterial mechanisms in the blood. However, if blood flow to the tissue was interrupted, as was the case when distention of the bladder wall beyond capacity occurred, then organisms, if present, were given the opportunity to invade the bladder wall and produce infection. To state that the presence of bacteriuria alone was responsible for infection did not take into consideration the possible variable of overdistention and subsequent interference with host defense mechanisms.

Buchsbaum (1978) also argued that the frequent voiding program recommended by Seski and Diokno (1977) was too "inconvenient" for patients to follow. The habit of voiding infrequently was proposed as a primary cause of bladder overdistention by Lapedes et al. (1968). Of 112 women with a documented history of recurrent urinary tract infection, 60 gave a history of infrequent voiding habits and demonstrated a bladder capacity in excess of 500 milliliters. In a 1979 study Adatto et al. compared voiding and sexual habits in a group of women who had a history of recurrent urinary tract infection with a control group who had no history of infection. Sexual habits were not significantly different in the two groups but voiding habits were. A significantly greater number of women in the group who experienced recurrent infection reported that they voluntarily retained urine in the

bladder for periods greater than one hour after first experiencing bladder fullness. There was also a significant decrease in the infection rate among those women who changed their micturition habits and followed a program of frequent voiding. Other investigations also supported this concept (Lalli & Lapidès, 1969; Lalli et al., 1971).

Buchsbaum (1977) suggested that self-catheterization was too difficult for most women to master. The majority of reports indicate that the task of self-catheterization was not insurmountable in most instances, and that not only women but children were able to accomplish the technique. However, some reports did indicate certain situations where difficulty was encountered. Diokno and Koppenhofer (1976) reported a case where a woman with achondroplastic dwarfism found self-catheterization physically difficult to execute because of her stature and had to discontinue the procedure as a result. In a discussion of the use of intermittent catheterization for children with myelomeningocele, Drago, Willner, Sanford and Rhoner, Jr., (1977) mentioned experience with "older girls" who demonstrated a dislike for intermittent catheterization and a preference for urinary diversion (p. 94), but the authors did not specify if the catheterizations were attempted by the individuals or by other care givers. Other investigators who used intermittent catheterization with

children did not report this problem, but, rather, experienced acceptance and enthusiasm on the part of those individuals who possessed the motor skills necessary to execute the procedure (Hilwa & Perlmutter, 1978; Kyker, Gregory, Shah, & Schoenberg, 1977; McIlroy, 1977; Mulcahy, James, & McRoberts, 1977; Plunkett & Braren, 1979). Altshuler, et al. (1977) anticipated reluctance and embarrassment concerning intermittent catheterization and self-catheterization on the part of school-age children and adolescents, but the problem was not encountered. They emphasized that their teaching approach was conducted in a "calm, forthright, and matter-of-fact manner" (p. 100) and that provisions were made for adequate privacy and freedom from interruptions during teaching and practice sessions. Wahlquist (1980a) suggested that assessment of "the psychological meaning that repeated touching of the genital region may have to the client" (p. 18) should be included in the process of teaching self-catheterization. She also emphasized the necessity of including assessment of the patient's motor and cognitive skills, as well as commitment to the program as important initial steps in the teaching process.

Psychosocial Considerations

Investigators who observed patients' responses to external urinary drainage devices and clean intermittent

self-catheterization frequently cited the importance of the consideration of body-image and social acceptability when assisting patients in the management of alternations in urinary elimination (Altshuler, et al., 1977; Geddes, 1978; Hardy, Melick, Gregory, & Schoenberg, 1975; Hendry & Geddes, 1978; Lapidès et al., 1972, 1976; Mulcahy, et al., 1977; Plunkett & Braren, 1979; Orikasa et al., 1976). It was noted that the majority of these patients preferred to use a method of urinary elimination that allowed them to function in a manner most like those who were not similarly affected.

Body-image theory lends support for the significant manner in which ones social interaction and bodily appearance and function affect ones body-image or self-concept. Fisher (1970) stated that an individual's self-concept rating could be exemplified by how positively or negatively the body was regarded. According to Chasey, Swartz, and Chasey (1974) "the body, its performance capacities, and physical characteristics represent important components of a person's total self-concept" (p. 440). Schoenfeld (1964) wrote that body-image development was affected (1) by the manner in which society reacted to an individual and the way in which the person interpreted those reactions, (2) by ones perception of and comparisons with the bodies of others, and (3) by

ones subjective interpretation of bodily appearance and functioning ability. Schilder's theory (1950) included the concept that any structure that emerged from the body became incorporated into the body-image, particularly firm objects which connected with the body in a rigid fashion. These concepts could be related to the psychological impact that the use of external urinary devices such as the suprapubic catheter might have on an individual.

Use of a Self-Care Model

Orem (1980) wrote extensively on the concept of self-care and its relation to the practice of nursing. Numerous authors have described the application of the self-care model to nursing practice (Caley, Dirksen, Engalla, & Henrich, 1980; Coleman, 1980; Crews, 1972; Kearney & Fleisher, 1979; Kinlein, 1977; Pridham, 1971). Backscheider (1974) stated that "nursing assistance is considered as a mediating system which compliments or overcomes self-care incapacities" (p. 1146). In a description of the development of a nurse-conducted and physician-supervised diabetic control clinic, Allison (1973) stated that the nurses were viewed as the members of the health care team who held the responsibility for providing assistance to the patients in overcoming limitations and deficits in self-care.

The literature also suggested that health-related self-care skills were gained primarily through patient education and that patient education was a professional nursing responsibility. Joseph (1980) described the application of Orem's self-care model to the nursing process and the intervention of patient education. Patient teaching, she said, was a major vehicle through which the self-care practices of an individual were increased. She stated further:

By embracing the theory of self-care, nursing is able to focus its attention on assisting patients in self-care practices and on increasing self-care abilities through patient education. Patient education includes assisting patients to care for themselves by modifying their self-care practices as a result of illness, chronic disease, or injury, and by teaching them to perform certain procedures needed for their treatment. (p. 132)

In a discussion of the use of education for the promotion of self-care practices, Hentges (1978) stated that "self-care is a universal necessity" (p. 31) and that the health care system would be inundated if it were not for active participation on the part of patients in the management of chronic deviations in health such as diabetes mellitus. She pointed out that, in general, providers of health care have held a pessimistic view of patients' willingness and ability to engage in health-related self-care practices, particularly those which involve the management of disease or deviations in health. This attitude was exemplified by

Buchsbaum (1977) who voiced opposition to the use of self-catheterization in women based on his observations of "the difficulty that trained individuals, nurses, medical students, and occasionally residents have in finding the urethral meatus in a patient who has been prepared and placed in the dorsal lithotomy position" (p. 650). Hentges also emphasized that engaging in self-care enhanced an individual's feelings of confidence and ability to cope.

The literature reflected a positive attitude toward the desirability of self-care practices. There was also a repeated association between the nursing profession and the provision of guidance in health-related self-care practices through patient education. "Thus," as Joseph wrote, "the self-care concept of nursing lends support to the education of patients in nursing practice" (p. 143).

Summary

This chapter presented a review of the literature which comprises the body of knowledge concerning the nature and management of bladder dysfunction following radical hysterectomy. Included were investigations which pertained to the use of bethanechol chloride for the treatment of urinary retention. Also reviewed were publications which report

experience with two methods of bladder drainage: (1) suprapubic catheter drainage and (2) clean intermittent self-catheterization. The psychosocial factors which should be considered in the choice of urinary drainage were related from various sources, as well as literature which supports the concept of patient education for self-care practices as a function of professional nursing.

CHAPTER 3

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

Polit and Hungler (1978) stated that explanation is used in research to identify the relationship between the variables. This was an explanatory study as it examined the association between two methods of postoperative bladder management in terms of outcome of bladder function. The design for this investigation was nonexperimental as it was based on existing data gathered from patient hospital records. In order for a research design to be classified as experimental it must meet three criteria: (1) randomization, (2) manipulation, and (3) control (Polit & Hungler, 1978). Therefore, research which uses existing data is non-experimental in design because the variables under investigation cannot be manipulated, nor can random assignment be made at any level.

Setting

The setting which was be used in this study is located in a metropolitan area of over one million persons in the southwestern United States. The subjects whose cases were

reviewed were treated at a non-profit, federally- and state-supported health care agency which specializes in oncology. The 580-bed hospital offers patient care services on both an inpatient and outpatient basis and is affiliated with a university which offers educational preparation in the health care sciences. Patients are admitted for treatment on a physician's referral basis and referrals originate locally, nationally and internationally.

Population and Sample

The research questions for this study were investigated by reviewing the clinical outcome on two groups selected from the population of patients who have undergone radical abdominal hysterectomy at the study setting. For approximately 36 months prior to this medical record review all patients undergoing radical abdominal hysterectomy were managed postoperatively with clean intermittent self-catheterization and bethanechol chloride. Prior to the initiation of that treatment protocol all patients were managed with indwelling urethral or suprapubic catheter drainage.

Groups were chosen on the basis of the treatment which was applied; therefore, convenience sampling was used. Group 1 consisted of all women who were managed postoperatively with clean intermittent self-catheterization and bethanechol chloride. Group 2 consisted of an equal number of previous

cases taken consecutively which were managed with suprapubic catheter drainage. Only those patients whose surgical procedure was carried out at least twelve months prior to the date of the investigation were chosen in order to insure an equal postoperative observational period. To control for the extraneous variable of extensiveness of surgical dissection, which could influence the degree of postoperative dysfunction (Twombly & Landers, 1956), only those cases in which a type III radical abdominal hysterectomy was performed were included in this study.

Protection of Human Subjects

No active participation by human subjects occurred in this investigation. Existing data on medical records were the single source of information gathered for analysis. Written agency permission to review the medical records was obtained prior to initiation of the study.

The following steps were taken to protect the rights of the subjects whose medical records were reviewed:

1. All data collection instruments were stored in a locked cabinet to which the investigator alone had access.
2. The only patient identifying information gathered was the medical record number which was kept confidential by changing all numbers in the series to

the next highest digit. For example, record number 83079 was transcribed 94180.

3. Anonymity was maintained in the reporting of data. Data were analyzed and reported as a group and any single response was reported in such a manner that the investigator was unable to link the information with that subject's identity.
4. All instruments were destroyed once the data had been extracted for analysis.

Instrument

A data collection instrument was designed by the investigator for the specific purpose of collecting pertinent data on the variables under investigation in this study. Data collected included: (1) the date of surgery, (2) the method of urinary drainage used, (3) the occurrence of early complications, (4) whether normal bladder function was achieved, (5) time in weeks needed to recover normal function, and (6) the occurrence of late complications. This was existing data obtained from medical records.

Validity

Content validity for this instrument was largely literature-based. Included as complications were those which have either been reported in other studies or which are regarded

as potential problems by other investigators (Buchsbaum, 1977, 1978; Frymier, 1971; Green et al., 1962; Jackson, 1969; Kariher et al., 1970; Koelle, 1970; van Nagell et al., 1972). Although not specifically reported in the literature, pain was regarded by the investigator as a potential complication because of the nature of the procedures under study. A category was also reserved for "other" complications, in order to account for any conditions which appeared in this investigation but had not been previously reported.

Reliability

The data collected for this investigation were demographic in nature and the investigator was the single person responsible for gathering that data from the medical records. It is important to note that the investigator did not have control over nor was able to establish reliability of the existing data that was collected.

Data Collection

A list was obtained which enumerates all patients who underwent radical hysterectomy at the study setting between the dates of May, 1976 and May, 1980. Each medical record from that group was reviewed beginning with the most recent case and proceeding back in reverse consecutive order until the entire sample was chosen as follows:

1. Type III radical abdominal hysterectomies alone were included.
2. All cases managed with clean intermittent self-catheterization and bethanechol chloride were included and reported as Group 1.
3. Group 2 consisted of an equal number of cases managed with suprapubic catheter drainage.
4. All cases which qualified for inclusion in the study were reviewed with the gathering of data specified by the data collection instrument.
5. In all cases the collection of data was limited to the 12-month period following the date of surgery.

Treatment of Data

This investigation examined the association between one independent variable with two levels and four dependent variables. The independent variable was the method of bladder drainage used, the two levels being (1) clean intermittent self-catheterization and bethanechol chloride, and (2) suprapubic catheter drainage. The four dependent variables examined in each group were: (1) percentage of subjects who recovered normal bladder function within 52 weeks following surgery, (2) time in weeks required to achieve normal function, (3) incidence of early complications per subject, and (4) incidence of late complications per subject.

A z test for differences in proportions (Champion, 1970) was used to analyze the difference in the rate of recovery of normal bladder function in each group. A t test was used to assess whether a significant difference existed in time needed to recover normal function in each group. A chi-square test was employed to analyze the difference in the incidence of early and late complications in each group.

The nonexperimental design for this explanatory study dictated the use of existing data gathered from medical records. The convenience sample was chosen from a population of patients who had undergone type III radical abdominal hysterectomy at one health care agency setting. After written permission to review the medical records was obtained, existing data on the variables under investigation were collected through the use of an instrument designed specifically for this study. Three statistical tests were used for inferential analysis of the data: (1) a z test for differences between proportions to analyze the recovery of normal bladder function, (2) a t test to compare the difference in time needed to recover normal function, and (3) a chi-square test to compare the incidence of early and late complications in each group. Precautions to maintain the anonymity of the subjects were taken in the process of the collection and reporting of data.

CHAPTER 4

ANALYSIS OF DATA

An explanatory, nonexperimental investigation was conducted to compare the effectiveness of two approaches recommended for the postoperative management of bladder dysfunction following radical hysterectomy: (1) clean intermittent self-catheterization and bethanechol chloride, and (2) suprapubic catheter drainage. This chapter presents a description of the study sample followed by a descriptive and inferential analysis of the findings.

Description of Sample

The sample for this investigation was comprised of 52 subjects divided into two intact groups of 26 subjects each. All subjects were women who had undergone a type III radical abdominal hysterectomy at the study setting at least 12 months prior to the investigation. Group 1 consisted of all women meeting the above criteria who had been managed postoperatively with clean intermittent self-catheterization and bethanechol chloride. An equal number of cases which had been managed with suprapubic catheters formed Group 2 and were chosen systematically in reverse consecutive order.

Findings

The findings of the study are presented as they relate to each of the four research questions. In comparing two groups of patients following radical abdominal hysterectomy, one group managed with clean intermittent self-catheterization and bethanechol chloride (Group 1) and a second group managed with suprapubic catheter drainage (Group 2), the following questions were investigated.

Research Question 1: Was there a significant difference in the number of patients who recovered normal bladder function within a 12-month period?

This research question was evaluated by using a z test for differences in proportions. All subjects in Group 1 recovered bladder function within 12 months whereas 20 subjects (77%) in Group 2 recovered. The difference in proportion between the groups was significant ($p < .01$). These results are summarized in Table 1.

Research Question 2: Was there a significant difference in the average period of time necessary to achieve normal bladder function?

A t test for differences between means was used for the analysis of the data pertaining to this question. Time was measured in weeks. The mean for Group 1 was 16.2 with a median of 8.0. Group 2 had a mean of 19.2 and a median of 6.5. The t test demonstrated a significance level of .5;

TABLE 1
INCIDENCE OF BLADDER FUNCTION RECOVERY
WITH RELATED Z TEST RESULTS

Bladder Function	<u>Subjects</u>	
	Number	Proportion
<u>Group 1 (N=26)</u>		
Recovery	26	1.00
No Recovery	0	.00
<u>Group 2 (N=26)</u>		
Recovery	20	.77
No Recovery	6	.23
Z TEST: $\underline{z} = 2.98$ $p < .01$		

therefore, the difference between the groups was not significant. These data are summarized in Table 2.

Research Question 3: Was there a significant difference in the incidence of early complications?

Research Question 4: Was there a significant difference in the incidence of late complications?

Early complications were manifested by five subjects in Group 1 and 11 subjects in Group 2. Four subjects in Group 1 experienced late complications as compared with 14 subjects in Group 2. When the number of subjects who did not experience complications was reviewed, the results showed 19 subjects in Group 1 and seven subjects in Group 2. A chi-square test was executed to analyze the significance of these findings. Concerning the incidence of early complications, the difference between groups was not significant ($p=.2$). At a .02 level of significance, the incidence of late complications was significantly greater in Group 2, and the number of subjects who did not experience any complications was significantly greater in Group 1. Table 3 presents a summary of these results.

A summary of the occurrence of specific complications is presented in Table 4. Of the early complications, pain, urinary tract infection and self-care deficit were the three variables which could be associated with both methods of

TABLE 2

AVERAGE TIME REQUIRED FOR BLADDER FUNCTION TO
RETURN WITH RELATED T TEST RESULTS

	Time in Weeks		Standard Deviation	Standard Error of the Mean
	Mean	Median		
Group 1	16.2	8.0	14.2	2.8
Group 2	19.2	6.5	19.5	3.8
T TEST: $t = -0.62$ $p=0.5$				

TABLE 3

INCIDENCE OF EARLY AND LATE COMPLICATIONS AMONG
SUBJECTS WITH RELATED CHI-SQUARE RESULTS

Complications	Number of Subjects		χ^2	Level of Significance
	Group 1 (N=26)	Group 2 (N=26)		
Early	5	11	2.25	.20
Late	4	14	5.56	.02
None	19	7	5.54	.02

TABLE 4

INCIDENCE OF SPECIFIC EARLY AND LATE COMPLICATIONS

	Number of Subjects	
	Group 1	Group 2
Early Complications	n (%)	n (%)
Pain	0(0)	3(11.5)
Urinary Tract Infection	1(3.8)	8(30.8)
Self-Care Deficit	4(15.4)	0(0)
Obstructed Catheter	---	3(11.3)
Displaced Catheter	---	1(3.8)
Leaking Catheter	---	2(7.7)
Intolerance to bethanechol chloride	0(0)	---
Calculi ^a	0(0)	1(3.8)
Late Complications		
Urinary tract infection	2(7.7)	8(30.8)
Urinary retention	3(11.5)	8(30.8)
Bladder decompensation	0(0)	3(11.5)

^aCategorized under "other" complication in data collection process

management. Pain due to bladder spasm occurred in three subjects (11.5%) in Group 2. No similar complaint was given by any subject in Group 1. Urinary tract infection was demonstrated in eight subjects (30.8%) managed with suprapubic catheters as opposed to one (3.8%) in the self-catheterization group, a difference found to be significant ($p < .01$) as analyzed by a z test and related in Table 5. Four subjects (15.4%) managed with the self-care program demonstrated some form of self-care deficit during the course of treatment; in each instance the deficit was overcome and self-care continued. In no subject was bethanechol chloride discontinued because of intolerance to the drug's side effects. Various suprapubic catheter malfunctions occurred in six subjects; three (11.5%) catheters became obstructed, one (3.8%) catheter was displaced from the bladder, and two (7.7%) catheters leaked. One subject (3.8%) managed with suprapubic drainage developed bladder calculi.

The late complications of urinary tract infection, urinary retention, and bladder decompensation were common to both groups. Two subjects (7.7%) in Group 1 manifested a urinary tract infection whereas this complication was demonstrated in eight subjects (30.8%) in Group 2. Not all persons who manifested a urinary tract infection during

TABLE 5

INCIDENCE OF URINARY TRACT INFECTION DURING
TREATMENT WITH RELATED Z TEST RESULTS

Urinary Tract Infection	<u>Subjects</u>	
	Number	Proportion
<u>Group 1 (N=26)</u>		
No Infection	25	.96
Infection	1	.04
<u>Group 2 (N=26)</u>		
No Infection	18	.69
Infection	8	.31
Z TEST: $\underline{z} = 2.70$ $p < .01$		

treatment did so in the post-treatment phase. Urinary retention occurred in three subjects (11.5%) in Group 1 but in Group 2 eight subjects (30.8%) experienced this problem. Finally, bladder decompensation was demonstrated in Group 2 only and occurred in three subjects (11.5%).

Five subjects in Group 2 manifested more than one complication during treatment whereas this was not the case in Group 1. In a similar review of late complications, one subject from Group 1 experienced two complications and four subjects from Group 2 manifested two or more complications. This information is summarized in Table 6.

TABLE 6
NUMBER OF COMPLICATIONS EXPERIENCED
PER SUBJECT

Number of Early Complications Experienced	Number of Subjects	
	Group 1 (N=26)	Group 2 (N=26)
0	21	15
1	5	6
2	0	3
3	0	2
Number of Late Complications Experienced		
0	22	12
1	3	10
2	1	3
3	0	1

Summary

This chapter presented the study sample composition as well as a description and analysis of the findings. The sample consisted of 52 subjects who had undergone a type III radical abdominal hysterectomy prior to this retrospective investigation. Group 1 contained 26 women who were managed with clean intermittent self-catheterization and bethanechol chloride; the 26 subjects in Group 2 were managed with suprapubic catheter drainage. Recovery of bladder function was significantly greater in the group managed with clean intermittent self-catheterization and bethanechol chloride. There was no significant difference between groups in the number of weeks required to recover bladder function. The analysis of data also indicated no significant difference between groups in the number of subjects who manifested early complications overall. However, when urinary tract infection was analyzed separately, the results demonstrated a significantly greater proportion of subjects in Group 2 who manifested that complication. Additional significant findings were (1) a greater number of subjects managed with suprapubic catheters experienced late complications and (2) no complications occurred with a significantly greater frequency in the group using clean intermittent self-catheterization.

CHAPTER 5

SUMMARY OF THE STUDY

This study was executed to compare the effectiveness of two methods of postoperative urinary bladder management following radical abdominal hysterectomy: (1) clean intermittent self-catheterization used in conjunction with bethanechol chloride, and (2) suprapubic catheter drainage. To answer the research questions set forth in this study a 12-month postoperative period was reviewed for two study groups, each treated with one of the bladder management approaches under investigation. The specific variables examined and compared were (1) the recovery of bladder function, (2) the average time needed to recover function, (3) the incidence of complications associated with the treatment phase (early complications), and (4) the incidence of complications which occurred after treatment was discontinued (late complications).

Summary

This was an explanatory, nonexperimental study which was based on existing data gathered from medical records. A

study setting was chosen where both bladder management programs under investigation had been applied to patients following radical hysterectomy. Cases were systematically selected from intact groups formed on the basis of treatment. Groups were chosen from those patients who underwent a type III radical abdominal hysterectomy between the dates of May, 1975 and May, 1979 at the study setting. All qualifying cases managed with clean intermittent self-catheterization and bethanechol chloride were included and classified as Group 1. An equal number of cases managed with suprapubic catheter drainage comprised Group 2; subjects were chosen in reverse consecutive order until the desired number was obtained. A total of 52 cases qualified for inclusion in the study. A data collection instrument was designed for the specific purpose of gathering information on the variables in question. Each medical record was reviewed and data collected from the 12-month period following the day of surgery.

To test the significance of the difference between groups with regard to recovery of bladder function, the subject of Research Question 1, a z test for differences in proportion was executed. This analysis showed a significantly greater number of subjects in Group 1 regained normal bladder function. To answer Research Question 2, a t test

was used to determine if a significant difference existed between groups in the average time needed to recover bladder function. The difference was not significant. Research Questions 3 and 4 asked if there was a significant difference between groups in the incidence of early complications and late complications, respectively. When the total number of patients who experienced early complications in each group was compared with a chi-square test, the difference was not significant. When the incidence of urinary tract infection was analyzed separately with a z test, the findings showed a significantly greater frequency of infection among subjects managed with suprapubic catheters. A chi-square test was also used to test for a significant difference between groups in (1) the number of subjects who experienced late complications and (2) the number of subjects who incurred no complications. The difference was significant in both instances.

Discussion of Findings

All patients managed with clean intermittent self-catheterization and bethanechol chloride in this investigation recovered normal bladder function whereas six patients (23%) managed with suprapubic drainage did not, a difference which was significant. Previous investigators have attributed chronic dysfunction to (1) an inevitable consequence of intraoperative denervation (Brunschwig, 1953; Douglas &

Birnbaum, 1954; Thornton, 1954), (2) insufficient duration of postoperative drainage (Green et al., 1962), and (3) bladder overdistention (Barclay & Roman-Lopez, 1975; Green et al., 1962; Meigs, 1954).

Van Nagell et al. (1972) used suprapubic catheterization in patients following radical hysterectomy, employing drainage for at least six weeks as recommended by Green et al. All patients managed with suprapubic catheters in the van Nagell study recovered normal bladder function; in the present investigation normal function was achieved in only 77 percent of the cases treated with suprapubic drainage. The discrepancy in these findings could possibly be attributed to a difference between patient populations in education received concerning the need to remain "bladder-conscious" and to void "by the clock" There was insufficient data available in both cases to determine the extent of instruction given to the patients concerning measures to follow in order to avoid bladder overdistention. No additional studies are available which report experience with suprapubic drainage following radical hysterectomy.

All patients managed with clean intermittent self-catheterization and bethanechol chloride in this investigation recovered normal function, which supports the findings of the investigators who proposed this treatment approach

(Seski & Diokno, 1977). All patients managed in this manner were on indwelling urethral catheter drainage for ten to 14 days immediately following surgery, a measure taken to allow for the resolution of postoperative discomfort prior to the initiation of self-catheterization. No patient in this group was maintained on an indwelling catheter for a period exceeding 14 days, which disputes the assumption made by Green et al. (1962) that some form of continuous drainage must be employed for at least six weeks to insure recovery.

Duration of Dysfunction

Twombly and Landers (1956) stated that the extensiveness of surgical dissection was directly related to the degree and duration of dysfunction manifested postoperatively. This study controlled for that conclusion by restricting study participants to those individuals upon which the more extensive type III procedure was executed. Previous studies have not made that distinction.

This study indicated that the method of urinary drainage used did not influence the amount of time needed to recover normal function, as the difference between groups in the average duration of dysfunction was not significant. The median time to recovery of normal function in the group managed with self-catheterization and bethanechol chloride was 8.0 weeks. These results concur with the findings of

Seski and Diokno (1977); fifty percent of the subjects in their series demonstrated normal voiding patterns with a residual volume of less than 50 milliliters by eight weeks following surgery. These authors did not report the mean duration of bladder dysfunction, but commented that one patient required five months to achieve normal function, with the remaining subjects recovering normal function in a shorter period of time. This would indicate that the mean duration of dysfunction in the Seski and Diokno series was considerably less than that demonstrated by the group managed with self-catheterization and bethanechol chloride in the present study. This discrepancy can possibly be attributed to a difference in extensiveness of surgical dissection between the two populations, as all subjects in the current group underwent a more radical procedure.

In the van Nagell et al. series, the mean duration of dysfunction in patients managed with suprapubic catheters was 7.2 weeks, a figure less than that demonstrated by the subjects managed with the suprapubic approach in the current investigation (19.2 weeks). A difference in degree of surgical dissection could also account for the difference.

Early Complications

Comparison of the overall incidence of early complications between groups was not significant. Some important observations were made, however, when the individual complications were compared.

Urinary tract infection. There was a significant difference between groups in the incidence of urinary tract infection which occurred during treatment. This is an important difference to note because the issue of urinary tract infection is cited most frequently in the debate over methods of bladder drainage. Buchsbaum (1977) stated that suprapubic drainage was preferable following radical hysterectomy because clean intermittent self-catheterization would compromise sterility. This study demonstrated that the use of clean intermittent self-catheterization can be associated with a significantly lower incidence of infection over the use of suprapubic catheters. These findings support results obtained by other investigators who also identified a reduced incidence of infection when clean intermittent self-catheterization was compared with other types of bladder drainage (Lapides et al., 1972, 1974, 1976). In a series of seven patients managed with clean-intermittent self-catheterization Champion (1976) reported the occurrence of infection in two patients which was directly related to a

self-care deficit of infrequent catheterizations which led to overdistention. When the self-care deficit was corrected, infection did not reoccur. Van Nagell et al. (1972) compared suprapubic drainage to urethral catheters following radical hysterectomy and reported a 23 percent rate of urinary tract infection in the group managed with suprapubic catheters. Similar results occurred in the present study as 30.8 percent of the subjects who were treated with suprapubic drainage demonstrated an infection of the urinary tract.

Self-care deficit. All patients managed with clean intermittent self-catheterization in the present investigation were able to execute the procedure. During therapy four subjects manifested self-care deficits in the form of inadequate frequency of catheterization and/or excessive fluid intake. In all cases, the deficit was overcome through additional teaching and reinforcement of the principles of therapy. Champion reported the same problem with resolution accomplished in a similar manner. No self-care deficit was demonstrated by patients managed with suprapubic catheters, but their level of self-care was much less than those patients responsible for their own catheterizations. One advantage to holding a higher degree of responsibility was demonstrated in the group managed with self-catheterization. When one subject encountered an unexpected episode of urinary

retention, she was able to reinstitute self-catheterization to relieve the problem immediately, rather than having to wait for medical assistance.

Catheter malfunction. The patients managed with suprapubic catheters experienced a variety of problems with catheter function which have been reported by previous investigators. Donovan et al. (1977) and van Nagell et al. (1972) each reported one case of catheter displacement from the bladder; Frymire (1971) experienced this difficulty in four cases. Donovan et al. encountered catheter obstruction once, Jackson (1969) reported two cases and Frymire experienced the problem in ten instances. Catheter leakage was demonstrated on two occasions in the report by Kariher et al. (1970). These catheter problems were encountered in the present study which lends further support to the assumption that a potential for catheter malfunction exists when suprapubic drainage is employed. The major concern posed by this potential problem is that if a malfunction occurs the bladder may become overdistended before a functioning catheter can be reinserted.

Calculus formation. One patient managed with suprapubic drainage developed bladder calculi. This particular subject also experienced urinary tract infection and catheter obstruction. Although not specifically reported in the

literature as a complication of suprapubic drainage, calculus formation has been associated with indwelling urethral catheters (Hardy, 1968). Renal calculi are also associated with urinary tract infection and metabolic disturbances, or their occurrence can be idiopathic in nature (Schmidt, 1978). Green et al. (1962) experienced a 1.4 percent incidence of bladder calculi following radical hysterectomy and attributed it to the prolonged urethral catheter drainage which was employed. The observation of calculus formation concurrent with suprapubic drainage in the present study is of interest but no conclusions can be drawn from the limited data available in this isolated case.

Pain. Enhanced patient comfort through the use of suprapubic drainage is one of the most frequently cited advantages given to support the use of that approach over urethral catheterization (Frymire, 1971; Hodgkinson & Hodari, 1966; Hofmeister, Martens, Strebel, 1970; Kariher et al., 1977; Taylor & Nickel, 1966; van Nagell, 1972). In the present investigation pain in the form of bladder spasm was reported by three subjects (11.5%) managed with suprapubic catheters whereas there were no similar reports given by any subject using self-catheterization. This finding would indicate that the use of intermittent catheterization is not

associated with any greater degree of discomfort than suprapubic drainage and could possibly be associated with less.

Intolerance to bethanechol chloride. The need to eliminate therapy with bethanechol chloride due to intolerance to the drug's side effects was not encountered in this study. This problem has not been reported by previous investigators who have applied the drug to the treatment of bladder dysfunction. These findings indicate that bethanechol chloride can be administered in therapeutic doses without a high incidence of intolerable side effects.

Late Complications

Certain complications have been associated with functioning of the urinary tract after normal voiding has resumed in patients after radical hysterectomy. Urinary tract infection, urinary retention and bladder decompensation all occurred in this investigation and were demonstrated to a significantly greater degree in the group managed with suprapubic catheters. Even after normal voiding has resumed, sensory impairment may persist, continuing to make the bladder vulnerable to overdistention, which can proceed to infection, urinary retention, and if severe or prolonged, to bladder decompensation (Green, et al., 1962). A possible explanation to the difference between groups concerning late

complications in this investigation is that the patients managed with suprapubic drainage were not provided with education concerning the necessity of remaining bladder-conscious after resumption of normal function. Conversely, the patients who engaged in a higher level of self-care from the onset of therapy may have been more inclined to continue frequent voiding practices after achieving normal function and, in the process, avoided late complications.

Conclusions and Implications

Existing data was used to evaluate the effectiveness of two methods of urinary bladder management following radical abdominal hysterectomy. Postoperative outcome was reviewed in 52 subjects; two intact groups formed on the basis of treatment were compared. Lack of randomization and the use of existing data limited generalizability of the findings to those subjects who were studied.

This investigation demonstrated that for the subjects studied:

1. Recovery of bladder function following radical abdominal hysterectomy was achieved with a significantly greater frequency in those individuals managed with clean intermittent self-catheterization and bethanechol chloride than in the subjects managed with suprapubic drainage.

2. The method of bladder management employed did not significantly affect the time required to achieve normal function.
3. Urinary tract infection occurred more frequently in the group managed with suprapubic drainage than in the group managed with clean intermittent self-catheterization; this difference was significant.
4. A significantly greater proportion of subjects managed with clean intermittent self-catheterization and bethanechol chloride experienced no complications in comparison with the subjects managed with suprapubic catheters.

Based on the findings of this study and a review of the relevant literature the following conclusions were drawn. Urinary bladder dysfunction following radical abdominal hysterectomy can be successfully managed by instructing patients in a self-care program of clean intermittent self-catheterization used in conjunction with the parasympathomimetic agent bethanechol chloride. This management approach does not appear to be associated with a greater degree of urinary tract infection than the more frequently advocated method of suprapubic catheter drainage. The findings also indicate that a greater number of potential complications are

associated with suprapubic catheters than with clean intermittent self-catheterization and bethanechol chloride.

An essential aspect of the self-catheterization program is patient education concerning the vulnerability of the sensory paralytic bladder to overdistention and the importance of following the preventive measures of frequent voiding and avoidance of excessive fluid intake. These self-care measures are easily accomplished by the average female adult who undergoes radical hysterectomy for the treatment of cancer of the cervix. By initially engaging in a higher level of self-care practice and responsibility required by the self-catheterization program these women may ultimately experience fewer late complications because they continue to be more attentive to the compromised state of the bladder.

Because the success of the self-care program is dependent upon the patient's understanding of the nature of her bladder dysfunction and her ability to engage in the necessary self-care practices, it is essential that a thorough educational program be developed and offered to these individuals. Careful assessment of the individual's ability to carry out the expected self-care activities is an important step in the teaching process. Because urinary bladder catheterization and patient education are both considered functions of professional nursing (Joseph, 1980; Wahlquist,

1980b), it is that group that should assume responsibility for developing and implementing the education that appears to be an essential component in the successful recovery of bladder function following radical hysterectomy. Additionally, as primary care givers, nurses can and should satisfy the need for research in this area of health care delivery by independently designing and executing scientific investigations which evaluate the effectiveness of various approaches to bladder evacuation and which also document patient preferences for and improved patient outcomes with techniques which encourage a high level of self-care.

Recommendations for Further Study

Based on the findings and conclusions of this investigation the following recommendations are made for further study:

1. To gain better control over the definition and measurement of the variables, this study should be repeated prospectively.
2. A larger sample should be studied and subjects randomly assigned to treatments; this modification would increase the generalizability of the findings.
3. To better define the effect that bethanechol chloride has on the variables in question, a

similar study should be conducted which includes two additional treatments: (1) bethanechol chloride used with suprapubic drainage, and (2) clean intermittent self-catheterization used without bethanechol chloride.

4. In replicating this study a standardized teaching program concerning health practices associated with self-care of the sensory and motor deficient urinary bladder should be given to all subjects regardless of bladder drainage approach; this step would possibly assist in the clarification of whether choice of bladder drainage has a significant bearing on recovery of bladder function and the incidence of complications.
5. Finally, an investigation could be conducted to study the effect that various urinary drainage approaches have on body-image.

APPENDIX A

CONSENT FORM

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING
DENTON, TEXAS 76204

DALLAS CENTER
1810 INWOOD ROAD
DALLAS, TEXAS 75235

HOUSTON CENTER
1130 M. D. ANDERSON BLVD.
HOUSTON, TEXAS 77025

AGENCY PERMISSION FOR CONDUCTING STUDY*

THE M. D. Anderson Hospital and Tumor Institute, Department of Gynecology

GRANTS TO Jeanine Ernst Seski, R.N., B.S.N.

a student enrolled in a program of nursing leading to a Master's Degree at Texas Woman's University, the privilege of its facilities in order to study the following problem:

Through patient record review, evaluation of the effectiveness of clean intermittent self-catheterization and bethanechol chloride versus suprapubic catheter drainage for the management of urinary bladder dysfunction following radical abdominal hysterectomy.

The conditions mutually agreed upon are as follows:

1. The agency (may) (~~may-not~~) be identified in the final report.
2. The names of consultative or administrative personnel in the agency (may) (~~may-not~~) be identified in the final report.
3. The agency (~~wants~~) (does not want) a conference with the student when the report is completed.
4. The agency is (willing) (~~unwilling~~) to allow the completed report to be circulated through interlibrary loan.
5. Other _____

Date: 5/6/81

Jeanine Ernst Seski
Signature of Student

John R. Kelly
Signature of Agency Personnel
John R. Kelly
Signature of Faculty Advisor

* Fill out and sign three copies to be distributed as follows: Original-Student;
First copy - agency; Second copy - TWU College of Nursing.

GP:GEN 13
07026074 cd

APPENDIX B

DATA COLLECTION INSTRUMENT

DATA COLLECTION INSTRUMENT

No. _____

Date of Operation _____

Treatment: _____ Clean intermittent self-catheterization and
bethanechol chloride
_____ Suprapubic catheter drainage

Early Complications:

_____ Pain (specify: _____)

_____ Urinary tract infection

_____ Hematuria

_____ Intolerance to bethanechol
(other drugs: _____)

_____ Noncompliance/self-care deficit

_____ Obstructed suprapubic catheter

_____ Dislodged suprapubic catheter

_____ Leaking suprapubic catheter

_____ Infection at incision for suprapubic
catheter

_____ Other: _____

Normal Bladder Function Resumed:

_____ Yes (Weeks to normal function: _____)

_____ No

Late Complications:

_____ Urinary tract infection

_____ Urinary retention

_____ Bladder decompensation

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