Kay Schwagmeyer Krusa. PREVALENT NURSING APPROACHES TO ACUTE URINARY RETENTION: A COMPARISON OF RAPID AND GRADUAL BLADDER EMPTYING METHODS. (Under the direction of Therese G. Lawler) School of Nursing, December, 1984.

The purpose of this study is to examine the various approaches to the nursing management of acute urinary retention in hospitalized patients. A longstanding controversy exists in relation to whether prompt, total evacuation or staged emptying of the distended urinary bladder is appropriate. At issue is whether total bladder emptying could induce complications such as shock, frank blood in the urine, and lightheadedness. Since most persons completely empty their bladders upon urination, it would seem reasonable to completely drain the bladder when passing a urinary catheter. Yet many practicing nurses and nurse educators advocate gradual emptying of the distended bladder, which is inconsistent with modern medical knowledge and beliefs.

A quasi-experimental study was designed to compare the two methods of bladder emptying with respect to immediate subsequent changes in arterial blood pressure and heart rate and the occurrence of bloody urine and patient reports of lightheadedness. In addition, a survey of eastern North Carolina hospitals was conducted to determine whether some community standard exists concerning the nursing management of acute urinary retention.

The results of the quasi-experimental study were of limited usefulness, in that after several months only three subjects were obtained. The incidence of complications following bladder catheterization was fairly evenly distributed between the total bladder emptying and gradual bladder emptying groups. Due to the small sample size, no conclusions could be drawn to reject or support the hypothesis that there is no difference between rapid, total bladder emptying and gradual bladder emptying with respect to immediate subsequent complications such as those described.

Among 18 area hospitals, fully one-third cite no written policy on bladder catheterization for acute urinary retention. Among those hospitals that carry a policy, no one method is preferred, but it seems that larger hospitals (over 100 beds as opposed to less than 100 beds) tend to advocate total bladder emptying.

PREVALENT NURSING APPROACHES TO ACUTE URINARY RETENTION: A COMPARISON OF RAPID AND GRADUAL BLADDER EMPTYING METHODS

A Thesis
Presented to
the Faculty of the School of Nursing
East Carolina University

In Partial Fulfillment
of the Requirements for the Degree
Master of Science in Nursing

by
Kay Schwagmeyer Krusa
December 1984

PREVALENT NURSING APPROACHES TO ACUTE URINARY RETENTION: A COMPARISON OF RAPID AND GRADUAL BLADDER EMPTYING METHODS

by

Kay Schwagmeyer Krusa

APPROVED BY:

DIRECTOR OF THESIS Therese Lawler
Therese Lawler, Ed.D.

COMMITTEE MEMBER Frances Eason
Frances Eason, Ed.D.

COMMITTEE MEMBER Dorothy Merrow
Dorothy Merrow, M.S.N., P.N.P.

COMMITTEE MEMBER Kevin F. O'Brien
Kevin O'Brien, Ph.D.

DEAN OF THE SCHOOL OF NURSING

Emilie Henning, Ha
Emilie Henning, Ed.D.

DEAN OF THE GRADUATE SCHOOL

Joseph E. Boyette
Joseph Boyette, Ph.D.

ACKNOWLEDGMENTS

Grateful acknowledgment is made to the following persons: Edward O. Janosko, M.D., without whose influence this thesis would never have been undertaken, and whose suggestions during the writing were most useful; Dorothy Merrow, M.S.N., P.N.P., Frances Eason, Ed.D., and Kevin O'Brien, Ph.D., committee members who generously offered their support and assistance; and Therese Lawler, Ed.D., thesis director, whose enthusiasm and guidance are so deeply appreciated.

TABLE OF CONTENTS

LIST OF TABLES

FOREWORD

It should be noted that a discrepancy exists between the name on the completed thesis and the name on the appendix forms. Kay S. Janosko and Kay S. Krusa are the same person.

CHAPTER ONE

DEFINITION OF THE PROBLEM

Introduction

Individuals frequently require catheterization for the relief of acute urinary retention. It is a longstanding nursing practice to withdraw urine only to a certain point. The maximum amount allowed ranges from 500 to 1000 ml., and is determined by agency policy or the nurse in charge of the procedure. The usual rationale for subtotal drainage is that sudden, complete emptying of a grossly distended bladder can cause shock. The purpose of this study is to investigate prevalent practices. To accomplish this goal, two approaches will be employed. The first is to test this thesis by comparing two methods of bladder catheterization in patients experiencing acute urinary retention. The first method involves the prompt evacuation of all urine present in the bladder; the second method involves the removal of a maximum of 750 ml. of urine, after which the catheter is clamped. After 30 minutes any remaining urine is emptied. These two methods will be compared in terms of immediate subsequent changes in arterial blood pressure and heart rate, and obvious hematuria. It is hoped that the information obtained will expand nursing knowledge and result in improved patient care.

In addition to the pilot experiment, a survey of eastern North Carolina hospitals will be conducted to learn

whether hospitals have a written policy on catheterization and whether some community standard exists as to prompt and gradual emptying of the distended bladder. Survey results that reveal an array of approaches would support the desirability of a definitive study that could yield new nursing knowledge.

Background of the Problem

Urinary retention occurs when urine fills the bladder and is not excreted from the bladder. Retention is characterized by (1) an inability to urinate; (2) feelings of fullness, pressure, and discomfort; and (3) tenderness over the bladder, which when distended is palpable over the symphysis pubis.[1]

Since the causes of urinary retention are numerous, only the more common causes will be discussed. Basically there are two mechanisms by which retention occurs: obstruction of the urinary passages and interruption of vesical innervation.[2] In the case of obstruction, lesions may constrict, block, or compress the urethra, preventing the flow of urine. When muscular action can no longer create enough force to propel the urine past the obstruction, urinary retention results. Generally, the lesions that cause this problem fall into five main categories: congenital, inflammatory, traumatic, neoplastic, and calculous diseases.[3]

In the unobstructed urethra, too, insufficient force may be present to propel the urine. Interruption of nervous

stimulation results in ineffective or absent muscle contractions. Trauma, neoplasm, inflammation, and degeneration constitute possible neurologic causes of retention.[4]

In addition to obstructive and neurologic causes, surgical procedures can contribute to urinary retention. Probably the most common type of retention encountered by nurses is postoperative retention.[5] Innes and Bruya (1977) studied 840 patients, of which 13% required catheterization. When spinal anesthesia was used singly or in combination with other anesthesia, the rate of catheterization climbed to over 23%.[6]

Several factors can account for postoperative delay of voiding:

1. Drugs, particularly such anticholinergics as atropine, depress bladder muscle function.
2. The effect of analgesia delays the signal from an overfilled bladder.
3. The supine position impedes urination, as does the lack of privacy in a hospital setting.
4. Pain, especially in the perineal or abdominal region, inhibits the perineal relaxation so vital to urination.
5. Intravenous fluids administered during and after the surgery may rapidly overdistend the bladder.
6. Many women, unlike men, experience little discomfort when the bladder is overfilled and so do not insist on relief-affording measures.[7]

Additional less common causes of acute urinary retention include urethral stricture secondary to gonorrhea or trauma, fecal impaction, prostatic abscess, and birth-related

trauma.[8] As stated, many medications interfere with the normal urination process and can produce acute retention. In addition to the above-mentioned anticholinergic-antispasmodic agents, these drugs have been identified as causes of acute urinary retention:

1. Antidepressant-antipsychotic agents such as phenothiazines, tricyclics, MAO inhibitors, and butyrophenones (Haldol);[9]

2. Antiparkinson preparations such as levodopa, artane, and cogentin;[10]

3. Alpha-adrenergic agonists such as Actifed, Ornade, and Sudafed.[11]

The dangers of acute bladder distention and retention are widely acknowledged; the risk of infection has been well publicized.[12] When the bladder overfills, the resultant stretching endangers the integrity of the bladder wall. In addition to possible tearing, a reduced supply of oxygenated blood is available to the mucosa. When the bladder is emptied, congestion and edema of the mucous membrane develop. These combined responses dramatically increase the likelihood of cystitis. The stagnant pool of urine then provides an excellent medium for bacterial growth.[13]

In addition to infection, hemorrhage can result from overdistention. The overfilled urinary bladder can be compared to an overfilled balloon in that its membrane becomes thinner and thinner. If tearing occurs, fragile blood vessels are then damaged, and bleeding ensues.[14]

Another complication, atony, more chronic and sometimes

irreversible, can follow an episode of bladder overdistention. Bladder atony develops in the following manner. Collagen settles between the bladder's smooth muscle fibers, reducing their contractility, and, as a result, bladder emptying is impaired. The return to full function may require weeks or months, or it may never occur.[15]

Acute urinary retention, then, is a situation which demands prompt intervention in order to arrest discomfort and prevent the complications described above. Medical literature dating to the mid-19th century examines this issue.

Prior to the 1930's, most physicians contended that sudden, total emptying of the overdistended bladder would provoke serious consequences, particularly systemic vascular collapse and bladder hemorrhage.[16] Subsequent studies questioned the existence of such relationships.[17] Thus a controversy arose concerning the desirability of one drainage method over the other, with some urologists aligned toward each method. Research has continued as knowledge of physiology expands and more sophisticated equipment and measurements are available. Among today's medical community it is generally acknowledged that total, prompt emptying of the overdistended bladder constitutes safe and effective management of acute urinary retention.

Nursing textbooks as well traditionally address the topic of acute urinary retention. Fourteen textbooks published since 1975 were reviewed by the investigator in order to

determine whether there is consistency in what is being taught on this topic. The findings are as follows:

Dison, in Clinical Nursing Techniques (1975): "...it is usual to clamp the catheter after 1000 ml. of urine has been removed and to seek further orders from the physician before the bladder is emptied completely. Removal of an amount in excess of 1000 ml. of urine predisposes the bladder to trauma and may cause complications such as shock and chills."[18]

Rines and Montag, in Nursing Concepts and Nursing Care (1976): "...usually no more than 1000 ml. at one time. Withdrawal of more can lead to sudden lowering of the blood pressure and even a state of shock."[19]

Henderson and Nite, in Principles and Practice of Nursing (1978): These authors launch a thorough discussion of the basic principles underlying treatments of the bladder -- intravesical pressure, the urge to void, and bladder distention due to retention of urine. They cite the classic studies by Creevy (1932) and Osius and Hinman (1963) regarding the proper management of acute retention. Henderson and Nite conclude that "since it is an unsolved problem in therapy the nurse should determine the physician's wishes in relation to this aspect of the procedure."[20]

Wolff, Weitzel, and Fuerst, in Fundamentals of Nursing (1979): "Gradual decompression of the distended bladder has generally been considered to be a safer procedure than rapid removal of all urine, although there is little research evidence to support this practice. Rapid emptying of the bladder was thought to cause severe systemic reactions, such as chills, fever, and shock. Gradual decompression has been credited with preventing engorgement of the vessels as well as helping to improve the tone of the bladder wall by adjusting the pressure within the bladder in stages...If as much as 2000 ml. is suspected, a special apparatus may be used to decompress the bladder over a period of 24 hours or more. When the nurse needs to exercise judgment as to the amount of urine to withdraw at a single catheterization, no more than 750 ml. of urine is removed from a patient at any one time."[21]

Kozier and Erb, in Fundamentals of Nursing Concepts and Procedures (1979): These authors recommend that "no more than 750 ml. be removed at one time. Removing larger amounts of urine too quickly can induce engorgement of the pelvic blood vessels and shock. Usually the physician will prescribe the amount and times at which urine is to be withdrawn."[27]

Saperstein and Frazier, in Introduction to Nursing Practice (1980): "After 750 to 1000 ml. (agency policies, physicians, and authorities may vary), remove catheter; do not compress bladder any further. Gradual decompression of overly distended bladder (sic) avoids loss of bladder tone with resultant trauma and damage to bladder. When emptied too quickly, chills, fever, and shock can occur due to rapid change of internal bladder pressure and distention of blood vessels."[23]

Massachusetts General Hospital Manual of Nursing Procedures (1980): "Allow urine to flow until the bladder is empty, or a maximum of 600 cc. has been withdrawn. Sudden release of intraabdominal pressure by withdrawing larger volume may cause shock. If bladder has not been emptied, clamp catheter for 15 minutes, then withdraw remaining urine volume."[24]

Budassi and Barber, in Emergency Nursing Principles and Practice (1981): "No more than 500 to 750 ml. urine should be removed at any one time (within one hour), however, since the sudden change in the intra-abdominal pressure can cause shock."[25]

Mitchell and Lousteau, in Concepts Basic to Nursing Practice (1981): "Urinary retention is potentially dangerous. If the bladder is allowed to collect an excessive volume of urine, the transitional epithelium of the bladder wall will be stretched thin and will become hypoxic because of the increased pressure on the arterial vessels...catheterization is the last resort. The...danger in decompression of the greatly distended bladder...must be considered. The bladder may lose tone, and with the rush of blood back into the pelvic area, the person may experience light-headedness, fainting, or even shock if more than 700 to 1000 cc. urine is removed at one time. The exact mechanisms of light-headedness and shock are unknown. Perhaps they may be due to the reflex dilatation of previously effaced pelvic arteries and veins. No clinical studies are available at this time."[26]

Chilman and Thomas, in Understanding Nursing Care (1981): "The patient requires catheterization in most instances except in postoperative retention, which is usually less acute and of psychological origin...If catheterization is required great care must be taken not to precipitate acute renal or cardiac failure by too rapid decompression of the bladder. The sudden release of pressure does produce this effect in some patients. The surgeon will indicate whether he wishes the bladder decompressed over a few hours."[27]

Beland and Passos, in Clinical Nursing: Pathophysiological and Psychosocial Approaches (1981): "Urine should not be drained off too fast from a greatly distended bladder. Regardless of how long it takes to drain the urine, the nurse must remain with the patient to observe closely the patient's response, and to prevent the catheter from being expelled by the pressure of the remaining urine in the bladder."[28]

Nursing '81 Books, Nursing Photobook: Implementing Urological Procedures (1981): "Don't allow more than 700 ml. urine to drain into the container. If the urine reaches this level, clamp the catheter immediately. Allowing more than 700 ml. urine to drain at one time may cause your patient to go into shock."[29]

Narrow and Buschle, in Fundamentals of Nursing Practice (1982): "If nursing measures to promote normal voiding are not successful, the patient will have to be catheterized. This must be done slowly, and no more than 750 to 1000 ml. should be removed at one time from a badly distended bladder. Too rapid or complete removal of urine decompresses the bladder faster than blood flow through the walls can be normalized, and the patient experiences chills, fever, lightheadedness, and possible shock."[30]

McConnell and Zimmerman, in Nursing Care of Patients with Urologic Problems (1983): "One important precaution... is that no more than 1000 cc. should be drained at one time. The theory behind this is that removing more than this amount at one time releases pressure on pelvic blood vessels, causing shock. This theory has not yet been substantiated by research and very large amounts of urine have been removed, especially in postpartum patients, without any complications. Nevertheless, however, most institutions include this precaution in their catheterization procedure. Thus the catheter is clamped after 1000 cc. has been removed, and the remainder is drained after waiting 30 to 60 minutes."[31]

In summary, most nursing textbooks advocate subtotal emptying of the grossly distended urinary bladder. Most authors suggest that no more than 750 ml. be released at once. At least in this point the writers are clear. However, the appropriate subsequent action, once 750 ml. is evacuated, seems vague in the minds of many nurse educators. How long should the catheter remain clamped? In what decre-

ments should the balance of the urine be evacuated, and over what period of time? What becomes of the patient who spontaneously voids an amount in excess of 750 ml.? Is this individual to be monitored for impending shock?

Significance of the Study

The lack of consistency among nursing textbooks as to what constitutes appropriate nursing management of acute urinary retention accounts, at least in part, for the wide array of nursing interventions employed today. No empirical data are available to confirm or refute the thesis that partial emptying of the overdistended bladder constitutes the most appropriate management of acute urinary retention. The dearth of scientific rationale utilizing physiological concepts and the general omission of documentation for assumptions made and approaches suggested call for a fresh appraisal of urinary retention and its management. The data obtained in this study may be useful in supplying alternatives to current techniques or in refining the nursing procedures presently in use.

A thorough review of the literature on this topic since Creevy's effort in 1932 was not found by this researcher. A number of cross-cultural writings have been uncovered, most notably those of European authors. It is hoped that interested medical and nursing professionals will benefit from the comprehensive list of publications reviewed in this paper.

The survey of area hospitals may expose a consistency or diversity of approaches to the nursing management of urinary retention, thereby describing one aspect of nursing practice as it exists in this region.

Focus of the Study

The variety of nursing approaches to the management of urinary retention has been outlined. The disadvantages of delayed bladder emptying (increased risk of infection, tissue hypoxia) have been discussed. The key issue is whether prompt, total emptying is associated with a significantly greater incidence of post-catheterization complications than gradual emptying. The purposes of this study are then (1) to compare prompt, total bladder emptying with gradual drainage with respect to subsequent changes in blood pressure and heart rate and the onset of gross hematuria and syncope, and (2) to identify current practice standards among a group of eastern North Carolina hospitals.

REFERENCES

[1]Barbara Narrow and Kay Brown Buschle, Fundamentals of Nursing Practice (New York: John Wiley and Sons, 1982), p. 482.

[2]Mims Gage Ochsner, "Acute Urinary Retention," Comprehensive Therapy 1983: 9(8) 61-67.

[3]David Culp, "Acute Urinary Retention," Postgraduate Medicine 31 (March 1962): 252.

[4]Ibid., p. 253.

[5]Irene Beland and Joyce Passos, Clinical Nursing: Pathophysiological and Psychosocial Approaches, 4th ed. (New York: Macmillan Publishing Co., Inc., 1981), p. 1196.

[6]Barbara Innes and Margaret Bruya, "Postoperative Voiding Patterns and Related Contributing Factors," Washington State Journal of Nursing 49 (Summer/Fall 1977): 15.

[7]Frank Hinman, "Postoperative Overdistention of the Bladder," Surgery, Gynecology, and Obstetrics 142 (June 1976): 901.

[8]D.P. Sanan, "Management of Acute Retention of Urine," Journal of the Indian Medical Association 44 (January 1965): 17.

[9]Edwina McConnell and Mary Zimmerman, Care of Patients with Urological Problems (Philadelphia: J.B. Lippincott Co., Inc., 1983), p. 40.

[10]George Webster, "Advances in Treating Lower Urinary Tract Dysfunction," Drug Therapy (December 1982): 119-127.

[11]Malachi J. Flanagan, "Acute Urinary Retention," Hospital Medicine (September 1976): 66.

[12]Frank Gould, Cheng-Yang Chang, and Jack Lapides, "Comparison of Rapid Versus Slow Decompression of the Distended Urinary Bladder," Investigative Urology 14 (September 1976): 157.

[13]Virginia Henderson and Gladys Nite, Principles and Practice of Nursing, 6th ed. (New York: Macmillan Publishing Co., Inc., 1978), p. 1893.

[14]Beverly Rambo and Lucille Wood, ed., Nursing Skills for Clinical Practice, 3rd ed. (Philadelphia: W.B. Saunders Co., 1982), p. 488.

[15]Hinman, op. cit.

[16]Herman Bumpus and Gordon Foulds, "Gradual Emptying of the Overdistended Bladder," Journal of the American Medical Association 81 (September 1923): 821.

[17]C.D. Creevy, "Sudden Decompression of the Chronically Distended Urinary Bladder," Archives of Surgery 25 (1932): 381.

[18]Norma Dison, Clinical Nursing Techniques, 3rd ed. (St. Louis: C.V. Mosby Co., 1975): p. 267.

[19]Alice R. Rines and Mildred L. Montag, Nursing Concepts and Nursing Care (New York: John Wiley and Sons, 1976), p. 343.

[20]Henderson and Nite, op. cit., p. 1258-9.

[21]LaVerne Wolff, Marlene Weitzel, and Elinor Fuerst, Fundamentals of Nursing, 6th ed. (New York: J.B. Lippincott Co., Inc., 1979), p. 469.

[22]Barbara Kozier and Glenora Erb, Fundamentals of Nursing -- Concepts and Procedures (Menlo Park, Calif.: Addison-Wesley Publishing Co., 1979), p. 647.

[23]Arlyne B. Saperstein and Margaret A. Frazier, Introduction to Nursing Practice (Philadelphia: F.A. Davis Co., 1980), p. 846.

[24]Department of Nursing, Massachusetts General Hospital Manual of Nursing Procedures, 2nd ed. (Boston: Little, Brown and Co., 1980), p. 309.

[25]Susan Budassi and Janet Barber, Emergency Nursing - Principles and Practice (St. Louis: C.V. Mosby Co., 1981), p. 468.

[26]Pamela Mitchell and Ann Lousteau, Concepts Basic to Nursing, 3rd ed. (New York: McGraw-Hill Co., Inc., 1981), p. 433

[27]Anne Chilman and Margaret Thomas, ed., Understanding Patient Care, 2nd ed. (Edinburgh: Churchill Livingstone, 1981), p. 308.

[28]Beland and Passos, op. cit., p. 1197.

[29]Nursing '81, Nursing Photobook, Implementing Urologic Procedures (Horsham, Pa.: Intermed Communications, 1981), p. 29.

[30]Narrow and Buschle, op. cit., p. 482.

[31]McConnell and Zimmerman, op. cit., p. 41.

CHAPTER TWO

REVIEW OF THE LITERATURE

Conceptual Framework

The conceptual framework for this study is based upon the physiological principles of normal micturition, bladder capacity and pressure, and shock. The relationships among these concepts as they pertain to bladder distention will be elucidated and used as a theoretical base for a nursing approach to the management of acute urinary retention.

Physiological Concepts

The bladder serves a twofold function: to provide a reservoir for urine and to empty its contents at appropriate intervals. The bladder is a distensible hollow organ with smooth muscle fibers in its wall. The muscle is often referred to as the detrusor, which is derived from a Latin word meaning "that which pushes down." The neck of the bladder, the internal sphincter, also contains smooth muscle. The body and neck of the bladder are supplied by the parasympathetic pelvic and the sympathetic hypogastric nerves. The external sphincter, in contrast, in composed of striated muscle and is innervated by the somatic pudendal nerves. Pelvic, hypogastric, and pudendal nerves all contain both sensory and motor nerves.[1]

At rest, the bladder exerts a pressure of five to ten centimeters water.[2] As urine accumulates in the bladder, the

muscle's tone adjusts to its capacity, so that minimal increases in bladder pressure occur over a wide range of intravesical volumes. The nerve supply to the external sphincter maintains its closed position. At a volume of 100 to 150 ml., most persons are first aware of bladder filling. The accumulation of about 250 ml. is accompanied by the first desire to void. Most individuals are quite uncomfortable when the volume reaches 350 to 400 ml.; at this point, pressure in the bladder is about ten cm. water. Characteristic of smooth muscle, as the bladder fills beyond its physiological capacity, it fails to adapt to the added volume, probably due to reflex detrusor contractions.[3] An increase in volume to 700 ml. causes severe pain due to parasympathetic pelvic afferents, and often incontinence.[4] The pressure at this point may approach what is considered peak voiding bladder pressure, about 30 to 60 cm. water.[5]

As described earlier, urinary retention predisposes to infection. The overstretching of the bladder wall can cause minute tears and bleeding. In this way blood and infected urine can mix, with resultant septicemia. Septic shock, an extremely grave complication, carries a high mortality rate. It requires prompt medical intervention, as it can develop quite suddenly, particularly following instrumentation.[6]

As far as hypotension is concerned, the most common associated condition is primary shock. Also known as neurogenic shock, it represents a precipitous decrease in arterial

pressure and cardiac output. Unlike hemorrhagic shock, which arises from a large loss of blood from the vascular system, and cardiogenic shock, which constitutes failure of the heart to pump adequately, neurogenic shock is marked by a transient loss of overall vasomotor tone. This loss of tone is particularly marked in the splanchnic region (liver, spleen, and intestines). Thus a significant proportion of the intravascular volume is collected in the splanchnic bed and legs; venous return is reduced, thereby decreasing the cardiac output and blood pressure. A change in posture relieves the problem: the ambulatory person is encouraged to quickly lie down, or the recumbent individual's legs are elevated. As vasoconstrictor tone returns, the victim generally recovers rapidly.[7]

Neurogenic shock may result from the administration of an anesthetic agent, a sudden change in posture, physical trauma, or psychological trauma, such as the sight of blood.[8] The circulatory collapse that results from "emotional fainting" is known as vasovagal syncope and usually is not due to vasomotor failure but rather to strong emotional excitation of the parasympathetic nerves to the heart and the vasodilator nerves to the skeletal muscles. The result is a slowing of the heart and a decrease in the arterial pressure.[9] It is suggested that some individuals who require catheterization for urinary retention and who experience "shock" as mentioned in certain nursing textbooks are in fact experiencing vasovagal syncope, a transient and harmless phenomenon. From

this discussion of the physiological concepts of normal micturition, bladder capacity and pressure, and shock, one can derive a clear understanding of the principles applicable to the nursing management of acute urinary retention. Nursing practice grounded in such theory earns it its distinct professional status.

Review of the Literature

Creevy's thorough review of the literature on this topic is considered by many to be a classic (1923). He cited works dating to the mid-1850s and including the efforts of French and German researchers of that era. Creevy noted that most European physicians interested in urinary retention concluded from their studies that rapid, total emptying of the acutely distended bladder is of itself harmless.[10]

Creevy carried out a study of 71 patients, some of whose bladders were emptied abruptly and others whose urine was evacuated gradually. Some subjects had residual volumes exceeding 500 ml.; others had less than 500 ml. Creevy found a 53.8% incidence of hematuria when bladders were emptied abruptly and a 48.5% incidence when emptying was done gradually, which was not significant. Hematuria was not found to be significantly more common in patients with over 500 ml. of residual urine (50.2% of patients with 500 ml. or more, and 47.6% of those with less than 500 ml. of residual urine). Creevy identified the actual peril as being high intravesical pressure and the release of that pressure. He concluded that

the value of gradual emptying of the distended bladder is open to question.[11]

In a subsequent (1934) study Creevy again examined the relationship between bladder distention and hemorrhage. He showed experimentally with dogs that the critical factor leading to bladder wall injury is the rise of pressure, which may be independent of bladder volume. He noted five human cases in which urine volumes ranging from 4000 ml. to 13,960 ml. were withdrawn without subsequent hemorrhage.[12]

Watkins (1938) used cats to examine the relationships among bladder volume, bladder pressure, and increased blood pressure. His graphs clearly demonstrate a direct relationship between blood pressure and bladder pressure; that is, a rise in bladder pressure is accompanied by a proportional rise in blood pressure. No such relationship, however, could be established between blood pressure and bladder volume.[13]

Hryntschak (1949) cited the results of two colleagues in Vienna, Brecher and Chwalla, who treated over 300 cases of urinary retention over a 3½-year period, employing sudden, complete emptying. Brecher and Chwalla encountered no complications as a result of this approach. Hryntschak stated that, since that time, for the past 16 years he has managed all his patients likewise, regardless of the amount of urine. He has never observed a complication attributable to sudden bladder emptying. He concluded his paper by noting the drawbacks to gradual emptying, namely the need to resume normal

renal function and to mediate against infection.[14]

The work of Lawson, Schneeberg, and Tomlinson (1952) focused on the relationship between the bladder volume and bladder pressure. At the time of their study, it was common practice for urologists to precipitously remove 200 ml. of urine to relieve pain before slowly "decompressing" the bladder. Out of interest in this approach, Lawson and his associates observed a group of patients in acute urinary retention as to initial bladder pressure and the alteration in this pressure following the evacuation of 200 ml. of urine. This group discovered that the higher the initial bladder pressure, the greater the drop in pressure upon removal of 200 ml. of urine. The pressure in the bladder after the removal of this amount actually falls, at times, to less than 1/5 the original bladder pressure. Obviously, they concluded, the evacuation of the initial 200 ml. of urine should be as traumatic as complete emptying of the bladder, given a bladder pressure above 30 cm. water. (As stated earlier, the normal peak voiding pressure ranges from 30 to 60 cm. water.) Lawson and his associates also found that small bladders may have very high pressures, and large bladders may have very low pressures. On the basis of their data, they asserted that the statement that grossly distended bladders should be decompressed more cautiously than small bladders does not hold true either theoretically or in actual practice.[15]

Whitteridge (1960) drew attention to cardiovascular re-

flexes initiated from sites other than the cardiovascular system itself. He suggested that vasoconstriction occurs when the bladder pressure exceeds 50 mm. mercury. Whitteridge also cited unpublished observations by More, which revealed a 50% incidence of a 20-to-30 mm. mercury decrease in blood pressure following rapid emptying of distended bladders.[16] However, these observations were not presented as research results.

Taylor (1963) investigated acute urinary retention to determine the frequency and nature of alterations in blood pressure following the relief of distention by catheterization. His research subjects included ten males, all over 40 years of age, admitted to the Emergency Department after giving a history of retention of between eight hours and three days. An initial blood pressure measurement was recorded on each patient. A clamped Foley catheter was passed and connected to a vertical manometer which measured a baseline bladder pressure. The stimulation of catheterization usually induced a rise in blood pressure; observations resumed once it stabilized. Urine was drained freely 100 ml. at a time, and blood pressure and bladder pressure were noted each time. After 500 ml. was removed, the remaining volume was emptied in 100-to-200 ml. decrements.

In eight of the ten cases, a decrease in blood pressure accompanied the evacuation of urine. However, three of these eight patients were hypertensive relative to their normal

blood pressure, at the time of catheterization. The blood pressure fell mainly during drainage of the first 200 ml. of urine. Only one patient experienced any subjective symptoms. His initial blood pressure was recorded as 260/125 mm. mercury; after 200 ml. of urine had been removed, his blood pressure had fallen to 240/100 mm. mercury. It was at this point that he felt faint. In addition to blood pressure, bladder pressure also fell most significantly during removal of the first 200 ml. of urine. Initial bladder pressures ranged from 27 to 52 cm. water, and the bladder volumes ranged from about 700 to 2000 ml. Neither of these was related to the amplitude of blood pressure.

Taylor summarized his findings:

"Since the blood pressure falls as soon as the initial bladder tension is relieved -- i.e., during the early stages of bladder emptying -- the method of bladder decompression by draining 0.2-5.0 litres of urine rapidly and thereafter allowing slow drainage would not prevent the onset of syncope; this could only be avoided by slow drainage throughout the period of bladder emptying. The transience of the fall in blood pressure, the absence as a rule of serious hypotension on rapid decompression of the bladder, and the ease with which this type of hypotension is treated by merely raising the legs argue against continuous slow bladder decompression in the treatment of acute urinary retention; but the speed of decompression must still be governed by the possibility of the more serious complication of intravesical hemorrhage." [17]

Osius and Hinman (1963) examined the dynamics of urinary retention, in particular the detrusor's response to urine withdrawal and subsequent refilling. Their purpose was to learn whether the acutely distended bladder loses its contractile and elastic properties; if so, removal of even small amounts of urine would cause such a drop in intravesical

pressure that the issue of rapid or slow decompression would be academic, since nearly any decrement would "decompress" the bladder. These researchers used spinal needles placed suprapubically to determine bladder volumes and pressures. Measurements of baseline volumes and pressures were recorded, and 100 ml. of urine was removed in 5 ml. decrements. Later the residual urine was evacuated via urethral catheter. The blood pressure was recorded at intervals for 24 hours to detect hypotension due to decompression.

Osius and Hinman found that the initial pressure bore little relation to the bladder volume. The withdrawal of 100 ml. of urine lowered the intravesical pressure to nearly half the baseline pressure. Large reductions in pressure occurred despite the fact the volume decreases were small. The fall was proportionately the same whether the volume was large or small (greater or less than one liter).

An additional aspect of their study was an investigation of the effects of refilling on bladder pressure. Their data indicate that small-volume bladders respond much more vigorously to refilling than large-volume bladders, suggesting that the less overdistended bladder has retained its elasticity, whereas the greatly overdistended bladder has not.

Osius and Hinman concluded that a precipitous fall in blood pressure does not accompany rapid emptying of the acutely distended bladder. Furthermore, many of the recommended techniques of slow decompression fail in their objective,

since it was found that decrements of 100 ml. reduce the intravesical pressure by half. Finally, the authors noted that since the complications arising from urinary retention are those related to infection, which in turn is fostered by stagnant urine, it is apparent that any means employed to eliminate pooling of urine would minimize the risk of septicemia.[18]

Szasz and Whyte (1967) examined the relationship between bladder distention and increased blood pressure. Their sample included seven healthy volunteers and four patients. An oral fluid load test and a retrograde bladder filling test were carried out in each case. Bladder pressure and blood pressure were measured during the procedures. Szasz and Whyte learned that as bladders filled, blood pressure rose significantly, sometimes as much as 50 mm. mercury systolic and 40 mm. mercury diastolic. Pulse rates were unaffected. They believed that the rise in blood pressure that accompanies bladder overdistention could depend upon additional factors such as anxiety, pain, distention of the hollow vesical, and sphincter contraction.[19]

Sands, Constantinou, and Govan (1972) investigated the effect of bladder pressure on mean arterial pressure, with particular emphasis on the rate of bladder filling and the resultant accommodation to increased pressure. Nine female mongrel dogs were used. After anesthetization, the dogs were subjected to various sequences of bladder filling and empty-

ing, with arterial and bladder pressures recorded at specific intervals. Sands and his associates showed that hemodynamic alterations are sensitive to the rate of bladder distention and pressure rather than to absolute bladder volume. During bladder emptying by gravity drainage, for example, a rapid reduction in bladder pressure is attended by an immediate decrease in blood pressure. This decrease in blood pressure occurs at a slower rate than the drop in bladder pressure. In this study the blood pressure did not fall below the pre-filling baseline blood pressures.[20]

In a like study, Finkbeiner and Lapides (1974) explored the effect of varying degrees of bladder distention on bladder circulation with female mongrel dogs as subjects. Based on the assumption that it leaves the tissue solely by blood-flow, radioactive krypton was utilized to demonstrate blood-flow through the bladder. The results of their cystometric interventions revealed that a two-hour distention produces a significant (25 to 30%) decrease in blood flow to the urinary bladder. Systemic blood pressure was found to remain constant over a period of four hours and was unaffected by alterations in either bladder pressure or volume.[21] Sample size was unclear.

A comparison of rapid versus slow emptying of the distended urinary bladder was made by Gould, Chang, and Lapides (1976). In a study of 22 dogs, bladders were filled and urethras ligated for 24 hours. When the drainage catheters

were placed, ten dogs' bladders were emptied rapidly and twelve were emptied slowly over approximately four hours. Measurements of intravesical pressure, urine volume and gross bladder appearance were recorded. In the rapidly emptied groups, six of ten dogs developed gross hematuria. These dogs all had bladder pressures over 43 cm. water and volumes exceeding 650 ml. In the gradually emptied group, seven of twelve dogs had gross hematuria. In all cases bladder pressures exceeded 42 cm. water. Bladder volume measurements were unobtainable in this group. Thus there was no significant difference between the two groups.

The intravesical pressure, not the rate of bladder emptying, was related to the gross appearance of the external bladder surface before and after the removal of urine. When the bladder pressure exceeded 30 cm. water, the bladder wall revealed varying stages of cyanosis and hemorrhage. Complete venous stasis was observed in some of the larger superficial vessels. Within 30 minutes after rapid emptying or with a lowering of intravesical pressure to less than 30 cm. water with gradual emptying, resumption of bloodflow was noted and was associated with vesical edema and increasing hemorrhage. When the baseline pressure was less than 30 cm. water, the bladder's external surface appeared normal before and after both modes of emptying. Thus Gould and his associates concluded that:

"High intravesical pressure and rapid overdistention of the bladder have been shown to affect the integrity of the

vessel wall through impairment of its circulation, with resultant ischemia, venous stasis, and eventual necrosis of tissue. In addition, these noxious hydrostatic forces actually tear apart epithelium, connective tissue, muscle, and vessels. It is obvious that hemorrhage and muscle irritability will reach the clinical horizon upon restoration of normal blood flow with bladder decompression. Once openings are made in the capillary wall by necrosis or a rent, blood will flow through these defects as soon as circulation resumes regardless of the rate of bladder emptying. Thus, slow decompression of the bladder in the patient with complete urinary retention has no virtues at all and should be discarded, for the prolongation of the period of bladder distention predisposes to the onset of urinary infection, septicemia if the infection is already present, and worsening of renal function."[22]

Brouder (1978) focused his dissertation on the incidence of impending shock resulting from sudden emptying of acutely distended bladders in albino rats. He distended the urinary bladders of 56 female rats and allowed them to equilibrate. He next carried out precipitous drainage through catheterization. Systolic aortic blood pressure and heart rate were monitored to determine the cardiovascular changes indicative of impending shock. He used a 20% decrease in blood pressure and a concomitant 20% increase in heart rate as criteria for impending shock. Brouder found that only two rats experienced these changes. He therefore concluded that, "for this population, no significant relationship exists between the precipitous emptying of the acutely distended bladder and the incidence of impending shock in rats."[23]

Paquin, Perreault, Faucher, Mauffette, and Berlinguet (1981) reported their findings with 50 consecutive patients, admitted to the Emergency Department for complete urine retention of sudden onset. All patients presented with an en-

larged bladder, containing 500 to 2200 ml. of urine. Every patient underwent bladder emptying by urethral catheterization without concern for slow evacuation. Six cases of macroscopic hematuria (12%) were discovered; no specific treatment was indicated. These authors believe there is no justification for slow urinary drainage.[24]

Glahn and Plucnar (1984) studied the occurrence of hematuria in connection with rapid one-stage complete emptying of the bladder in a series of 300 cases of urinary retention treated by routine catheterization. The incidence of hematuria during bladder emptying or during the next 24 hours was 16.3%. In 37 instances the hematuria was slight, in ten moderate, and in two cases severe.

No correlations could be drawn between urine volume and the occurrence or degree of hematuria, or between sex and the occurrence of bleeding.

Glahn and Plucnar concluded that quick emptying may be carried out without any appreciable risk of causing significant hematuria. Furthermore, it is generally acknowledged that delayed emptying does not reduce the likelihood of hematuria.[25]

Hypotheses

The hypotheses appropriate to this experiment are the following:

1. There is no difference between sudden, complete emptying and gradual emptying of the acutely distended urinary bladder with regard to immediate subsequent alteration in blood pressure.

2. There is no difference between sudden, complete emptying and gradual emptying of the acutely distended urinary bladder with regard to immediate subsequent alteration in heart rate.

3. There is no difference between sudden, complete emptying and gradual emptying of the acutely distended urinary bladder with regard to immediate subsequent gross hematuria.

4. There is no difference between sudden complete emptying and gradual emptying of the acutely distended urinary bladder with regard to immediate subsequent patient reports of syncope.

The hypotheses appropriate to the survey are as follows:

1. There is no difference as to choice of catheterization method based on the bed size of the hospital -- less than 100 beds or greater than 100 beds.

2. There is no difference as to choice of catheterization method based on the type of hospital -- medical school-affiliated regional referral center, military institution, or community hospital.

Operational Definitions

Syncope shall be defined as an individual's report of feeling lightheaded or dizzy.

Gross hematuria shall be defined as any pinkish tinge, visible to the naked eye, in urine; blood is assumed present.

A change of 20 mm. mercury in either diastolic or systolic blood pressure shall constitute a significant alteration consistent with impending shock.

A change of 20 beats per minute in heart rate shall constitute a significant alteration consistent with impending shock.

A nursing procedure manual which cites a policy but does not specify a volume limit shall be considered as approving total bladder emptying.

REFERENCES

[1]Ewald D. Selkurt, Ed., Basic Physiology for the Health Sciences, 2nd ed. (Boston: Little, Brown and Co., 1982), p. 437.

[2]R.B. Brown, Clinical Urology Illustrated (New York: ADIS Press, 1982), p. 189.

[3]John Brobeck, ed., Best & Taylor's Physiological Basis of Medical Practice, 10th ed. (Baltimore: Williams and Wilkins Co., 1979), p. 100.

[4]Ibid., p. 438.

[5]Brown, op. cit.

[6]Jack Lapides, Fundamentals of Urology (Philadelphia: W.B. Saunders Co., 1976), p. 322.

[7]Selkurt, op. cit., p. 316.

[8]Ibid.

[9]A.C. Guyton, Textbook of Medical Physiology, 6th ed. (Philadelphia: W.B. Saunders Co., 1981), p. 339.

[10]C.D. Creevy, "Sudden Decompression of the Chronically Distended Urinary Bladder - A Clinical and Pathologic Study," Archives of Survery 25 (1932): 356.

[11]C.D. Creevy, "Distention of the Urinary Bladder - Hematuria and Sudden Emptying; An Experimental and Clinical Study," Archives of Surgery 28 (1934): 948.

[12]Ibid.

[13]A.K. Watkins, "Reflex Response of the Nictitating Membrane and the Blood Pressure to Distention of the Bladder and Rectum," American Journal of Physiology 121 (1938): 32-39.

[14]Theodor Hryntschak, "Sudden and Complete Decompression Versus Slow Emptying of the Distended Urinary Bladder," Journal of Urology 61 (March 1949): 545-549.

[15]John D. Lawson, Arthur L. Schneeberg, and William B. Tomlinson, "Observations on Dynamics of Acute Urinary Retention in Man," Journal of Urology 67 (June 1952): 951-956.

[16]D. Whitteridge, "Cardiovascular Reflexes Initiated From Afferent Sites Other Than the Cardiovascular System Itself," Physiology Review 40 (1960 - supp. 4): 198.

[17]D.E.M. Taylor, "Cardiovascular Disturbances in Acute Retention of Urine," The Lancet 25 (16 November 1963): 1033-1035.

[18]Theodore G. Osius and Frank Hinman, Jr., "Dynamics of Acute Urinary Retention: A Manometric, Radiographic and Clinical Study," Journal of Urology 90 (1963): 702-712.

[19]J.J.G. Szasz and H.M. Whyte, "Effect of Distension of the Bladder and of Contraction of Sphincters on Blood Pressure," British Medical Journal 22 (22 April 1967): 208.

[20]J.P. Sands, C.E. Constantinou, and D.E. Govan, "Bladder Pressure and Its Effect on Mean Arterial Pressure," Investigative Urology 10 (1972): 14-18.

[21]Alex Finkbeiner and Jack Lapides, "Effect of Distention on Blood Flow on Dog's Urinary Bladder," Investigative Urology 12 (1974): 210.

[22]Frank Gould, Cheng-Yang Chang and Jack Lapides, "Comparison of Rapid Versus Slow Decompression of the Distended Urinary Bladder," Investigative Urology 14 (September 1976): 156-158.

[23]Gerald Thomas Brouder, "The Incidence of Impending Shock Resulting from Precipitous Emptying of Acutely Distended Urinary Bladders in Female Albino Rats," (Ph.D. dissertation, University of Texas at Austin, 1978), abstract.

[24]J.M. Paquin, J.P. Perreault, R. Faucher, F. Mauffette, and J.C. Berlinguet, "Treatment of the Acute Phase of Urinary Retention," Journal of Urology-Paris 87 (1981): 37-38.

[25]Benedicte E. Glahn and Bohumil J. Plucnar, "Quick Complete Emptying of the Bladder in 300 Cases of Urinary Retention. The Occurrence of Haematuria," Danish Medical Bulletin 31 (February 1984): 68-70.

CHAPTER THREE

METHODOLOGY

For this evaluation, a mixed methodology was employed. A quasi-experimental study was conducted to compare the bladder evacuation methods in a small sample. Also, a survey of hospitals in eastern North Carolina was carried out to learn what practices the area hospitals support. It was suspected that hospitals differ as to their policies on this procedure. Survey results demonstrating an array of catheterization approaches would lend support to the usefulness of a definitive analysis.

Quasi-experiment Study Setting

In regard to the quasi-experiment, the intervention was carried out in an acute care hospital setting. The subjects were inpatients on adult nursing units. This part of the study was conducted at Pitt County Memorial Hospital, Greenville, North Carolina, a medical school-affiliated regional referral center.

Design

The quasi-experimental design was selected after a review of the criteria for experimental designs. This study featured the following:

1. Manipulation. Multiple interventions were carried out on each subject and measurable data were collected. The researcher did not perform the interventions but relied on hospital nursing staff.

2. Control. A comparison group was used for control purposes. In the experimental group, the entire bladder contents were withdrawn precipitously; in the control group, the urine was removed gradually.
3. Randomization. A probability sampling technique was utilized in this study. On each nursing unit, the data collection forms were arranged in a manner to alternate gradual emptying and prompt emptying methods, with the nursing staff selecting the topmost form on the stack. In this way the subjects fell alternately into the two groups.

In accordance with the practices of this hospital, all necessary formal permissions were obtained from physicians and/or administrators. (See Appendix A) An informed consent was also secured from each subject. (See Appendix B) The study was conducted over approximately a seven-month period. All procedures were performed by qualified personnel and in keeping with aseptic technique.

Sample

The patients included were located on five surgical units: 2 South A, 2 South B, 2 North A, 2 North B, and the surgical critical care unit. Each of these units carries a reasonably high incidence of patients needing catheterization for urinary retention. The principal investigator met with the nursing staff on each unit and outlined the procedure to be followed. All necessary equipment for data collection was standardized

and placed in a central location.

Patients who experienced urinary retention and whose physicians prescribed bladder catheterization were sought for the study. The patients were placed in the control or experimental group according to the following guidelines.

A non-randomized sampling method was employed. The study was designed so that the experimental and control groups would each contain 20 patients. Each nursing unit received a set of cards numbered 1-20, with which to base assignments to the two groups. (It was assumed that a fair number of patients would be ineligible for inclusion in the study, most likely due to small bladder volumes.) On each card was written either "total emptying" or "gradual emptying." Even numbered cards were designated for total emptying and served as the experimental group. Odd numbered cards were designated for gradual emptying and represented the control group. When a patient developed urinary retention necessitating catheterization, the nursing employee took the topmost card from the stack and performed the procedure accordingly. In this manner each subject had an equal chance of being included as either control or experimental.

Exclusions

The inclusion of certain types of patients could have altered the validity of the results; therefore, they were excluded. Diabetic persons were excluded because the peripheral neuropathy to which they are prone can render these persons

susceptible to syncope.[1] Psychiatric patients were eliminated because their condition might make them hyperreactive to the intervention. Any patient whose bladder contained less than 750 ml. of urine was omitted. Finally, patients under the age of 18 were excluded.

Data Collection

The nursing staff member caring for each patient/subject completed a short, simple form at the time of the intervention. (See Appendix C) The following demographic information was obtained for each subject:

1. Subject name
2. Hospital number
3. Date
4. Time of day
5. Diagnosis
6. Age
7. Sex

The researcher consulted with the nursing staff on a weekly basis or as needed and collected completed forms.

These physiological parameters were measured as baseline and outcome criteria:

1. Blood pressure and heart rate (vital signs).
2. Amount of urine withdrawn (experimental group).
3. Vital signs five minutes post-catheterization.
4. Presence/absence of syncope.
5. Presence/absence of gross hematuria.
6. Amount of urine obtained 30 minutes after the clamped catheter is unclamped (control group).
7. Vital signs at completion of bladder emptying.

Analysis

The results were evaluated in terms of these criterion measures:

1. A marked change in heart rate (20 beats per minute or more).
2. A marked change in either diastolic or systolic blood pressure (20 mm. mercury or greater).
3. The presence of gross hematuria.
4. Syncope, as evidenced by subjective feelings of lightheadedness or dizziness.

These factors comprised the measures for data analysis against which the research hypotheses were tested. Frequency distributions were described and an attempt was made to identify some correlation between physiological changes and method of urine evacuation.

Methodological Limitations

The study design called for a sample size of at least 20 subjects in each of the two groups. A comparison of interventions carried out on 40 individuals might have yielded sufficient results to justify some generalizations or comments on an association between method of bladder emptying and subsequent physiological effects. However, after seven months only three subjects were found for the study, which severely compromised the impact of its outcome.

In some cases an alteration in vital signs may have occurred due to prior administration of a narcotic or other medication. Some of this information was discovered as charts were reviewed. No attempt was made to control for this phenomenon, however, because with purposive sampling it should have been equally distributed between the two groups.

It is not inconceivable that a response similar to the Hawthorne effect took place, in that the subjects knew they

were part of a research effort and were monitored closely. They were not told that they were being observed for subjective symptoms such as lightheadedness; however, this response could be a factor in the results.

The researcher depended upon others to carry out most interventions, an unavoidable design characteristic in view of the somewhat emergent and unpredictable nature of urinary retention. Finally, the possibility that different persons assessed vital signs on the same subject and obtained varying readings might alter the findings to some degree. An attempt was made to stress the importance of the same person conducting all aspects of the data collection on a given patient/subject.

Survey Design

A letter was sent to the Nursing Inservice Coordinator of each hospital briefly describing the intent of the survey, which was to learn what the hospital considers proper nursing management of the patient in urinary retention -- whether a prompt, total emptying or gradual emptying method is the rule. (See Appendix D) A stamped, self-addressed envelope was enclosed for the convenience of the respondents.

Sample

Approximately 20 hospitals in eastern North Carolina were contacted. The hospitals were selected chiefly on the basis of their membership in the Eastern Area Health Education region of responsibility, rather than on the basis of bed size

or population served. Of the Eastern Area hospitals, one is a medical school-affiliated regional referral center, several are small community hospitals, and others are military installations. One additional area hospital, not in the Eastern Area, was included because the variables being measured were volunteered to the investigator, and the largest sample size possible was sought.

Data Collection

The hospitals either sent a copy of their policy or, where no policy exists, outlined their usual procedure. Responses not obtained by mail were sought by telephone interview. Demographic descriptive data was obtained either directly from the hospital or the appropriate library reference source. Such data included the hospital bed size and the population served.

Analysis

Responses from the hospitals were examined to see whether the institutions follow a policy of gradual or total emptying, or provide no written policy for this procedure. The frequency distribution for each possibility was described, and an attempt was made to identify some correlation between method of bladder emptying and the variables selected, specifically, hospital bed size and type of hospital. An attempt was made to determine whether there exists some trend or community practice standard concerning nursing management of acute urinary retention.

REFERENCE

[1]Richard Marx, M.D., Department of Medicine, School of Medicine, East Carolina University, Greenville, North Carolina (Interviews, October, 1983).

CHAPTER FOUR

RESULTS AND CONCLUSIONS

Pilot Study

Despite a lengthy time period and the inclusion of five nursing care units, only three subjects were obtained for the comparison study. The subjects were all females with ages from 21 to 56 years. Two patients were catheterized according to the gradual emptying method, while the third underwent total bladder emptying. (See Appendix C) The intervention findings are presented in Table 1.

Table 1. Physiological Parameters in Three Catheterization Cases.

Case No.	Heart Rate	Blood Pressure	Hematuria	Syncope
1.	I 88	I 136/74	I Ø	I Ø
1025 cc.	M 87	M 136/70	M Ø	M Ø
	E 88	E 124/70	E Ø	E Ø
2.	I 100	I 110/70	I Ø	I Ø
1650 cc.	M 104	M 130/80	M Ø	M Ø
	E 100	E 130/80	E Ø	E Ø
3.	I 88	I 100/60	I Ø	I Ø
900 cc.	E 80	E 100/80	E Ø	E Ø
Key: I = Initial; M = Midway; E = End				

Analysis

The findings were evaluated in terms of these criterion measures:

1. A marked change in heart rate (20 beats per minute or more).
2. A marked change in either systolic or diastolic blood pressure (20 mm. mercury or greater).
3. The presence of gross hematuria.
4. Syncope, as evidenced by subjective feelings of lightheadedness or dizziness.

No patient experienced a significant change in heart rate. Subject number two sustained a 20 mm. mercury increase in systolic blood pressure after the first stage of gradual bladder emptying. Subject number three experienced a diastolic increase of 20 mm. mercury upon total drainage of the bladder contents. Based upon the criteria set forth earlier, these alterations are consistent with a diagnosis of impending shock. It should be pointed out that a rise in blood pressure may also be associated with physical discomfort or tension secondary to the procedure being performed. However, in neither of these cases was the patient symptomatic; and no treatment was instituted.

As shown in Table 1, there were no instances of hematuria or syncope at any time in any case.

The frequency of significantly altered blood pressure is 50% in the gradual group, and 100% in the total group, or 67% overall. However, given the extremely small sample size, such statistics have limited usefulness, and on this basis the hypotheses cannot be accepted or rejected.

Interestingly, the subjects who experienced a blood pressure change were those with the largest and the smallest bladder volumes, 1650 and 900 cc., respectively. Due to the small sample size it is of limited value to suggest a correlation between alteration in blood pressure and total bladder volume. The literature has suggested that no relationship exists between blood pressure and bladder volume.[1]

Discussion

Attention should be directed to the small size of the sample. The primary reason for this was that the researcher did not perform all the procedures herself but relied upon hospital staff to assist with data collection. This was arranged because of the unpredictable and somewhat emergent nature of urinary retention; it was impossible for the researcher to be available on any unit, at any time, to work with a patient whose nurse had obtained an order for bladder catheterization. The researcher did approach two patients in the critical care unit where she worked, and thus gained first-hand knowledge of how time-consuming it can be to explain a consent form to a patient. (Both patients agreed to participate in the study, but in each case the patient was ineligible due to small urine volume.)

At the outset of the project, only the second floor areas (2 South A, 2 South B, 2 North A, and 2 North B) were to be used. The surgical critical care unit was added later as data trickled in slowly and the staff, who were co-workers of the

researcher, expressed interest in and support for the project. The critical care nurses were aware of the project from its inception, and volunteered to assist with the data collection. It is interesting to note that one of the three cases obtained for the study came from this unit and was, in fact, secured by a fellow graduate student in nursing.

It was the original intent that the researcher would personally meet with the staff on each unit at a staff meeting and present the study. Each group was to have a choice of whether to assist with the data collection. These meetings were possible on all but one unit, and due to schedule conflicts, on this unit the head nurse decided to present the study to her staff herself. Whether the group was given a choice is unknown. No patients were ever obtained from this unit. No attempt is made to draw any conclusions from this information or make any judgments, for the adjacent unit's staff were informed of the study by the researcher and were given a choice as to participation; no data were ever obtained from that unit, either.

One of the other units expressed both acceptance and reservations concerning the study when approached about assisting with it. Some patients were obtained from this unit, but none were eligible for inclusion. The study had the full support of the head nurse, but midway through the project, as no more data were forthcoming, the head nurse admitted to the researcher that the staff had indicated they were too busy with

patient care to continue with the study, and so had stopped seeking patients.

Two of the three patients were obtained from the fourth unit, whose staff were interested to the point of asking the researcher about the physiological concepts on which the study was based. Again, the study had the support of the head nurse, who, interestingly, was the only one of the five head nurses who did not hold or was not working toward an advanced nursing degree. It should be emphasized that no attempt is made to make any judgments regarding this information, such as whether a head nurse's academic preparation and exposure to research would incline her to support others' endeavors. These might be salient questions for separate research efforts. In fact, the decision to participate with the study rested with each individual nurse on each unit. Because everyone has his or her particular belief system, values, and interests, the lack of subjects could well be due to apathy among the staff. Whether they were disinterested in the issues raised by this study or in nursing research in general is unclear, and no attempt was made to elicit such feedback from the staff.

As mentioned above, some nurses were interested in the concepts underlying this pilot study, and sought to increase their knowledge of physiology. Still others were genuinely concerned about patients' well-being and protection, and suggested alternate means of obtaining informed consents so that

patients under the influence of narcotics post-operatively would not be asked to give consent. It was suggested that the form for this study be obtained pre-operatively with the operation permit, and used only if the patient subsequently required catheterization.

Three hospital physicians sat on the Institutional Research Review Board which sanctioned this research effort. The review process was a highly challenging and stimulating one and provided the researcher with an opportunity for an open physician-nurse exchange of information. This group of physicians was generally unaware of the hospital policy on bladder catheterization (which stipulates that up to 1000 cc. may be withdrawn at once, after which the catheter is clamped for 30 minutes and the balance is then emptied). These doctors also did not realize that different nurses approach some basic nursing procedures differently, and often for tradition-based reasons. They felt that this study had merit and could contribute to nursing knowledge so that nursing might base its practice on theory, rather than on habit.

Survey Findings

Of the 22 hospitals contacted during this survey, 18 responses were returned and tabulated. The hospitals were categorized both by bed size and the type of population served. The respondents included nine hospitals of less than 100 beds and nine hospitals of more than 100 beds. The sample included one medical school-affiliated regional referral

center, two military installations, and 15 community hospitals. The results of the survey are presented in Table 2 and Table 3.

Table 2. Method of Bladder Emptying With Respect to Bed Size.

Method	Bed Size <100	Bed Size ≥100	Total
Total Emptying	1	5	6
Gradual Emptying	4	2	6
No Policy	4	2	6
Total	9	9	18

Table 3. Method of Bladder Emptying With Respect to Type of Hospital.

Method	Type of Hospital: Referral	Military	Community	Total
Total Emptying	Ø	Ø	6	6
Gradual Emptying	1	Ø	5	6
No Policy	Ø	2	4	6
Total	1	2	15	18

Analysis

Table 2 illustrates that of the hospitals with a policy, those with less than 100 beds prefer gradual emptying, whereas those with 100 or more beds choose total emptying. Among all nine of the smaller hospitals, there appears to be no real tendency toward one pattern over the others. However, among the nine larger hospitals, there does seem to be a trend toward total emptying. Thus there seems to be an association between large bed size and a tendency to support total bladder emptying, which does not support the original hypothesis that no difference exists.

It is important to note that for the entire group of 18 hospitals, no one method is preferred over the others. This is an interesting finding, considering that one-third of these hospitals invoke no written policy at all.

Table 3 demonstrates that the majority of hospitals responding to the survey were community hospitals. In fact, the majority of hospitals in the Eastern Area district are community hospitals. Among this group no clear trend is revealed. Of the 15 hospitals, six favor total emptying, five favor gradual emptying, and four cite no written policy.

Of the two military installations, neither carries a written policy regarding this procedure.

Due to the majority of hospitals surveyed being community agencies, no correlation statement regarding hospital practices and type of population served is appropriate. No one method

is a strong favorite. Because of the disproportion among the three types of hospitals, no comment on the original hypothesis concerning type of hospital is warranted.

Discussion

The survey provided some interesting data regarding hospital practices. Some of the respondents noted that since they had no written policy on bladder catheterization, and the survey did not address that possibility, they felt their response was not needed, and had not intended to reply. In these cases the telephone interview prompted the desired information. This strategy should be recalled during future endeavors. Also, future questionnaires should offer better clarity as to the specific information being sought.

It is possible that the military hospitals have a policy prohibiting them from releasing information to civilians, and this might account for the lack of response from two such hospitals.

The nurse executive from one small community hospital expressed an interest in the results of the survey and noted that her policy probably needs updating; she asked to be advised of the overall trend or community standard, should one exist. Another individual inquired about the other aspects of the study and wanted a copy of the pilot study results. In general, the respondents were very helpful and appreciative of being included in the study.

Finally, it is important to stress that six of 18 hospi-

tals surveyed have no written policy on what constitutes a basic nursing procedure. The researcher is not familiar with hospital regulations among military agencies, but among community, state, and federal hospitals in general, the national accrediting body for hospitals stipulates that they must carry a written policy for all basic patient care procedures. One wonders how these six hospitals can justify their positions.

Conclusions

In regard to the pilot study, the small sample size makes it unseemly to make any generalizations about the results obtained. It would be helpful to look at more cases and see whether the incidence of changes in vital signs is indeed equally distributed between patients undergoing total and gradual bladder emptying. It would also be useful to learn whether, in a larger sample, hematuria or syncope were complications of either method. At this point no statements regarding the original hypotheses are appropriate.

In the case of the survey, one conclusion can be drawn concerning the correlation between hospital bed size and preference for a certain catheterization method: hospitals of greater than 100 beds generally advocate total bladder emptying for the patient in urinary retention. This finding fails to support the original hypothesis that no difference exists.

With regard to any association between type of hospital and preference for one bladder emptying method over another,

no meaningful conclusion can be made on the basis of these survey results. The distribution of preferences was fairly even among the 15 community hospitals. A survey which included more referral centers and military hospitals might yield more telling results.

REFERENCE

[1]A.L. Watkins, op. cit.

CHAPTER FIVE

RECOMMENDATIONS AND IMPLICATIONS

Nursing has been practiced for thousands of years; and tradition has played an ongoing role with regard to why persons pursue a nursing career and why certain practices are carried out as they are.

But in a complex profession such as nursing, which integrates concepts from science as well as the arts, tradition is not a viable basis for nursing actions. Nursing must base its practice on theory if it is to achieve the stature it deserves. Practitioners of nursing must be able to articulate the rationale for their judgments and actions. Only by structuring their practice around theory can they do so.

The review of literature illustrates what can be accomplished by applying theory to practice. Scientific studies of acute urinary retention yielded new information regarding the desirability of one bladder emptying method over another. The findings indicate that there is no justification for delayed bladder emptying. On the basis of these findings, this researcher has concluded that prompt, total emptying is the treatment of choice for patients in acute urinary retention. The literature review demonstrates that out of practice comes theory, and theory which is investigated can lead to new knowledge, translated into practice.

The literature review for this thesis is significant for another reason. Very little research on this topic has been

carried out since the early part of this century. A detailed search revealed a scarcity of comprehensive literature reviews since 1932. An updated and thorough literature review has been conducted by this researcher. An issue of such continuing controversy over such an extended period of time merits such ongoing attention.

The quasi-experiment results also bear implications for nursing practice. While the results are of limited usefulness, they do demonstrate that simple observations of patient responses to routine nursing procedures can yield interesting and perhaps helpful information for nursing.

The survey findings are significant because they show that a variety of approaches to urinary retention are in current use. On the basis on the survey results, the researcher suggests that this inconsistency is undesirable and that hospitals lacking a written policy develop one that is consistent with current knowledge about urinary retention.

The variety of approaches to urinary retention is due in part to the fact that nursing textbooks vary greatly in their teachings. On the basis of twelve years' experience in nursing and nursing education, it is the opinion of the researcher that educators should support their views with scientific rationale. This not only would strengthen their content but would also model for students the desirability of such indepth cognitive activity.

Finally, the implications for research are apparent. Studies such as this could be more successful if done on a

collaborative, cooperative basis. Opportunities abound for practicing nurses to join efforts with nurse educators and researchers to explore situations and problems that arise in everyday practice. As present methods are evaluated and compared with new alternatives, knowledge is generated which will expand and enhance the nursing profession as a whole.

In conclusion, the following recommendations are offered:

1. Nursing practice should be grounded in theory.
2. Nursing education should visibly include those concepts which undergird the classroom and clinical content.
3. Hospitals should include in their procedure manuals a policy regarding catheterization of the patient in acute urinary retention; such policy should be consistent with current knowledge about the safety of total, prompt bladder evacuation.
4. Research of a collaborative, cooperative nature among nurses should be encouraged, both for the advancement of nursing knowledge and the increased stature of nursing.
5. The socialization of nursing students should include an appreciation of evaluative, critical, and analytical thinking, in addition to the recognition that opportunities for nursing research abound and are within reach.

ADDITIONAL BIBLIOGRAPHY

V.J. O'Connor, "Observations on the Blood Pressure in Cases of Prostatic Obstruction," Archives of Surgery 1 (1920): 366.

E. Clay Shaw and Hugh H. Young, "Gradual Decompression in Chronic Vesical Distention," Journal of Urology 11 (1920): 393.

APPENDIX A

PITT COUNTY MEMORIAL HOSPITAL, Inc.

P.O. BOX 6028 / GREENVILLE / NORTH CAROLINA / 27834

PHYSICIAN AGREEMENT FORM

Rapid Versus Gradual Emptying
of the Distended Urinary Bladder
and Its Effects on Physiological Status

I understand the proposed research on the treatment of urinary retention to be conducted by Kay Janocko, R.N. I approve the study and consent to the inclusion of my patients if the patient gives informed consent.

Date _____ Signature _____

PITT COUNTY MEMORIAL HOSPITAL, Inc.

P.O. BOX 6028 / GREENVILLE / NORTH CAROLINA / 27834

BLADDER CATHETERIZATION STUDY

PATIENT INFORMATION SHEET

Dear Patient,

Your physician has made a diagnosis of inability to empty your bladder, and has prescribed a catheterization to drain your bladder of urine. There are different ways to carry out this procedure--either by total, prompt emptying or by gradual emptying. Both methods are in use in hospitals today and are generally considered safe and effective procedures.

I am doing a nursing study to compare the effects of the two methods of bladder emptying. I feel there is little danger or risk involved in either procedure. Should you choose to participate in this study, you will be randomly assigned to either a prompt or interrupted emptying group. Your blood pressure and heart rate will be measured and the urine collected, measured, and examined.

I believe this study will help improve the quality of care to persons like yourself. I hope you will participate, but you have the option to refuse to take part, without any loss of care or benefits to which you are entitled. There will be no added cost to you, and you can withdraw from the study at any time.

Your participation is totally confidential. I will have access to your medical records solely for the purpose of completing my study. You will not be identified in any way should the results of my study be published. I am interested only in comparing groups of patients.

The policy at East Carolina University does not provide for compensation or medical treatment for subjects because of physical or other injury resulting from this research activity. However, every effort will be made to make the facilities of the School of Medicine and Pitt County Memorial Hospital available for treatment in the unlikely event of such physical injury.

If at any time you have questions, you may contact me at East Carolina University School of Nursing, telephone 757-6061.

Thank you for your assistance!

Kay S. Janosko, R.N.

Kay S. Janosko, R.N.
Graduate Student

THIS SHEET IS TO REMAIN ATTACHED TO THE VOLUNTEER CONSENT FORM. A COPY OF THE CONSENT FORM SHALL BE GIVEN TO THE PERSON SIGNING AS THE SUBJECT OR AS THE SUBJECT'S AUTHORIZED REPRESENTATIVE.

1/84

APPENDIX B

PITT COUNTY MEMORIAL HOSPITAL, Inc.

P.O. BOX 6028 / GREENVILLE / NORTH CAROLINA / 27834

VOLUNTEER AGREEMENT----INFORMED CONSENT FORM

FOR BLADDER CATHETERIZATION STUDY

I,_____, being of legal age and having full capacity to consent, do hereby volunteer to participate in an investigational study called, "Rapid Versus Gradual Emptying of the Distended Urinary Bladder and Its Effects on Physiological Status."

I understand the patient information sheet, have had the opportunity to ask any questions I might have, and have been given answers to my full and complete satisfaction.

I give permission to review my medical records which are relevant to this study. I understand that this information will be treated as confidential medical information. I will not be personally identified in any publication of the results of this study.

I understand that my physician has determined that I have urinary retention and has prescribed bladder catheterization to relieve this discomfort. I understand that my blood pressure and heart rate will be measured during this procedure and my urine collected, measured, and examined. The catheterization technique to be performed on me is considered routine and standard procedure and carries little risk of discomfort or danger.

I understand that this study will be done at no extra cost to me, and that I may discontinue participation at any time if I choose, without any penalty or loss of benefits otherwise due me.

I understand that East Carolina University does not provide for compensation or medical treatment in the unlikely event of physical or other injury resulting from this research activity, but that every effort will be made to make the facilities of the School of Medicine and Pitt County Memorial Hospital available for such treatment in case of such injury.

I do not knowingly have sugar diabetes.

_____ _____

Patient Signature Printed Name

I was present during the explanation referred to above, as well as during the volunteer's opportunity to ask questions. I hereby witness the volunteer's signature.

_____ _____

Signature Date

APPENDIX C

PITT COUNTY MEMORIAL HOSPITAL, Inc.

P.O. BOX 6028 / GREENVILLE / NORTH CAROLINA / 27834

BLADDER CATHETERIZATION STUDY

GRADUAL EMPTYING----------ODD-NUMBERED CARDS ONLY

Patient Name_____Hospital #_____

Date_____Time_____Diagnosis_____

Baseline B/P_____Heart Rate_____

Go over the Patient Information Sheet with the patient and obtain a signed consent for this special study. One copy is given to the patient; the other goes into his/her chart.

Catheterize the patient in the usual aseptic manner, using a catheter attached to a standard drainage bag hung to promote gravity drainage. Place it where you can observe the amount filling.

Have a C-clamp or strip of tape ready so you can stop the flow of urine after 750 cc. have been withdrawn.

If less than 750 cc. present, record this amount_____

Such a patient is ineligible for this study. Continue nursing care as indicated. Return this form to the data collection envelope.

If when you clamped the catheter it appeared that more urine was present in the bladder, recheck vital signs. Make the patient comfortable.

B/P_____Heart Rate_____Was there obvious blood or any pink tinge to the urine? Note._____

Ask the patient how (s)he feels. Any reports of discomfort?_____

_____

Return after 30 minutes; empty the rest of the urine present.

Amount_____Blood or pink tinge?_____

Recheck B/P_____Heart Rate_____

Any other symptoms? Explain._____

_____

Thank you!

Kay Janosko, RN

APPENDIX C

PITT COUNTY MEMORIAL HOSPITAL, Inc.

P.O. BOX 6028 / GREENVILLE / NORTH CAROLINA / 27834

BLADDER CATHETERIZATION STUDY

TOTAL EMPTYING---------EVEN-NUMBERED CARDS ONLY

Patient Name_____ Hospital #_____

Date_____ Time_____ Diagnosis_____

Baseline B/P_____ Heart Rate_____

Go over the Patient Information Sheet with the patient and obtain a signed consent form for this special study. One copy is given to the patient; the other copy goes into his/her chart.

Catheterize the patient in the usual aseptic manner, using a catheter attached to a standard drainage bag hung to promote gravity drainage. Place it where you can observe the amount filling.

Amount of urine withdrawn:_____

If less than 750 cc., this patient is ineligible for the study. Continue nursing care as indicated. Do not discard this form, but return it to the data collection envelope.

If more than 750 cc.:

Recheck B/P_____ Heart Rate_____

Was there obvious blood or any pink tinge to the urine? Explain.

_____

Ask the patient how (s)he feels. Any reports of discomfort?

_____

Additional comments_____

_____

Thank you!

Kay Janosko, RN

APPENDIX D

EAST CAROLINA UNIVERSITY
GREENVILLE, NORTH CAROLINA 27834

SCHOOL OF NURSING

Telephone (919) 757-6061

October 24, 1984

Dear_____:

I am a graduate student in nursing at East Carolina University. At this time I am completing my thesis which concerns methods of catheterizing patients in acute urinary retention. I am interested in learning what numerous hospitals advocate with regard to total versus gradual emptying of the distended bladder -- that is, whether policy dictates that a catheter be clamped after a designated volume has been emptied, or whether all urine, regardless of amount, is collected at once.

Would you send me a copy of your policy regarding this nursing procedure? I would like to include about twenty-five (25) hospitals in eastern North Carolina in my sample.

I am enclosing a self-addressed, postage-paid envelope for your convenience. Thank you!

Yours for quality nursing care,

Kay S. Janosko, R.N., B.S.N.

enc