

URINARY INCONTINENCE

A Comprehensive Examination Presented to the Faculty
of
California State University, Stanislaus

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

By
Shokoufeh Jashnani
May 2017

CERTIFICATION OF APPROVAL

URINARY INCONTINENCE

by
Shokoufeh Jashnani

Signed Certification of Approval page is
on file with the University Library

Dr. Carolyn Martin
Professor of Nursing

Date

Sherri Brown
Assistant Professor of Nursing

Date

Jessica Fisher
RN, MSN

Date

© 2017

Shokoufeh Jashnani
ALL RIGHTS RESERVED

DEDICATION

I proudly dedicate my culminating experience to my only family member in the United State, my dear brother-in- law (Dr. Ali Izadi) and his family, who encouraged and warmly supported me in my personal and academic efforts. I will always appreciate all they have done for me.

To my beloved parents who encouraged and supported me with their countless love which allowed me to reach my dreams and overcome overwhelming moments in my life. You are forever my strength and inspiration in my life.

I also dedicate this culminating experience to my only dearest love, my husband, who built a warm and loving life for me away from my family and country. He always encouraged and gave me hope to be the best. Words cannot express my gratitude to his continuous support.

Also, a special deepest feeling of gratitude goes to my dearest precious brother and sister in Iran, who always supported and encouraged me emotionally at all times with phone calls and text messages. I am blessed that I have both of you in my life. To my precious and extraordinary kind friend, Joni Boden Hall and her lovely family, who always supported and encouraged me to overcome my English language challenges. They never allowed me to give up on reaching my dreams. I will never forget all of their kindness and support.

Above all, thank God for all your blessings on me, helping and listening to my prayers so that my dreams come true.

ACKNOWLEDGEMENTS

Words cannot express my sincere gratitude to my chair, Dr. Carolyn Martin, for her extraordinary guidance, support, and supervision through my graduate program. Without her kind direction, patients, and encouragement, I would not be able to finish my culminating experience. Thank you so much for being such a wonderful, knowledgeable role model in my life and helping me reach my dream. I could not ask for anyone better than you.

I also would like to convey my sincere gratitude to my comprehensive examination committee members, Sherri Brown and Jessica Fisher, for their inspiration, encouragement, helpful comments, and advise. I really appreciate all your support.

My deepest appreciation goes to Dr. Marla Jean Seacrist, who warmly supported and encouraged me through my graduate program. She never let me to give up and always inspired me to continue my education.

I would like to gratefully acknowledge my friend, Gizela Howe, who was always available to support and encourage me by editing the chapters of my comprehensive examination. Thank you for your great personality.

Finally, I am very thankful to all the other nursing faculty members at California State University, Stanislaus for their encouragement, support, and inspiration through my graduate program.

TABLE OF CONTENTS

	PAGE
Dedication.....	iv
Acknowledgements.....	v
Abstract.....	viii
CHAPTER	
I. Introduction.....	1
II. What Is Urinary Incontinence?	3
Urinary Incontinence Classifications	4
Urgency Urinary Incontinence.....	4
Stress Urinary Incontinence.....	5
Mixed Urinary Incontinence	6
Overflow Incontinence.....	6
Functional Incontinence.....	7
Gender Risk Factor Associated with Urinary Incontinence	7
Female Gender	7
Male Gender.....	8
Transient Risk Factors Related to Incontinence	9
III. Why Is Urinary Incontinence Important?	12
Quality of Life.....	12
Psychological Issues	12
Gender Issues	13
Cultural Issues.....	14
Urinary Incontinence and Increased Incidents of Falling	14
Financial Issues.....	15
Skin Integrity Issues.....	17
Urinary Tract Infection	18
IV. What are the Current Interventions for Urinary Incontinence?	21
Bladder Training	21
Pelvic Floor Exercise	22
Behavioral Approaches	23
Catheter Clamping	25
Lifestyle Interventions	26

	Pharmacologic Treatment	27
	Invasive Treatment.....	29
	Indwelling and Self Catheterization.....	29
V.	Implications for Nursing Practice	33
	Nursing Assessment.....	33
	Pelvic Floor Muscle Exercises.....	34
	Bladder Training	34
	Urinary Catheter Management.....	37
	Incontinence Associated Dermatitis	37
	Hand Hygiene	38
	Dementia.....	38
	Patient Resources	38
	Conclusion	39
	References.....	41

ABSTRACT

No one has positive feelings about urinary incontinence, but many people experience incontinence at some point in their lives. Numerous risk factors for urinary incontinence have been identified. Urinary incontinence can cause skin breakdown, loss of independence, decreased quality of life, financial problems, and patient dissatisfaction. Adverse psychosocial issues can occur as a result of urinary incontinence, such as the fear of being embarrassed in public. Catheterization is routinely performed on patients diagnosed with bladder malfunction to resolve incontinence and retention. However, hospitalized patients may face serious life threatening side effects, such as urinary tract infections as a result of prolonged urinary catheterization. Few people ask for help to treat their incontinence problem. Therapeutic interventions for urinary incontinence include bladder training strategies. A nurse's knowledge regarding bladder training and proper management of those who are at risk for urinary incontinence is needed to improve the quality of patients' lives. Current research discusses both effective and non-effective bladder training methods including behavioral treatment, pelvic floor muscle exercise, and catheter clamping. These methods can be used to support and treat inpatient and outpatient populations suffering from urinary incontinence. Urinary incontinence is comprehensively examined in this document and research based best practices are reported.

CHAPTER I

INTRODUCTION

Urinary Incontinence (UI) brings to mind many images, none of them positive. Incontinence in adults is always perceived as shameful, often hidden and may be veiled rather than dealt with (Green, 2015; Nichols & Layton, 2012). Urinary incontinence is an embarrassing and unreported condition across all countries and cultures (Minassian, Drutz, & Al-Badr, 2003). Not many UI sufferers seek treatment, and if they have discovered a remedy, it might not be the appropriate treatment for them. Urinary incontinence and related issues, along with treatments, are discussed in the following chapters. The purpose of these chapters is to answer three questions and suggest recommendations for those at risk for UI.

Chapter II answers the question: What is the UI? The chapter details five classifications of UI that include: urgency, stress, mix, overflow, and functional UI. Each single category will be discussed with its common causes; such as disease, medications, and daily life habits. Also, chapter II talks about gender risk factors related to UI and discusses the most typical transient risk factors associated with UI.

The discussion in chapter III answers the question: Why is UI important? This chapter presents insights into the quality of life of those who suffer from UI. It covers most common psychosocial issues in patients with UI. Also, this chapter provides information related to UI that influences daily life in some cultures and religions. This chapter clarifies relationships between UI and increased incidence of falling.

Additionally, the impact of UI on health care costs, financial challenges in older and disable adults, and direct and indirect financial issues on people with UI are discussed. The risk of urinary tract infections and skin integrity issues due to UI are detailed in this chapter.

Chapter IV discusses UI interventions. This chapter elaborates on three of the most common researched bladder training strategies. It highlights who can benefit from each type of bladder training. Additionally, other types of treatment related to UI, such as pelvic floor muscle exercises, behavioral options, catheter clamping, lifestyle interventions, indwelling and self catheterization, pharmacological and invasive treatment are reviewed.

Implications for nursing care are covered in chapter five. The role the nurse serves in assessment, hand hygiene, dementia, skin care, and patient education and resources are discussed. Evidence-based bladder training recommendation for nurses, healthcare managers, and patients are included in this chapter. Gaps in research are explored.

Urinary incontinence is a medical and social problem that impacts people's life. Preventing UI is very important and can be accomplished by reducing or avoiding risk factors. It is essential to recognize UI risk factors, prevention strategies, and treatment options. The intention of this document is to provide information related to UI and bladder training strategies using current evidence-based practice for patients at risk. All adults and health care professionals can benefit by becoming familiar with major UI concerns discussed in this document.

CHAPTER II

WHAT IS URINARY INCONTINENCE?

Studies of urinary incontinence (UI) are widespread in the literature. Urinary incontinence, which is defined as the involuntary leakage of urine, affects 13 million individuals for various reasons, and occurs in both men and women (Ferreira, Santos, Duarte, & Rodrigues, 2012; Grandstaff, & Lyons, 2012; Lin, Yang, Chia-Hsiang Lin, Yu, & Chiang, 2011; Publicover & Bear, 1997; Roe, Milne, Ostaszkiwicz, & Wallace, 2007a; Rosqvist, Aukee, Kallinen, & Rantanen, 2008; Sangsawang & Serisathien, 2012; Van Gerwen, Schellevis, & Lagro-Janssen, 2009). This chapter will describe UI.

Urinary incontinence is known to increase in prevalence in men and women with age and can have a devastating effect on quality of life (Kehinde, 2016). Men and women are exposed to different risk factors that contribute to pelvic floor dysfunction. Chronic diseases, like prostate cancer, kidney disease, stroke, vascular disease, diabetes, Alzheimer's and Parkinson's disease are risk factors for UI (Minassian, Drutz, & Al-Badr. 2003; Shultz, 2012; Wood & Anger, 2014). Additionally, urinary incontinence can result from pregnancy or can be a side effect of postoperative surgery (Kehinde, 2016).

According to the National Institute of Health (NIH), when urinary leakage is permanent, it may be a result of a weakening bladder, pelvic floor muscles, or a pelvic organ (bladder, rectum, or uterus); that has prolapsed, resulting in changes in

vaginal placement (2016). Additionally, a vaginal birth can cause this to occur as a result of added pressure on the pelvic floor by the enlarging uterus. Considering that a vaginal birth can potentiate UI, it can be concluded that UI does not only result from the normal aging process (Rosqvist et al., 2008).

Urinary Incontinence Classifications

Urinary incontinence has five classifications that include: urgency, stress, mix, overflow, and functional incontinence UI (NIH, 2016). Each of these classifications is discussed.

Urgency Urinary Incontinence

When individuals have an abrupt need to empty their bladder, and are not able to keep their urine prior to reaching the toilet, involuntary leakage may occur (Wood & Anger, 2014). This incident is called urgency UI, which is due to an overactive or spastic bladder (NIH, 2016; Shultz, 2012). This type of incontinence has characteristics of frequency (the need to void too often), urgency, and nocturia (night time voiding). Research also concludes that smoking has a relationship with urgency UI in women, which is related to the irritating effects on the bladder (Wood & Anger, 2014).

In some cases, early signs of bladder cancer can show urgency UI (Wood & Anger, 2014). Sometimes urgent UI occurs in individuals who have diabetes, stroke, or Parkinson's and Alzheimer's disease. Various neurological lesions in areas related to stroke can cause primary micturition and incontinence (Wood & Anger, 2014).

Urgency UI most commonly appears in older adults. Physiological changes in the lower urinary tract function, in combination with the effects of lower urinary tract diseases, and the side effects of medication, make older adults less successful with voiding (Singh & Arya, 2011; Shultz, 2012). On the other hand older adults do not receive as much assessment and treatment for UI compared to younger adults (Singh & Arya, 2011; Shultz, 2012).

Stress Urinary Incontinence

When pressure is put on the bladder, for example, during physical exertion (such as lifting heavy items), sneezing, coughing, and laughing, urine may leak and stress UI occurs (NIH, 2016). In addition, since smoking is related to chronic cough, it can contribute to stress UI since the cough causes pressure on the urinary sphincter and increases the abdominal pressure (Wood & Anger, 2014). It has been found that 15 to 40 percent of women in most countries have stress UI (Heydari, Motaghd, & Abbaszadeh, 2016). Stress UI can affect social relationships, sexuality, and psychological health (Heydari et al. 2016).

Forty percent of women who have daily caffeine intake of more than 204 mg., are more likely to demonstrate stress UI as a result of the diuretic effect and increased fluid volume (Wood & Anger, 2014). Research also shows that stress UI is 2.7 times greater in women who gave birth vaginally (Kearney, Miller, Ashton-Miller, & DeLancey, 2006). Levator ani muscle injury was discovered in parous women after vaginal delivery (Kearney et al., 2006).

Mixed Urinary Incontinence

Mixed urinary incontinence is a combination of stress and urgency UI (NIH, 2016). People may experience leaking during sneezing and laughing, while at other times they cannot control a sudden urge and leakage takes place (Kehinde, 2016). According to National Association for Continence (NAFC, 2015), people may have mixed UI if there is urine leakage while they sleep. If a person has a sudden urge to void after drinking a small amount of water, simply touching water or hearing it run they may have mixed UI (NAFC, 2015).

Overflow Incontinence

When people cannot empty their bladder completely and newly produced urine overflows, it is considered overflow incontinence (Shultz, 2012). They usually empty only small amounts of urine into their bladder while awake in the day. This causes them to have to wake up during the night to empty their bladder (Shultz, 2012). Overflow incontinence is characterized by a weak stream of urine, hesitancy, dysuria (pain or discomfort when urinating), dribbling of urine, nocturia, and incomplete voiding (Shultz, 2012). According to the American Urological Association (AUA), when an elevation in the detrusor (bladder muscle wall) pressure overcomes the outlet resistant, it causes urinary leakage (2016). Overflow incontinence typically occurs in patients with spinal cord injury, diabetes, constipation, organ prolapse, and in males with an enlarged prostate. Additionally, people undergoing pelvic surgery and are pregnant have increased occurrence of overflow incontinence (Kehinde, 2016; NIH, 2016).

Functional Incontinence

Functional incontinence is related to the loss of urine due to a functional deficit rather than a structural problem in the bladder (Shultz, 2012). Patients with decreased mobility and access deficits who need to use a wheelchair, walker, or braces have a limited ability to reach facilities. In this case, functional incontinence occurs. Additionally, other conditions can be a risk factor for functional incontinence. Conditions including morbid obesity, mental health problems such as depression and Alzheimer's disease, peripheral neuropathy, weakness, altered mental status, and impaired vision can lead to functional incontinence (Kehinde, 2016; Shultz, 2012).

Gender Risk Factors Associated with Urinary Incontinence

Female Gender

Based on a research studies, the prevalence of UI is high in woman (Botlero, Urquhart, Davis, & Bell, 2008; Harrison & Memel, 1994; Van Gerwen, Schellevis, & Lagro-Janssen, 2009). Lack of knowledge related to different treatment options, shyness, or a belief that UI is an expected result of aging causes half of females not to report UI to their primary care providers (Wood & Anger, 2014). The connection between prevalence of any type of UI and age in females is not straight forward.

Women start experience UI more frequently, starting around age fifty (Minassian, Drutz, & Al-Badr, 2003). According to research menopause (female hormone changes) does not affect UI (Milsom et al., 2014; Minassian et al., 2003). Stress UI peaks for women in their forties and it gradually decreases to its lowest rate for women in their eighties (Wood & Anger, 2014). Ten percent of middle aged

women have daily stress UI and one third of women report weekly stress related UI (Wood & Anger, 2014). The frequency of urge and mixed incontinence enhanced after the age of forty (Minassian et al., 2003).

In general, women experience more urgency UI than men, 9.3% and 2.6% respectively (Wood & Anger, 2014). Occurrence of UI in women with vaginal delivery is 21% higher than in cesarean deliveries (15.9%) (Kearney et al., 2006; Wood & Anger, 2014). Risk factors of UI in women can include depression, chronic cough, pregnancy, obesity, hysterectomy, history of stroke, general health statues, functional or motor impairment, family history, and impaired lower urinary tract systems (Minassian et al., 2003; Wood & Anger, 2014).

Male Gender

The normal aging process usually causes a man's urinary tract symptoms. Unfortunately, many men do not talk about their symptoms with their health care provider (Roehrborn, Lowe, Gittelman, Wruck , & Verbeek, 2016). Therefore, their symptoms remain untreated which impairs their quality of life (Roehrborn et al., 2016). Additionally, being a veteran appears to play a role. Male veterans living in the United States are identified as having considerably more health problems compared to men in the civilian population (Vaughan et al., 2014). This group has increased prevalence of depression, posttraumatic stress disorder, prostate cancer, and lower urinary tract system problems. Military service is related to UI in American men 55 years old or younger (Vaughan et al., 2014). Urgency incontinence is the

most common problem in this group. Overall, urethral obstruction related to benign prostatic hyperplasia is the most common cause of UI in males (NIH, 2016).

Transient Risk Factors Related to Incontinence

According to American Urological Association (2016), incontinence may occur because of a non-urologic cause. This is typically reversible when the fundamental problem is treated. Those risk factors include:

- Infection: Urinary tract irritation may be enhanced by symptomatic infections that result in incontinence, such as atrophic vaginitis.
- Diuretics: Urge incontinence may occur after overwhelming the bladder's capacity by sudden diuresis.
- Stool impaction: Urge or overflow UI may occur in patients with impacted stool, which may be combined with concomitant fecal incontinence.
- Sedatives: Confusion and secondary incontinence may occur due to alcohol and long-acting benzodiazepines usage.
- Anticholinergics: Urinary retention with frequency and overflow incontinence are considered side effects of anticholinergics medications.
- Psychological: Depression has been associated with UI.

Polypharmacy (the use of multiple medications by a person) is common in older adults (Wagg, 2013). Many medications can lead to the development of (UI) especially in this population (Wagg, 2013). Medications with possible side effects that may increase the risk for UI include:

- Calcium channel blockers:

- Side effects: constipation, edema
- Examples: Verapamil may cause constipation that can result in UI and Amlodipine and Nifedipine may cause dependent edema, which can result in nocturnal polyuria
- Opioid analgesics:
 - Side effects: constipation, confusion, and immobility
 - Example: Morphine and Oxycodone
- Sedatives, hypnotics, antipsychotics:
 - Side effects: anticholinergics effects, which include confusion and sedation
 - Examples: Clonazepam, Diazepam (Valium), and Zolpidom
- Alpha-adrenoceptor antagonist:
 - Side effects: decline in smooth muscle tone in the urethra
 - Example: Terazosin
- Angiotensin -converting enzyme (ACE) inhibitor:
 - Side effects: cough
 - Examples: Ramipril and Enalapril
- Antimuscarinic:
 - Side effects: unsuccessful voiding, cognitive impairment with decreased toileting ability.
 - Example: Scopolamine
- Lithium Carbonate:

- Side effects: polyuria (large volumes of dilute urine)
- Example: Lithium
- Anticonvulsant:
 - Side effects: edema, polyuria, worsened nocturia and night time incontinence
 - Example: Gabapentin

(Wagg, 2013)

Urinary incontinence is prevalent in society in many forms; stress, urge, overflow, mixed, and functional incontinence. Different risk factors can expose people to UI. Urinary incontinence is often underreported and is an embarrassing experience for most people of all cultures. Severity of UI related to volume, duration, and frequency of occurrence is directly related to quality of life (Minassian, Drutz, & Al-Badr, 2003). Quality of life and cultural factors related to UI will be discussed in the following chapter. In addition, the reasons for being concerned about UI are discussed.

CHAPTER III

WHY IS URINARY INCONTINENCE IMPORTANT?

Urinary Incontinence (UI) is a prevalent health concern influencing the physical, mental, social, and financial wellbeing of people and their family. Also, it is a situation that creates a burden on health and social services and affects quality of life (QOL) (Barghouti, Yasein, Jaber, Hatamleh, & Takruri, 2013; Botlero, Urquhart, Davis, & Bell, 2008; Kocaöz, Talas, & Atabekoğlu, 2010). In this chapter the reasons for being concerned about UI will be discussed.

Quality of Life

As discussed in chapter II, UI is a widespread issue that influences many people of all ages. Although it is not a fatal condition, it is related to declining QOL and loss of independence (Kehinde, 2016). Urinary incontinence affects regular activities like sleep, the ability to perform household tasks, and limits physical activity such as walking and exercise.

Psychological Issues

Feelings of isolation as a result of UI can influence a person's body image, and can impact personal and sexual relationships (Basak, Kok, & Guvenc, 2013; Kehinde, 2016; Nichols & Layton, 2012). Incontinence can cause people to be embarrassed diminishing their sense of self worth, stopping them from travelling from their homes. Many people with UI confine their social activities, such as visiting friends or family, to decrease the incidence of possible accidental urine leakage in

public. They may fear going shopping, except to places where they can quickly access a bathroom facility (Kehinde, 2016; Nichols, & Layton, 2012). Social isolation and depression can be a consequence of UI (Basak et al., 2013; Kehinde, 2016; Nichols & Layton, 2012)

According to Nicholas and Layton (2012), the activities avoided because of bladder problems include laughing, swimming, camping, and going to a wedding. Additionally, worrying about odor, the need to change underwear frequently, wearing pads or bulky diapers,-limiting fluid intake, and the use of certain types of clothing are some complaints of those with UI. These concerns cause social barriers for this population (Nichols & Layton, 2012).

Gender Issues

Urinary incontinence can influence men and women differently. It was reported that mixed and stress UI in women changes their QOL more than other types of incontinence (Barghouti et al., 2013; Basak et al., 2013; Bunyavejchevin, 2006; Coyne, Zhou, Thompson, & Versi, 2003). Most men with lower urinary tract symptoms indicative of benign prostate hyperplasia (BPH), self manage their UI symptoms (Roehrborn, Lowe, Gittelman, Wruck, & Verbeek, 2016). Lower urinary tract symptoms in males are viewed as a normal process of aging (Roehrborn et al., 2016). As a result, many of men do not talk about their symptoms with their health care providers. Therefore, symptoms in both genders often are not treated and can significantly reduce people's QOL (Roehrborn et al., 2016).

Cultural Issues

Patients with incontinence in the African-American population compared to Caucasians experience greater psychological distress related to incontinence (Bogner, 2004). On the other hand, South Asian and Indian women had reduced help seeking behavior due to feelings of embarrassment related to discussing UI, especially with male health care professional (Doshani, Pithforth, Mayne, & Tincello, 2007).

Urinary incontinence has much more destructive impact on the QOL of Muslim woman compared to non Muslim woman due to it having a negative impact on religious practices (Bahar, Beşer, Özbıçakcı, & Haney, 2014; Basak et al., 2013). For example namaz, which is a Muslim prayer, is one of the practices of Islam that is performed five times a day at special times. It obliges a Muslim to stand, bend, and sit several times while reciting the verses of the Quran. Ablution, a cleaning ritual, needs to be is performed by every Muslim prior to prayer. Different actions during namaz could cause leakage in people with UI. When people are under namaz and pass flatus, stool, and/or urine, it is required that they carry out the ablution requirements again. Therefore, UI is a barrier to the Muslim religion practices due to the statutes of purity required during prayer (Basak et al., 2013; Ozkan, Ogce, & Cakir, 2011; Sange & Hill, 2008).

Urinary Incontinence and Increased Incidents of Falling

Falls are widespread in the elderly residents. Falls may result in bone fracture, feelings of panic related to the potential of future falling, and loss of self-reliance. Patients with UI are at increased risk of fall due to the need to reach a toilet quickly to

prevent leakage of urine (Foley et al., 2012; Kehinde, 2016). Falls can occur when a patient has symptoms of urgency, urge incontinence, and nocturia (Foley et al., 2012). Falls lead to hospital admission, urinary tract infection and catheterization, anxiety, depression, and the need for institutional care.

Nineteen to 50 percent of people ages 70 years old and older are at risk of falling.-Cognitive impairment and immobility are two major factors that lead to falling in this population (Foley et al., 2012). According to Foley et al. (2012), UI is related to falls with 47.6% of individuals falling admitting to urine leakage in comparison with 30.6% with none. It was reported that people who experienced urinary symptoms, such as pain on micturition, and those with restricted body movement were more endangered to fall.

Financial Issues

The impact of UI is significant on health care cost. Because of this condition, there is substantial financial burden on patients, their families, and health care organizations (Milsom et al., 2014; Minassian, Drutz, & Al-Badr, 2003). Urgency UI is chronic and age related condition that has associated costs, which include direct, indirect, and intangible costs (Coyne et al., 2014; Hu et al., 2003; Milsom et al., 2014). These costs include the need for incontinence pads, diapers, bedside toilets, latex gloves, skin protection materials, and pant liners.

Incontinent older and disabled adults may encounter financial challenges when trying to manage their own continence problems. For example, if they have financial issues they may need to use homemade pads from a toilet roll,

clothes/towels, or use commercial sanitary towels/napkins. In 2005, out of pocket cost for routine care in women was particularly higher with urgency UI (\$313 per year) and mixed UI (\$330 per year) than for those with stress UI (\$204 per year) (Coyne et al., 2014). Material cost is accrued in nursing homes and at home for routine care. Diagnostic laboratory test costs and treatment such as medication and surgical procedures add to the financial burden. Also, urinary tract infection (UTI) treatment and costs related to complications are considered a direct cost associated with urgency UI. According to Medicare (n.d.), incontinence supplies or adult diapers are not covered. On the other hand, if patients are confined to a bed, purchasing a commode chair is considered a durable medical supply if there is a doctor's order and it is covered by medical insurance (Medicare, n.d.).

Indirect costs include lost salary for patients and caregivers and costs from reduced productivity, because of absenteeism and presenteeism (the practice of coming to work despite illness, injury, anxiety, etc., often resulting in reduced productivity). Pain, suffering, and decreased health-related QOL are considered indefinable costs for people with urgency UI (Coyne et al., 2014; Hu et al., 2003; Milsom et al., 2014). Falls and resulting fractured bones that occur as a result of rushing to the bathroom, longer hospital stays, skin infection and breakdown, additional doctor visits, nursing home admission, and urinary tract infection can also add to the cost related to UI (Botlero et al., 2008; Hu et al., 2003; Wood & Anger, 2014). The risk of nursing home admission as a result of having a UI for females is

two percent and for males it is 3.2 percent compared to those without UI (Wood & Anger, 2014).

The total cost of overactive bladder syndrome (OAB) with urgency UI for adult aged 25 years and older was \$65.9 billion in 2007, with costs increasing to \$76.2 billion in 2015 and \$82.6 billion by 2020 (Coyne et al., 2014; Wood & Anger, 2014). In the United States, direct costs are the major driver of the total cost of urgency UI. The direct cost of routine care items like incontinent pads contribute to the majority of the cost for the patient. It was reported that women age 65 and younger sustain more expense related to UI diagnostic procedures compared to older women as more young people have overactive bladder than do older individuals (Hu et al., 2003). On the other hand, women 65 years and older women incurred higher home and routine care compared to younger women (Hu et al., 2003). Overall, the cost of diagnostic test, treatment, home and routine care in women is more than in men (Hu et al., 2003)

Skin Integrity Issues

Moisture does not directly damage skin, but when moisture includes irritating material, such as alkaline urine that stays on the skin for a long time, harm is done (Rippon, Colegrave, & Ousey, 2016). Urinary incontinence can cause a clinical manifestation called incontinence-associated dermatitis (IAD) (Rippon et al., 2016; Voegeli, 2016). Urine can alter the normal skin flora causing superficial skin damage. Redness, swelling, and blisters are characteristics of IAD. As a result, it causes considerable discomfort and decreased QOL. It was found that IAD occurs mostly in

men, people with diabetes mellitus, UI, individuals with an elevated body mass index, and the aging population (Rippon et al., 2016). The major risk factors for IAD includes UI, frequent episodes of incontinence, lack of ability to maintain individual hygiene, poor existing skin condition, application of occlusive containment products (external condoms), decreased mobility, reduced cognitive awareness, and pain (Voegeli, 2016). People with IAD residing in all locations including long-term care, acute care, and the community have a high prevalence of IAD (Voegeli, 2016). The overall cost of incontinence is increased due to treatment of IAD (Jacobson & Wright, 2015; Rippon et al., 2016; Voegeli, 2016).

Urinary incontinence and IAD are risk factors for developing a pressure ulcer (PU) (Beeckman, Van Lancker, Van Hecke, & Verhaeghe, 2014; Southgate & Bradbury, 2016). Pressure ulcers are the result of injury to the skin and/or essential tissue. They usually occur over a bony prominence resulting from continuous pressure or friction (Rippon et al., 2016). Physical and mental discomforts, pain, infection, promotion of dependence, limitation in activities, and extended hospitalization are results of PU (Beeckman et al., 2014; Southgate & Bradbury, 2016).

Urinary Tract Infection

Urinary tract infection is a frequent problem in nursing home residents (Omli et al., 2010). The incidence of asymptomatic bacteriuria is around 30% in nursing home residents (Omli et al., 2010). The risk factors for developing UTIs in older adults rises as a result of physiological changes related to aging, malnutrition,

cognitive insufficiency, immobility, use of indwelling catheter, illnesses, UI, and fecal incontinence (Omli et al., 2010; Ronald, 2003). Additionally, diabetes mellitus and spinal cord injury can have a significant impact on the etiology of UTIs (Omli et al., 2010; Ronald, 2003).

Chronic degenerative neurological diseases like Alzheimer's, Parkinson's, and cerebrovascular accidents (CVA) are related to a neurogenic bladder. All these situations lead to impaired ureteric reflux and bladder emptying, which add to the high incidence of bacteriuria (Nicolle, 2000). During incontinence care, transmission of bacteria promotes UTIs.

External condom drainage, which is used for men with UI, doubles the chance for occurrence of bacteriuria (Nicolle, 2000). In addition, one of the other most important risks of developing UTIs is associated with using absorbents pads in nursing homes (Omli et al., 2010). The number of changes of the pad is not related to the risk of UTIs occurring in both women and men. The use of absorbent products causes an elevation in heat and moisture that may result in irritation of the skin. Ulcers and irritated skin are common reasons of skin infection in the nursing home residents (Omli et al., 2010). Also, since constipation can cause fecal incontinence, it is also a risk factor for the development of UTIs in these individuals (Omli et al., 2010).

It is necessary to develop effective treatments for UI in order to improve QOL for those who are at risk. The long term goal is to alleviate the use of valuable health care resources and to reduce the economic burden acquired because of this problem.

Successful treatment of urgency UI, clinical management programs, and early identification may reduce resource utilization and result in cost control (Coyne et al., 2014; Milsom et al., 2014). Understanding the prevalence and occurrence of UI and developing essential strategies for prevention and treatment will assist with reducing the financial and social impact caused by this condition (Botlero et al., 2008).

Although UI may not be life threatening, all patients have the right to receive treatment in order to improve their QOL (Kehinde, 2016). In the next chapter, current interventions for UI and bladder training will be discussed.

CHAPTER IV

WHAT ARE THE CURRENT INTERVENTIONS FOR URINARY INCONTINENCE?

As mentioned in previous chapters, urinary incontinence (UI) is often considered a minor issue or seen as a normal component of the aging process that doesn't require treatment. Many individuals have no perception of treatment options. People may not seek treatment related to their problem and find limited support resources (Nichols & Layton, 2012). There are various strategies and treatments that may improve daily activities and quality of life (QOL) for people who have UI.

Bladder Training

Bladder training is a behavior therapy that can be useful in treating UI. The goal of bladder training is to increase the time interval between voids either by a mandatory or self-adjustable schedule so that incontinence and retention is avoided (Hsiu-Chuan, Sheng-Mou, Shu-Yun, Ho-Hsiung, & Jau-Yih, 2011; Publicover & Bear, 1997; Roe, Milne, Ostaszewicz, & Wallace, 2007a). Bladder training and voiding programs are commonplace clinical practices for the management of UI or involuntary loss of urine. According to Liu, Wei, and Elliott (2015), bladder training can affect bladder tone, sensation, and stimulate normal bladder function in different types of UI. Bladder training can be helpful by enhancing the amount of urine that the bladder retains, controlling the urge to void, and increasing the length of time between bathroom trips. According to the National Association for Incontinence

(NAI), since the muscles control the bladder and sphincters, it is possible to train them (NAI, 2015). Over the years, many research studies found a bladder training program effective for both males and females in urge incontinence and overactive bladder. The following bladder training strategies are discussed: pelvic floor muscle exercise, behavioral treatment, and catheter clamping

Pelvic Floor Exercise

Pelvic floor muscles are the most important anatomical structures that control urinary continence. They keep the pelvic support in place by slow contraction of fibers and prevent UI during sudden increases in intra-abdominal cavity pressure (Ferreira, Santos, Duarte, & Rodrigues, 2012). According to research, pelvic floor muscle (PFM) exercise is the most common physical therapy treatment that is used for different types of UI (Ferreira et al., 2012; Hsiu-Chuan et al., 2011; Lin, Yang, Chia-Hsiang Lin, Yu, & Chiang, 2011; McClurg, Lowe-Strong, & Ashe, 2008; Rosqvist, Aukee, Kallinen, & Rantanen, 2008; Sangsawang & Serisathien, 2012). This exercise is commonly known as a Kegel, after Dr. Arnold Kegel who invented the exercise in 1948 (Kegel, 1948; Testa, 2015). Strengthening of the PFM is commonly used to treat stress UI (Hsiu-Chuan et al., 2011). Based on early research studies, PFM training has no adverse effects, and it is recommended that it be offered as first-line therapy to all women with stress, urge, or mixed UI (Ferreira et al., 2012; Rosqvist et al., 2008; Sangsawang & Serisathien, 2012). Pelvic floor muscle training involves educating patients along with developing a scheduled voiding regimen that gradually progresses the voiding interval (Rosqvist et al., 2008).

Pelvic floor muscle training includes repetitive selective voluntary contraction and relaxation of specific muscles. The goal is to strengthen the non-optimally functioning pelvic floor by improving the force generation, correcting timing, or managing the function of the PFM (McClurg et al., 2008). This strengthening is thought to accelerate muscle size and stiffness and to stabilize the bladder neck during the high pressure that is placed on the intra-abdominal muscles (Hsiu-Chuan et al., 2011).

The effectiveness of PFM training on UI in people with disease, pregnancy, and increased age is well established. Pelvic floor muscle exercise is not only helpful for the treatment and prevention of stress UI during pregnancy, but it also relieves stress UI symptoms (McClurg et al., 2008). Since 50% of people with Multiple Sclerosis develop bladder dysfunction, PFM training can be used to decrease the devastating symptoms of this condition (McClurg et al., 2008). These exercises improve the patient's quality of life after major urological surgery (Lin et al., 2011; McClurg et al. 2008). Pelvic floor muscle and bladder training programs are perceived as acceptable and feasible treatment since following these programs in daily life can be quite easy without negative impact and has no financial cost (Rosqvist et al., 2008).

Behavioral Approaches

Bladder training is used for physically and cognitively able adults to achieve continence by accelerating the timed interval between voids (Roe et al., 2007a; Sanders & Bray, 2013). Over the past decades bladder training, prompt voiding, habit

retraining, and time voiding have been used in nursing practice to manage UI in adults in institutional and community settings. These terms will be defined in the following section.

Habit retraining and timed voiding are used with individuals experiencing physical and cognitive problems, and need to be assisted to the toilet at regular intervals (Roe et al., 2007a). Prompted voiding is used to train individuals with or without cognitive impairment to begin toileting via requests for help and from positive reinforcement from others (Roe et al., 2007a). Timed voiding or scheduled voiding is defined as a routine or regular toileting that is characterized by a fixed time interval (such as every three hours) and helps individuals with or without cognitive impairment. People who cannot undertake independent toileting can benefit from a toileting assistance program that is started and maintained by nursing and caregiver assistance (Roe et al., 2007b; Wagg, 2013).

Behavioral treatment interventions, which include mandatory schedules and self-monitored voiding records, are first line treatment for most patients with UI (Publicover & Bear, 1997). Self-monitoring is an important key component of bladder training. A voiding record determines progress and serves as the basis for assessing changes in the voiding schedule. In addition, Publicover and Bear (1997) report that in a bladder training program, positive reinforcement and a therapeutic relationship are crucial components of this treatment. Ultimately, success in therapeutic programs and bladder training depends on the degree and involvement of the patients and caregivers.

Catheter Clamping

Experiencing pain and being confined to a bed can result in difficulty or inability to void in the post operative phase. Indwelling urinary catheters are inserted in one quarter of hospitalized patients before surgery (Liu et al., 2015; Nyman, Johansson, & Gustafsson, 2010). Postoperative urinary retention and difficulties in return of normal bladder function after removal of the urinary catheter are frequent in patients with hip fracture and neurosurgical conditions (Nyman et al., 2010).

Acute urinary retention is the sudden inability to pass any urine although there is urine in the bladder and the person has a desire to urinate (Gray, 2000). In the past, it was reported that clamping a urinary catheter before its removal would decrease the frequency of urinary retention and shorten the time to return to normal bladder function (Williamson, 1982). It was thought that clamping a catheter stimulates normal bladder filling and voiding by improving bladder sensation and tone (Williamson, 1982). Researchers concluded that catheter clamping minimizes postoperative neurogenic dysfunction up to six days post catheterization (Roe, 1989). The prevention of bladder dysfunction is the goal of clamping a catheter (Nyman et al., 2010).

More recently researchers explored the effectiveness of clamping a catheter for bladder training in adults who had undergone surgery but came up with different results (Liu et al., 2015; Nyman et al., 2010). The first researchers used a bladder scanner to measure residual urine volume. Nyman et al. (2010) included two groups; the sample included a clamped catheter group with 55 patients and a free drainage

group with 58 patients. Almost six hours was required for the bladder to return to normal function in the clamped catheter group compared to four hours in the free drainage group of patients. Based on this randomized trial, there was no advantage to clamping the urinary catheter before removal (Nyman et al., 2010). This research demonstrated that clamping a catheter becomes an unnecessary step for the provider in the process of removing an indwelling urinary catheter.

In another study, Liu et al. (2015) sampled two groups (37 in each group), with one designed to be observational and the other a control group with catheters clamped or on free drainage. It was found that patients with clamped catheters experienced shorter time to first postoperative urination and less residual urine. In opposition to Nyman et al.'s (2010) research results, these researchers demonstrated that an early catheter clamping protocol could facilitate regaining normal bladder function postoperatively and reduce the rate of dysuria. It is obvious that there are differing opinions on clamping catheters as an intervention for acute urinary retention. While both studies had limitations, such as small sample sizes that investigated different groups of patients (neurosurgical versus those with a hip fracture), it remains clear that catheter clamping protocols need more research to resolve this controversy.

Lifestyle Interventions

Lifestyle changes specifically for overactive bladder syndrome and urge incontinence are recommended (Jamieson, Brady, & Peacock, 2010; Ostle, 2016). Lifestyle intervention can include fluid adjustment, weight loss, and caffeine

reduction. Caffeine products enhance urinary urgency and are associated with urinary leakage (Jamieson et al., 2010; Ostle, 2016; Testa, 2015). Simply limiting fluid intake at certain times, such as bedtime, can improve UI for some individuals; however in older people fluid restriction should not be strict due to concerns about dehydration and hypotension (Green, 2015; Testa, 2015). Since extra abdominal weight in obese women enhances more force on bladder, weight loss would likely improve UI in this population (Testa, 2015). Also, there is evidence for recommending a decrease in carbonated and alcohol beverages intake to avoid UI (Jamieson et al., 2010; Ostle, 2016). Low consumption of citrus fruits and tomatoes are suggested to decrease irritation of the bladder although there is not sufficient evidence to support this recommendation (Ostle, 2016).

Pharmacologic Treatment

If lifestyle and behavioral options are not helpful, pharmacologic treatment may be considered (Ostle, 2016). The medication classifications and an explanation of how they can assist with treatment of UI are described below. While medication usage is not ideal, it may assist in some cases.

Medications that have alpha-agonistic or alpha-adrenergic agonists properties have been proven to slightly raise the tone of the urethral sphincter and are used to treat stress UI (Testa, 2015). They cause contraction of the internal urethral sphincter and raise the urethral resistance to urinary flow (Ostle, 2016; Testa, 2015). On the other hand, since the clinical effectiveness of these drugs is limited to stress UI, these

medications are not used. They also need to be used cautiously in older adult, because their anticholinergic effect potentially can cause a fall risk (Wagg, 2013).

Antimuscarinic or anticholinergic medications have continuously been used as a pharmacological treatment for UI since the discovery of oxybutynin over thirty years ago (Wagg, 2013). Since that time, unfavorable outcomes and tolerability issues of these medications when used for overactive bladder have been discovered (Ostle, 2016; Wagg, 2013). Antimuscarinic medications should be used sparingly especially amongst older adults because of increased fall risk. Antimuscarinic medications with the exception of oxybutynin are chosen for people with cognitive depletion.

More recently, a β -3 adrenergic agonist, mirabegron, has been authorized for treatment of overactive bladder and has had early positive results in treating community dwelling older adult with UI (Ostle, 2016; Wagg, 2013). For post-menopausal women with over active bladder syndrome and vaginal atrophy, vaginal estrogen can be prescribed (Ostle, 2016). As ovaries stop making estrogen during menopause, all organs grow weaker, such as vaginal tissue, and pelvic floor muscles that maintain bladder and urethra control. Therefore, women may benefit from vaginal oestrogen therapy (Trabucco et al., 2007).

Tamsulosin is an alpha one adrenoceptor antagonist, a subclass of alpha-adrenergic agonist, and is a first line drug for older adult men with lower urinary tract symptoms. Men with large prostates can benefit from a 5 alpha-reductase inhibitor, such as finasteride or dutasteride (Wagg, 2013). Tamsulosin decreases smooth muscle tone in the bladder neck and prostatic capsule, and a 5 alpha-reductase inhibitor

decreases prostatic volume (Lowe, 2005). It is safe and effective to treat lower urinary tract symptoms related to benign prostatic hyperplasia (BPH) with Tamsulosin in the United States and Europe (Lowe, 2005).

Invasive Treatment

When medical and behavioral treatments are not helpful in managing UI and overactive bladder, there is good evidence that a botulinum toxin injection into the bladder using cystoscopy can be successful (Ostle, 2016; Wagg, 2013). Interavesical botulinum toxin causes paralysis of part of the detrusor muscle (smooth muscle in the bladder wall); unfortunately, the procedure has to be repeated frequently (Ostle, 2016).

Stress UI is one of the most common types of UI that can be treated by an invasive surgical treatment using a sling procedure that lifts and provides support to the bladder neck and urethra (Testa, 2015). Alternate choices for other types of incontinence are urethral bulking agents and artificial urinary sphincters. In addition, surgery may be useful for relieving urethral obstruction resulting from BPH, organ prolapse, and urethral stricture (Testa, 2015).

Indwelling and Self Catheterization

An indwelling urethral catheter is not indicated in all circumstances for the treatment of UI, especially if it only serves as a substitute for nursing care of the older adults with UI (Wagg, 2013). End-of-life catheterization and a condom catheter for comfort may be used for people with UI instead of pads for men (Wagg, 2013). Also, sometimes self catheterization is taught and recommended after botulinum toxin

injection into the bladder as incomplete bladder emptying may occur (Ostle, 2016). In addition, when residual urinary volumes continue to occur in some cases with UI, intermittent catheterization may be necessary especially in patients with paralysis (Jamieson et al., 2010).

People who are suffering from spinal cord injury (SCI) experience poorly functioning bladders. According to Paralyzed Veterans of America (PVA, 2010), there are many common bladder management options for SCI individuals that improve their quality of life. Indwelling catheterization, such as urethral catheters, and indwelling suprapubic catheters, and finally intermittent catheterization (self catheterization every 4 to 6 hours) are some invasive options for people with SCI (PVA, 2010). People with SCI may benefit from a number of surgical procedures to increase control over their bladder. Some of the surgical methods include bladder augmentation to increase bladder capacity and reduce leaking and continent urinary diversion to bypass the bladder by using a section of stomach or intestine to create a permanent outlet in the lower abdomen (PVA, 2010). Urinary management in case of continent urinary diversion will be maintained with self catheterization (PVA, 2010).

An indwelling urethral catheter is not a first option for UI. The rate of catheter associated urinary tract infection (CAUTI) is increasing and it can enhance the patient's length of hospital stay by two to four days (Panchisin, 2016). The best way to prevent CAUTI is to avoid unnecessary catheterization (Panchisin, 2016). Other options to help with incontinence should be considered before catheterization. An indwelling urinary catheter is the biggest risk factor for a urinary tract infection

(Weber et al., 2011). Catheter associated urinary tract infections cause an unnecessary enhanced burden on patients and health care facilities

(Galiczewski, 2016). It is important to identify interventions that have a positive effect on the CAUTI rate and to develop evidence-based guidelines and policies

(Galiczewski, 2016).

According to the Centers for Disease Control and Prevention (CDC) (2009) the following guidelines for foley catheter insertion need to be considered:

- Monitor urinary output when large intraoperative volumes of fluid or diuretics are used
- Maintain strict measurements of intake and output
- Assess for obstruction of the bladder outlet when there is acute urinary retention
- Consider that patients undergoing specific surgical procedures like genitourinary surgery or colorectal surgery are approved for catheter insertion
- Provide wound healing support for sacral or perineal wounds in patients with UI
- Monitor patients that need long term immobilization related to possible unsteady vertebral injuries or multiple traumatic injuries
- Remember placement of foley catheter improves comfort care at the end-of-life (CDC, 2009)

Clearly there are multiple evidence-based interventions that treat and manage UI. It is important how they are identified while understanding different patients' needs. The next chapter explains implications for nursing practice.

CHAPTER V

IMPLICATIONS FOR NURSING PRACTICE

This chapter summarizes recommendations for nursing care to improve outcomes for patients with urinary incontinence (UI). Quality patient care includes consideration for physical and emotional elements that are patient centered (Maben & Griffith, 2008). Nurses advocate for patients while delivering evidenced-based, safe, and efficient nursing interventions (Maben & Griffith, 2008). In addition, interdisciplinary approaches improve overall care for patients with UI. Nurses have a very important role in the care of patients with UI.

Nursing Assessment

Although UI is commonplace in both men and women of different ages, health care providers rarely discuss this issue with patients (Wagg, 2013). Many people with various risk factors become incontinent at different times in their lives (Wagg, 2013). Motivated by embarrassment, patients delay or never seek care (Wagg, 2013). Individuals suffering from incontinence must realize that it changes their everyday living and normal activities.

Nurses must identify incontinent patients early and assess the type of UI in order to provide the best care to support improved outcomes. Accurate assessment and efficient management of incontinence can reduce emotional and social distress of patients along with financial burden and utilization of social services (Barghouti, Yasein, Jaber, Hatamleh, & Takturi, 2013).

Pelvic Floor Muscle Exercises

It is important that nurses educate patients with UI about PFM exercise and encourage patients to utilize them to reduce the severity of stress UI symptoms (Ferreira et al., 2012; Sangsawang & Serisathien, 2012). Nurses play pivotal roles in the education of pre and post surgery patients regarding PFM exercises, which is important for early recovery from UI (Lin, Yang, Chia-Hsiang Lin, Yu, & Chiang, 2011). Nurses need to deliver knowledge about UI and PFM exercise by verbal instruction combined with handbooks, pamphlets, and fact sheets.

Different educational approaches are necessary for cultural, cognitive, and physical differences (Marcus, 2014). Many people are visual learners, therefore they can benefit from written educational tools to supplement verbal education (Marcus, 2014). Nurses can educate, recommend, and give instructions related to specific problems to their patients and family members, which result in high effects and quality of learning.

Bladder Training

Nurses need to encourage mandatory voiding schedules and the use of self-monitored voiding records in bladder training. Good communication between the nurse and patient is one of the most successful strategies of bladder training (Lin et al., 2011). It is necessary that managers emphasize and encourage nurses to be trained to educate patients with stress UI. See Table 1 for a summary of research-based recommendations for bladder training that takes a team approach.

Table 1

Evidenced-Based Bladder Training Recommendations for Nurses, Health Care Managers, and Patients

Recommendations to the Nurse
1. Learn more information about how to select patients that would benefit from bladder training.
2. Encourage patients with Multiple Sclerosis and bladder dysfunction to do PFM exercises.
3. Educate patients with UI that bladder training is a safe, easy, and inexpensive treatment.
4. Encourage the use of voiding schedules and educate patients about the importance of self-monitoring.
5. Assess fall patients to assure that they don't have UI, overactive bladder, or urge incontinence.
6. Understand that therapeutic communication and positive reinforcement are crucial components of bladder training.
7. Educate pre and post surgery patients that PFM exercises assure early recovery from acute UI.
8. Observe patients after discontinuing an indwelling urethral catheter for UI and urinary retention.
9. Utilize a bladder scanner to measure residual urine volume in patients with urinary

retention.
10. Teach pre and post surgical patients with a radical prostatectomy and UI to perform PFM exercises.
11. Consider that short-term indwelling catheter clamping prior to removal is questionable.
12. Review patient medication list for drugs (diuretics and analgesics) that may aggravate UI.
13. Understand that conditions such as urinary tract infection, chronic cough, constipation, and atrophic vaginitis can lead to UI.
Health Care Manager Recommendations
1. Encourage staff to broaden their knowledge about strategies to resolve UI.
2. Train staff on methods to educate patients about bladder training, especially pre and post operatively.
3. Develop policies for bladder training patients with UI.
4. Develop educational handbooks and pamphlets that teach patients about PFM exercises for UI treatment.
5. Provide a list of patient that would benefit from UI treatment strategies.
Patient Recommendations
1. Listen carefully to advise on the benefits of bladder training.
2. Practice PFM exercises, especially pre and post operatively.
3. Keep a record of voiding time.

4. Report changes in voiding schedule.
--

(Ferreira et al., 2012; Grandstaff & Lyons, 2012; Kehinde, 2016; Lin et al., 2011; McClurg et al., 2008; Nyman et al., 2010; Roe et al., 2007b; Rosqvist et al., 2008; Sangsawang & Serisathien, 2012).

Urinary Catheter Management

Nurses can play a very important role in indwelling urinary catheter management and removal. Nurses need to be proactive about reporting catheter insertion and duration dates. It is very important that nurses update and review the agency policy to prevent the use of an indwelling urethral catheter as a first option for UI.

Incontinence Associated Dermatitis

In management of incontinence associated dermatitis (IAD), daily skin assessment should be performed on at risk patients. Adoption of a structured skin care regime by nurses and caregivers is necessary for management of IAD to improve the care of the skin in order to prevent irritation from bodily fluid and skin breakdown (Southgate & Bradbury, 2016; Voegeli, 2016). It is important that soap and water are not used for skin cleansing to prevent the depletion of the skins moisture. Extreme friction on the skin by rubbing should be avoided. Air drying of the skin and the use of soft wipes in conjunction with cleanser is suggested. Applying a skin barrier protection is an important strategy in managing IAD since it provides a barrier against skin damage exposure to urine and feces (Southgate & Bradbury, 2016).

Hand Hygiene

Hand hygiene by both staff and resident during pad changing is very important in order to reduce the transmission of pathological microbes in nursing homes (Loeb et al., 2003; Nicolle, 2000; Omli et al., 2010)

Dementia

There are practical strategies to assist patients with dementia with going to the toilet that makes it less stressful such as:

- Placing a big picture of a toilet on the toilet door to make it easier to locate;
- Opening the toilet door to make sure that the patient can reach the toilet easily;
- Observing patients for signs of restlessness or moving up and down from a sitting position or bed, which may mean that they need to go to the toilet; and
- Assuring that patients can remove their clothes without struggling with zipper or buttons (Barrie, 2016).

Patient Resources

There are resources to support people with UI. Health care professionals, such as a continence advisor or incontinence physiotherapist recommend websites such as www.nhs.uk and www.continenceproductadvisor.org and an information for support groups and aid organization like the Bladder and Bowel Foundation (Bladder and

Bowel Foundation, 2017; Green, 2015). Referring at risk patients to nurse and physician specialty services should be considered.

Conclusion

An abundance of treatments and interventions are available to control and manage UI. Overall, many people with UI can benefit from a variety of care strategies including bladder training, behavioral approaches, lifestyle interventions, medications, and invasive treatments. Pelvic floor muscle exercise is strongly recommended as a first line therapy to all women with stress, urge, or mixed UI (Ferreira et al., 2012; Rosqvist et al., 2008). Nursing interventions play a vital role in the management of UI in all health care environments.

It is vital that nurses follow evidenced-based strategies in the care of patients with UI. Theoretical approaches in bladder training, voiding programs, and their suitability for patients need further research (Roe et al., 2007b). Clearly, more research is needed related to clamping catheters to achieve normal bladder function in patients (Liu et al., 2015; et al., 2010).

This document addressed the issue of UI and discussed the most common research-based treatment options. Most importantly, the role of the nurse in the management of patients with UI care is described. It is important that providers of care recognize the burden this condition places on patients and the health care system and work together to improve their quality of life.

REFERENCES

REFERENCES

- American Urological Association. (2016). *Urinary incontinence*. Retrieved from <https://www.auanet.org/education/urinary-incontinence.cfm>
- Bahar, Z., Beşer, A., Özbıçakcı, Ş., & Haney, M. Ö. (2014). Health promotion behaviors of Turkish women. *Dokuz Eylül Üniversitesi Hemşirelik Fakültesi Elektronik Dergisi*, 6(1), 9-16.
- Barghouti, F. F., Yasein, N. A., Jaber, R. M., Hatamleh, L. N., & Tahruri, A. H. (2013). Prevalence and risk factors of urinary incontinence among Jordanian women: impact on their life. *Health Care for Women International*, 34(11), 1015-1023.
- Barrie, M. (2016). Dealing with patients with concurrent dementia and urinary incontinence. *Journal of Community Nursing*, 30(3), 37-46.
- Basak, T., Kok, G., & Guvenc, G. (2013). Prevalence, risk factors and quality of life in Turkish women with urinary incontinence: A synthesis of the literature. *International Nursing Review*, 60(4), 448-460.
- Beeckman, D., Van Lancker, A., Van Hecke, A., & Verhaeghe, S. (2014). A systematic review and meta-analysis of incontinence-associated dermatitis, incontinence, and moisture as risk factors for pressure ulcer development. *Research in Nursing & Health*, 37(3), 204-218.

- Bogner, H. R. (2004). Urinary incontinence and psychological distress in community dwelling older African Americans and whites. *Journal of the American Geriatrics Society*, 52(11), 1870-1874.
- Botlero, R., Urquhart, D. M., Davis, S. R., & Bell, R. J. (2008). Prevalence and incidence of urinary incontinence in women: Review of the literature and investigation of methodological issues. *International Journal of Urology*, 15(3), 230-234.
- Bunyavejchevin, M. D. (2006). The impact of overactive bladder, stress and mixed urinary incontinence on quality of life in Thai postmenopausal women. *Journal of the Medical Association of Thailand*, 89(3), 294-8.
- Bladder and Bowel Foundation (2017). Retrieved from www.bladderandbowelfoundation.org
- Centers for Disease Control and Prevention. Gould, C. V., Umscheid, C. A., Rajender, K., Agarwal, R. K., Kuntz, G., & Pegues, D. A. (2009). *Guideline for prevention of catheter-associated urinary tract infections*. Retrieved from www.cdc.gov/hicpac/pdf/CAUTI/CAUTIguideline2009final.pdf
- Coyne, K. S., Wein, A., Nicholson, S., Kvasz, M., Chen, C. I., & Milsom, I. (2014). Economic burden of urgency urinary incontinence in the United States: A systematic review. *Journal of Managed Care Pharmacy*, 20(2), 130-140.
- Coyne, K. S., Zhou, Z., Thompson, C., & Versi, E. (2003). The impact on health-related quality of life of stress, urge and mixed urinary incontinence. *British Journal Urology International*, 92(7), 731-735.

- Doshani, A., Pitchforth, E., Mayne, C. J., & Tincello, D. G. (2007). Culturally sensitive continence care: A qualitative study among South Asian Indian women in Leicester. *Family Practice, 24*(6), 585-593.
- Ferreira, M., Santos, P. C., Duarte, J. A., & Rodrigues, R. (2012). Exercise programmes for women with stress urinary incontinence. *Primary Health Care, 22*(3), 24-27.
- Foley, A. L., Loharuka, S., Barrett, J. A., Mathews, R., Williams, K., McGrother, C. W., & Roe, B. H. (2012). Association between the Geriatric Giants of urinary incontinence and falls in older people using data from the Leicestershire MRC Incontinence Study. *Age and Ageing, 41*(1), 35-40.
- Galiczewski, J. (2016). Interventions for the prevention of catheter associated urinary tract infections in intensive care units: An integrative review. *Intensive & Critical Care Nursing, 32*(1), 1-11.
- Grandstaff, M., & Lyons, D. (2012). Impact of a continence training program on patient safety and quality. *Rehabilitation Nursing, 37*(4), 180-184.
doi:10.1002/rnj.34
- Gray, M. (2000). Urinary Retention: Management in the Acute Care Setting Part 1. *The American Journal of Nursing, 100*(7), 40-48.
- Green, D. (2015). Breaking down barriers to support those with incontinence. *Nursing and Residential Care, 17*(7), 370-372.
- Harrison, G., & Memel, D. (1994). Urinary incontinence in women: Its prevalence and its management in a health promotion clinic. *The British Journal of*

General Practice: The Journal of the Royal College of General Practitioners, 44(381), 149-152.

Heydari, F., Motaghd, Z., & Abbaszadeh, F. (2016). Could urinary tract infection cause female stress urinary incontinence? A clinical study. *Nephro-Urology Monthly*, 8(1), e33571.

Hsiu-Chuan, H., Sheng-Mou, H., Shu-Yun, C., Ho-Hsiung, L., & Jau-Yih, T. (2011). Effect of pelvic-floor muscle strengthening on bladder neck mobility: A clinical trial. *Physical Therapy*, 91(7), 1030-1038. doi:10.2522/ptj.20100186

Hu, T. W., Wagner, T. H., Bentkover, J. D., LeBlanc, K., Piantentini, A., Stewart, W. F., ... & Hunt, T. L. (2003). Estimated economic costs of overactive bladder in the United States. *Urology*, 61(6), 1123-1128.

Jacobson, T. M., & Wright, T. (2015). Improving quality by taking aim at incontinence-associated dermatitis in hospitalized adults. *MedSurg Nursing*, 24(3), 151-158.

Jamieson, K., Brady, M., & Peacock, C. (2010). Urinary dysfunction: Assessment and management in stroke patients. *Nursing Standard*, 25(3), 49-55.

Kearney, R., Miller, J. M., Ashton-Miller, J. A., & DeLancey, J. O. (2006). Obstetrical factors associated with levator ani muscle injury after vaginal birth. *Obstetrics and Gynecology*, 107(1), 144.

Kegel, A. H. (1948). The nonsurgical treatment of genital relaxation; use of the perineometer as an aid in restoring anatomic and functional structure. *Annals of Western MedSurg*, 2(5), 213-216.

- Kehinde, O. (2016). Common incontinence problems seen by community nurses. *Journal of Community Nursing, 30*(4), 46-55.
- Kocaöz, S., Talas, M. S., & Atabekoğlu, C. S. (2010). Urinary incontinence in pregnant women and their quality of life. *Journal of Clinical Nursing, 19*(23-24), 3314-3323.
- Lin, Y., Yang, M., Chia-Hsiang Lin, V., Yu, T., & Chiang, P. (2011). The effectiveness of pelvic floor exercise on urinary incontinence in radical prostatectomy patients. *International Journal of Urological Nursing, 5*(3), 115-122. doi:10.1111/j.1749-771X.2011.01125.x
- Liu, Y. S., Wei, S., & Elliott, M. (2015). The effects of a catheter clamping protocol on bladder function in neurosurgical patients: A controlled trial. *International Journal of Nursing Practice, 21*(1), 29-36. doi:10.1111/ijn.12209
- Loeb, M. B., Craven, S., McGeer, A. J., Simor, A. E., Bradley, S. F., Low, D. E., ... & Walter, S. D. (2003). Risk factors for resistance to antimicrobial agents among nursing home residents. *American Journal of Epidemiology, 157*(1), 40-47.
- Lowe, F. (2005). Summary of clinical experiences with tamsulosin for the treatment of benign prostatic hyperplasia. *Reviews in Urology, 7 Suppl 4*, S13.
- Maben, J., & Griffiths, P. D. (2008). Nurses in society: Starting the debate. *National Nursing Research Unit at King's College London*. Retrieved from https://www.researchgate.net/publication/237432706_Nurses_in_Society_Starting_the_Debate

- Marcus, C. (2014). Strategies for improving the quality of verbal patient and family education: a review of the literature and creation of the EDUCATE model. *Health Psychology and Behavioral Medicine, 2*(1), 482-495.
- McClurg, D., Lowe-Strong, A., & Ashe, R. (2008). The benefits of pelvic floor muscle training in people with multiple sclerosis and lower urinary tract dysfunction. *Journal of the Association of Chartered Physiotherapists in Women's Health, (103)*, 21-28.
- Medicare. gov.(n.d.). *Incontinence supplies & adult diapers*. Retrieved from <https://www.medicare.gov/coverage/incontinence-and-adult-diapers.html>
- Milsom, I., Coyne, K. S., Nicholson, S., Kvasz, M., Chen, C. I., & Wein, A. J. (2014). Global prevalence and economic burden of urgency urinary incontinence: A systematic review. *European Urology, 65*(1), 79-95.
- Minassian, V. A., Drutz, H. P., & Al-Badr, A. (2003). Urinary incontinence as a worldwide problem. *International Journal of Gynecology & Obstetrics, 82*(3), 327-338.
- National Association for Incontinence. (2015). *Bladder retraining*. Retrieved from <http://www.nafc.org/bladder-retraining/>
- National Association for Continence. (2015). *Mixed incontinence*. Retrieved from <http://www.nafc.org/mixed-incontinence/>
- National Institute of Health. (2016). *Senior health cause of urinary incontinence*. Retrieved from

<https://nihseniorhealth.gov/urinaryincontinence/causesofurinaryincontinence/01.html>

- Nichols, T. R., & Layton, M. (2012). Life management and quality of life issues for those with urinary incontinence. *International Journal of Urological Nursing*, 6(2), 66-71.
- Nicolle, L. E. (2000). Urinary tract infection in long-term-care facility residents. *Clinical Infectious Diseases*, 31(3), 757-761.
- Nyman, M., Johansson, J., & Gustafsson, M. (2010). A randomised controlled trial on the effect of clamping the indwelling urinary catheter in patients with hip fracture. *Journal of Clinical Nursing*, 19(3-4), 405-413. doi:10.1111/j.1365-2702.2009.03050.x
- Omli, R., Skotnes, L. H., Romild, U., Bakke, A., Mykletun, A., & Kuhry, E. (2010). Pad per day usage, urinary incontinence and urinary tract infections in nursing home residents. *Age and ageing*, 39(5), 549-554.
- Ostle, Z. (2016). Assessment, diagnosis and treatment of urinary incontinence in women. *British Journal of Nursing*, 25(2), 84-91.
- Ozkan, S., Ogce, F., & Cakir, D. (2011). Quality of life and sexual function of women with urinary incontinence. *Japan Journal of Nursing Science*, 8(1), 11-19.
- Panchisin, T. L. (2016). Improving outcomes with the ANA CAUTI Prevention Tool. *Nursing*, 46(3), 55-59.

- Paralyzed Veterans of America. (2010). *Bladder management following spinal cord injury* retrieved from http://www.pva.org/media/pdf/Consumer_Guide_Bladder_071410.pdf
- Publicover, C., & Bear, M. (1997). The effect of bladder training on urinary incontinence in community-dwelling older women. *Journal of Wound, Ostomy and Continence Nursing*, 24(6), 319-324.
- Rippon, M., Colegrave, M., & Ousey, K. (2016). Incontinence-associated dermatitis: reducing adverse events. *British Journal of Nursing*, 25(18), 1016-1021.
- Roe, B. (1989). Do we need to clamp catheters? *Nursing times*, 86(43), 66-67.
- Roe, B., Milne, J., Ostaszkiwicz, J., & Wallace, S. (2007a). Systematic reviews of bladder training and voiding programmes in adults: A synopsis of findings on theory and methods using metastudy techniques. *Journal of Advanced Nursing*, 57(1), 3-14.
doi:10.1111/j.1365-2648.2006.04098.x
- Roe, B., Ostaszkiwicz, J., Milne, J., & Wallace, S. (2007b). Systematic reviews of bladder training and voiding programmes in adults: A synopsis of findings from data analysis and outcomes using metastudy techniques. *Journal of Advanced Nursing*, 57(1), 15-31. doi:10.1111/j.1365-2648.2006.04097.x
- Roehrborn, C. G., Lowe, F. C., Gittelman, M., Wruck, J. M., & Verbeek, A. E. (2016). Feasibility of an alternative option for the management of male lower urinary tract symptoms. *The Journal of Urology*, 195(1), 125-130.

- Ronald, A. (2003). The etiology of urinary tract infection: Traditional and emerging pathogens. *Disease-a-Month*, 49(2), 71-82.
- Rosqvist, E., Aukee, P., Kallinen, M., & Rantanen, T. (2008). Feasibility and acceptability of the pelvic floor muscle and bladder training programme. *International Journal of Urological Nursing*, 2(3), 113-118.
- Sanders, C., & Bray, L. (2013). Young people's evaluation of a nurse-led bladder training service: Working towards developing a patient reported experience and outcome measure. *International Journal of Urological Nursing*, 7(1), 25-32. doi:10.1111/j.1749-771X.2012.01164.x
- Sange, C., & Hill, L. M. S. (2008). Urinary incontinence in Muslim women. *Nursing Science*, 8(1), 61-76.
- Sangsawang, B., & Serisathien, Y. (2012). Effect of pelvic floor muscle exercise programme on stress urinary incontinence among pregnant women. *Journal of Advanced Nursing*, 68(9), 1997-2007. doi:10.1111/j.1365-2648.2011.05890.x
- Shultz, J. M. (2012). Rethink urinary incontinence in older women. *Nursing 2015*, 42(11), 32-40.
- Singh, N., & Arya, K. N. (2011). Effectiveness of bladder rehabilitation program in the management of urge urinary incontinence in older women. *Indian Journal*, 5(3), 96-99.
- Southgate, G., & Bradbury, S. (2016). Management of incontinence-associated dermatitis with a skin barrier protectant. *British Journal of Nursing*, 25(9), S20.

- Testa, A. (2015). Understanding Urinary Incontinence in Adults. *Urologic Nursing*, 35(2), 82-86. doi:10.7257/1053-816X.2015.35.2.82
- Trabucco, E., Soderberg, M., Cobellis, L., Torella, M., Bystrom, B., et al. (2007). Role of proteoglycans in the organization of periurethral connective tissue in women with stress urinary incontinence. *Maturitas*, 58(4), 395-405.
- Van Gerwen, M. A., Schellevis, F. G., & Lagro-Janssen, A. M. (2009). Management of urinary incontinence in general practice: Data from the Second Dutch National Survey. *Journal of Evaluation in Clinical Practice*, 15(2), 341-345. doi:10.1111/j.1365-2753.2008.01012.x
- Vaughan, C. P., Johnson, T. M., Goode, P. S., Redden, D. T., Burgio, K. L., & Markland, A. D. (2014). Military exposure and urinary incontinence among American men. *The Journal of Urology*, 191(1), 125-129.
- Voegeli, D. (2016). Incontinence-associated dermatitis: New insights into an old problem. *British Journal of Nursing*, 25(5), 256-262.
- Wagg, A. (2013). Urinary incontinence in older people: An overview. *Medicine*, 41(1), 20-23.
- Weber, D., Sickbert-Bennett, E., Gould, C., Brown, V., Huslage, K., & Rutala, W. A. (2011). Incidence of catheter-associated and non-catheter-associated urinary tract infections in a healthcare system. *Infection Control and Hospital Epidemiology*, 32(8), 822-823.
- Williamson, M. L. (1982). Reducing post-catheterization bladder dysfunction by reconditioning. *Nursing Research*, 31(1), 28-30.

Wood, L. N., & Anger, J. T. (2014). Urinary incontinence in women. *British Medical Journal*, 349(15), 4531-4542.