PLANNING LIFE WITH A NEUROGENIC BLADDER

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Introduction

The bladder is a lifelong concern. It affects quality of life, health, longevity, and physical function. When an individual has to be concerned with leaking urine, bladder infections, and kidney failure; activities of daily living may be consumed with toileting and containing complications caused by a urinary system that does not function properly.

A Simplistic interpretation of Anatomy & Physiology of the Lower urinary Tract

Urine is produced in the kidneys and facilitates the elimination of unwanted body wastes. Urine travels from the kidneys through the ureters into the bladder. The bladder stores the urine at low pressure. When the bladder is full, it sends signals through the nervous system via the spinal cord to the brain. When the individual is ready, the cerebral cortex in the brain commands the bladder to contract while relaxing the internal and external sphincters that prevent urine from leaking from the bladder. When any part of this system is interrupted or signals are not transmitted, problems occur that affect an individual’s ability to function.

McQuire (1981) studied myelodysplastic children and found that when pressures within the bladder rose above 40cm of water that urine did not drain normally from the kidneys. It was this phenomenon that caused the nephrons within the kidney to deteriorate, not the bladder volume or bacteria in the urine. This discovery was applied to all individuals who had neurogenic bladders: spinal cord injured, multiple sclerosis, diabetics, Parkinsons, and other neurologic conditions. With a concerted effort to keep pressures below the 40cm of water, deterioration of the kidneys was diminished and was no longer the leading cause of death in individuals with spinal cord injury.

Barrett & Wein (1991) developed a simple method to evaluate the complex process of micturition, failure to store urine or failure to empty. This process is not fully understood. With increased sophistication of video urodynamics healthcare providers have been afforded the opportunity to examine the storage and emptying phases while observing the functional components of the urinary system. Resultant problems of a malfunction may be identified as hyperreflexia, areflexia, detrusor sphincter dyssynergia, detrusor hyperactivity with impaired contractility, detrusor non-compliance, or outlet incompetence to name a few. Symptoms may include urinary incontinence, retention, chronic urinary tract infections, hematuria, autonomic dysreflexia, increased spasticity, fatigue, or malaise.

Treatment interventions are designed to address urologic symptomatology while keeping bladder pressures low within the urinary system. It is important to be aware of acceptable treatment interventions from the least invasive to the most invasive.

Treatment Interventions

There are many different types of treatment interventions but the one with the least morbity is clean intermittent catheterization (CIC) (Chancellor & Rivas, 1995). Supplies are kept clean, not sterile. Individuals are instructed to catheterize their bladder on a set schedule. Input is regulated so that output is constant and controlled. The bladder has an ability to fill and empty at regular intervals. The treatment requires the patient to have functional ability to perform the maneuver. It is easier for males then females who generally need to use a touch method to locate their urethra. Independence in performing this activity is preferable since it will place a burden on partners and restrict their activities that in turn could affect an already demanding relationship.

Medications such as anticholinergics, Ditropan or Detrol may be used by themselves or in conjunction with the CIC to lower the pressures in the bladder while it stores urine. These medications allow the bladder to be compliant and relax while filling with urine. Their side effects have been diminished with new capsule dispensing techniques and once a day dosing, but some individuals still experience dry mouth, headaches, and constipation. Individuals with acute glaucoma should not take these medications since it may cause eye pressures to rise.
For men, the endourethral stent is a form of treatment that involves the introduction of a stent through the urethra into the external sphincter, keeping it open and allowing the bladder to drain at low pressure. The stents are removable if necessary. A more permanent method of keeping the external sphincter open would be a sphincterotomy. This intervention may cause scarring and the need for repeat surgeries. With either intervention, the individual needs to be able to wear a condom without irritation or leakage. Again it is preferable to have the individual be independent in this activity, but since the condom only has to be changed daily, it requires less demands on functional ability and/or the caregiver. The female cannot benefit from this intervention since there is not a suitable device to collect urine without having the individual wear diapers.

To enhance the effect of opening the external sphincter, in males, a medication affecting the alpha fibers of the bladder neck may be used. Prazosin, Terrazosin, Lomax are just a few. Since some of these medications were originally designed for control of hypertension, individuals may have a problem with hypotension. The first dose should be started at bedtime and gradually increased to help body accommodation.

If the above treatment interventions do not lower pressures within the bladder, then an augmentation, surgically enlarging the bladder with bowel or ileum, is an option (Rink, Hollenske, & Adams, 1995). This procedure is suitable for men or woman. A concern following this procedure is the accumulation of mucus that is produced by the transplanted bowel in the bladder. To prevent mucous accumulation, the bladder needs to be irrigated and mucous removed at least one time per day. Many times these individuals with bladder augmentation will be on a CIC program and can remove mucus from bladder at the time of their catheterization.

For individuals who continue to have problems with a high pressure bladder or have a tortuous urethra that prevents catheterization, and intermittent emptying of the bladder, a urinary diversion may be considered. This requires that the ureters be detached from the bladder and attached to another receptacle to collect the urine.

Neobladders, creation of a storage pouch for urine, are created with different surgical techniques (Indiana pouch, Koch pouch, Florida pouch, and Mainz pouch) (Gillenwater, 1991). Functional ability is necessary because most of these pouches require that the urine be drained with a catheter. Stomas are placed on the abdomen so individuals have easy access.

Urinary conduits (ileal, colon, or sigmoid) are used when the individual is unable to catheterize. The conduit is designed so urine will continually drain from the conduit into a urinary bag that is attached to an appliance over the stoma on the abdomen. The bag is drained and emptied periodically during the day. The appliance usually needs to be reapplied on a weekly basis. Many of these systems are designed to be refluxing, so the individual may form stones due to reabsorption of electrolytes that are normally excreted from the urine.

Indwelling catheters are usually the last consideration since they have the highest morbidity with infections, stones, and mechanical obstructions (Wein, 1998). Catheters can be placed through the urethra or suprapublically. Individuals need to have urethral catheters changed at least every 6-8 weeks and suprapubic catheters replaced every four weeks to prevent symptomatic infections and stone formations.

The demand bladder stimulator is a device that must be surgically implanted, can be used on individuals who have complete injuries since a rhizotomy of sensory fibers in the sacral cord need to be performed to allow the device to function appropriately. When conventional treatment interventions have failed and quality of life is affected, then this is an excellent treatment intervention for individuals with an intact sacral reflex arc.

All of the above treatments were designed to allow urine to either store in the bladder at low pressures or drain from the bladder with low pressures and unobstructed. Specific supplies are necessary to support successful treatment. Straight catheters that are cleaned and reused till they lose their form or condom catheters are commonly used items. Generally 8-10 catheters will be sufficient for a month supply for CIC. If the individual is using a condom, the condom should be changed daily, and the area examined and allowed to aerate for at least 30 minutes to will prevent skin breakdown. Because many individuals who are constantly exposed to latex are developing allergies, institutions are reverting to non-latex products.

**Recommendations for Successful Treatment**

Once kidney function is lost, it seldom can be regained so preventing problems is critical to the health of the nephrons of the kidneys. Preventative care will identify problems early, allow institute
appropriate treatment interventions, and enhance quality of life. Routine yearly evaluations should include: a simple x-ray of the kidneys, ureters and bladder to evaluate size and structure; ultrasound of the kidneys to evaluate for stones, tumors and renal parenchymal density; a blood test for blood urea nitrogen and creatinine with a 24 hour urine for creatinine clearance to test the kidney's ability to filtrate urine; and a video urodynamic study (Blaivas & Chancellor, 1996) to evaluate bladder pressures and effectiveness of treatment interventions. Baseline screening and results will determine the frequency of needed testing and identify problematic areas such as stones, tumors, obstructions, and renal deterioration. Factor in changes that occur with aging and individuals can be followed and treated for the gradual changes that occur from year to year.

Conclusion

In formulating a life care plan, healthy kidneys should be a priority. The sequelae of compromised kidneys will affect not only the patient, but also the caregivers. Physiologic, financial, and emotional health is at risk. Referral to the Nursing Clinical Practice Guideline: Neurogenic Bladder Management (1998) is an excellent resource that is research-based and peer-reviewed to assist with development of care plan recommendations. Planning and periodic evaluations are imperative to afford all individuals an opportunity to live a healthy life.

References


About the Author:

Angela C. Joseph is a Clinical Nurse Specialist certified in Urology. She has worked in Urology for over 30 years and at present teaches complex urodynamics, coordinates FDA Clinical Trials, initiated continence treatment for Post-prostatectomy individuals, administers urologic care for the neuourologic population, and writes and lectures about her patient populations.