



# The Urinary System

This handout describes the urinary system and how it works. It also explains incontinence, and how spinal cord injury can change how the urinary system works.

## The Parts of the Urinary System

The urinary system is made up of 5 major parts:

### *Kidneys*

The 2 kidneys filter waste and excess water from the blood and make urine. Urine is being made every minute of the day.

### *Ureters*

Each kidney has a *ureter* (a thin, hollow tube) that connects to the bladder. Urine flows down the ureters from the kidneys and empties into the bladder. The ureters have 1-way valves in them so that urine does not flow back to the kidneys from the bladder – even if you stand on your head.

### *Bladder*

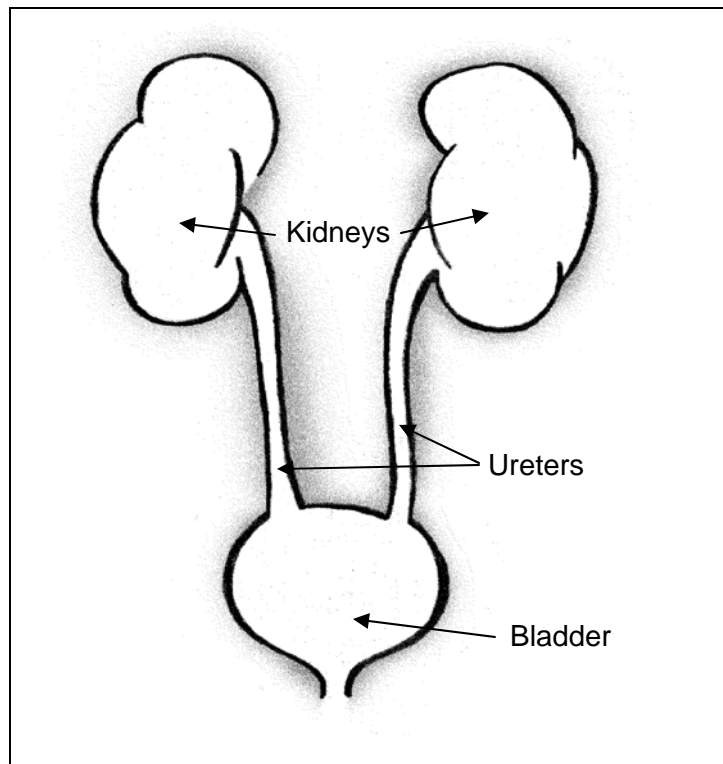
The bladder is a sac lying in the pelvis that can stretch to hold urine until you are ready to urinate and then shrinks when it is empty. The bladder's walls are made up of a series of muscles called the *detrusor* muscles. When you are ready to urinate, the detrusor muscles contract to help empty urine from the bladder. The lower part of the bladder that funnels urine into the urethra is called the *bladder neck* or *bladder outlet*.

### *Sphincter Muscles*

The sphincter muscles make up a ring of muscles around the urethra that keeps urine in the bladder. When you are ready to urinate, these muscles relax to allow urine to flow out of the bladder.

### *Urethra*

The urethra is a small tube that allows urine to flow from the bladder to outside the body. The male urethra is 8 to 10 inches long and the female urethra is 1 to 2 inches long. The external urethral opening from the body is called the *meatus* for both men and women.



The main parts of the urinary system

### **Voiding (Urination)**

When the bladder gets full (about 1 to 2 cups for most people), nerve endings in the bladder wall send a message to the brain through the spinal cord. The brain sends a message back to the bladder to contract the detrusor muscles and relax the sphincter muscles so you can *void* (urinate). If you can't get to a toilet, the brain delays the messages until you are ready to void.

### **Incontinence**

Incontinence is urinating when you do not want to. One type of incontinence occurs with coughing or sneezing and is called *stress incontinence*. Most cases of incontinence can be treated with the help of your health care provider. You do not need to suffer with it or wear diapers or pads. It is not a normal part of aging. Do not let embarrassment keep you from getting help.

## Questions?

Call 206-598-4295

Your questions are important. Call your doctor or health care provider if you have questions or concerns. UWMC clinic staff are also available to help.

Rehabilitation  
Medicine Clinic:  
206-598-4295

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## After Spinal Cord Injury

After spinal cord injury, the bladder, along with the rest of the body, undergoes dramatic changes. Since the messages from the bladder cannot travel up and down the spinal cord to the brain, in most cases “normal” voiding patterns are not possible. After spinal cord injury, the bladder may be either *floppy* or *hyperactive*.

- A **floppy bladder** loses detrusor muscle tone and contractions, so your bladder does not empty. This type of bladder can be easily overstretched with too much urine. Overstretching can cause damage to the bladder wall and increase the risk of infection. Emptying the floppy bladder can be done with methods such as Credé, Valsalva, or *intermittent catheterization*. Do not let your bladder get too full, even if it means waking at night more often to cath.
- A **hyperactive bladder** may have increased muscle activity. It may contract automatically, causing incontinence. At times the bladder sphincters are uncoordinated and other forms of treatment may be needed.

Bladder function can change for some time after spinal cord injury. With the advice of your health care provider, you may need to change how you manage your bladder as your bladder changes.

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