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Course Code: PHS 212

Question
Write a **short** note on Micturition

Answer
Micturition or urination is the process of expelling urine from the bladder. This act is also known as voiding of the bladder. The process of micturition is regulated by the nervous system and the muscles of the bladder and urethra. The urinary bladder can store around 350-400ml of urine before it expels it out.

The two main steps involved in micturition include;
- Firstly, the bladder fills progressively until the tension in its walls rises above a threshold level;
- this elicits the second step, which is a nervous reflex called the micturition reflex that empties the bladder or if this fails, at least causes a conscious desire to urinate.

Although the micturition reflex is an automatic spinal cord reflex, it can also be inhibited or facilitated by centers in the cerebral cortex or brain stem.

Physiology of micturition:
Once the urinary bladder reaches its maximum capacity, the stretch receptors in the walls of the bladder send an impulse via the pelvic nerve to the brain via the spinal cord.

The micturition reflex is ultimately generated from the level of the spinal cord after it receives reflexes from the pontine region in the brain. Once the bladder and the urethra receive the signals to empty the bladder, the two sphincters relax and the detrusor muscle causes the contractions of the bladder.

Along with these muscles, the muscles of the abdomen also play a role by putting pressure on the bladder wall. This leads to complete emptying of the bladder.

In other words…

I.) Stretch receptors detect filling of bladder, and then transmits afferent signals to spinal cord

II.) Signals return to the bladder from spinal cord segments S2 and S3 via parasympathetic fibers in pelvic nerve.

III.) Efferent signals excite detrusor muscle.

IV.) Efferent signals relax internal urethral sphincter. Urine is involuntarily voided if not inhibited by the brain

V.) For voluntary control, micturition center is pons receive signals from stretched receptors.

VI.) If it is timely to urinate, pons return signals to spinal inter neurons that excite detrusor and relax internal urethral sphincter. Urine is voided.

VII.) If it is untimely to urinate, signals from pons excite spinal inter neurons that keep external urethral sphincter contracted. Urine is retained in bladder.

VIII.) If it is timely to urinate, signals from pons cease and external urethral sphincter relaxes. Urine is voided.

Conclusion:
Micturition requires the coordinated activity of sympathetic, parasympathetic and somatic nerves. It also requires normal muscle tone and freedom from physical obstruction and psychological inhibition. Control from our higher brain centers allow us to determine the right time and place to allow this important physiological function to occur.