

HUMAN ANATOMY & PHYSIOLOGY-II- BP201T**UNIT: 3 (Urinary System)****CLASS: 8****TOPIC: MICTURITION REFLEX**

Micturition is a process by which urine is voided from the urinary bladder. It is a reflex process. However, in grown up children and adults, it can be controlled voluntarily to some extent. Urinary bladder is a triangular hollow organ located in lower abdomen. It consists of a body and neck. Wall of the bladder is formed by smooth muscle. It consists of three ill-defined layers of muscle fibers called detrusor muscle, the inner longitudinal layer, middle circular layer and outer longitudinal layer. Inner surface of urinary bladder is lined by mucus membrane. In empty bladder, the mucosa falls into many folds called rugae. At the posterior surface of the bladder wall, there is a triangular area called trigone. At the upper angles of this trigone, two ureters enter the bladder. Lower part of the bladder is narrow and forms the neck. It opens into urethra via internal urethral sphincter.

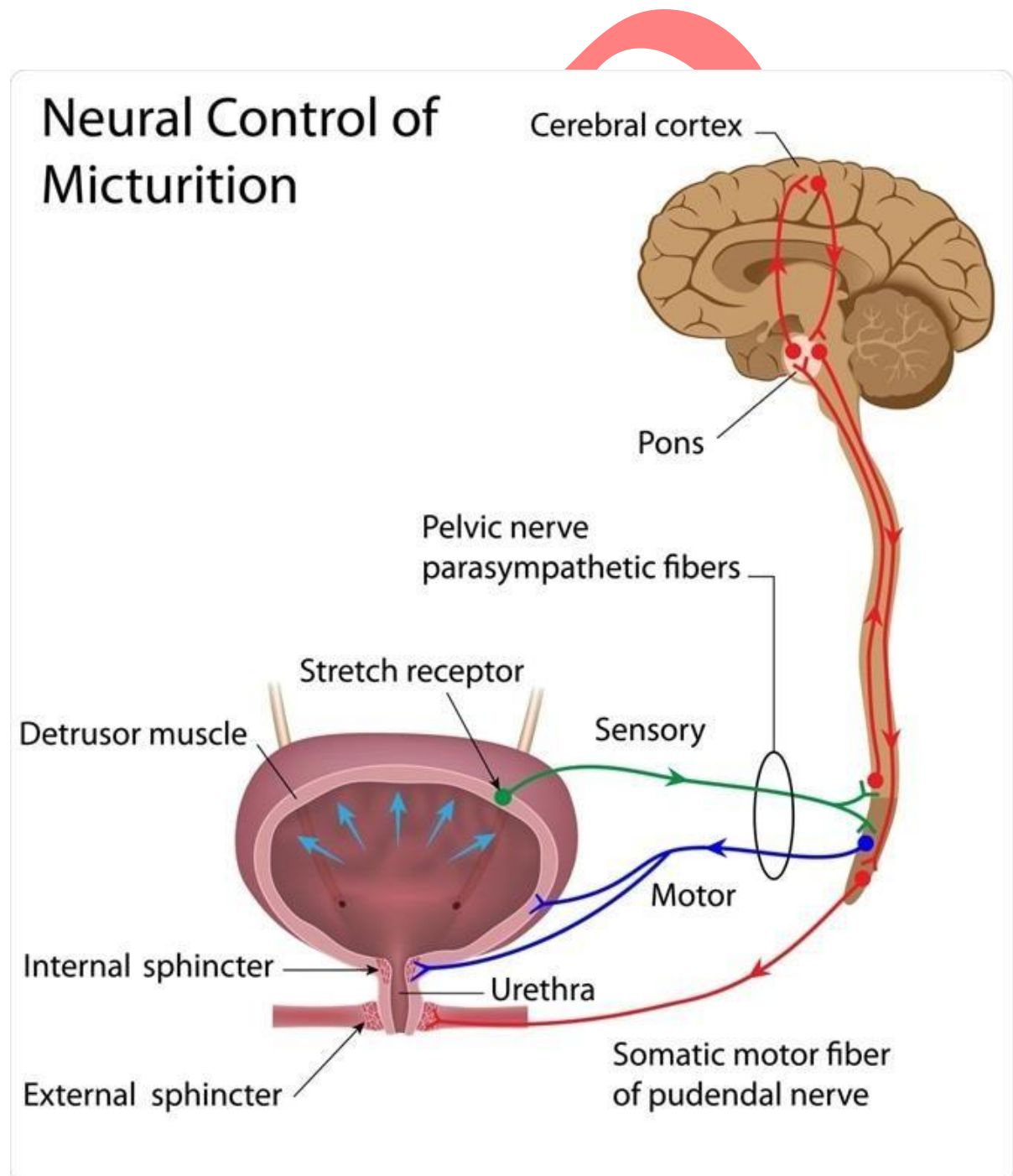
Male urethra has both urinary function and reproductive function. It carries urine and semen. Female urethra has only urinary function and it carries only urine. So, male urethra is structurally different from female urethra. There are two urethral sphincters in urinary tract: 1. Internal urethral sphincter 2. External urethral sphincter. Urinary bladder and the internal sphincter are supplied by sympathetic and parasympathetic divisions of autonomic nervous system whereas, the external sphincter is supplied by the somatic nerve fibers.

Micturition reflex is a reflex by which urinary bladder empties when it is filled. Though it is a reflex process, in adults it can be controlled voluntarily to some extent. Emptying of bladder is mainly guarded by internal and external sphincter mechanism. Internal sphincter is completely involuntary (smooth muscle) and external sphincter is voluntary (skeletal muscle). Detrusor muscle present in body of bladder is capable of contraction and expansion in response to stimulus and hence it is mainly responsible for emptying of bladder.

Urinary bladder and internal uterine sphincter are supplied by sympathetic and parasympathetic nerve fibres, external sphincter is supplied by somatic nerve fibres (Pudendal nerve). Stimulation of pelvic nerve causes contraction of detrusor muscle and relaxation of internal sphincter.

When the bladder is full, stretch receptors on the bladder wall are activated sensory signal is given to spinal centres through sensory fibres of parasympathetic nerve, reflex arc is

produced in spinal cord, motor signal is given to urinary bladder through motor fibres of parasympathetic nerve as a result detrusor muscle contracts and internal sphincter relaxes. Afferent impulse reaches the higher centres in brain, if the signal from brain stem is to micturate impulse created from spinal centre block pudendal nerve at the same time sympathetic efferents are inhibited so external sphincter relaxes and micturition occurs, if the signal from brain stem is not to micturate sympathetic efferents are stimulated as a result detrusor expands and internal sphincter constricts, external sphincter remain constricted so urine continues to accumulate in bladder.



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