

Physiology of Micturition

Urinary Bladder		Micturition
Anatomical - Body: Wall of bladder contain smooth muscle (detrusor muscle) - Neck - 2 Sphincters : External US (smooth muscle) Internal US (skeletal muscle).	Innervation - Parasympathetic (pelvic N.) from LHCs of the Sacral 2,3,4 :contraction of bladder & relaxation of neck .”passage of urine” - Sympathetic (hypogastric N.) from Lumbar 1,2,3 : Stimulate <u>mainly</u> the blood vessels also relaxation of bladder and contraction of neck. .”storage of urine” - Somatic (pudendal N.)from AHCs of S 2.3.4 : control skeletal muscle in sphincter.	It is the process of emptying the urinary bladder through the urethra. Consist of 3 processes: Filling of bladder -> Micturition Reflex -> Voluntary control. <b style="color: red;">Micturition reflex - Center: S 2, 3 & 4. - Receptors: stretch (receptor) in the wall of bladder. - Afferent & efferent: pelvic N. - Response: 1- Contraction of detrusor muscle .2.Relaxation of internal sphincter of urethra. 3.Relaxation of external urethral sphincter
Sensations from the U.B at different urine volumes		Control of micturition reflex
- from 150 -300 ml ⇒the first urge to void urine. - From 300 -400 ml ⇒sense of fullness of the bladder. - From 400 -600 ml ⇒sense of discomfort. - From 600 -700 ml ⇒sense of pain. #Micturition reflexes start to appear at the first stage. They are progressively intensified in the subsequent stages up to stage 4. Micturition reflexes can be voluntarily suppressed. At about 700 ml ⇒break point ⇒micturition CAN NOT be suppressed.		It is a complete autonomic spinal reflex to get urine outside the body, that is facilitated or inhibited by higher brain centers.
Voluntary control :		
Higher centers control : 1-Cerebral cortex: either stimulation or inhibition. 2- Hypothalamus: There is facilitatory area. 3- Midbrain: inhibition. 4- Pons: facilitation.		
mechnism		
Filling of the bladder beyond 300 –400 ml causes stretching of sensory stretch receptors. These sensory signals stimulate sacral segment, which is consciously appreciated by higher centers.		
Condition is Favorable	Condition is unfavorable	
(+) of sacral micturition center.(-) of pudendal nerves -> relaxation of external urethral sphincter ,Contraction of anterior abdominal muscle &Contraction of Diaphragm. (inintensifies the micturition reflex-> urination)	Higher centers will inhibit the micturition reflex (-) of sacral micturition center (+) of pudendal nerves -> contraction of sxternal sphincter. (Inhibit the micturition reflex -> No urination)	
Disturbances of micturition		
Denervation of both afferent and efferent nerve supply such as in tumor or trauma	Denervation of the afferent supply only such as in Tabes Dorsalis. Outcome -> There is retention with overflow. (Dribbling of urine when the bladder becomes over filled)	Spinal cord transaction (Above the sacral region) the spinal cord transaction

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