Parasympathetics

Parasympathetic activity comes from the brainstem and the sacrum and knowing the specifics is high yield for the COMLEX. Note that while there are parasympathetic nerves other than the vagus nerve and the pelvic splanchnic nerves these are low yield. The vagus nerve (cranial nerve X) originates in the medulla and facilitates the parasympathetic activity of the viscera above the diaphragm and many viscera below the diaphragm. The pelvic splanchnic nerves arise from the sacral plexus and innervate the reproductive organs, lower urinary tract, and parts of the gastrointestinal tract. Somatic dysfunctions of the sacrum and upper cervical spine can contribute to abnormal autonomic tone. Treatment of somatic dysfunctions of occipitoatlantal joint, atlanto-axial joint, and C2 can balance parasympathetic tone to the viscera via the vagus nerve. Treatment of sacral somatic dysfunctions can balance parasympathetic tone in the pelvic splanchnic nerves.

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Vagus Nerve

Thoracic Viscera

Thor Visor

The vagus nerve provides parasympathetic innervation to the viscera above the diaphragm. It causes decreased heart rate and contractility, increases bronchial gland secretion and increased contraction of bronchiolar smooth muscle.

Proximal Gastrointestinal Tract

P-rocks and GI-guy

The proximal portion of the gastrointestinal tract receives parasympathetic innervation from the vagus nerve. This includes the distal esophagus, stomach, liver, gallbladder, pancreas, spleen and small intestine. Parasympathetic tone in these organs causes increased motility, increased secretions and relaxation of sphincters.

Ascending and Transverse Colon

Rising Colon and Transverse Colon

The ascending and transverse colon both receive parasympathetic innervation from the vagus nerve. Parasympathetic input causes increased contractions, secretions and motility as well as relaxation of various sphincters.

Pelvic Splanchnic (Sacral) Nerves

Descending and Rectosigmoid Colon

Falling Colon and Rectangle-s-mud Colon

The descending and sigmoid colon as well as the rectum are the only parts of the gastrointestinal system that receive parasympathetic innervation from the pelvic splanchnic nerves. Input from these nerves is similar to input from the vagus nerve in that it causes increased contractions, secretions and motility as well as relaxation of various sphincters.

Lower Urinary Tract

Lower Urinary Tract

The pelvic splanchnic nerves provide innervation to the lower urinary tract. Parasympathetic input causes contraction of the detrusor muscle and relaxation of the internal sphincter, resulting in bladder emptying. Parasympathetic input to the ureter may increase contractility.

Reproductive Organs

Reproductive Organs

The reproductive organs receive parasympathetic innervation from the pelvic splanchnic nerves. Parasympathetic input is responsible for production of erection in penile tissue.

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