



CLINICAL FOCUS

Disorders of the Autonomic Nervous System

Normal function of all the components of the ANS is not required to maintain life, as long as environmental conditions are constant and optimal. Abnormal autonomic functions, however, markedly affect an individual's ability to respond to changing conditions. **Sympathectomy**, the removal of sympathetic ganglia, demonstrates this. The normal regulation of body temperature is lost following sympathectomy. In a hot environment, the ability to lose heat by increasing blood flow to the skin and by sweating is decreased. When one is exposed to the cold, the ability to reduce blood flow to the skin and conserve heat is decreased. Sympathectomy also results in low blood pressure caused by dilation of peripheral blood vessels and in the inability to increase blood pressure during periods of physical activity.

Raynaud disease involves the spasmodic contraction of blood vessels in the periphery of the body, especially in the digits, and results in pale, cold hands that are prone to ulcerations and gangrene because of poor circulation. This condition can be caused by exaggerated sensitivity of blood vessels to sympathetic innervation. Preganglionic denervation (cutting the preganglionic neurons) is occasionally performed to alleviate the condition.

Hyperhidrosis (hī'per-hī-drō'sis), or excessive sweating, is caused by exaggerated sympathetic innervation of the sweat glands.

Achalasia (ak-ā-lā'zē-ā) is characterized by difficulty in swallowing and in controlling contraction of the esophagus where it enters the stomach, therefore interrupting normal peristaltic contractions of the esophagus. The swallowing reflex is controlled partly by somatic

reflexes and partly by parasympathetic reflexes. The cause of achalasia can be abnormal parasympathetic regulation of the swallowing reflex. The condition is aggravated by emotions.

Dysautonomia (dis'aw-to-nō'mē-ā), an inherited condition involving an autosomal-recessive gene, causes reduced tear gland secretion, poor vasomotor control, trouble swallowing, and other symptoms. It is the result of poorly controlled autonomic reflexes.

Hirschsprung disease, or **megacolon**, is caused by a functional obstruction in the lower colon and rectum. Ineffective parasympathetic stimulation and a predominance of sympathetic stimulation of the colon inhibit peristaltic contractions, causing feces to accumulate above the inhibited area. The resulting dilation of the colon can be so great that surgery is required to alleviate the condition.