There are two types of vagal sensory fibers, each responsible for transmitting a different type of sensory information. Visceral sensory fibers carry information from stretch receptors and chemoreceptors (regarding oxygen levels) in the abdomen and thorax, in addition to other sensations from the abdomen, thorax, tongue, pharynx, larynx, bronchi and esophagus—they tell us when we "feel bad." These fibers terminate in the solitary tract, which mediates the gag and cough reflexes, as well as keeping mucous membranes hydrated, which is important for swallowing. Visceral pain is carried separately in fibers of the sympathetic system.

General sensory fibers transmit pain, touch and temperature information from the skin of the external ear, external auditory canal, external tympanic membrane, larynx and pharynx to the spinal trigeminal nucleus, which is the pain and temperature center for all the cranial nerves.

**Motor fibers**

Motor fibers begin in the dorsal vagal nucleus, the parasympathetic center in the brainstem. The parasympathetic system is responsible for initiating "rest and digest" activities in the body. Vagus nerve fibers originating in this nucleus activate smooth muscles and mucosal glands in the pharynx, larynx and esophagus—as well as the thoracic and abdominal viscera—to aid in swallowing and digestion. The nerve fibers synapse on nerve cell bodies in the ganglion and then travel in the pharyngeal branch and internal laryngeal branch of the superior laryngeal.

**Pharyngeal branch (not shown)**

The pharyngeal branch is the principal motor nerve of the pharynx and soft palate, supplying all the striated muscles except the stylopharyngeus and the tensor veli palati. It branches from the inferior ganglion and innervates all the pharyngeal constrictors, which aid in swallowing, and the levator palatine, which closes off the nasal cavity from the oral cavity. It also innervates the salpingopharyngeus, palatopharyngeus and palatoglossus, all of which change the pharynx's shape for speech and swallowing. Oral examination reveals deviation of the uvula to the unaffected side because of unopposed muscular action and drooping of the soft palate on the affected side. Unilateral damage to this branch of the nerve results in dysphagia.

**External portion of the superior laryngeal branch**

The superior laryngeal branch arises from the inferior ganglion. At the larynx it splits into the internal and external laryngeal nerves. Although primarily a sensory nerve, the motor segment of the external laryngeal branch supplies the cricothyroid muscle, a primary driver of pitch. Unilateral damage to this portion of the nerve results in voice disorders. The internal branch does not contain motor fibers.

**Inferior pharyngeal constrictor muscle**

**Cricothyroid muscle**

**Cricopharyngeus muscle (part of the inferior pharyngeal constrictor)**

**Recurrent laryngeal nerve**

This branch of the vagus nerve literally bypasses the larynx and then loops back or "recurs" superiorly to innervate all the intrinsic muscles of the larynx except the cricothyroid. Thus, virtually all the muscles that open, close, tense or relax the vocal folds are supplied by this nerve. It has different pathways on the left and the right sides of the body. The right recurrent laryngeal loops under the subclavian artery and then travels upward between the trachea and the esophagus to enter the larynx. The left recurrent laryngeal loops under the aorta and ascends in the groove between the trachea and esophagus on the left. As it enters the larynx, the recurrent becomes the inferior laryngeal nerve and innervates the lateral cricoarytenoids, thyroarytenoids, posterior cricoarytenoids and the transverse arytenoids. Unilateral damage results in weakness or paralysis of the affected side, resulting in breathiness, a weak voice or hoarseness. Coughing or choking can occur while eating.