TABLE 12-6 THE CRANIAL NERVES

NUMBER AND NAME	ORIGIN AND COURSE	FUNCTION	HOW TESTED
I. Olfactory	Fibers arise from nasal olfactory epithelium and form synapses with olfactory bulbs, which transmit impulses to temporal lobe	Purely sensory; carries impulses for sense of smell	Person is asked to sniff aromatic substances, such as oil of cloves and vanilla, and to identify them
II. Optic	Fibers arise from retina of eye to form optic nerve, which passes through sphenoid bone; two optic nerves then form optic chiasma (with partial crossover of fibers) and eventually end in occipital cortex	Purely sensory; carries impulses for vision	Vision and visual field tested with an eye chart and by testing point at which person first sees an object (finger) moving into visual field; inside of eye is viewed with ophthalmoscope to observe blood vessels of eye interior
III. Oculomotor	Fibers emerge from midbrain and exit from skull to run to eye	Contains motor fibers to inferior oblique and to superior, inferior, and medial rectus extraocular muscles that direct eyeball; levator muscles of eyelid; smooth muscles of iris and ciliary body; and proprioception (sensory) to brain from extraocular muscles	Pupils examined for size, shape, and equality; pupillary reflex tested with a penlight (pupils should constrict when illuminated); ability to follow moving objects
IV. Trochlear	Fibers emerge from posterior midbrain and exit from skull to run to eye	Proprioceptor and motor fibers for superior oblique muscle of eye (extraocular muscle)	Tested in common with cranial nerve III relative to ability to follow moving objects
V. Trigeminal	Fibers emerge from pons and form three divisions that exit from skull and run to face and cranial dura mater	Both motor and sensory for face; conducts sensory impulses from mouth, nose, surface of eye, and dura mater; also contains motor fibers that stimulate chewing muscles	Sensations of pain, touch, and temperature tested with safety pin and hot and cold objects; corneal reflex tested with a wisp of cotton; motor branch tested by asking subject to clench teeth, open mouth against resistance, and move jaw from side to side
VI. Abducens	Fibers leave inferior pons and exit from skull to run to eye	Contains motor fibers to lateral rectus muscle and proprioceptor fibers from same muscle to brain	Tested in common with cranial nerve III relative to ability to move each eye laterally
VII. Facial	Fibers leave pons and travel through temporal bone to reach face	Mixed: (1) supplies motor fibers to muscles of facial expression and to lacrimal and salivary glands and (2) carries sensory fibers from taste buds of anterior part of tongue	Anterior two thirds of tongue tested for ability to taste sweet (sugar), salty, sour (vinegar), and bitter (quinine) substances; symmetry of face checked; subject asked to close eyes, smile, whistle, and so on; tearing tested with ammonia fumes
VIII. Vestibulocochlear (acoustic)	Fibers run from inner ear (hearing and equilibrium receptors in temporal bone) to enter brain stem just below pons	Purely sensory; vestibular branch transmits impulses for sense of equilibrium; cochlear branch transmits impulses for sense of hearing	Hearing checked by air and bone conduction by use of a tuning fork; vestibular tests: Bárány and caloric tests
IX. Glossopharyngeal	Fibers emerge from medulla and leave skull to run to throat	Mixed: (1) motor fibers serve pharynx (throat) and salivary glands, and (2) sensory fibers carry impulses from pharynx, posterior tongue (taste buds), and pressure receptors of carotid artery	Gag and swallow reflexes checked; subject asked to speak and cough; posterior one third of tongue may be tested for taste
X. Vagus	Fibers emerge from medulla, pass through skull, and descend through neck region into thorax and abdominal region	Fibers carry sensory and motor impulses for pharynx; a large part of this nerve is parasympathetic motor fibers, which supply smooth muscles of abdominal organs; receives sensory impulses from viscera	Same as for cranial nerve IX (IX and X are tested in common) because they both serve muscles of throat
XI. Spinal accessory	Fibers arise from medulla and superior spinal cord and travel to muscles of neck and back	Provides sensory and motor fibers for sternocleidomastoid and trapezius muscles and muscles of soft palate, pharynx, and larynx	Sternocleidomastoid and trapezius muscles checked for strength by asking subject to rotate head and shrug shoulders against resistance
XII. Hypoglossal	Fibers arise from medulla and exit from skull to travel to tongue	Carries motor fibers to muscles of tongue and sensory impulses from tongue to brain	Subject asked to stick out tongue, and any position abnormalities are noted