

Table of Contents

1 Sensory System	1
Receptors	1
The Peripheral Nerve	3
Neurons of the Central Nervous System ..	6
Proprioception	7
Peripheral Servo Mechanism	7
Monosynaptic Proprioceptive Reflex ..	7
Other Reflexes	10
Spinocerebellar Tracts	14
Posterior Spinocerebellar Tract	14
Anterior Spinocerebellar Tract	14
Posterior Funiculi	15
Syndromes of Injury of Posterior	
Funiculi	16
Spinothalamic Tracts	17
Anterior Spinothalamic Tract	17
Lateral Spinothalamic Tract	17
Spinal Cord and Peripheral Innervation ..	21
Syndromes of Interruptions of	
Sensory Pathways	26
2 Motor System	29
Corticospinal or Pyramidal Tract	30
Corticonuclear or Corticobulbar Tract ..	32
Extrapyramidal Motor System	32
Damage to Pyramidal and Extra-	
pyramidal Pathways	35
Syndrome of Central Spastic	
Paralysis	36
Peripheral Neuron, Motor and Sensory ..	38
Syndrome of Radicular Nerve	
Damage	42
Segmental and Peripheral Muscle	
Innervation	43
Disorder of the Motor Unit	43
Syndrome of Flaccid Paralysis	46
Damage to Plexuses	47
Frequent Syndromes of Periph-	
eral Nerve Damage	48
Syndrome of Spinal Cord	
and Peripheral Nerve Damage	49
Spinal Radicular Syndromes Caused	
by Diseases of the Disk (Osteo-	
chondrosis, Disk Protrusion,	
Prolapse, or Herniation)	59
Blood Supply of the Spinal Cord	63
Arterial Supply	63
Venous Drainage	65
Syndromes Caused by Spinal	
Vascular Lesions	66
Spinal Tumors	66
Extramedullary Tumors	66
Intramedullary Tumors	68
Hourglass Tumor	68
Disorders of Neuromuscular Junctions	
and Muscles	69
Myopathies	69

3 Brainstem	70
External Structure	70
Medulla Oblongata	70
Pons	72
Midbrain	73
Cranial Nerves	74
Origin, Constituents and Function	74
Olfactory System (I)	75
Optic System (II, III, IV, VI)	81
The Visual Pathway (II)	81
Oculomotion (III, IV, VI)	85
Paralysis of Eye Muscles	90
Voluntary and Reflex Innervation of the Eye Muscles	94
Convergence and Accommodation	97
Light Reflex	99
Sympathetic Innervation of the Eye	101
Trigeminal Nerve (V)	103
Facial Pain	106
Facial and Intermediate Nerves (VII)	108
Facial Nerve Proper	109
Intermediate Nerve	110
Frequent Types of Damage to VII	113
Auditory System (VIII)	114
Impairments of Hearing	119
Vestibular or Equilibrium System (VIII)	120
Impairment of the Vestibular System	124
Vagal System (VII Intermediate, IX, X, Cranial XI)	125
Glossopharyngeal Nerve (XI)	125
Vagus Nerve (X)	128
Accessory Nerve (Cranial XI)	129
Nucleus Ambiguus	129
Parasympathetic Motor Nuclei	129
Visceral Afferent Fibers of IX and X	130
Somatic Afferent Fibers of IX and X	131
Accessory Nerve (Spinal XI)	131
Syndrome of impairment of accessory nerve	131
Hypoglossal Nerve (XII)	132
Combined Impairment of IX through XII	134
Internal Structure of the Brainstem	134
Medulla Oblongata	136
Pons	140
Mesencephalon (Midbrain)	141
Blood Supply of the Brainstem	145
Arteries	145
Veins	148
Syndromes Caused by Circulatory Disorders	148
Syndromes Caused by Tumors	154
Syndromes of Tentorium and Foramen Magnum Impaction	156
Decerebrate Rigidity	162
Apallic Syndrome	163
4 Cerebellum	164
External Architecture	164
Internal Architecture	165
Function	170
Signs of Neocerebellar Dysfunction	171
Blood Supply of the Cerebellum	172
Arteries	172
Superior Cerebellar Arteries	173
Inferior Anterior Cerebellar Arteries	174
Inferior Posterior Cerebellar Arteries	174
Veins	174
Circulatory Lesions	174
Obstruction of Superior Cerebellar Artery	174
Compression of Superior Cerebellar Arteries along Tentorial Margin	174
Cerebellar Hematoma	175
Cerebellar Tumors	176
Cerebellar Astrocytoma	176
Medulloblastoma	176
Angioblastoma (Lindau's Disease)	177
Metastatic tumors	177
Acoustic Neurinoma	177
Ependymoma	179
Other Cerebellar Diseases	179
Addendum	179

5 Diencephalon	180
Thalamus	181
Function	187
Blood Supply	187
Syndrome of Thalamic Disorders	188
Syndromes of Thalamic Circulatory Disorders	189
Tumors of the Thalamus	190
Inflammatory Disease of the Thalamus	191
Epithalamus	192
Subthalamus	193
Hypothalamus	194
Structure	194
Hypothalamus and Hypophysis	197
Function of Hypothalamus	200
Limbic System	202
Entorhinal Area	203
Amygdaloid Nuclear Complex	204
Hippocampus	205
Limbic System as a Circuitry for Mechanisms of Expression, Formation of Emotions, Dispositions, and Instinctive Drives	205
Damage to the Hypothalamus	208
Tumors	209
Peripheral Autonomic Nervous System	213
Control by the Hypothalamus	213
Function	213
Sympathetic Nervous System	215
Parasympathetic Nervous System	217
The Sacral Component	217
Referred Pain	222
6 Basal Ganglia and Extrapyrarnidal System	225
Basal Ganglia	225
Extrapyrarnidal System	226
Signs Caused by Lesions in Extrapyrarnidal Grisea	232
Hypokinesia-Hypertonia Syndrome	232
Hyperkinesia-Hypotonia Syndrome	234
Other signs	236
7 Meninges, Ventricles and Cerebrospinal Fluid	239
Meninges	239
Dura mater	239
Arachnoid	240
Pia mater	241
Subarachnoid Space	241
Ventricles and Cerebrospinal Fluid	243
Ventricles	243
Cerebrospinal Fluid	244
Blockages of Cerebrospinal Fluid Flow	247
8 Telencephalon or Cerebral Cortex	256
External Characteristics	256
Internal Characteristics	259
Cortex	259
White Matter	264
Projection Fibers	264
Association Fibers	266
Commissural Fibers	268
Functional Organization of the Cortex	268
Primary Receptive Fields of Parietal, Occipital, and Temporal Cortex	274
Primary Somatosensory Cortex	274
Primary Visual Cortex	275
Primary Auditory Cortex	277
Primary Gustatory Cortex	277
Primary Vestibular Cortex	277
Frontal Lobe	277
Primary Somatomotor Cortex (Precentral Gyrus)	278
Premotor Cortex	278
Motor Speech Cortex (Broca)	279
Prefrontal Cortex (Frontal Association Areas)	281

Secondary Receptive Cortical Fields (Parietal, Occipital, Temporal Association Areas)	284	Cerebral Arteries Proper	304
Focal Signs Caused by Lesions in Association Territories	285	Peripheral Anastomoses of Cerebral Arteries	308
Sensory or Wernicke's Aphasia	294	Signs and Syndromes of Cerebral Circulatory Deficiencies	308
Additional Remarks	297	Vertebrobasilar Insufficiency	309
General Signs and Symptoms Accom- panying Diseases of the Cerebrum	297	Internal Carotid Artery Insuffi- ciency	311
Meningiomas	299	Arterial Aneurysms	316
Epileptic Seizures	300	Hypertensive Arterial Disease and Intracerebral Bleeding	318
Circulatory System of the Cerebrum	301	Veins and Dural Sinuses	320
Arterial Supply	301	External Veins	320
Internal Carotid Arteries	302	Internal Veins	322
Vertebral Arteries	302	Symptomatology of Venous and Sinus Thromboses	324
Arterial Circle of Willis	302		
References	328		
Index	337		