

1. Record Nr.	UNINA9910955159203321
Autore	Jergenson Margaret A
Titolo	Neuroscience for Dentistry / / by: O'Kane, Barbara J., Barritt, Laura C.
Pubbl/distr/stampa	NEW YORK : , : Thieme Medical Publishers, Incorporated, , 2022 ©2022
ISBN	9781684203116 1684203112 9781626237827 1626237824
Edizione	[1st ed.]
Descrizione fisica	1 online resource (522 pages)
Soggetti	Dentistry Neurology, Neuropathology, Clinical Neuroscience
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Neuroscience for Dentistry -- Title Page -- Copyright -- Dedication -- Contents -- Preface -- Acknowledgments -- Contributors -- Part A Basic Neuroscience -- Unit I Central Nervous System -- 1 Organization of the Nervous System -- 1.1 Overview of the Nervous System -- 1.2 The Central Nervous System -- 1.3 The Peripheral Nervous System -- 2 Development of the Nervous System -- 2.1 Overview of Nervous System Development -- 2.1.1 Introduction -- 2.1.2 Neural Tube Development -- 2.2 Spinal Cord Differentiation -- 2.2.1 Gray Matter: Alar and Basal Plate Development -- 2.2.2 White Matter -- 2.2.3 Segmental Nerve Distribution: Myotomes and Dermatomes -- 2.2.4 Positional Changes in Spinal Cord -- 2.3 Brain Differentiation -- 2.3.1 Brainstem Differentiation -- 2.3.2 Forebrain and Cerebellar Differentiation -- 2.4 Development and Derivatives of the Rhombencephalon -- 2.4.1 Myelencephalon: Medulla Oblongata -- 2.4.2 Metencephalon: Pons and Cerebellum -- 2.4.3 Development and Derivatives of the Mesencephalon (Midbrain) -- 2.4.4 Development and Derivatives of Prosencephalon (Forebrain) -- 3 Neurohistology -- 3.1 Classification of Cells of the Nervous System -- 3.1.1 Introduction -- 3.2 Neurons -- 3.2.1 Structural Components of Neurons -- 3.2.2

Myelination of Axon -- 3.2.3 Axonal Transport -- 3.2.4 Neuronal Communication: Synapses -- 3.2.5 Organization of Neurons in the CNS and PNS -- 3.2.6 Central Nervous System -- 3.2.7 Peripheral Nervous System -- 3.2.8 Classification of Nerve Fibers -- 3.3 Classification of Neurons in the Nervous System -- 3.3.1 Morphological Neuronal Classification -- 3.3.2 Functional Neuronal Classification -- 3.4 Neuroglial Cells -- 3.4.1 General Characteristics of Neuroglial Cells -- 3.4.2 Neuroglial Cells in the Central Nervous System -- 3.4.3 Neuroglial Cells in the Peripheral Nervous System -- 3.5 Histological Appearance of CNS.

3.5.1 Spinal Cord Histology -- 3.5.2 Brainstem Histology -- 3.5.3 Cerebellum Histology -- 3.5.4 Cerebrum Histology -- 4 Neurophysiology -- 4.1 Neurophysiology Overview -- 4.2 Cell Membrane -- 4.3 Action Potentials -- 4.4 Synapses -- 4.5 Neurotransmitters and Receptors -- 4.6 Clinical Correlations -- Unit II Gross Anatomy of Brain and Spinal Cord -- 5 Gross Topography of the Brain -- 5.1 Overview -- 5.2 Neuroanatomical Terms -- 5.3 Telencephalon -- 5.4 Diencephalon -- 5.5 Mesencephalon -- 5.6 Metencephalon -- 5.7 Myelencephalon -- 5.8 Medial Surface of the Cerebral Hemispheres -- 5.9 Inferior Aspect of the Cerebral Hemispheres -- 6 Blood Supply of the Brain -- 6.1 Overview of the Blood Supply to the Brain -- 6.2 Anterior Circulation of the Brain -- 6.2.1 The Anterior Cerebral Artery (ACA) -- 6.2.2 The Middle Cerebral Artery (MCA) -- 6.3 Posterior Circulation of the Brain -- 6.4 Circle of Willis -- 6.5 Blood-Brain Barrier -- 6.6 Venous Drainage in the Brain -- 7 Ventricles and Cerebrospinal Fluid (CSF) -- 7.1 Overview of the Ventricles and CSF -- 7.2 Ventricles -- 7.3 Flow of CSF through the Ventricular System -- 7.4 Choroid Plexus and CSF -- 7.4.1 Choroid Plexus -- 7.4.2 Cerebral Spinal Fluid -- 8 The Meninges -- 8.1 Overview of the Meninges -- 8.2 Meningeal Layers -- 8.3 Function of the Meninges -- 8.4 Dural Septa -- 8.5 Dural Sinuses -- 8.6 Blood Supply to the Meninges -- 8.7 Innervation of the Meninges -- 9 Cranial Nerves -- 9.1 Overview of Cranial Nerves -- 9.2 Functional Modalities of Cranial Nerves -- 9.2.1 Classification of Functional Fiber Types -- 9.2.2 Cranial Nuclei -- 9.2.3 General Overview of Motor and Sensory Pathways -- 9.2.4 Cranial Nerve Sensory Pathways: Ganglia and Nuclei -- 9.2.5 Cranial Motor Pathways: Nuclei and Ganglia -- 9.3 Summary of Cranial Nerves -- 9.4 Summary of Cranial Nerve Testing -- 10 Gross Anatomy of the Spinal Cord.

10.1 Overview of the Spinal Cord -- 10.2 Organization of the Spinal Cord -- 10.2.1 Development of the Spinal Cord -- 10.2.2 Segmental Organization of the Spinal Cord -- 10.3 Gross Anatomy of the Spinal Cord -- 10.4 Internal Anatomy of the Spinal Cord -- 10.4.1 Gray Matter -- 10.4.2 White Matter -- 10.5 Meninges -- 10.6 Blood Supply to the Spinal Cord -- Unit III Sensory Systems -- 11 Anatomical Receptors and Nerve Fibers -- 11.1 Overview of Anatomical Receptors -- 11.1.1 General Properties of Somatosensory Receptors -- 11.2 Sensory Reception and Transduction -- 11.2.1 Adequate Stimulus -- 11.2.2 Receptive Fields -- 11.2.3 Sensory Adaptation -- 11.3 Stimulus (Sensory) Modalities -- 11.4 Somatosensory Receptor Classification -- 11.4.1 Functional Classification -- 11.4.2 Structural Receptor Classification -- 11.4.3 Receptor Classification Based on Anatomical Location -- 11.4.4 Types of Exteroceptors: Cutaneous Tactile Mechanoreceptors -- 11.4.5 Types of Proprioceptive Receptors -- 11.4.6 Muscle Proprioceptors -- 11.4.7 Tendon Proprioceptive Receptors -- 11.4.8 Joint Proprioceptive Receptors -- 11.4.9 Visceral Receptors -- 11.5 Cutaneous Receptors of the Oral Mucosa -- 12 Somatosensory Systems Part I-Somatosensory Pathways of Body --

12.1 Overview of Ascending Somatosensory System -- 12.1.1 Function of the Somatosensory System -- 12.2 Transmission of Conscious and Unconscious Sensations -- 12.2.1 Common Features of the Conscious Somatosensory Pathways -- 12.3 Anterolateral System -- 12.3.1 Functional Overview of the Anterolateral System -- 12.3.2 Direct Path of Anterolateral Pathway -- 12.3.3 Indirect Pathways of the Anterolateral System -- 12.4 Dorsal Column-Medial Lemniscus (DCML) Pathway -- 12.4.1 Functional Overview of DCML -- 12.4.2 DCML Pathway -- 12.5 Spinocerebellar System -- 13 Somatosensory Systems Part II-Somatosensory Pathways of Head.

13.1 Overview of Somatosensory Innervation of the Head -- 13.1.1 General Organization of the Trigeminal System -- 13.1.2 Trigeminal Nerve Distribution -- 13.1.3 Trigeminal Ganglia -- 13.2 Trigeminal Nuclear Complex -- 13.2.1 Components of Trigeminal Sensory Nuclear Complex -- 13.3 Trigeminal Somatosensory Pathways -- 13.3.1 Central Ascending Pathways: Protopathic Sensations of the Face -- 13.3.2 Central Ascending Pathways: Epicritic Sensations for the Face -- 13.3.3 Central Ascending Pathways: Unconscious Proprioception from the Orofacial Region -- 13.4 Sensory Contributions from Facial, Glossopharyngeal, and Vagus Nerves -- 13.4.1 GSA Input from Facial, Glossopharyngeal, and Vagus Cranial Nerves -- 13.4.2 Reflexes Associated with CNs V, VII, IX, and X -- 13.4.3 Viscerosensory (GVA) Input from Cranial Nerves VII, IX, and X -- 14 Pain -- 14.1 Overview of Pain -- 14.2 Classification of Pain -- 14.3 Pain Receptors and Afferents -- 14.4 Physiology of Pain -- 14.5 Mechanisms of Pain Modulation -- 14.5.1 Endogenous Opioids -- 14.5.2 Segmental Inhibition -- 14.6 Descending Pathways of Pain Modulation -- 14.6.1 Overview of Pain Modulation -- 14.6.2 Pathways -- 14.7 Acute versus Chronic Pain -- 14.8 Differences in Pain Perception -- 14.8.1 Central Sensitization and Neuroplasticity -- 15 Special Senses -- 15.1 Special Visceral Afferents (SVA) -- 15.1.1 CN I -- 15.1.2 CN VII -- 15.1.3 CN IX -- 15.1.4 CN X -- 15.2 Special Somatic Afferents (SSA) -- 15.2.1 CN II -- 15.2.2 CN VIII -- Unit IV Motor Systems -- 16 Direct Activation Pathways -- 16.1 Overview of Direct Motor Pathways -- 16.2 Motor Neurons -- 16.3 Corticospinal Tract -- 16.4 Corticobulbar Tract -- 16.4.1 Lesions of the Corticobulbar Tract -- 16.5 Disorders of the Motor System -- 16.5.1 Upper Motor Neuron Syndrome -- 16.5.2 Lower Motor Neuron Syndrome -- 16.6 Spinal Reflexes.

17 Indirect Activation Pathways -- 17.1 Overview of Indirect Influences on Movement -- 17.2 Brainstem Nuclei and Tracts -- 17.2.1 Rubrospinal Tract -- 17.2.2 Reticulospinal Tract -- 17.2.3 Vestibulospinal Tract -- 17.2.4 Tectospinal Tract -- 17.3 Basal Ganglia -- 17.4 Cerebellum -- 18 Integrated Systems -- 18.1 Autonomic Nervous System (ANS) -- 18.1.1 Overview -- 18.1.2 Organization of the ANS -- 18.1.3 Sympathetic Division -- 18.1.4 Parasympathetic Division -- 18.1.5 Neurotransmitters of the ANS -- 18.1.6 Autonomic Plexi -- 18.2 Hypothalamus -- 18.2.1 Overview -- 18.2.2 Anatomy -- 18.2.3 Neural Connections -- 18.3 Limbic System -- 18.3.1 Overview -- 18.3.2 Anatomy -- 18.3.3 Function -- 18.4 Reticular Formation -- 18.4.1 Overview -- 18.4.2 Function -- Part B Orofacial Neuroscience -- Unit V Review of Orofacial Structures and Tissues -- 19 Development and Organization of Oropharyngeal Region -- 19.1 Overview of Oropharyngeal Development -- 19.1.1 Pharyngeal Arches -- 19.1.2 Development of Oral Cavity and Face -- 19.1.3 Palatal Development -- 19.1.4 Development of Pharynx -- 19.1.5 Tongue Development -- 19.1.6 Development of the Larynx -- 19.2 Overview of Oral Cavity and Oral Mucosa -- 19.2.1 Oral Cavity -- 19.2.2 Oral Mucosa -- 19.3 Structures of Oral Vestibule -- 19.3.1 Lips and Cheeks -- 19.3.2

Alveolar Mucosa and Gingiva -- 19.4 Structures of the Oral Cavity Proper -- 19.4.1 Roof of Oral Cavity Proper -- 19.4.2 Floor of the Oral Cavity Proper -- 19.4.3 Tongue -- 19.5 Structures of Pharyngeal Region -- 19.5.1 Nasopharynx -- 19.5.2 Oropharynx -- 19.5.3 Laryngopharynx -- 19.6 Structures of the Larynx -- 19.6.1 Cartilage and Muscles of the Larynx -- 19.6.2 Regions of the Larynx -- 19.6.3 Laryngeal Mucosa -- 19.6.4 Innervation to Larynx -- 20 Overview of Orofacial Pathways Part I-Trigeminal and Facial Nerves -- 20.1 Introduction.
20.2 Trigeminal Nerve: Overview of Functional Components.

Sommario/riassunto

A practical, reader-friendly guide for dental students on the neuroscience of the orofacial region. Understanding neural mechanisms that control orofacial pain, proper masticatory function, taste, speech, swallowing, and proprioceptive input to the temporomandibular joint and teeth is an important facet of dentistry. Neuroscience of Dentistry by renowned educators Barbara J. O'Kane and Laura C. Barritt provides foundational knowledge on these topics. The text integrates fundamental concepts of general neuroscience with vital information on neural mechanisms of the orofacial region and associated pain pathways. The book is organized in two parts covering basic neuroscience and orofacial neuroscience. Part one is subdivided into four units on the central nervous system, brain and spinal cord gross anatomy, sensory systems, and motor systems. Part two features three units focused on orofacial structures and tissues, dental structures, and orofacial pain and anesthesia. Each generously illustrated, succinctly written, and consistently formatted chapter includes an introductory overview and learning objectives. Key Highlights Throughout the book, relevant clinical correlations emphasize the relationship between basic neuroscience and clinical practice. Concise, high-yield illustrations, schematics, charts, and tables enhance understanding of general and orofacial neuroanatomy concepts. Helpful overviews at the beginning of each chapter highlight key concepts. National board style questions at the end of each chapter emphasize board-relevant information that enables self-study. This is a must-have resource for dental students taking neuroscience during their first or second year of dental school. It will also benefit other health science and dental hygiene students, as well as oral and maxillofacial surgery residents.
