UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Physiology of The Stomatognathic System

2627-3-H4601D071-H4601D033M

Aims

The course provides students with an in-depth understanding of the physiological functioning of the structures involved in the stomatognathic system, which includes organs and systems responsible for masticatory, swallowing, and phonatory functions.
The overall objective is to train students to integrate their understanding of the physiology of the stomatognathic system into the diagnosis and treatment of oral and dental conditions, ensuring a functional approach to clinical practice, which is essential for the exercise of the profession.

Expected learning outcomes at the end of the course, according to the *Dublin Descriptors* (DdD):

1. Knowledge and understanding: Acquire solid knowledge of the physiological functioning of the stomatognathic system and its related systems.

2. Applying knowledge and understanding: Be able to use physiological knowledge to interpret clinical signs and develop appropriate diagnostic and therapeutic strategies.

3. Making judgements: Develop the ability to critically and independently analyze physiological and clinical data related to the functioning of the stomatognathic system.

4. Communication skills: Communicate acquired knowledge effectively and appropriately, using adequate technical language and adapting communication according to the interlocutor (colleagues, patients, other healthcare professionals).

5. Learning skills: Consolidate an autonomous study and self-updating method that allows for the further deepening, even in the future, of topics relating to physiology applied to dental clinical practice.

Contents

The course will cover the physiological functioning of the structures involved in the stomatognathic system, including the organs and systems responsible for masticatory, swallowing, and phonatory functions. The physiological mechanisms regulating these functions will be explored, which are essential for recognizing functional disorders. The objective is to equip students with the necessary skills to make accurate diagnoses and that can be effectively integrated into clinical dental practice.

Detailed program

Salivation. Secretion of water and electrolytes. Ionic mechanisms of salivary secretion. Enzyme secretion. Cellular mechanisms of control of salivary secretion. Nervous control of salivary glands.

Sensitivity of the oro-facial region. Sensory innervation of oro-facial region: the touch-pressure receptors, thermal receptors, nociceptors, receptors of the temporomandibular joint. Muscle and tendon receptors. Sensory innervation of the tooth; the innervation of the periodontal ligament

The trigeminal territory. Anatomical and functional organization of the trigeminal nuclear complex. The trigeminal pain.

Taste: taste receptors, distribution and innervation.

The biomechanics of mastication. Temporo-mandibular joint. Movements of elevation and lowering of the jaw. Lateral movements. Bone and dental structures: dento-alveolar articulation (gomphosis) and occlusion. The muscles of mastication: muscle fiber type and motor unit and the lowering of the elevator muscles of the jaw, tension-length relationship. Jaw movements and muscle activity during chewing. Central integration of the sensitivity and motility of the masticatory system. The brainstem (cranial nerve nuclei, reticular formation and monoaminergic systems).

The reflexes of the masticatory muscles: Excitation and inhibition of mastication motor neurons: synaptic effects of proprioceptive muscle afferents of the oral cavity. Reflex actions initiated by muscle proprioceptors. Degree of jaw reflexes: their role during locomotion and during chewing. Adjustment and sensitivity of the stretch reflex during mastication

The masticatory function. Masticatory cycle: during opening, closing, occlusal phase (phase of working power). Control of mastication: local control: reflex compensation masticatory loading and unloading; central control: subcortical rhythm generator; trunk circuits-brain and cerebellar influences and the role of the cerebral cortex.

Deglutition. Voluntary and involuntary phases of swallowing. Influence of the pharyngeal phase on the breath. Neural control of swallowing. Motility of the esophagus and lower esophageal sphincter function.

Calcium homeostasis. Introduction of calcium in the diet and its absorption, calcium content in the blood, calcium deposits in the body, control of calcium excretion and balance.

Phonation: general

Prerequisites

Preliminary required knowledge: Fundamentals of physics, biochemistry, histology and nervous system anatomy,

the cardiovascular anatomy, skeletal muscle anatomy, respiratory system anatomy, gastrointestinal system anatomy, histology and anatomy of the kidney, stomatognathic system anatomy.

Teaching form

In-person lectures, complemented by interactive teaching sessions.

The course consists of 5 four-hour lessons. Part of each lesson will focus on the presentation and illustration of content by the instructor (lecture-based teaching), followed by student interaction for questions, clarifications, or further exploration of topics (interactive teaching).

Textbook and teaching resource

Fisiologia orale e dell'apparato stomatognatico, Manzoni D.- Scarnati E., (edi-ermes)

PowerPoint presentations

Semester

First

Assessment method

The exam consists in a written test. Open and closed questions will be posed to the student in order to evaluate the general knowledge of the topics, in a context of clinical evaluation of the main physiological parameters with particular reference to the relationships and interactions between the functions of the organs, apparatuses and systems.

Office hours

By appointment only. Please send an email to giulia.terribile@unimib.it to schedule a meeting.

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION | PARTNERSHIPS FOR THE GOALS