



Study program: Integrated Academic Studies in Dental Medicine

Course title: Clinically Oriented Embryology

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Course status: elective

ECTS Credits: 3

Condition: -

Course aim

Explanation of purpose and application of embryology in clinical practice with a detailed understanding of gametogenesis, *in vivo* fertilization along with retrospection and correlation with *in vitro* fertilization, embryo formation and fetal development with histological analysis of embryonic and fetal structures.

Getting familiar with the application of clinically oriented embryology in gynecology, paediatrics, pathology and other areas of medicine. Parallel to the theoretical knowledge about proper development and training of practical knowledge of normal embryology, the purpose of the subject is to explain the development of congenital malformations (teratology), to give a detailed explanation of their origin and mechanism of their appearance, as well as the importance of their recognition and practical issues (consequences, the possibility of medical care).

Expected outcome of the course:

Upon completion of this course, students will be trained to know in detail the structure and needs of the conceptus. Their knowledge of the normal and abnormal development in humans will be expanded greatly, which will be an important basis for understanding other familiar branches of medicine (gynecology, paediatrics, paediatric surgery).

Course description

Theoretical education

1. Introduction and history of reproductive biology – embryology as a science and basics of teratology
2. Oogenesis
3. Spermatogenesis
4. Phases of fertilization *in vivo* and correlation with *in vitro* fertilization
5. Blastomerization, implantation, gastrulation, formation of germ layers and neuralization
6. Branchial system and development of the head and neck region of the embryo with possible malformations
7. Development of cardiovascular system with possible malformations
8. Development of digestive system with possible malformations
9. Development of respiratory system with possible malformations
10. Development of urinary system with possible malformations
11. Development of reproductive system with possible malformations
12. Development of endocrine system
13. Development of nervous system and senses with possible malformations
14. Development of musculoskeletal system and abdominal wall with possible malformations
15. Development of placenta and its functions

Practical education

Microscopic analysis of human and animal material. Analysis of histological specimens of embryonal and fetal structures. Macroscopic analysis. Essay. Pre-exam review classes. Student's scientific papers.

Literature

Compulsory

1. Sadler T. Langman's medical embryology, 14th ed. Baltimore: Lippincott, Williams & Wilkins; 2018. 456 p.
2. Moore KL, Persaud TVN. The Developing human. Clinically oriented embryology. 10th ed. Philadelphia: Saunders; 2015. 560 p.

Additional

1. Singh V. Textbook of clinical embryology. Elsevier India; 2013. 352 p.
2. Schoenwolf GC, Bleyl SB, Brauer PR, Francis-West PH. Larsen's human embryology, 5th ed. New York, Edinburgh: Churchill Livingstone; 2014. 576 p.
3. Gilbert SF. Developmental biology. 8th ed. Sunderland: Sinauer Associates; 2006. 785 p.
4. Keeling JW, Khong TY. Fetal and neonatal pathology, 5th ed. London: Springer; 2015. 882 p.

5. Trounson A, Gosden R, Eichenlaub-Ritter U. Biology and pathology of the oocyte. Role in fertility, medicine and nuclear reprogramming, 2nd ed. Cambridge: University press; 2013. 466 p.
 6. Ten Donkelaar HJ, Lammens M, Hori A. Clinical neuroembryology. Development and developmental disorders of human central nervous system. 2nd ed. Berlin Heidelberg: Springer; 2006. 659 p.

Number of active classes	Theoretical classes: 30	Practical classes: 15	
Teaching methods: oral presentations and interactive lectures using multi-medial didactic tools and virtual microscopy. Practical work (individual or in small groups) through microscopic analysis of histologic specimens, and macroscopic analysis of relevant cases.			
Pre-exam activities	points	Final exam	points
Lectures	30	Written	
Practices	10	Oral	60
Colloquium		
Essay			