

MAS in Cardiovascular Perfusion

002 Medical Technology and Natural Science I

The cardiovascular perfusionist is responsible for the patient's life by controlling the heart-lung machine properly during cardiac surgery. This module will cover fundamental basics in physics, chemistry, biochemistry, pharmacology and medical technology. Topics of learning and knowledge management as well as job description round off the module.

History has shown that the principle of the heart-lung machine (HLM) today has changed little since its inception. However, new therapies and interventions are continually being developed by today's cardiologists and cardiac surgeons due to highly specialized medical devices and technologies. Accordingly, the perfusionist is confronted with extended requirements to be capable to manage the HLM: essential is a comprehensive insight in the complex relationships between patient and the HLM. The necessary fundamental scientific and technological knowledge will be compiled in this and the following modules. Therefore a fundamental technical and scientific knowledge is mandatory to understand the complexity of cardiovascular perfusion in order to allow correct decisions when needed.

Learning Outcomes/Competencies

The students will be able to,

- utilize knowledge and self-management for study and profession in an effective manner
- select the appropriate materials to be used
- demonstrate the relationships between basics in electronic measurement and the values produced by monitoring equipment in perfusion
- describe the basic principle of different extracorporeal systems
- describe fundamental basics in physics, chemistry, and biochemistry and medical technology to ensure the correct understanding and management of medico-technical processes
- administer pharmaceuticals, particularly pertaining to patients with cardiovascular disease
- describe the historical development of perfusion science.

Module Content

- Job description
- Learning and knowledge management
- Biocompatibility
- Electronics - Electronic measurement
- Chemistry/Biochemistry
- Perfusion Basics
- Physics: Thermodynamics
- Extracorporeal systems
- Pharmacology

Teaching and Learning Methods

Lectures, Learning on the model, Discussions, Case Studies, Guided Self-Study, Training, etc.

Proof of Performance

Written examination

Literature

American Chemical Society (2015). Chemistry Is Everywhere. <http://www.acs.org/content/acs/en/education/whatischemistry.html> [10.10.2015]

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Fäh, A. (2015). Documents on learning platform.

Giancoli, D. (2005). Physics. Principles with applications. (6th ed.). New Jersey: Upper Saddle River.

Gravlee, G., Davis, R., Hammon, J. & Kussmann, B. (2016). Cardiopulmonary Bypass and Mechanical Support: Principles & Practice (4th edition). Philadelphia: Wolters Kluwer.

Sarrazin, T. (2009). Erste Verordnung zur Änderung der ausbildungs- und Prüfungsordnung für Kardiotechnikerinnen und Kardiotechniker. Berlin: Senatsverwaltung für Gesundheit, Umweltschutz und Verbraucherschutz.

Schmid, C & Philipp, A. (2011). Guidelines for Extracorporeal Circulation. Heidelberg: Springer.

Module Convener

Manuel Iafrate, Head of MAS FH in Cardiovascular Perfusion; BSc in Cardiovascular Perfusion, ECCP

Teaching Staff

Araujo Klein Mira, clinical perfusionist ECCP, MAS CP
Araujo Klein Grazielle, English instructor
Costabile Simon, clinical perfusionist ECCP
Fäh Andreas
Dr. Fusina Fabian
Graves Kirk, clinical perfusionist ECCP
Lüders Geraldine
Meier Winfried
Dr. Schreiber Peter, FMH Infectiology
Schärli Marianne, MScN, MAS eLearning & Knowledge Management

Requirements

- ability to read and understand English expert literature and to follow classes taught in English
- knowledge of Scientific Work
- prospect of an internship in the area Cardiovascular Perfusion

Module Code

MAS_CP_002

Module Type/Module Order

Mandatory Module in the course MAS Cardiovascular Perfusion
The module order is fix.

Study Time/ECTS

150 hours, 5 ECTS points
40 hours Classroom Lessons and 110 hours Guided Self-Study

Module Fees

On request

Teaching Language

English

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