

# MAS in Cardiovascular Perfusion

## 008 Applied Perfusion Science III

**In recent decades the treatment of heart failure has shown the implantation of several kind of mechanical assist devices or heart transplantation if necessary. This module will cover supporting cardiac and lung transplantation, intra-operative circulatory support in special situations and renal replacement therapy. Topics of soft and hardware development or optimization through medical industry round off the module.**

The increase in life expectancy through the progress of medicine increases the prevalence for congestive heart failure. For the 200'000 people experiencing congestive heart failure in Switzerland, optimum drug therapy remains the main treatment. In those cases, where medical therapy is exhausted, the implantation of a cardiac assist device, such as the Ventricular Assist Device (VAD), for heart failure with cardiogenic shock is indicated as a "bridge" or "bridge to bridge" (bridge to a decision, or bridge to a further alternative), bridge to transplantation or a "bridge to recovery" (of the heart muscle).

### Learning Outcomes/Competencies

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The students will be able to,

- take essential measures in supporting cardiac and lung transplantation
- provide intra-operative circulatory support in special situations
- implement continuous renal replacement therapy
- apply myocardial protection techniques as required by the situation
- contribute to soft and hardware development or optimization through medical industry
- to use various systems for the circulatory and/or pulmonary support
- measure and interpret relevant laboratory values and apply to actual situations.

### Module Content

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- VAD
- Laboratory diagnostics
- Renal replacement therapy
- Instruction
- Heart transplantation
- Anesthesiology techniques
- Organ management
- Myocardial protection
- Special perfusion
- Pacer/Defibrillation
- Thoracic surgery
- ECMO

### Teaching and Learning Methods

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

### Proof of Performance

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Written examination

### Literature

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

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

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

#### Module Convener

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

#### Teaching Staff

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M. Araujo Klein  
F. Archontidis  
G. Erdös  
S. Hofer  
I. Inci  
B. Lüders  
M. Schärli  
O. Stanger  
G. Lüders

#### Requirements

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- 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

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**MAS\_CP\_008**

#### Module Type/Module Order

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

#### Study Time/ECTS

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

#### Module Fees

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On request

#### Teaching Language

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English

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