Caring for patients on ECMO in the ICU

Carolin Keim, clinical nurse specialist, Intensive Care Unit
Structure

- What treatment procedures are available?
- Indications for ECMO/ECLS
- Education and collaboration with cardiotechnology
- Patients awake on ECMO/ECLS
- Mobilization on ECMO
- Documentation
What treatment procedures are available?

- ECMO (ExtraCorporeal Membrane Oxygenation)
- ECLS (ExtraCorporeal Life Support)

source: Keim, (2016)
Indications for ECMO

- Respiratory failure (ARDS, pneumonia)

Example for the ECMO-Mode: veno-venous

source: SOP ECMO/ECLS, USZ (2015)
Indications for ECLS

- Cardiogenic shock / Circulatory failure

Example for the ECMO-Mode: veno-arterial

source: SOP ECMO/ECLS, USZ (2015)
Indications for ECLS

- Combine Respiratory failure and Circulatory failure

Example for the ECMO-Mode: veno-venous-arterial

(source: SOP ECMO/ECLS, USZ (2015))
Treatment options

- bridge to recovery
- bridge to decision
- bridge to transplant

The medical team decides on cannulation and treatment

source: https://caloniedoesart.files.wordpress.com, (2012)
Indications for ECMO/ECLS

Bridge to decision

Organ recovery / Circulatory improvement / Neurological evaluation

Weaning
Assist Device
Transplantation
Death

source: ELSO, (2013) (Guidelines for Adult Respiratory Failure/Cardiac Failure and ECPR Cases)
139 patients with an ECMO/ECLS procedure were cared for in the intensive care unit at the University Hospital Zurich last year.

8 patients were not ventilated on ECMO/ECLS.

Data 2015

- ECMO/Lung Assist
  Zum Beispiel: ECMO; ILA active; ProLung

source: Minimal Data Set, (2016)

source: Keim, (2016)
Education and collaboration with cardiotechnology I

- Joint decision for a training concept
- The concept includes theoretical and practical training in an interdisciplinary setting for intensive care staff and cardiotechnologist
- Treatment procedure is challenging and associated with potential risks
- Intensive care staff can care for these patients if:
  - for at least 6 months in the ICU
  - after theoretical and practical education
Education and collaboration with cardiotechnology II

- Theoretical content:
  Pathophysiology of heart, lung, and coagulation system

- Practical content:
  Use of device / emergency situations

- Quality is provided by Standard Operation Procedures (SOP) with defined responsibilities, checklists and data sheets

- Daily communication between cardiotechnology, intensive care staff
Patients awake on ECMO

- Patients can be awake on ECMO while waiting for a lung or heart transplant.
- Communication with awake ECMO/ECLS patients is perceived as very important and valuable to overcome the "long waiting time" for an organ.
Mobilization of awake patients on ECMO

- Two impressions

source: USZ, (2014)
Mobilization of awake patients on ECMO I

- Responsibilities in mobilization:
  - Physiotherapist: mobilization and guiding the patient
  - Intensive care nurse: monitoring vital signs
  - Physician: securing the ECMO tubes
  - Cardiotechnologist: monitoring ECMO
Mobilization of awake patients on ECMO II

- Significant training effect on muscles with more endurance, coordination of movement, and balance
- Walking distance can be extended
- Self-confidence can be strengthened as a result
- Coordinated multi-professional cooperation supports the preservation of mobility in ECMO patients
Documentation

- The tubes are measured and documented using checklists
- Photo documentation has proven to be very helpful

source: Keim, (2016)
Now, I am prepared to answer your questions. And I hope you have some!