ECMO

중앙대학교병원
심장혈관센터, 흉부외과
정윤상
What is ECMO?

- **Extra Corporeal Membrane Oxygenator** (체외 막형 산화기)
- Provide both cardiac and respiratory support oxygen.
- Heart and lungs are so severely diseased or damaged.
ECMO is achieved by

- Draining venous blood
- Removing CO2 and adding O2
- Returning the blood to the circulation via a vein (venovenous) or artery (venoarterial)
  - Venovenous – lung
  - Venoarterial – heart (& lung)
ECMO – venovenous type

- Draining venous blood from RA
- Removing CO2 and adding O2
- Returning the perfusate blood to the circulation via a vein
ECMO – venoarterial type

- Draining venous blood from RA
- Removing CO2 and adding O2
- Returning the perfusate blood to the circulation via a artery
Brief History of ECMO

- 1972 First successful use of ECMO by Hill
  - An adult patient with posttraumatic ARDS
Objectives

- VA ECMO
  - Heart (& lung) support
- VV ECMO
  - Lung support
- Time for recovery
- Bridge to definite therapy
  - Transplant
Indication

- ECMO is indicated for potentially reversible, life-threatening forms of respiratory and/or cardiac failure which are unresponsive to conventional therapy.

- The decision to institute ECMO is usually decided on a case by case basis with considered consultation.
VV ECMO

- **Common**
  1. Severe pneumonia
  2. ARDS
  3. Pulmonary contusion
  4. Acute lung (graft) failure following transplant

- **Other**
  1. Alveolar proteinosis
  2. Smoke/toxin/irritant inhalation
  3. Status asthmaticus
  4. Airway obstruction
  5. Aspiration syndromes
VA ECMO

- **Common**
  1. Cardiogenic shock: AMI and complications
     (including: wall rupture, papillary muscle rupture, refractory VT / VF)
  2. Post cardiac surgery: unable to wean safely from cardiopulmonary bypass
     using conventional supports
  3. Sepsis with profound cardiac depression
  4. Drug overdose with profound cardiac depression

- **Other**
  1. Myocarditis
  2. Pulmonary embolism
  3. Cardiac or major vessel trauma
  4. Massive haemoptysis / pulmonary haemorrhage
  5. Pulmonary trauma
  6. Acute anaphylaxis
  7. Chronic cardiomyopathy: as a “bridge” to longer term
     ventricular assist device
In CAU

- 3 ECMO available
- 1 in ER
- 2 in OR

PLS x 2  SCP x 1
여러 ECMO 활용

- 2009 H1N1
- 2015 MERS
- 심,폐부전 환자에서 타기관으로 이송
- Portable outside hospital ECMO application
- Cardiac death환자의 organ donation(DCD)
- Lung, Heart surgery under ECMO support
ECMO can be a good problem solver.

더 이상 “최후의 수단”이 아니다.

ECMO는 치료범은 아니지만, 치료될 수 있도록 충분한 시간을 주는 것이다.
Good clinical practice in ECMO treatment

„a piece of advice“

Be careful with the patient
Don‘t solve problems that do not really exist
Don‘t treat numbers, if the patient looks good
Make it simply and safe
Try not to kill the patient by unnecessary actions