Focus of research group

Name PI: Leo Heunks
Dept: ICU, location VUmc
Research group: 6 PhDs, ±5 (inter)n’l students

Mission:
• To prevent and treat critical illness associated diaphragm dyfunction by understanding the mechanisms of disease

Vision:
• No patient ventilator-bound due to critical illness associated diaphragm weakness

Aims:
• Develop & validate tools to monitor diaphragm effort
• Develop diaphragm protective ventilation strategy (prevention)
• Develop therapeutic interventions
Focus of research group

Current expertise

- **Diaphragm muscle function in ICU patients**
  - Transdiaphragmatic pressure
  - Electromyography (esophagus and surface)
  - Ultrasound (conventional)
  - MRI, high spatial / temporal resolution (Tim Marcus)

- **International network**
  - Co-chair WEAN SAFE executive committee
  - Visiting professor Zhejiang University, School of Medicine, Hangzhou
  - Canada

Current funding

- ACS: PhD and out of the box grants
- European Respiratory Society: CRC grant
- Ventfree (USA)
- Orion pharma (Finland)
- Pulmotech (NL)
Future plans

**Short term (1-2 year) plan**
- Ultrasound (tissue doppler imaging / speckle tracking)
- Dynamic MRI in ventilator ICU patients: PEEP
- Multicenter RCT levosimendan (?)
- Intensify collaboration with Chinese centers

**Necessary infrastructure:**
- Advanced ultrasound (expertise needed)
- Expertise in MRI image analysis (in progress)
- Animal facility (collaboration China?)

**Long term (>2 year) plan**
- Diaphragm expertise center (clinical/pre-clinical; **not limited** to critically ill)

**Necessary infrastructure:**
- Support from UMC board
- Imaging (ultrasound / MRI / PET tracers for perfusion/metabolism)

**Collaboration in ACS**
Vumc: Coen Ottenheijm; Tim Marcus
AMC: Janneke Horn & Marcus Schultz; Gustav Strijkers & Aart Nederveen; Jeroen Hutten