SUBJECT: ECMO WATCH – CARDIAC AND RESPIRATORY FAILURE CONSULTATIONS

SUPERSEDES: New **PAGE:** 1 of 3

RECOMMENDATION(S): Benjamin Davis, MD **APPROVAL: 4/1/2021**

CONCURRENCE(S): Jay Bhama, MD **EFFECTIVE: 4/1/2021**

BACKGROUND: ExtraCorporeal Membrane Oxygenation (ECMO) is a form of mechanical circulatory and respiratory support for patients with severe heart and lung disease. ECMO has been initiated at UAMS a handful of times over the years. The UAMS surgical critical care team (to include anesthesia intensivists) and cardiac surgery teams have developed a dedicated ECMO program to provide this service to patients at UAMS and therefore the state of Arkansas.

DEFINITIONS: ECMO Watch: A state of readiness in which the ECMO team has been consulted on a patient with cardiac or respiratory failure for evaluation for initiation of ECMO therapy. Length of evaluation period to be determined by resources and personnel available as well as patient condition.

PROCESS: The ECMO attending on call can be found on the UAMS online call schedule under "ECMO." Any attending or fellow may call the ECMO attending for a consultation. A high-level conversation about the patient's condition, long term prognosis, medical history, and other relevant data will occur. If the ECMO attending agrees that the patient may be a candidate for ECMO, they will evaluate the patient in person and discuss with a second ECMO attending. Final decision authority lies with the ECMO attending on call, who will mobilize ECMO resources when appropriate. If patient is deemed safe for transfer, they will be transferred to H4 for cannulation and remain there for the duration of their cannulation period. Which attending provider remains primary (MICU, neuro ICU, SICU vs the ECMO attending) will be determined on a case-by-case basis. The ECMO attending and the appropriate ICU team will round on the patient together at a mutually agreeable time, preferably at 0800 or before daily rounds. As always, we will take a collaborative approach to decision making. However, while a patient is on ECMO, final authority for decisions regarding the ECMO circuit, ventilator, pressors/inotropes (in the case of VA ECMO), and anticoagulation will rest with the ECMO attending of record. Questions regarding those items will go directly to the ECMO attending on call.

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RESPIRATORY (VV) CONSULTATION TRIGGERS: Impending or worsening respiratory failure despite medical optimization of TV, PEEP, and high (>80%) FIO2 as well as any of the following:

- PaO2/FiO2 < 100
- Hypercapnia with respiratory acidosis (pH < 7.2)
- Murray Score > 3 (http://cesar.lshtm.ac.uk/murrayscorecalculator.htm)
- Medical Paralysis or Prone Position
- Consideration of inhaled pulmonary vasodilators

CONTRA-INDICATIONS TO VV ECMO:

ABSOLUTE:

- Estimated physiologic age > 70
- Mechanical Ventilation ≥ 10 days (≥ 5 days if pPlat ≥ 40 cm H2O
- Home oxygen dependence
- Active malignancy without possible surgical (non-immunosuppressive) cure
- Clinical evidence of non-recoverable CNS injury (e.g., anoxic brain injury)
- End Stage Liver Disease (Child's B/C)
- Active bleeding/hemorrhagic shock
- GVHD
- Allogeneic Hematopoietic Stem Cell Transplantation within the last 8 months
- Bleomycin-induced lung injury
- Multisystem Organ Failure as determined by ECMO team
- Moribund patient as determined by ECMO team
- Inconsistent with patient wishes/goals-of-care or active & confirmed DNR/DNI

RELATIVE:

- Mechanical ventilation ≥ 7 days
- Significant acute hepatic injury
- Long term immunosuppression
- DIC
- HIT
- TBI or large stroke
- Contraindications to anticoagulation

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CARDIAC (VA) CONSULTATION TRIGGERS: Cardiogenic shock as evidenced by two high dose inotropes and one of the following:

PA catheter with CI < 1.8

-OR-

Clinical and echocardiographic evidence of cardiogenic shock

Note that ECPR is not yet supported by the UAMS ECMO team.

CONTRA-INDICATIONS TO VA ECMO:

ABSOLUTE:

- Estimated physiologic age > 70
- No "bridge" to recovery, transplant, destination, or surgery
- Active malignancy without possible surgical (non-immunosuppressive) cure
- Clinical evidence of non-recoverable CNS injury (e.g., anoxic brain injury)
- End Stage Liver Disease (Child's B/C)
- Active bleeding/hemorrhagic shock
- GVHD
- Allogeneic Hematopoietic Stem Cell Transplantation within the last 8 months
- Severe peripheral arterial disease
- Multisystem Organ Failure as determined by ECMO team
- Moribund patient as determined by ECMO team
- Inconsistent with patient wishes/goals-of-care or active & confirmed DNR/DNI

RELATIVE:

- Uncontrolled bleeding or contraindications to anticoagulation
- Significant acute hepatic injury
- Long term immunosuppression
- DIC
- HIT
- TBI or large stroke
- Contraindications to anticoagulation