Monitoring COVID-19 ICU Patients

**Central venous access**

**WARNING SIGNS**
- Low central venous oxygen saturation (ScvO₂)
- Elevated central venous pressure (CVP)

**SUGGESTION**
- Check SaO₂, cardiac output and hemoglobin
- Check right ventricular function

**ECG monitoring**

**WARNING SIGNS**
- Arrhythmia
- ST elevation
- Increase QT interval

**SUGGESTION**
- Check electrolytes and consider decreasing catecholamines
- Check ECG, troponin and contact cardiologist
- Perform 12-lead resting ECG and consider iatrogenicity, possibly decrease/stop QT-prolonging drugs

**Ultrasound evaluation**

**WARNING SIGNS**
- B lines
- Lung consolidation
- Lack of pleural sliding
- LV systolic dysfunction
- RV dilation
- Large inferior vena cava (IVC) respiratory variations
- Low VTI

**SUGGESTION**
- Caution with intravenous fluid administration, consider diuretics or ultrafiltration (if RRT)
- Consider antibiotics, chest physical therapy. Follow up examination may be used instead of frequent chest X-rays
- Consider further evaluation to rule out barotrauma pneumothorax in appropriate clinical settings
- Consider decreasing PEEP and inotropes
- Careful with PEEP, diuretics and ultrafiltration (if RRT) and consider fluid if shock
- Check right and left ventricular function and consider fluid or inotropes

**Respiratory monitoring**

**WARNING SIGNS**
- SpO₂ < 92%
- Tidal volume > 8 ml/kg
- Plateau pressure > 30 cm H₂O
- Elevated pulmonary artery occlusion pressure (PAOP)

**SUGGESTION**
- Consider increasing FiO₂ or PEEP and prone positioning
- Reduce tidal volume
- Consider reducing tidal volume and reducing PEEP
- Consider fluid restriction, diuretics or ultrafiltration (if RRT)
- Check right ventricular function
- Consider right and left ventricular function and consider fluid or inotropes
- Check SaO₂, cardiac output and hemoglobin

**Swan Ganz catheter**

**WARNING SIGNS**
- Elevated pulmonary artery pressure (PAP)
- Low cardiac output (CO)

**SUGGESTION**
- Check right and left ventricular function and consider fluid or inotropes
- Check cardiac function, fluid responsiveness and consider vasopressors, fluid, inotropes or decreasing PEEP
- Check fluid restriction, diuretics or ultrafiltration (if RRT)
- Low venous oxygen saturation (SvO₂)
- Check SaO₂, cardiac output and hemoglobin

**Arterial access**

**WARNING SIGNS**
- Hypoxemia
- Hypercapnia
- Hypotension
- Large pulse pressure variation (PPV)

**SUGGESTION**
- Consider increasing FiO₂ or PEEP and prone positioning
- Consider increasing tidal volume or respiratory frequency
- Check cardiac function, fluid responsiveness and consider vasopressors, fluid, inotropes or decreasing PEEP
- Careful with PEEP, diuretics and ultrafiltration (if RRT) and consider fluid if shock
- Check right and left ventricular function and consider fluid or inotropes
- Check fluid restriction, diuretics or ultrafiltration (if RRT)

**Neurology monitoring**

**WARNING SIGNS**
- Low level of consciousness index

**SUGGESTION**
- Consider decreasing sedation

NOTE: This is a selection of the most frequently used clinical variables by clinicians in the acute phase of this disease. This is not meant to be an exhaustive checklist.

References:

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