

Covid-19: Haemodynamic and Fluid Management

Rational

Intravenous fluid resuscitation is an important aspect of resuscitation of septic patients. The Nice guideline for IV fluids aims to guide prescribers to improve fluid administration and outcomes. Somehow, COVID-19 patients should follow this guidance with a few particularities related to the different stages of the disease progression (SSC 2020).

There is no direct evidence for the management of fluid for COVID-19 patients. Therefore, this guidance is based on indirect evidence from studies published on fluid management with patient with ARDS and others, recent reports in the literature from COVID19 patients and collective experience.

Most patients presenting early are haemodynamic stable and do not require resuscitation as such. Nevertheless, a meticulous fluid assessment is always required. Some patients presenting to ED are already dehydrated, as they have been unable to keep up with food and fluids at home. They will require an initial period of resuscitation; often accomplish with a few fluid challenges using balance crystalloid. Others, when signs of shock are present, may require further fluid and/or vasopressors.

Typically, Covid-19 patients present with signs of an increase of lung water as a result of viral inflammatory process mainly in the lung (viral pneumonitis). The radiological image shows multiple infiltrates and ground-glass areas, similar to classical ARDS. However, Covid-19 ARDS has an initial vascular and later alveolar element, making it fluid management a huge challenge. Whereas dry may end up developing MOF and wet precipitate acute hypoxia. Therefore, the aim is **euvolaemia**; strictly assessed daily by clinical signs, lab results and invasive monitoring in severe cases.

Oral intake is always preferable.- Encouraging oral fluid and nutrition is paramount. However, most patients are lethargic, as a result of their illness, and unable to see the urgency of oral intake.

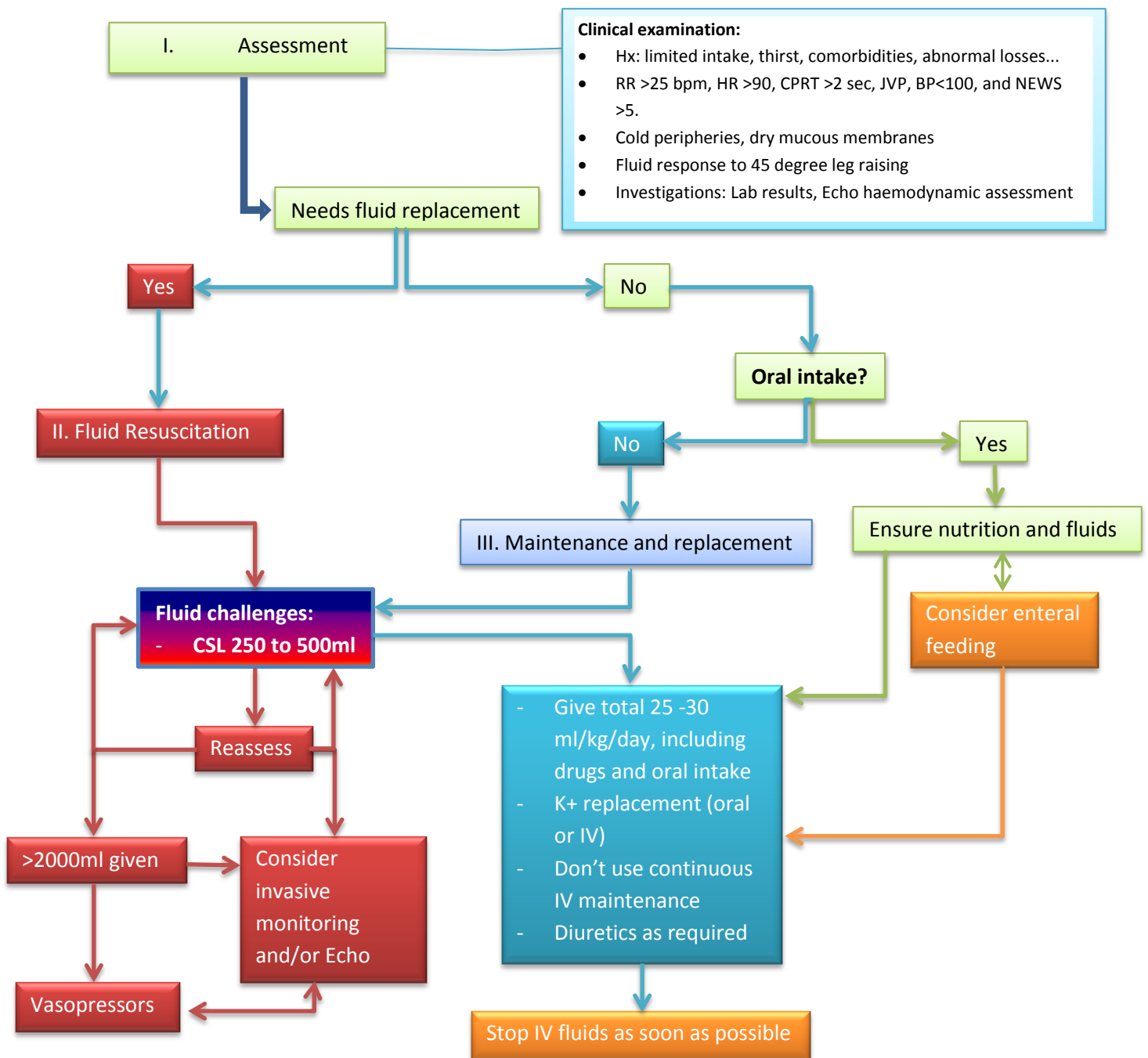
Intravenous fluids should not be administered continuously, as they may be accumulated in inflamed areas of the body, mainly in the lung. Fluid challenge should be the norm, as it may improve the haemodynamic response and this response can be rapidly assessed and likely avoids tissue waterlogged.

What fluids.- Crystalloid may be preferable, as there are no evidence colloids are any better. Blood and blood products may be required in severe cases.

Vasopressors (See vasopressor alternatives to NA guidance).- Inotropic and vasopressors should be used to limited large amounts of fluids in septic patients and maintain adequate perfusion. Maintain **euvolaemia** by frequent clinical assessment (ANDROMEDA SHOCK trial). Use cardiac flow monitoring whenever necessary. Haemodynamic Echo would be useful. PICCO values may be abnormal or difficult to interpret with high lung water results, even in those with low CO patients.

Target MAP >60-65. Ensure adequate peripheral perfusion and adequate urine output. Mentation is a must; although, these patients are languid, unquestioning their own distress!

IV fluid administration COVID-19



Monitoring daily fluid balance:

- Oral intake
- IV intake, including drugs
- Urine output
- Bowel motion
- Temperature: 15% fluid positive of total daily intake per °C above 37.5
- $BW \times 30 \times 15\% \times \text{number } ^\circ\text{C above } 37.5$. [e.g. 80 Kg x 30 ml/kg/day x 0.15 x 1 (38.5°C) = 360ml +ve]