

SOP: SafeBoosC-IIIv Treatment Guideline

Version	Author(s)	Date	Changes	Approved by
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Assessment of cerebral oxygen saturation

Regional cerebral tissue oxygen saturation (rStO₂) is a composite measure of tissue oxygen saturation across arterial, capillary, and venous beds and reflects a balance between cerebral oxygen delivery (CDO₂) and cerebral metabolic rate (CMRO₂). In infants, the CMRO₂ is unlikely to vary much and a change in rStO₂ largely reflects changes in CDO₂. The factors, which influence CDO₂ are arterial oxygen saturation (SaO₂), hemoglobin concentration ([Hb]), and cerebral blood flow (CBF).

Establishment of monitoring of cerebral oxygenation

Before, or as soon as possible and within 6 hours after invasive (endotracheal tube) mechanical ventilation has been initiated.

Period of monitoring of cerebral oxygenation

Until one of the following four scenarios occurs

1. The cardiopulmonary function has been stabilised as indicated by the need for respiratory and circulatory support and evaluated by the responsible physician.
2. The infant is extubated.
3. The infant reaches 28 days after birth.
4. The infant dies.

Recommendation for clinical interventions

The thresholds for intervention depends on the oximeter. If StO₂ is predominantly below the hypoxic threshold over a 10-minute period or drops acutely and markedly under the threshold, and there is no apparent reason for that according to the patient's clinical status (no other routine monitors reveal a potential clinical event) the sensor should be inspected for any potential displacement, and possibly be repositioned. If this does not solve the problem, a decision regarding intervention (modification of cardio-respiratory support) should be made (identified in '•') as listed below and StO₂ reassessed 30 to 60 minutes after the intervention. Generally, only one intervention should be chosen at a time. All the

interventions proposed here are commonly used in this patient group. The interventions listed below, are in a non-prioritized order.

Rationale/aim of interventions: A low $rStO_2$ reflects a low CDO_2 . The interventions should be directed to increasing CBF, blood haemoglobin concentration, or SaO_2 .

Assess cardiovascular status:

Blood pressure low in normal range, consider:

- Vasopressor-inotropes
- Fluid bolus (normal saline)
- Decrease mean airway pressure (MAP)

Poor systemic circulation, consider if:

Echocardiography shows low cardiac output and/or low SVC flow

- Inotropes
- Fluid bolus (normal saline)
- Decrease mean airway pressure (MAP)
- Reduce vasopressor

Echocardiography not available but has at least 2 of the following signs:

Lactate > 3.5 mmol/l

CRT > 3 seconds

Urine output < 1 ml/kg/hour

consider:

- Inotropes
- Fluid bolus (normal saline)
- Decrease mean airway pressure (MAP)
- Reduce vasopressor

Patent ductus arteriosus, consider:

- Medical treatment

Assess oxygen transport:

Hemoglobin low in the normal range, consider:

- Red blood cell transfusion

Assess respiratory status:

SaO₂ low in normal range, consider:

- Increase FiO₂ (ATTENTION: be careful not to exceed the local upper target threshold of SpO₂)
- Increase mean airway pressure (MAP)

PCO₂ below the normal range or low, even in normal range, consider:

- Decrease minute ventilation

Evidence

In the protocol, appendix A, the level of evidence and strength of recommendations for each intervention can be found.