SOP: NIRS device and sensor handling

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Introduction

This Standard Operating Procedure (SOP) is meant as a general guidance when beginning NIRS monitoring for a patient in the experimental arm of SafeBoosC-IIIv. For further instructions, we recommend going through the individual devices' instruction manuals. It is recommended to adjust this SOP for local circumstances (e.g. different devices and/or sensors), thereby creating a local procedure description for NIRS monitoring.

How to begin patient NIRS monitoring

NIRS monitoring must be started before, or as soon as possible and within six hours after initiation of invasive mechanical ventilation.

Procedure

1. Make sure the patient has been included in the SafeBoosC-IIIv trial and all relevant forms have been signed.
2. Verify the group allocation: experimental or control group.
3. Turn on the NIRS device and make sure the sensor is connected. All CE-marked devices where the appropriate intervention threshold has been defined (corresponding to a rStO2 value of 55% using the INVOS adult SomaSensor), can be used in this trial (See 'SOP: Hypoxic threshold for cerebral oximeters' on safeboosc.eu).
4. Enter new patient. Identification is not important.
5. Place probe on your own forearm. The device should give readings between 50% and 90%. If not:
    a. Check correct placement of sensor.
    b. Change sensor.
6. Position the sensor on the infant's head as described below.
7. 'START' NIRS monitoring

How to position the NIRS sensor on the infant's head

When using INVOS, or other devices with adhesive sensors, apply the adhesive side of the sensor on a clean surface, e.g. the inside of the packaging repeatedly, until the adhesive strength wears off.

Procedure

1. To ensure good contact, clean/degrease the skin using water. Ensure patient's skin is completely dry.
2. Check that the sensor is not defect. If it is, discard it immediately and take a new.
3. Select sensor site on the head. Aim for a site with as little hair as possible, as this can introduce inaccurate readings. Do not place the sensor over sinus cavities, the superior sagittal sinus, subdural or epidural haematomas or other anomalies such as arterio-venous malformations, as this may cause readings that are not reflective of brain tissue or no readings at all.
4. Ensure intact skin surface.
5. Apply sensor to the head so that the light source is facing towards the skin. The sensor should be fixed with a self-adhesive single use bandage or a (CPAP) cap.
6. Secure the cable to a fixed object to avoid strain on the sensor to skin interface.

CAUTION: TO AVOID PRESSURE SORES, KEEP THE EXTERNAL PRESSURE ON THE SENSOR TO A MINIMUM WHILE MAINTAINING SUFFICIENT SENSOR-SKIN CONTACT.

CAUTION: THE SENSOR IS NOT MRI COMPATIBLE.

How to change the position of the NIRS sensor

For extended monitoring, the sensor should be repositioned at a different location. For infants with scalp oedema or poor perfusion, this may be done often to avoid damage from heat and/or pressure. If possible, do it as part of the routine handling of the infant to disturb the infant as little as possible.

Procedure

1. Gently remove the sensor from the skin.
2. Carefully inspect the skin for any sensor related marks.
3. Apply the sensor on a different site according to the instructions above.

CAUTION: IF THE SENSOR IS DIFFICULT TO REMOVE, THE LOCAL PROTOCOL FOR PROTECTION OF THE INTEGRETY OF THE SKIN SHOULD BE FOLLOWED.