Oxygen Administration Guideline and Checklist

Best Practice Checklist

This document refers mainly to infants with birth weight < 1,750 grams < 32-34 weeks gestation and < 4-8 weeks of postnatal age, with the need for supplemental oxygen and with one or more of the following conditions:

**INDICATIONS FOR SUPPLEMENTAL OXYGEN:**
- Need for delivery room resuscitation
- Respiratory distress syndrome
- Air leak
- Pulmonary edema
- Pneumonia
- Atelectasis
- Chronic lung disease
- Other non-respiratory conditions: ________________

**EQUIPMENT:**
- Pulse Oximeter
- Utilize a pulse oximeter that will monitor through infant motion and low perfusion to minimize SpO2 false alarms and detect true SpO2 values
- Suggested Alarm and operational settings
  - Low SpO2 limit = 86%, high SpO2 limit = 93-94% (or up to 95% in larger VLBW infants)
- Sensor
  - Use appropriate adhesive sensor for patient size
  - Clean sensor site
  - Turn monitor on to ensure operational and confirm alarm and sensitivity settings
  - Connect sensor to patient cable, then to the patient, and begin monitoring
  - Whenever the sensor is to be moved, it should be disconnected from the cable, moved, and then reconnected to the cable
  - Sensor should only have power when it is connected to a patient
- Oxygen blender
  - Confirm readily available, operational and connected to a reliable oxygen and air source

**THERAPY, TITRATION AND MONITORING:**
- In all circumstances, aim to avoid hypoxia, hypoxia and periodic cycles of hyperoxia/hypoxia
- Based on current literature and evidence, targeted SpO2 for preterm infants receiving supplemental oxygen should be 87-89% as a minimum and 93-95% as maximum after about 10 minutes of life:
  - Aim to avoid SpO2 levels > 95% and < 87%
  - Infants > 32 weeks gestation SpO2 = target 87% - 95%
  - Infants ≤ 32 weeks gestation SpO2 = target 87% - 93%
- Based on current available evidence, hyperoxia must also be avoided during the first 10 minutes of life in the delivery room
- Use the SpO2 monitor and have available “guiding” parameters (see table)
- If the SpO2 is low, initiate oxygen at FiO2 of 30% and then titrate FiO2 according to SpO2 levels
- If the SpO2 is below the 10th percentile for postnatal age, the SpO2 should be increased until the SpO2 reaches at least the 10th percentile
- If there is no improvement in SpO2 or if the heart rate falls, recheck ventilation strategy and then increase FiO2 until SpO2 stabilizes between the 10th and 90th percentile
- If when providing oxygen in the delivery room SpO2 is > 90% percentile for postnatal age or > 92%, reduce the FiO2 until the SpO2 is < 90% percentile or < 92%

**ALARMS AND ASSESSMENTS:**
- Do not disable alarms
- Evaluate infant and pulse oximeter signal quality and perfusion index before changing FiO2

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**Guide for normal SpO2 during transition (10 first minutes of life)**

<table>
<thead>
<tr>
<th>Postnatal age (minutes)</th>
<th>SpO2 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>55-65</td>
</tr>
<tr>
<td>2</td>
<td>65-70</td>
</tr>
<tr>
<td>3</td>
<td>70-75</td>
</tr>
<tr>
<td>4</td>
<td>75-80</td>
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<tr>
<td>5</td>
<td>80-85</td>
</tr>
<tr>
<td>10</td>
<td>85-95</td>
</tr>
</tbody>
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Oxygen Management for Preterm Infants

- If SpO2 < 85-86%
  - Is the heart rate > 100bpm?
  - What are respiratory parameters (on respirator)?
- If SpO2 > 93-94%
  - Was FiO2 increased recently?
  - Was surfactant administered recently?
  - How low is the SpO2 and for what period of time has it been below acceptable values?

WEANING FiO2 TO TARGET SpO2 LEVELS

- In delivery room and during transport to NICU after 10 minutes of life, if SpO2 ≥ high lii Wean FiO2 as rapidly as possible, observing the changes in SpO2 (using a target range: 87% - 95%)
- In NICU, if SpO2 is high lii Gradually wean FiO2 incrementally by 2% - 5% at a time

DELIVERY, TRANS PORT, AND NICU

- Do not increase FiO2 to “pre-oxygenate”
- Adjust FiO2 in conjunction with:
  - Transient increase in positive end-expiratory pressure (PEEP)
  - Consider transient increase in ventilator rate
- Do not increase FiO2 as only action to avoid hypoxia in these situations
- If FiO2 was increased, do not leave FiO2 above baseline value

DURING PROCEDURES (I.E. AIRWAY SUC TIONING)

- Treat according to severity
- In general, use gentle tactile stimulation
- In general, the same FiO2 setting that the infant was receiving before the episode should be used during and after the episode to avoid significant hyperoxemia as soon as breathing resumes
- If infant not on ventilator, consider non-invasive ventilation or intubation if non-invasive ventilator is ineffectual
- If infant is on respirator: Increase respiratory rate, or if no response increase respiratory parameters

DURING APNEIC SPELLS AND SPONTANEOUS DESATURATIONS

- Charting
  - When infant and SpO2 are reliable at constant FiO2: record that FiO2 as the baseline
  - If infant is weaned, wait until SpO2 has stabilized in targeted range before leaving bedside and record new SpO2 reading and FiO2 setting
  - When a change is made, the change and reason for the change should be charted

DURATION OF OXYGEN MANAGEMENT:

- Continue until 4 to 8 weeks or longer after birth, depending on duration of oxygen therapy, gestational age at birth and retinal vascular maturity

REFERENCES USED TO MAKE THIS DOCUMENT (BY ALPHABETIC ORDER):

This Best Practice Checklist is based on current literature and available evidence. It is educational in nature and is not intended to replace practice guidelines or individual clinician preferences. Always consult the currently available guidelines and evidence prior to implementing any protocol or checklist into clinical practice.

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