PURPOSE:

Provide guidelines for weaning oxygen on patients in the NICU in an effort to lower the incidence of chronic lung disease and possibly lower the incidence of ROP.

INTRODUCTION:

Oxygen is a potent drug. The sigmoid shape of the oxygen dissociation curve proves that arterial oxygen values become elevated at higher saturation levels. In the VLBW (very low birth weight) preterm infant, many potentially significant adverse effects have been identified with the use of too much or too little oxygen. Although hypoxia is important to consider, oxidative stress and injury may occur as a result of hyperoxia. Repeated cycles of hypoxia and hyperoxia may result in significant alterations in the vascular tone in VLBW infants. The purpose of these guidelines is to avoid these episodes and therefore protect the developing vascular beds in various organs during Phase I.

PROCEDURE:

- Oxygen Saturations will be targeted based on the following chart:

<table>
<thead>
<tr>
<th>Birthweight &amp;/or Gestational Age at Birth</th>
<th>Target SpO2 from Birth (Phase I)</th>
<th>Target SpO2 at PMA of: (Phase II)</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Less than 1250 grams OR</td>
<td>87 to 90%</td>
<td>33 to 36 weeks: 90 to 94%</td>
</tr>
<tr>
<td>* Less than 29 weeks OR</td>
<td></td>
<td>36 weeks and above: 94 to 98%</td>
</tr>
<tr>
<td>* Less than 1250 grams AND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>between 29 to 32 6/7 weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>More than 1250 grams AND</td>
<td>90 to 94%</td>
<td></td>
</tr>
<tr>
<td>between 29 and 33 weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33 weeks and greater</td>
<td>94-98%</td>
<td></td>
</tr>
</tbody>
</table>

- Ranges will be re-written on cards that are easily visible at every patient's bedside during rounds every Monday morning.

- Oxygen will be weaned in increments of 1% to 3% to maintain target saturation range.
Monitor Alarm Limits:

Alarm limits should be set 2% below and 2% above the target range:

During PHASE I (<33 weeks PMA):
- Patients born prior to 29 weeks OR are < 1250 grams OR are < 1250 grams and <33 weeks: alarm limits 85 to 92%
- Patients >1250 grams AND are between 29 to 32 6/7 weeks: alarm limits 88 to 96%
- All patients born at 33 weeks gestation and greater: alarm limits 92-100%

During PHASE II (>33 weeks PMA):
- Patients 33 to 36 weeks PMA: alarm limits 88 to 96%
- All patients 36 weeks and above PMA OR all patients born at 33 weeks gestation and greater: alarm limits 92-100%
- Exception: If patient has a condition, such as congenital heart disease, the physician or NNP should order parameters that are appropriate for that disease.

EXCEPTION:
- If patient is on Room Air (21%), the upper alarm limit may be increased to 100%. If the patient has an increase in oxygen >21%, the alarm limits must be adjusted to meet the standards as seen on the above chart.

Monitoring and Documentation:

Increase or decrease the oxygen only in increments of 1% to 3%.
- Exceptions: Infant has a history of desaturations with handling and procedures; oxygen may be increased by 5% to 10% during these periods.
- Significant desaturations (persistently < 70%); increase the oxygen to double the baseline % to bring the patient saturation up to 85%. Once at >85%, wean oxygen to within 3% of baseline.
- AVOID exaggerated changes in the oxygen; small changes are safer than large changes.
- Do not continue to increase the oxygen without notifying the MD/NNP; changes in respiratory alarm parameters may be necessary.
- RN or RT is to remain at patient’s bedside until there is a return to baseline and saturations have stabilized.
• No patient should be left as stable if there has been a > 3% to 5% increase in oxygen.
• Inability to maintain oxygen saturations within goal range requires discussion among team members: MD, NNP, RN and RT.
• Pre-oxygenation is acceptable BUT only increase oxygen by 5% to 10% immediately before handling or procedure. On ventilated patient’s, use suction support breath to pre-oxygenate patient (and not 100% oxygen breath). Turn oxygen down as soon as possible.
• AVOID large changes in oxygen and saturations. Use other options rather than hand ventilation (provide manual breaths through ventilator and pre-oxygenate with only a 5% to 10% increase in delivered oxygen). Only use hand ventilation when essential. Resuscitation bags should have a blended oxygen source on patients with an artificial airway.
• Weaning Supplemental Oxygen via Nasal Cannula:
  Adjust oxygen down in gradual increments (1% to 3%) according to patient’s saturation on monitor (see chart below for how to respond to various alarms).
  • Flow: maintain L/min as order details; only adjust flow with an order from a MD/NNP.
    • As a rule of thumb, if flow in L/min equals or exceeds body weight in kg, the effective fraction of inspired oxygen will equal the set oxygen concentration.