ORI is a non-invasive and continuous parameter that provides information about the oxygenation in the moderate hyperoxic ("oxygen reserve") range:

\[ \text{PaO}_2 > 100 \text{ and } < \approx 200 \text{ mm Hg} \]
The Oxygen Reserve Index (ORI)

- The ORI is aimed for patients receiving supplemental oxygen (anesthesia, procedural sedation, ICU).
- The ORI may provide an advance warning of an impending hypoxic state, or an indication of an unintended hyperoxic state.
- ORI may enable proactive interventions to avoid hypoxia or unintended hyperoxia.
- ORI is an “index” with a unit-less scale between 0.00 and 1.00.
Example of ORI during intubation in a high-risk pediatric surgery

- Oxygen reserve starts to deplete
- ORI alarm sounds
- Patient is given extra oxygen prior to intubation
- SpO2 drops
- SpO2 alarms
- Additional FiO2 provided, and airway is established
The ORI makes pre-oxygenation visible!

Arterial oxygen saturation before intubation of the trachea: An assessment of oxygenation techniques
G. B. DRUMMOND and G. R. PARK

The incidence of oxygen desaturation during rapid sequence induction and intubation
Endale Gebregeziabher Gebremedhin, Desta Mesele, Derso Aemero, Ehtemariam Alemu

Airway management and oxygenation in obese patients
Caitriona Murphy, MD · David T. Wong, MD
Pre-oxygenation should be routine, as oxygen reserves are not always sufficient to cover the duration of intubation.

Predictive risk factors for inadequate pre-oxygenation share overlap with criteria predictive of difficult mask ventilation.
Noninvasive Ventilation Improves Preoxygenation before Intubation of Hypoxic Patients

Christophe Baillard, Jean-Philippe Fosse, Mustapha Sebbane, Gérald Chanques, François Vincent, Patricia Courouble, Yves Cohen, Jean-Jacques Eledjam, Frédéric Adnet, and Samir Jaber


### TABLE 2. BLOOD GASES VALUES AFTER PREOXYGENATION, 5 AND 30 MINUTES AFTER ENDOTRACHEAL INTUBATION

<table>
<thead>
<tr>
<th>Blood Gases</th>
<th>Control (n = 26)</th>
<th>NIV (n = 27)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>After preoxygenation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\text{Pa}_2\text{O}_3$, mm Hg</td>
<td>97 (66–163)</td>
<td>203 (116–276)</td>
<td>0.01*</td>
</tr>
<tr>
<td>5 min after ETI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\text{Pa}_2\text{O}_3$, mm Hg</td>
<td>124 (70–183)</td>
<td>160 (123–299)</td>
<td>0.03*</td>
</tr>
<tr>
<td>30 min after ETI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\text{Pa}_2\text{O}_3$, mmHg</td>
<td>137 (82–180)</td>
<td>151 (144–247)</td>
<td>0.01*</td>
</tr>
</tbody>
</table>
Suctioning: a review of current research recommendations

Tina Day, Sarah Farnell and Jenifer Wilson-Barnett

*Intensive and Critical Care Nursing* (2002) 18, 79–89

**Hyperoxygenation**

Suctioning may frequently lead to hypoxaemia, which can cause cardiac dysrhythmias (*Stone et al. 1991b*), hypotension (*Goodnough 1985*) and even cardiac arrest and death (*Wood 1998*). Strategies used to minimise these effects include hyperoxygenation or hyperinflation (*Wainwright & Gould 1996*).
**Example of ORI during intubation in a high-risk pediatric surgery**

- **ORI = early warning**
  - Oxygen reserve starts to deplete
  - ORI alarm sounds
  - Patient is given extra oxygen prior to intubation
  - Additional FiO₂ provided, and airway is established

- **SpO₂ = late warning**
  - SpO₂ drops
  - SpO₂ alarms

**Timeline:**
- 0 minutes: Room air
- 1 minute: 100% FiO₂
- 2 minutes: 30% FiO₂
- 7 minutes: Intubation
- 18 minutes: Reoxygenation (100% FiO₂)
S-377 - RELATIONSHIP BETWEEN OXYGEN RESERVE INDEX AND ARTERIAL PARTIAL PRESSURE OF OXYGEN DURING SURGERY

The combination of robust pulse oximetry and the ORI may enable

- better control of optimal oxygenation
- proactive interventions to avoid hypoxia or unintended hyperoxia