I. Subject:

Oxygen Therapy Protocol

II. Purpose:

To provide adequate oxygenation for patients, the respiratory care practitioner will utilize the following protocol to evaluate, treat, and monitor appropriate oxygen administration.

III. Patient Type:

All patients determined to meet oxygen therapy indicated as outlined in this protocol.

IV. Clinical Area:

All patient care areas.

V. Equipment Needed:

Pulse oximeter

VI. Lab Data Needed:

Recent ABG's and chest X-Ray

VII. Overview:

Oxygen Therapy order received
Assess patient
Select appropriate oxygen device
Re-evaluate

VIII. Protocol:

The following guidelines will be followed in determining the indications for oxygen therapy and for selection of appropriate oxygen therapy delivery devices.

A. Indications for oxygen therapy include:

1. Documented hypoxemia- PaO2 less than 60 mmHg or SpO2 less than 90%
2. in adults, or PaO2 less than 60 mmHg or SpO2 less than 90% in neonates.

3. An acute care situation associated with suspected tissue hypoxia (e.g. pulmonary edema, drug overdose, or carbon monoxide poisoning).

4. Clinical signs or symptoms of tissue hypoxia (e.g. tachycardia, tachypnea, dyspnea, cyanosis, diaphoresis, confusion or chest pain).

5. Acute myocardial infarction with continuing pain, arrhythmias, congestive heart failure.

6. Other medical emergency situations may include:
   a. Acute pulmonary disorders including-
      i. adult respiratory distress syndrome
      ii. acute pulmonary embolism
      iii. aspiration pneumonitis
      iv. near drowning
      v. acute asthma
      vi. acute exacerbation of COPD
      vii. acute pneumonia
      viii. acute bronchiolitis
      ix. newborn respiratory distress syndrome
   b. Other medical/surgical emergencies include:
      i. acute congestive heart failure
      ii. drug overdose
      iii. head and blunt chest trauma
      iv. hepatic failure
      v. acute pancreatitis
      vi. shock
      vii. post-seizure

B. Guidelines for selection of appropriate oxygen delivery devices: (estimated FiO2 delivery listed below is for adult patients)
1. High flow versus low flow oxygen therapy systems.
   a. High flow systems will provide adequate flow of oxygen to
      meet/exceed patients inspired flow rate needs.
   b. Low flow systems will only provide flow of oxygen to supplement
      the patient’s inspired flow rate needs.
   c. Criteria for use of a Low Flow System-
      i. VT: 300 to 700 ml
      ii. respiratory rate less than 25 bpm
      iii. regular ventilatory pattern
      iv. FIO2 less than 45%
   d. Criteria for use of a High Flow System-
      i. FIO2 greater than 45%
      ii. VT less than 300 ml
      iii. Evidence of alveolar hypoventilation with CO2 retention
   e. Respiratory rate greater than 25 bpm (adults)

2. Types of Low Flow Devices-
   a. Cannula
      i. Delivers FIO2 approximately 24% to 45%
      ii. Most appropriate initial device for COPD patients
   b. Simple Oxygen Mask
      i. Delivers FIO2 40 to 60%
   c. Partial Rebreather Mask
      i. Delivers FIO2 50-80%
3. Types of High Flow Devices -
   a. Non rebreather mask
      i. Delivers FIO2 70-85 to 95%+
   b. Venturi Mask
      i. Delivers FIO2 24 to 50%

4. Humidification -
   a. All low flow oxygen administration devices will require supplemental bubble humidifiers if flow exceeds 3 l/min.

C. Titration of FIO2:
   1. Observe oxygen saturation SpO₂ at least 90% (desired level may be higher or lower-see section on Special Considerations).
   2. Observe absence of clinical signs of symptoms of hypoxia.
   3. As long as SpO₂ is at least 90%, FIO₂ may be decreased by 5 to 10%.
   4. Continue to decrease FIO₂ in 10% increments allowing 15 to 30 minutes for stabilization, until a stable SpO₂ measurement of at least 90% is achieved.
   5. The patient may have their oxygen discontinued upon completion of this protocol if the following criteria are met:
      a. Able to maintain SpO₂ 90% or greater on room air.
      b. Stable vital signs.
D. Assessment of Outcome:

1. Absence of clinical signs of symptoms of hypoxia.
   a. SpO2 is greater than or equal to 90% or PaO2 ≥ 60 in adults, SpO2 ≥ 90% or PaO2 ≥ 60 in neonates.
   b. Respiratory rate less than or equal to 30 (adults).
   c. Heart rate less than or equal to 120 BPM (adults).
   d. Mucosal color pink.
   e. Patients sensorium normal to improved.

2. Absence of acute episode associated with tissue hypoxia.
   a. Pulmonary edema resolved.
   b. Carboxyhemoglobin within normal limits.
   c. Improved Chest X-Ray.

IX. Special Considerations:

A. In patients with documented or suspected chronic CO2 retention, the acceptable range for oxygen saturation SpO2 is 88% to 90%.

B. Neonatal SpO2 should be targeted between 90%-95%.

X. Guidelines/Warnings:

Monitor patient’s vital signs and evaluate patient’s clinical status. Do not continue titration process if patient develops-

1. A pulse greater than 120 bpm, or if adjustment of FIO2 results in pulse increase of 20 bpm (adults).
2. Significant EKG change, e.g. onset of arrhythmias or ischemic morphology.
3. A change in sensorium occurs, e.g. confusion, lethargy, etc.

4. A respiratory rate greater than or equal to 30 (adults).

5. Clinical signs and symptoms of hypoxia.

*Note- If patient is not tolerating FIO2 titration process, return patient to previous FIO2 setting, reassess patient, and continue as tolerated. If FIO2 is greater than 50% is required, or FIO2 must be increased by more than 20% contact physician and consider rapid response alert.

XI. Clinical Responsibilities:

A. Initiation of oxygen therapy will be performed following assessment of indications and upon the written order of a physician. Oxygen therapy may be initiated by respiratory therapy or nursing personnel as part of an approved treatment protocol or in the case of a clinical emergency in which hypoxia is suspected.

B. Changes in FIO2 will be adjusted by respiratory care practitioner or other qualified nursing service personnel.

C. All oxygen titrations should be documented and communicated to the nurse in charge of the patient.

C. If, during the titration period, the patient exhibits persistent difficulty in maintaining acceptable SpO2 of 90% or greater, the respiratory care practitioner will place the patient back on their last FIO2 setting which met the criteria for acceptable SpO2 or PaO2.

REFERENCES


REFERENCES (continued)