



# Prince Sultan Military Medical City

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Departmental Policy	Dept.: Intensive Care Services	Policy No: 1-2-9451-03-016 Version No: 03		
Title: High Flow Nasal Cannula System for Adult (HFNCS)		JCI Code: COP		
Supersedes: 1-2-9451-03-016 Version No: 02; 23 June 2019	Issue Date: 31 May 2023	Effective Date: 21 May 2023	Revision Date: 20 May 2026	Page 1 of 6

### 1. INTRODUCTION

The High Flow Nasal Cannula (HFNC) oxygen therapy is carried out using an air/oxygen blender, active humidifier, single heated tube, and nasal cannula. Able to deliver adequately heated and humidified medical gas at flows up to 60 L/min. The HFNC membrane technology delivers molecular vapours with nearly 100% relative humidity at a set temperature from 33° C to 43° C. This warmth and humidity expands option to include nasal and tracheal delivery of gas flow rates of up to 60 l/m, to decreases the discomfort or damage to airway epithelia. The HFNC support is to maintain adequate oxygenation.

### 2. PURPOSE

To establish safe practices and standards that will ensure delivery of quality of care with the high flow nasal cannula system.

### 3. APPLICABILITY

To all health care practitioners (HCP) who provide direct care to patients receiving HFNC, i.e. physicians, nurses, and respiratory care practitioners (RCP's).

### 4. POLICY

- 4.1 The order of HFNCS must be by Intensive Care Services (ICS) or Emergency Room (ER) physician only.
- 4.2 If HFNC initiated by ER physician, once patient care transferred to primary team, the primary team should activate code green, so that ICS Rapid Response Team (RRT) can follow the patient.

### 5. PROCEDURES

#### 5.1. Acceptable criteria for high flow oxygen therapy are:

- 5.1.1. An arterial blood gas sample on venturi mask or non-rebreather mask that show signs of hypoxemia (PaO<sub>2</sub> below 60 mmHg, or below the normal range for that particular patient).
- 5.1.2. An arterial saturation SaO<sub>2</sub> on venturi mask or non-rebreather mask below or equal to 92%.
- 5.1.3. Patient shows any signs of respiratory distress (e.g., increased work of breathing, retractions of chest wall, tachypnea, nasal flaring, using accessory muscles, etc.).



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### 5.1.4. Medical emergencies where symptoms are evident:

- 5.1.4.1 Tissue hypoxia may be reasonably expected to be part of the problem due to shock, pulmonary edema, or drug overdose.
- 5.1.4.2 Physical symptoms of tissue hypoxia (e.g., increased work of breathing, cyanosis, tachycardia, confusion, etc.)
- 5.1.4.3 Prophylactic use in-patients with symptoms, which indicate pending hypoxemia (e.g., suspected myocardial infarction).

### 5.2. Advantage:

- 5.2.1. Correct hypoxemia includes hypoxic respiratory failure, exacerbation of COPD, post-extubation & pre-intubation oxygenation and acute heart failure.
- 5.2.2. Reduced anatomical dead space, constant FIO<sub>2</sub>, and good humidification.
- 5.2.3. Carbon dioxide washout (reduced anatomical dead space).
- 5.2.4. Provides low positive end expiratory pressure effect.
- 5.2.5. Comfort due to similarity of humidified, warmed air to physiologic conditions of the airway.
- 5.2.6. Leaves mouth free for talking, eating, or coughing.

### 5.3. Disadvantages:

- 5.3.1 Potential discomfort due to high flow and relatively hot air sensation.
- 5.3.2 Not immediately available.
- 5.3.3 Aerosol-generating procedure that can potentially increase the risk of viral transmission.

### 5.4. Standards for high flow oxygen therapy are:

- 5.4.1. When oxygen is ordered for a patient as therapeutically or prophylactically, the indication should be documented as per arterial blood gas or vital signs.
- 5.5. High Flow Oxygen will be started after receiving the ICS/ER physician order.



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- 5.6. Documentation of the time of initiation of therapy, evaluation of the patient's hypoxemia via arterial blood gases, pulse oximetry saturation, signs of cyanosis, pulse rate, respiratory rate, oxygen flow rate and FiO<sub>2</sub>.
- 5.7. The patient's cardiopulmonary status should be evaluated at least three times per shift to determine the dosage of oxygen required.
- 5.8. Patients receiving oxygen therapy to treat hypoxemia should not be removed from oxygen without documentation of their ability to maintain an adequate PaO<sub>2</sub> above 60 mmHg or SaO<sub>2</sub> of 88% & above or as pre-ICS physician order.
- 5.9. Only sterile distilled water (sterile water, USP) will be used.
- 5.10. Oxygen delivery devices (HFNC) may be removed from patient's room after at least 72 hours of discontinuation.
- 5.11. **Instituting High Flow Oxygen Therapy:**

5.11.1. Collect the appropriate equipment, which fit in patient's room.

- 5.11.1.1 An air/oxygen blender (vapotherm)
- 5.11.1.2 An Oxygen blender (inspierd)
- 5.11.1.3 An Oxygen flowmeter (Airvo)

5.11.2. Properly identify the patient as per the PSMMC patient identification policy.

5.11.3. Review patient's medical history.

5.11.4. Wash hands and using appropriate PPE's as per Infection control approved policy.

5.11.5. Enter patient's room; introduce yourself to the patient and the purpose of the visit.

5.11.6. Explain prescribed therapy to the patient, oxygen safety and hazards.

5.11.7. Connect the oxygen into wall outlet and plug into electrical outlet with UPS.

5.11.8. Assemble the circuit.

5.11.9. Turn the unit on and check that all the display indicators are functioning.

5.11.10 Allow to warm



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5.11.11. Set the  $\text{FiO}_2$ , temperature, and flow (for adult maximum flow rate 60 l/m).

5.11.11.1  $\text{FIO}_2$  range can be adjusted from 0.21 to 1.0, which generates up to 60 L/min flow.

5.11.11.2 The gas is heated and humidified through an active heated *humidifier* and delivered via a *single-limb* heated inspiratory circuit.

5.11.11.3 The patient breathes the adequately heated and humidified medical gas through *nasal cannulas* with a large diameter.

5.11.12 Assure proper function of equipment.

5.11.13 Apply oxygen delivery device to the patient.

5.11.14 Monitor patient's heart rate, respiratory rate, work of breathing and note any change in oxygen saturation.

5.11.15 Remove PPE and Perform hand hygiene before leaving the patient's room.

5.11.16 Complete appropriate documentation

### 5.12. Monitoring High Flow Oxygen Therapy

- 5.12.1. Properly identify the patient as per the PSMMC patient identification policy.
- 5.12.2. Wash hands and using appropriate PPE's.
- 5.12.3. Enter patient's room; introduce yourself to the patient and the purpose of the visit.
- 5.12.4. Assess the patient's vital signs to determine respiratory rate, pulse rate, saturation and cyanotic state
- 5.12.5. Assess appearance and patency of nasal passage
- 5.12.6. Check equipment for proper function, humidification fluid level, proper  $\text{FiO}_2$  or flow rate and proper fit on patient
- 5.12.7. Remove PPE and Perform hand hygiene before leaving the patient's room
- 5.12.8. Complete appropriate documentation

### 5.13. Weaning Considerations:

5.13.1.  $\text{FiO}_2$  should always be weaned first.

5.13.2. When desired  $\text{FiO}_2$  is achieved and physician's order allows wean flow as tolerated

### 5.14. Discontinuing Oxygen Therapy

- 5.14.1. Criteria to consider for discontinuation of high flow delivery system
  - 5.13.1.1 Minimum  $\text{FiO}_2$  40% or less achieved and: (Flow rate is < 40 l/m for adult patients).
  - 5.13.1.2 In the presence of nasal thermal injury
- 5.14.2. Explain the discontinuing the therapy to the patient
- 5.14.3. Place on appropriate alternative oxygen device.



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- 5.14.4. Discard all disposable equipment
- 5.14.5. Remove all oxygen therapy equipment from the patient room
- 5.14.6. Clean heating unit and disinfect and/or between each patient use
- 5.14.7. Complete appropriate documentation.

## 6. REFERENCES

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**7. ORIGINATING DEPARTMENT/S**

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