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Document Title: Policy and Procedure of Oxygen via Non- Rebreathing Mask

Approval Process

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Acronyms:

ABG	Arterial Blood Gas
ASAP	As Soon As Possible
DOB	Date of Birth
FIO2	Fraction of Inspired Oxygen
LPM	Liters per Minute
NRB	Non Rebreathing Mask
O2	Oxygen
PaCO2	Partial pressure of carbon dioxide in arterial blood
PaO2	Partial pressure of oxygen in arterial blood;
PIFR	Peak Inspiratory Flow Rate
SaO2	Percentage of oxygen saturation of arterial blood
SpO2	Percentage of oxygen saturation of arterial blood (measured by pulse oximetry)

Policy and Procedure of Oxygen via Non- Rebreathing Mask

1. Introduction

Non-rebreathing masks (NRM) are similar to partial-rebreathing masks but do not permit the mixing of exhaled gases with the fresh gas supply. The non-rebreather mask covers both the nose and mouth of the patient and attaches with the use of an elastic cord around the patient's head. The NRM has an attached reservoir bag, typically one liter that connects to an external oxygen tank or Bulk Oxygen Supply system. Before an NRB is placed on the patient, the reservoir bag is inflated to greater than two-thirds full of oxygen, at a rate of 15 liters per minute (minimum of 10 Lpm to prevent rebreathing). Approximately ⅓ of the air from the reservoir is depleted as the patient inhales, and it is then replaced by the flow from the O2 supply. If the bag becomes completely deflated, the patient will no longer have a source of air to breathe.

A series of one-way valves, one has unidirectional inspiration valve and two unidirectional expiration valves. The one-way valve over the reservoir bag prevents entry of expired gas, and the one-way valve on the side of the mask allow exhaled air to escape freely and limits entrainment of room air. As the victim breathes, he or she inhales oxygen from the bag. This design provides a higher FIO2 than the simple and partial-rebreathing masks. Non-rebreathing masks are used to deliver concentrations > or = 0.60 or specific concentrations (as from a blender). The delivered oxygen concentration is variable and will depend on the mask fit and the patient's breathing pattern.

The non-rebreathing oxygen mask is best utilized in acute cardiopulmonary emergencies where a high FiO2 is necessary such as cardiac arrest, shock, sepsis, pulmonary embolus, trauma and emergency in whom carbon dioxide retention is unlikely etc.

2. Scope

This policy is applicable to all Respiratory Therapist and Nurses in all health care institutions of the Ministry of Health.

3. Purpose

3.1 To ensure that all patients requiring supplemental Oxygen therapy receives therapy that is appropriate to their clinical condition

3.2 To facilitate the correct use of Non-rebreathing masks in the delivery of higher concentrations of oxygen.

3.3 To provide a standardize direction in the delivery of high oxygen concentration via face mask in an acute emergency.

4. Definitions

4.1 High flow: High flow systems are specific devices that deliver the patient's entire ventilatory demand, meeting, or exceeding the patients Peak Inspiratory Flow Rate (PIFR), thereby providing an accurate FiO2. Where the total flow delivered to the patient meets or exceeds their Peak Inspiratory Flow Rate the FiO2 delivered to the patient will be accurate.

4.2 Peak Inspiratory Flow Rate (PIFR): the fastest flow rate of air during inspiration, measured in liters per second

4.3 Humidification: is the addition of heat and moisture to a gas. The amount of water vapor that a gas can carry increases with temperature.

4.4 Hypercapnia: Increased amounts of carbon dioxide in the blood.

4.5 Hypoxemia: Low arterial oxygen tension (in the blood.)

4.6 Hypoxia: Low oxygen level at the tissues.

5. Policy

5.1 Oxygen shall be administered by staff who are trained in oxygen administration that knows the use of appropriate devices and flow rates in order to achieve the target saturation range

5.2 The written physician's order should include 100% O2 by non- rebreathing mask. In the absence of a complete order, Non-Rebreathing Mask therapy will be administered only in an emergency. The order shall be secured ASAP after emergency administration has occurred. Otherwise, the complete order shall be secured before therapy can be administered.

5.3 Non-rebreathing masks (with oxygen reservoir bags) shall be used cautiously by experienced medical staff and with an appropriately high oxygen flow of 10–15 L/minute

5.4 Respiratory Care Services provides equipment and therapy according to physician's orders for patients requiring supplemental oxygen to maintain adequate blood levels of oxygen.

5.5 The reservoir bag needs to be inflated prior to placing on the patients face to ensure the highest concentration of oxygen is delivered to the patient

5.6 The flow rate from the wall to the mask shall be adequate to maintain a fully inflated reservoir bag during the whole respiratory cycle (i.e. inspiration and expiration).

5.7 Non-rebreathing face mask are not designed to allow added humidification.

6. Procedure

6.1 Equipment:

6.1.1 O2 Flow-meter or cylinder regulator

6.1.2 Non- Rebreathing Mask with reservoir bag and complete valves (Adult or Pediatric)

6.1.3 Connecting tubing

6.1.4 Oxygen Nipple Adapter

6.1.5 Oxygen Source (via Cylinder or wall outlet)

6.2 Contraindications:

Non-Rebreathing Mask may be contraindicated:

6.2.1 In patients that are chronic CO2 retainers.

6.2.2 For patients with facial injuries.

6.2.3 For patients who will not leave mask in place.

6.2.4 For patients experiencing adverse psychological effects of mask therapy.

6.3 Method:

6.3.1 Read the patient's order sheet for the physician's specific instructions. Verify the patient's name, day of birth (DOB), and bed location.

6.3.2 Obtain the necessary equipment from the Respiratory Therapy equipment room and proceed to the patient's nursing unit.

6.3.3 Proceed to the patient's bed, introduce yourself, and explain what you are about to do and that it has been ordered by the patient's doctor. Check the patient's

name and DOB verbally and by the patient's wristband. Be reassuring. Make sure there is no ignition material at the patient's bedside.

6.3.4 Wash your hands.

6.3.5 Connect the flow meter to the oxygen source. Attach the connecting tube and NRM mask.

6.3.6 Set the oxygen flow rate to 12-15 l/minute. Occlude the valve between the mask and the oxygen reservoir bag using the finger and check if the reservoir bag is filling up. Remove the finger.

6.3.7 Squeeze the oxygen reservoir bag to check the patency of the valve between the mask and the reservoir bag. If the valve is working correctly it will be possible to empty the reservoir bag. If the reservoir bag does not empty, discard it and select another mask.

6.3.8 Again, occlude the valve between the mask and the oxygen reservoir bag and allow the reservoir bag to fill up.

6.3.9 Place the mask with a filled oxygen reservoir bag on the patient's face, ensuring a tight fit. Adjust the mask on the patient's face for maximum comfort and security.

6.3.10 Adjust the oxygen flow rate until it is sufficient to ensure that the reservoir bag deflates by approximately one-third with each breath. The bag must not completely collapse with any inspiration

6.3.11 The oxygen flow rate must be increase until there is some degree of bag inflation through each respiratory cycle.

6.3.12 Reassure the patient, who may need time to become accustomed to the mask.

6.3.13 Monitor the patient's vital signs closely. Assess the response to the oxygen therapy, checking respiratory rate, mechanics of breathing, color, oxygen saturation levels and consciousness. Usually, arterial blood gas will also be monitored.

6.3.14 Observe the initial effects of the treatment and make any necessary adjustments.

6.3.15 Discontinue or reduce the oxygen concentration as appropriate following advice from a suitably qualified practitioner. (secure physician's order to replace mask with nasal cannula during meal)

6.3.16 If the equipment is on stand-by status the oxygen delivery appliance must be placed in a plastic set up bag

6.3.17 Charge the patient for the equipment used and for the appropriate oxygen hourly usage.(for Private Institutions)

7. Responsibilities

7.1 Respiratory Therapists are responsible for:

7.1.1 Assessing patients, initiate and monitor oxygen delivery systems, recommends changes in therapy and discontinuation of the therapy.

7.1.2 Educating patients and family members in the safe use of oxygen therapy equipment preventing dangerous incidents or events.

7.1.3 Regular observations and detection of potential or existing problems to determine the effectiveness of oxygen therapy.

7.1.4 Document the settings of any equipment being used and your observations related to the client's condition.

7.2 Doctor or Physician is responsible for:

7.2.1 Evaluating the patients need for oxygen and writes a specific order for oxygen therapy with the appropriate settings.

7.2.2 Monitoring results of arterial blood gases (ABGs) to assess improvement in a patient's condition or needing discontinuation of therapy.

7.3 Nursing Staff is responsible for:

7.3.1 Informing the patient and their relatives regarding the procedure and the necessary precautions.

7.3.2 Initiating, monitoring changes in therapy and discontinues oxygen therapy if RT is unavailable by following doctor's order of the flow as prescribed.

7.3.3 Checking and documenting of devices if being used appropriately.

7.3.4 Assessment of physiologic parameters (measurement of PaO2s or saturation) in any patient treated with oxygen

7.3.5 Notifying a physician immediately if any signs of respiratory difficulty or distress occur

8. Document History and Version Control

Document History and Version Control			
Version	**Description of Amendment**	**Author**	**Review Date**
01	Initial Release	Respiratory Care Services Team	May/2024
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Respiratory Care Services Team	Khalsa Al Siyabi Haifaa Mohammed Al Saadi	Dr. Kadhim Sulaiman

9. Related Documents:

There is no related document for this policy

10. References:

Title of book/ journal/ articles/ Website	Author	Year of publication	Page
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