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	Effective Date:	03-31-2022
	Document Type:	Standard Operating Procedure
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	Department/Section:	Respiratory Therapy Services
	Document Title:	BILEVEL POSITIVE AIRWAY PRESSURE (BiPAP)

PURPOSE:

To outline the steps in attaching patient to Bilevel Positive Airway Pressure (BiPAP) machine.

SCOPE:


Applies to all Respiratory Therapy Services staff of Dr. Pablo O. Torre Memorial Hospital

PERSON RESPONSIBLE:

Respiratory Therapist, Nurses, Physicians

GENERAL GUIDELINES:

1. The policy on 2 patient identifiers should be practiced prior to the procedure.
2. Hand washing should be observed.
3. Always check the parameters ordered by the physician before the procedure is performed.
4. Provide patient education to gain patient's cooperation. The following may be discussed:
 - 4.1. **What is BiPAP?** – stands for Bilevel positive airway pressure. It uses an electronic circuit to monitor the patient's breathing, unlike continuous positive airway pressure (CPAP) and provides two different pressures, a higher one during inhalation (IPAP) and a lower pressure during exhalation (EPAP). With the development of BiPAP, air delivered through a mask can be set at one pressure for inhaling and another for exhaling. This makes BiPAP much easier for users to adapt to and also allows neuromuscular disease sufferers to use the device. Because of these dual settings, BiPAP allows people to get more air in and out of the lungs without the natural muscular effort needed to do so.

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4.2. COMMON PROBLEMS WITH BIPAP


- 4.2.1. **Snoring-** The pressure may be too high or too low on the machine. Mouth breathers may need a full facemask. Weight gain may also increase snoring.
- 4.2.2. **Mouth Opening-** this difficulty can be solved by using a full facemask or using a chinstrap.
- 4.2.3. **Mask Leaks-** generally caused by a poor fitting of the mask. Over time, the mask will begin to age and mask leakage is an indication that a new mask is needed.
- 4.2.4. **Nose Bleeds-** usually results from extreme dryness and should not persist more than two days. If persistent, contact the attending physician.
- 4.2.5. **Nasal Dryness-** BiPAP units blow air into the airway and dryness can occur. Heated humidification added to the unit can fix the problem. By increasing the heat on the humidifier, the humidity will be increased.
- 4.2.6. **Skin Irritation-** an effect to a new mask or problems with pressure on your face from a mask of BiPAP needs to be communicated to the equipment company first and if they cannot help, contact the attending physician.

5. BI-LEVEL PRESSURE DEVICES

- 5.1. **BiPAP** (Bilevel Positive Airway Pressure) provides two levels of pressure:
 - a) Inspiratory Positive Airway Pressure (IPAP)
 - b) Lower Expiratory Positive Airway Pressure (EPAP) for easier exhalation.

6. Modes

- 6.1. **S (Spontaneous)-** in spontaneous mode the device triggers IPAP when flow sensors detect spontaneous inspiratory effort and then cycles back to EPAP.
- 6.2. **T (Timed)-** in timed mode the IPAP/EPAP cycling is purely machine-triggered, at a set rate, typically expressed in breaths per minute (BPM).
- 6.3. **S/T (Spontaneous/Timed) -** like spontaneous mode, the device triggers to IPAP on patient inspiratory effort. But in spontaneous/timed mode a

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"backup" rate is also set to ensure that patients still receive a minimum number of breaths per minute if they fail to breathe spontaneously.

7. Components

- 7.1. **Flow generator** (PAP machine) provides the airflow
- 7.2. **Hose** connects the flow generator (sometimes via an in-line humidifier) to the interface
- 7.3. **Interface** (nasal or full face mask, nasal pillows, or less commonly a lip-seal mouthpiece) provides the connection to the user's airway

8. Optional features

- 8.1. **Humidifier-** adds moisture to the air
- 8.2. **Heated-** heated water chamber that can increase patient comfort by eliminating the dryness of the compressed air. The temperature can usually be adjusted or turned off to act as a passive humidifier if desired. In general, a heated humidifier is either integrated into the unit or has a separate power source (i.e. plug).
- 8.3. **Passive-** air is blown through an unheated water chamber and is dependent on ambient air temperature. It is not as effective as the heated humidifier described above, but still can increase patient comfort by eliminating the dryness of the compressed air. In general, a passive humidifier is a separate unit and does not have a power source.
- 8.4. **Ramp-** is used to temporarily lower the pressure to allow the user to fall asleep more easily. The pressure gradually rises to the prescribed level over a period of time that can be adjusted by the patient and/or the (DME) Durable Medical Equipment provider.
- 8.5. **Exhalation pressure relief-** Gives a short drop in pressure during exhalation to reduce the effort required
- 8.6. **Flexible chin straps-** are used to help the patient not breathe through the mouth, thereby keeping a closed pressure system. The straps are elastic enough that the patient can easily open his mouth if he feels that he needs to.

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9. Procedure may vary depending on the make and model of the BiPAP machine used. The current model being used in the department are Philips Respironics CPAP/BiPAP Machine models A30/A40.

PROCEDURE:

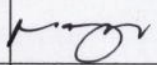

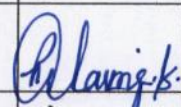

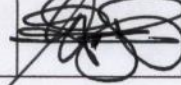
1. Review the patient's chart as to the diagnosis, doctor's order, and manner of BiPAP.
2. Take note of the prescribed BiPAP pressure and FiO₂.
3. Introduce yourself to the patient and inform that he/she will be attached to a BiPAP machine which will help him/her to breath easier. Reassure the patient and try to gain his/her confidence and trust.
4. Assess patient and initiate high flow oxygen as indicated.
5. Monitor pulse oximetry as indicated.
6. Apply BiPAP if oxygen saturation < 90% on high flow oxygen via (NRB) Non-Rebreathing Bag mask.
7. Connect BiPAP device to suitable oxygen supply.
8. Attach breathing circuit to BiPAP device and ensure device is functioning properly.
9. Apply and secure appropriate size breathing circuit mask to patient. The mask required to deliver CPAP must have a tight seal, and should hold on very firmly.
10. Titrate positive airway pressure up until improvement in patient pulse oximetry and symptoms.
11. Reassess the patient.
12. The whole procedure takes 1 hour to finish.


REFERENCE:

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APPROVAL:

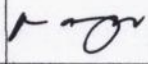

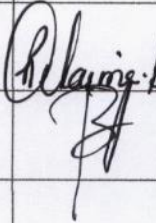
	Name/Title	Signature	Date
Prepared by:	SHIRLEY B. MALAGA, RMT, RTRP RTS Supervisor		3.7.2022
Reviewed:	DENNIS C. ESCALONA, MN, FPCHA, FPSQua Quality Assurance Supervisor		3-7-2022
Recommending Approval:	ROSARIO D. ABARING, RN, MN, PhD, FPCHA Ancillary Services Division Officer		3.7.2022
	HENRY F. ALAVAREN, MD, FPSMID, FPSQua Total Quality Division Officer		3/7/2022
Approved:	GENESIS GOLDI D. GOLINGAN President and CEO		3/17/22

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KEY TASKS	PERSON RESPONSIBLE
1. Reviews the patient's chart as to the diagnosis, doctor's order, and manner of BiPAP.	RTS Staff
2. Takes note of the prescribed BiPAP pressure and FiO ₂ .	
3. Assesses patient and initiate high flow oxygen as indicated.	
4. Monitors pulse oximetry as indicated	
5. Applies BiPAP if oxygen saturation < 90% on high flow oxygen via (NRB) Non- Rebreathing Bag mask.	
6. Reassesses the patient.	

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APPROVAL:

	Name/Title	Signature	Date
Prepared by:	SHIRLEY B. MALAGA, RMT, RTRP RTS Supervisor		7-6-2022
Reviewed:	DENNIS C. ESCALONA, MN, FPCHA, FPSQua Quality Assurance Supervisor		24-06-2022
Recommending Approval:	ROSARIO D. ABARING, RN, MN, PhD, FPCHA Ancillary Services Division Officer		07.06.2022
	FREDERIC IVAN L. TING, MD OIC- Total Quality Division		7/6/22
Approved:	GENESIS GOLDI D. GOLINGAN President and CEO		

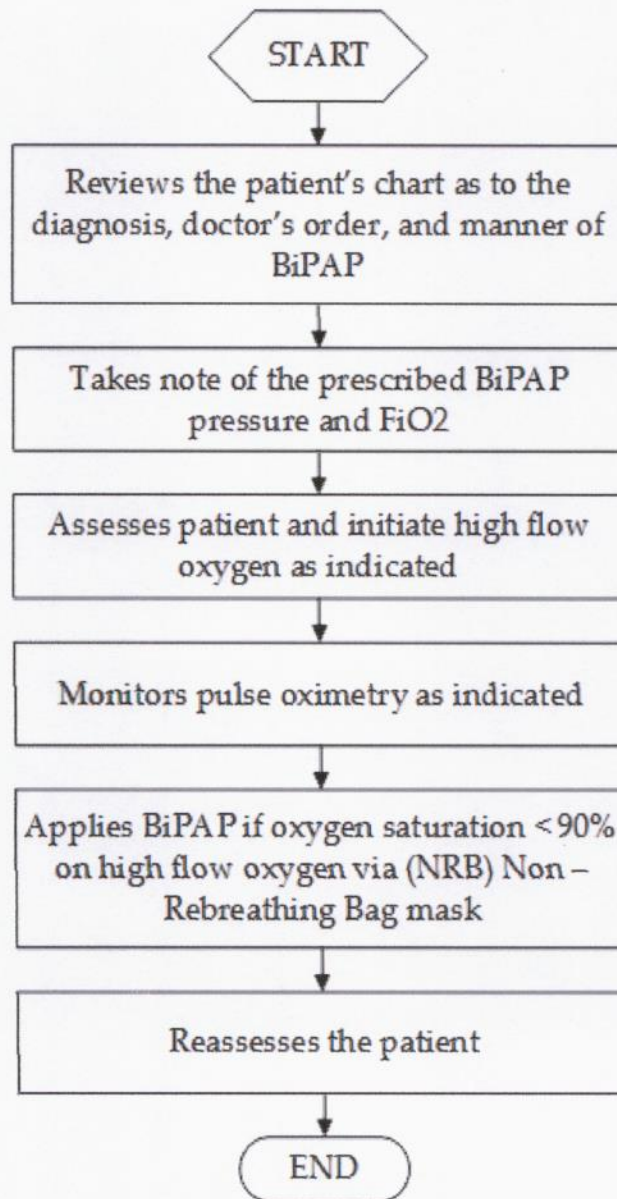



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Negros Occidental,
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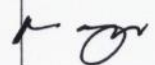

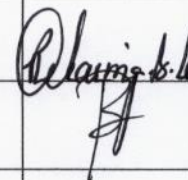
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FLOWCHART



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APPROVAL:

	Name/Title	Signature	Date
Prepared by:	SHIRLEY B. MALAGA, RMT, RTRP RTS Supervisor		7.6.2022
Reviewed:	DENNIS C. ESCALONA, MN, FPCHA, FPSQua Quality Assurance Supervisor		07-06-2022
Recommending Approval:	ROSARIO D. ABARING, MAN, PhD Ancillary Division Officer		07.06.2022
	FREDERIC IVAN L. TING, MD OIC-Total Quality Division		7/8/22
Approved:	GENESIS GOLDI D. GOLINGAN President and CEO		