

<b>POSTOPERATIVE REMOTE MONITORING OF ADULT SURGICAL CLIENTS WITH KNOWN OR SUSPECTED OBSTRUCTIVE SLEEP APNEA (OSA)</b>	<b>Patient Care</b>  <b>220-PC-016</b>
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<b>Office of Administrative Responsibility</b>	Surgery Program
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## Overview

This policy speaks to implementation of remote pulse oximetry and capnography monitoring in the Surgery Program.

Obstructive sleep apnea (OSA) is a sleep disorder that is caused by repetitive partial or complete upper airway obstruction. OSA places the client at increased risk of post-operative apnea and desaturation related to sedation, anaesthesia, and postoperative analgesia.

Postoperative clients identified as high risk for respiratory complications are ordered **continuous monitoring** for the immediate postoperative period. Continuous monitoring is provided by a registered nurse (RN) or respiratory therapist (RT), either directly in the same physical location, or remotely via remote pulse oximetry and capnography.

## POLICY

Clients ordered postoperative continuous monitoring for OSA require either:

- RN/RT in the client's room at all times, *or*
- Continuous remote pulse oximetry and capnography.

## Scope

Physicians, registered nurses (RN within the Surgery Program), and respiratory therapists (RT) working within Regional Surgical Services.

## Purpose

To provide direction for the pilot implementation of remote pulse oximetry and capnography monitoring.

To reduce the risk of adverse outcomes in surgical clients with known or suspected OSA, who receive sedation, analgesia or anaesthesia.

## Procedure

The patient care facilitator (PCF) or designate determines availability of equipment for remote monitoring.

If equipment for remote monitoring is unavailable:

- (a) The PCF/designate checks with another facility for availability of equipment.
- (b) Refer to policy 220-PC-015, *Management of Adult Surgical Clients with Known or Suspected Obstructive Sleep Apnea (OSA)*.

### Post-Operatively

1. Clients are discharged after **one** hour to an inpatient unit, with remote monitoring if:
  - Post-anaesthesia care unit (PACU) discharge criteria are met.
  - Client maintains SpO<sub>2</sub> above 92%, or as otherwise ordered by a physician.
  - No periods of sleep apnea noted.
  - Adequate pain control with the prescribed analgesia.
  - Written orders for oxygen, continuous pulse oximetry, and capnography monitoring that includes:
    - Remote monitoring for a minimum of 12 hours: Must continue overnight on the day of surgery.
    - Administration of oxygen to maintain SpO<sub>2</sub> greater than or equal to 92%, except when pre-hospital SpO<sub>2</sub> is less than 92%, or as otherwise ordered by a physician.
2. RT/RN is notified of anticipated time of transfer to inpatient unit.
  - (a) Any client who requires continuous SpO<sub>2</sub> apnea monitoring is connected to the capnography monitor.

- (b) See **Attachment A** for remote monitoring guidelines.
- (c) RT assessment is required, at minimum, every 4 hours.
- (d) Once continuous SpO<sub>2</sub>/capnography monitoring is discontinued, the bedside monitor is removed from the client's room and disinfected, as per manufacturer's guidelines (see **Attachment B**).

**NOTE: A monitor does not replace nursing assessment, nor does it replace routine or close surveillance.**

## Guideline

See Attachment A.

## Supporting Documents *(References, Industry Best Practice, Legislation, etc.)*

- Chung, S.A., Yuan, H., & Chung, F. (2008). A systematic review of obstructive sleep apnea and its implications for anesthesiologists. *Ambulatory Anesthesiology*, 107(5), 1543-1563.
- Power-Murrin, M. (2008). Report on the perioperative management of patients with diagnosed or suspected obstructive sleep apnea.

## Linkages

- Assessment & Monitoring of Clients in Surgical Day Care: 260-SDC-20
- Assessment & Monitoring of Clients in the Post-Anaesthesia Care Unit: 260-PACU-40
- Continuous Pulse Oximetry: 204(NUR)-12-100
- Discharge Criteria (PACU): 260-PACU-80
- Discharge Criteria - Surgical Day Care: 260-SDC-220
- Hand Hygiene: IPC-150
- Management of Adult Surgical Clients with Known or Suspected Obstructive Sleep Apnea (OSA): 220-PC-015
- Management of BiPAP/CPAP Units in Acute Care: PRC-090
- Pre-Admission Clinic Visit: 260-PAC-10
- Personal Protective Equipment: IPC-190
- Routine Practices: IPC-200

## Key Words

obstructive sleep apnea, remote monitoring, sleep apnea, end tidal carbon dioxide

## Definitions & Acronyms

<b>capnography</b>	the non-invasive, continuous measurement of CO <sub>2</sub> concentration in the airway
<b>continuous monitoring</b>	the provision of continuous oxygen saturation monitoring, either remotely or directly, by a registered nurse or a respiratory therapist
<b>ETCO<sub>2</sub></b>	end tidal carbon dioxide
<b>MCP</b>	medical care plan
<b>obstructive sleep apnea (OSA)</b>	sleep disorder caused by repetitive partial or complete upper airway obstruction. It may be treated by the use of CPAP/NIV in the community.
<b>OR</b>	operating room
<b>PACU</b>	post-anaesthesia care unit
<b>PCF</b>	patient care facilitator
<b>primary nurse</b>	nurse assigned to the client who is ordered continuous capnography/SpO <sub>2</sub> monitoring
<b>RN</b>	registered nurse
<b>RT</b>	respiratory therapist
<b>secondary nurse</b>	nurse who is assigned as backup RN to primary nurse
<b>SpO<sub>2</sub></b>	pulse oximeter oxygen saturation

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## Attachment A

### Remote Monitoring Guidelines

1. Remote monitoring equipment is **NOT** to go outside the Surgery Program.

Units within the Surgery Program are:

- 4NB General Surgery/Plastics/Burns, HSC
- 5NA Orthopedics, HSC
- 5SB Urology, HSC
- 5SB Neurosurgery, HSC
- 6 West Orthopedics, SCMH
- 6 East General Surgery/Thoracic, SCMH
- 5 East Vascular Surgery, SCMH
- 4 East Head & Neck, SCMH

2. When **not in use** the monitors, supplies and cellular telephones are stored:

HSC

- (a) PCF office on Urology 5SB
- (b) Room 5271 on Orthopedics 5NA

SCMH

- (a) Equipment storage Room 6182 on Orthopedics 6 West

**\*\*There is a sign-out book at each site location. Equipment must be signed out.**

**If there is no available equipment on site, check for availability at the other site.**

3. Prior to transfer of the client:
  - (a) The assigned PACU RN **notifies** the accepting unit RN.
  - (b) The assigned Unit RN (primary nurse) ensures **setup** of the remote monitoring equipment.
4. The primary and secondary nurse:
  - (a) Configure the client information to their cellular telephone:
    - At the beginning of their shift
    - At each break period
    - Receipt of a new client assignment
    - Change in a client's room or bed space; and
    - Synchronized to the capnography equipment.

**NOTE: Nurses enter client information using a Medical Care Plan (MCP) number.**

- (b) Ensure the cellular telephone has a minimum of 50% battery life. Replace cellular telephone once the battery life reaches 25%.
5. Ensure **ALL** monitors are plugged into the **RED** emergency outlets while in use.
- \*\* Any offline messages, network errors, loss of network, or loss of power ARE reported immediately to Biomed on call. \*\***
- \*\*If unable to remotely monitor, revert back to 1:2 nursing as per policy 220-PC-015: Management of Adult Surgical Clients with Known or Suspected Obstructive Sleep Apnea (OSA) \*\***
6. Continuous pulse oximetry alarm is set on the client monitor at 92, unless otherwise ordered by anaesthesiologist or designate.
- End tidal CO<sub>2</sub> (ETCO<sub>2</sub>) alarm is set on the client monitor as ordered by anaesthesiologist or designate.
7. Any alarm on the primary nurse's cellular telephone requires **prompt** assessment and resolution **at the bedside**. Failure to do so results in an alarm being sent to backup (secondary nurse). If the alarm is not addressed, the message is sent back to the primary nurse.

#### Alarm Management

##### **RED Alarms - Critical/Life Threatening** (*example*: severe apneic period)

The primary nurse has 20 seconds to intervene or resolve the alarm at the bedside, or the alarm is escalated to the secondary nurse.

##### **YELLOW Alarms - Warning Alarms** (*example*: low SpO<sub>2</sub>; high respirations)

The primary nurse has 20 seconds to intervene or resolve the alarm at the bedside, or the alarm is escalated to the secondary nurse.

##### **GREEN Alarms - Advisory Alarms** (*example*: SpO<sub>2</sub> probe off)

The primary nurse has 30 seconds to intervene or resolve the alarm at the bedside, or the alarm is escalated to the secondary nurse.

8. If ETCO<sub>2</sub> cannot be monitored effectively due to the patient wearing an OSA therapy device, *i.e.*, CPAP mask, then continuous pulse oximetry is maintained.

Physician is informed that the patient's OSA therapy device is interfering with the ETCO<sub>2</sub> monitoring. Once the OSA therapy device is taken off the patient, ETCO<sub>2</sub> monitoring is re-initiated.

9. Documentation includes:
  - Respiratory rate, oxygen saturation, sedation level and end tidal CO<sub>2</sub> every hour.
  - Respiratory assessment with auscultation every four hours.
  - Apneic periods.
  - Desaturation and client's ability to arouse himself/herself.
  - High priority alarms requiring intervention (*example*: administration of oxygen for low SpO<sub>2</sub>). **Physician also notified.**
  - Vital signs: blood pressure, pulse and temperature monitored and documented at a minimum of every four hours, and more frequently if needed.
  - Print a record from client monitor every 12 hours, and place under progress note section of the client chart.
  
10. Once continuous SpO<sub>2</sub>/capnography monitoring is discontinued, the bedside monitor is removed from the client's room and disinfected, as per manufacturer's guidelines (see **Attachment B**).
  
11. Monitor is returned to designated storage area. Ensure:
  - The monitor and telephone are plugged in; *and*
  - Document on the sign-in book.

## Attachment B

# Capnostream 20p Bedside Capnography Monitor

### ***Cleaning and Disinfection Instructions***

To clean the monitor's surfaces, dampen a cloth with a commercial, non-abrasive cleaner and wipe the top, bottom, and front surfaces lightly.

#### **Recommended Solutions:**

- 70% Isopropyl Alcohol
- Quaternary Ammonium Compounds
- Quaternary ammonium compounds in combination with polyhexanide
- Glucoprotamin
- PDI Sani-System
- 10% chlorine bleach solution

**WARNING:** Do not autoclave or sterilize this device.

**CAUTION:** Do not spray or pour any liquid directly on the monitor, accessories or consumables.

**CAUTION:** Do not use caustic or abrasive cleaners, or harsh solvents, including petroleum-based or acetone solutions, to clean the device.

**CAUTION:** Microstream® ETCO<sub>2</sub> consumables are designed for single patient use and are not to be reprocessed.

**CAUTION:** If a 1:10 bleach dilution (0.5% to 1% Sodium Hypochlorite solution) in the form of wipes is used to disinfect external surfaces of the monitor, exposure of the connectors and the display to the bleach solution should be avoided. Repeated cleaning with bleach over time may cause discoloration and residue on the surfaces.

**To ensure accurate performance and prevent device failure, do not expose the monitoring system to extreme moisture, such as direct exposure to rain. Such exposure may cause inaccurate performance or device failure.**

For sensors, follow cleaning instructions in the instructions for use shipped with those components. Before attempting to clean a Nellcor™ pulse oximetry sensor, read the *Instructions for Use* enclosed with the sensor. Each sensor model has cleaning instructions specific to that sensor. Follow the pulse oximetry sensor cleaning and disinfecting procedures in the particular sensor's *Instructions for Use*. Avoid spilling liquid on the monitoring system, especially in connector areas, but if a spill occurs, clean and thoroughly dry the monitoring system before reuse. If in doubt about monitoring system safety, refer the monitoring system to a qualified service technician for examination.

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