Procedural Sedation (Adult)

Site Applicability

Procedural sedation as described in this document is restricted to the following clinical areas:

PHC & BC Cancer:

- Emergency Departments
- Bronchoscopy suites
- Cardiac Interventional units
- Critical Care units
- Delia Tetrault Procedure Rooms (MSJ)
- Endoscopy suites
- Interventional Radiology
- BC Cancer Surgical Suites

Practice Level

RN	Specialized skill. Additional Education required
RT	Basic Skill. (Ensuring adequacy of airway, breathing, SpO_2 and waveform capnography)

Requirements

Informed consent must be obtained and documented by a physician as per the PHC Consent to Health Care Policy or PHSA Consent to Health Care Policy prior to procedural sedation occurring.

A physician must be immediately accessible on site during procedural sedation, while the patient is sedated, and until the patient meets Discharge or Transfer from Procedure Clinic / Area criteria (see Appendix A).

Clinicians able to provide definitive airway management (including endotracheal intubation) and advanced cardiac life support (ACLS) and must be immediately available to respond to patients undergoing procedural sedation. This may include clinicians involved with performing procedural sedation or an on-site code blue team.

Need to Know

- Procedural sedation is a process where medications are titrated to improve patient comfort, and reduce anxiety to facilitate the performance of a procedure, while the patient remains conscious and responsive. Procedural sedation is an adjunct to effective local and/or topical anesthesia.

- The endpoint of sedation is tailored for each individual based upon the urgency and nature of the procedure, and individual patient characteristics.

- Medications employed for procedural sedation can rapidly affect the patient's airway, breathing, and cardiovascular status adversely.

- Patients at higher risk for adverse events during procedural sedation include those where there is:
    a. known difficult airway, shared airway (when the procedure involves or affects the airway)
    b. multiple co-morbidities
    c. underlying cardiorespiratory disease
    d. prone positioning
    e. polypharmacy
    f. advanced age
    g. Increased body mass index (BMI)

- When planning for procedural sedation the urgency of the procedure is balanced against the risk of aspiration.

- Procedures are immediately suspended if patient has any adverse event (including but not limited to, compromised airway or circulation) in order to focus on patient safety.

- All reasonable efforts must be made prior to commencing a procedure to ensure the patient undergoing procedural sedation has a responsible adult to accompany them home. A responsible adult not being available to accompany the patient home post procedure will result in:
    - Cancellation of a planned procedure; or
    - An adequate period of observation until the patient meets discharge criteria (see Appendix A), and has returned to baseline cognitive and functional status as determined by the physician.
    - A further 1 hour period of observation prior to discharge is required for patients who received unintended deep sedation or an unintended period of general anesthesia.
    - Patients must be instructed not to drive home. Provide patients with a taxi voucher if necessary.

Equipment and Supplies

Required at the Bedside

- Bag valve mask
- Oral airways
- Nasal airways
- Supplemental oxygen
- Oxygen delivery devices (e.g. nasal prongs, face mask) that permit simultaneous waveform capnography
- Oral suction
- Blood pressure monitor
- SpO_2 monitor
- ECG monitor when required (see monitoring)
- Medications required for procedure
- Establish End Tidal CO_2 monitoring:
  - When deep sedation is a probable or planned outcome
  - When moderate or dissociative sedation is a probable or planned outcome
  - For any patient with ASA III classification or greater
  - For any patient with a BMI greater than 35 kg/m^2
  - For any patient whose respiratory status may be difficult to assess due to draping or positioning.
  - For any patient otherwise identified as being at increased risk of adverse events during PSA

Immediately Available

These items must be immediately available and staff must know how to access:

- Appropriate reversal agents for medications used during the procedure including:
  - naloxone if opiates will be administered
  - flumazenil if benzodiazepines will be administered
- Definitive airway and ACLS supplies and equipment, including defibrillator and ACLS medications (this can include equipment and supplies that are brought with the activation of an on-site code blue).

Protocol

Pre Procedure

1. Verify:
    - Informed consent has been obtained and documented by a physician;
    - Allergies have been assessed and documented;
    - The patient's American Society of Anesthesiology (ASA) score has been documented by a physician;
    - Required orders are signed
    - Patient height and weight have been documented.
    - Patient has a responsible adult to accompany them home post procedure
    - Identify any special precautions (e.g. isolation requirements).
2. Complete pre-procedure documentation on the Patient Preparation PowerForm- Perioperative Pre-Procedure Checklist or Pre-Procedure section of iView; or paper equivalent as per unit process. This includes time and type of last intake of food or drink.
    - Notify the physician if patient does not meet fasting requirements required for procedure (see Appendix B).
    - Notify physician if the patient has taken or received any medications with respiratory or central nervous depressing effects in the past 24 hours.
    - Notify physician if there is documented:
        - Difficult airway or bag valve mask fit concerns, or history of obstructive sleep apnea
        - History of cardiovascular disease
        - History of previous adverse reactions to sedatives, opioids, or general anesthesia
3. Perform a respiratory and cardiovascular assessment.
4. Obtain baseline vital signs including SpO_2.
5. Obtain a capillary blood glucose reading from patients with a history of diabetes or pre-diabetes and notify physician if blood glucose is below 4 mmol/L or above 10 mmol/L.
6. Ensure patent IV access.
7. Ensure patient understands the procedure and the instructions on how to respond to stimulation (verbal response or 'thumbs up')

Required Clinicians:

A minimum of **2** to **3** clinicians are required to perform procedural sedation:

1. A Physician to perform the procedure and order medications.
    i. The physician performing the procedure CANNOT be responsible for patient monitoring or medication administration.

2. A qualified RN or physician must be designated to monitor airway patency, adequacy of ventilation, vital signs, and administer medications.

i. The designated clinician(s) monitoring the patient and administering medication must have no other responsibilities during and after the procedure that will compromise their ability to continuously monitor the patient.

ii. The responsibility for patient monitoring may be transferred to another qualified clinician, if necessary provided the transfer of care includes clear communication of relevant patient information

iii. A RT may be responsible for monitoring airway patency, adequacy of ventilation, SpO_2, and waveform capnography.

3. Additional clinicians as required to assist with the procedure.

Prior to Administration of Sedation:

With all team members present, the entire team will conduct a **time out** and:

- Introduce themselves and their roles
- Verify the patient's identity using at least two unique identifiers
- Confirm the informed consent is completed and verify it matches the scheduled / planned procedure
- Ensure the procedure site is marked as by the Surgical Site Identification Policy and Surgical and Procedural Safety Checklist (S-PSCL) / Surgical Safety Checklist Policy (BC Cancer)
- Ensure any allergies are communicated to the team
- Discuss patient specific safety concerns (e.g. difficult airway, co-morbidities, recent food intake)
- Identify planned depth of sedation and ensure required medications are available
- Verbalize backup plan in case of emergency (e.g. administration of reversal agents, calling a code blue)
- Ensure required equipment, including emergency equipment is present and functioning
- Ensure required monitoring is initiated.
- Ask, "are we ready to proceed with sedation?"

See Appendix C: Pre-Procedural Sedation Checklist or follow area specific checklist (e.g. Cerner content or other Procedural Safety Checklist)

During Procedure: Required Monitoring and Frequency

Monitoring equipment alarms must be on during entire procedure and recovery period, and must be appropriately adjusted for individual patients.

Monitoring	Required For	Frequency During Procedure	Post Procedure	
			Frequency Until Criteria Met to Discharge from 1:1 Monitoring[1]	Frequency Until Criteria Met for Discharge from Procedural Sedation Clinic/Area
Level of Consciousness *Ability to respond to verbal stimulation or give "thumbs up"* **Depth of Sedation** *Alert physician if patient enters **anesthesia or unplanned deep sedation.*** **Airway Patency** *Alert physician if patient snoring, gurgling, or other evidence of an inadequate or obstructed airway is present.* **Respiratory Rate** *Alert physician if respiratory rate is below **8 breaths per minute.*** **Heart Rate and Blood Pressure**	All Patients	• Before and after medication administration • Q 5 min • PRN	• Q 15 min • PRN	• Q 15 min x 2 then Q 30 min until discharge criteria from procedural sedation area met (return to baseline in Critical Care) • PRN • Prior to discharge from procedural sedation clinic/area
SpO_2 *Maintain SpO_2 equal to or above 94% or patient's baseline. Alert physician if SpO_2 **cannot be maintained despite supplemental oxygen.*** **Waveform Capnography** (when used) *Notify physician if evidence of inadequate ventilation including respiratory rate **below 8 breaths per minutes and/or $EtCO_2$ 50 mmHg or greater.***		Continuous (Document Q 5 min)	Continuous (Document Q 15 min)	
ECG Monitoring	• History of cardiovascular disease • ASA Score 3 or greater	Continuous when required	Continuous when required	
Assess pain and nausea, response to medication	All Patients	After medication administration, PRN	PRN	Prior to discharge from procedural sedation clinic/area

[1]Can occur in any suitable clinical area, including but not limited to a recovery area

Post Procedure

Before the patient leaves the procedure area:

- Verify the name of the procedure
- Verify specimen have been labelled correctly including two unique patient identifiers
- Determine if there was an adverse event during the procedure that requires Patient Safety Learning System (PSLS/SLS) documentation (see Evaluation)
- Determine if there were there any equipment problems that need to be addressed
- Determine if there are they key concerns for recovery and monitoring of the patient
- Determine the appropriate immediate disposition for the patient

See Appendix D: Procedural Sedation Debrief or follow area specific checklist

Patients must be monitored as above (post procedure monitoring) until:

- Discharge from 1:1 monitoring criteria are met (see Appendix A)
- Patients may be discharged or transferred from the procedure clinic / area when the criteria Discharge or Transfer from Procedure Clinic / Area (see Appendix A) are met

Documentation

Complete documentation in the Procedural Sedation band in iView/SAAnesthesia/Perioperative IntraopRecord/MacLab or paper documents as appropriate for your area. Include:

- Pain assessment
- Pre-sedation monitoring
- Procedural sedation medication administered (Cerner sites note this does not automatically populate the MAR in Cerner, that must be done separately)
- Procedural sedation and analgesia monitoring
- Post sedation monitoring

Ensure all medications administered are documented on the MAR/eMAR following the procedure.

Document discharge teaching and educational resources provided.

Patient and Family Education

Prior to discharge, appropriate verbal and written instructions must be given to the patient and guardian / responsible adult, including procedure specific instructions (e.g.: Emergency Department Procedural Sedation and Analgesia (PSA)).

Evaluation

A Safety Learning System (SLS) report must be completed for any adverse event occurring during procedural sedation including:

- Use of reversal agent including naloxone or flumazenil
- Patient enters a state of general anesthesia
- Bag-valve mask ventilation
- Endotracheal intubation
- Use of resuscitative or ACLS drugs
  (e.g. amiodarone, atropine, epinephrine, phenylephrine, norepinephrine)
- CPR
- Prolonged recovery period greater than 3 hours
- Unplanned admission to hospital as a direct result of procedural sedation

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Definitions

Anxiolysis/ Light sedation is a drug-induced state during which patients respond normally to verbal commands. Although cognitive function and physical coordination may be impaired, airway reflexes, and ventilatory and cardiovascular functions are unaffected.

Capnography: refers to the noninvasive measurement of the partial pressure of carbon dioxide (CO_2) in exhaled breath expressed as the CO_2concentration over time. The relationship of CO_2 concentration to time is graphically represented by the CO_2 waveform, or capnogram. Capnography can rapidly detect the common adverse airway and respiratory events associated with procedural sedation and analgesia (PSA), including: respiratory depression, apnea, upper airway obstruction, laryngospasm, and bronchospasm. Respiratory depression caused by oversedation will manifest an abnormally high or low $EtCO_2$ well before pulse oximetry detects a falling oxyhemoglobin saturation, especially in patients receiving supplemental oxygen.

Deep Sedation: is a drug-induced depression of consciousness during which patients cannot be easily aroused but respond purposefully* following repeated or painful stimulation. The ability to independently maintain ventilatory function may be impaired. Patients may require assistance in maintaining a patent airway, and spontaneous ventilation may be inadequate. Cardiovascular function is usually maintained.

Difficult Airway: A difficult airway is defined as the clinical situation in which a conventionally trained anesthesiologist experiences difficulty with facemask ventilation of the upper airway, difficulty with tracheal intubation, or both.

Dissociative Sedation: is a separate category from the other levels of sedation, and is caused by ketamine. Dissociative sedation is a trance like cataleptic state characterized by profound analgesia and amnesia, with retention of airway reflexes, and spontaneous respirations, and cardiopulmonary stability.

General Anesthesia: is a drug-induced loss of consciousness during which patients are not arousable, even by painful stimulation. The ability to independently maintain ventilatory function is often impaired. Patients often require assistance in maintaining a patent airway, and positive pressure ventilation may be required because of depressed spontaneous ventilation or drug-induced depression of neuromuscular function. Cardiovascular function may be impaired.

Moderate sedation: is a drug-induced depression of consciousness during which patients respond purposefully* to verbal commands, either alone or accompanied by light tactile stimulation. No interventions are required to maintain a patent airway, and spontaneous ventilation is adequate. Cardiovascular function is usually maintained.

Sedation is a continuum, and it is not always possible to maintain patients at a pre-determined sedation depth.

* Reflex withdrawal from a painful stimulus is NOT considered a purposeful response.

Appendix A Discharge Criteria (Recovery Scoring)

Criteria for Discontinuing from One to One monitoring

- Modified Aldrete score for **Respirations** must be **2**; AND
- Modified Aldrete score for **Oxygen Saturation** must be **1 or greater;** AND
- **Total** Modified Aldrete score must be **8 or greater.**

Criteria for Discharge or Transfer from Procedure Clinic / Area

- 30 minutes after the last dose of sedation or analgesia is given; AND
- 120 minutes after the last dose of IV reversal agent administered (if given); AND
- **Total** Modified Aldrete score must be **10;** AND
- Nausea and Vomiting must be acceptable to patient; AND
- Pain must be acceptable to patient; AND
- Dressing/operative site is dry or requires extra padding but marked and not increasing; hematoma present but not growing. Indication of potential internal bleeding absent.

Modified Aldrete Scale

Category	Criteria	Point Value
Respirations	Able to deep breath and cough freely	2
	Dyspnea or limited breathing	1
	Apneic	0
Oxygenation	Able to maintain SpO_2 greater than 92% on room air	2
	Requires supplemental oxygen to maintain SpO_2 greater than 90%	1
	SpO_2 below 90% even with supplemental oxygen	0
Circulation	Blood pressure +/- 20mmHg pre-procedure value	2
	Blood pressure +/- 20mmHg to 50mmHg pre-procedure value	1
	Blood pressure +/- greater than 50mmHg of pre-procedure value	0
Level of Consciousness	Awake and oriented	2
	Wakens with stimulation	1
	Not responding	0
Movement	Moves 4 limbs on own	2
	Moves 2 limbs on own	1
	Moves 0 limbs on own	0

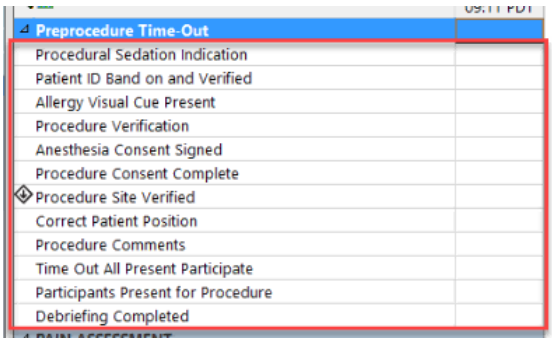
Appendix B Fasting Guidelines

Type of Food	Minimum Fasting Duration
Meat, fried or fatty foods	8 hours
Light meal (such as toast and a clear fluid); or Infant formula; or Non-human milk	6 hours
Breast milk (no additions allowed to pumped breast milk)	4 hours
Clear Fluids	2 hours

Appendix C Pre-Procedure Checklist (example)

- Complete prior to administration of sedation, with entire team present.
- Any team member may initiate checklist.

- ☐ Team introduces themselves and role
- ☐ Verify correct patient using two unique identifiers
- ☐ Informed consent is completed and matches scheduled / planned procedure
- ☐ Procedure site marked if required
- ☐ State any known allergies
- ☐ State any patient specific safety concerns including:
  - Difficult airway
  - Co-morbidities
  - Recent food intake
- ☐ Identify planned depth of sedation
- ☐ Required medications are available
- ☐ Verbalize backup plan in case of emergency
- ☐ Required equipment, including emergency equipment, is present and functioning
- ☐ Required monitoring is initiated
  - SpO_2
  - Wave form Capnography ($EtCO_2$)
  - Heart Rate and Blood Pressure
  - ECG monitoring; if history of cardiovascular disease or ASA score 3 or greater
- ☐ Are we ready to proceed with sedation?



Appendix D Procedural Sedation De-Brief

Before the patient leaves the procedure area:

- □ Verify the name of the procedure
- □ Verify specimens have been labelled correctly including two unique patient identifiers
- □ Determine if there an adverse event during the procedure that requires Patient Safety Learning System (PSLS/SLS) documentation including:
  - Use of reversal agent including naloxone or flumazenil
  - State of general anesthesia is entered
  - Bag-valve mask ventilation
  - Endotracheal intubation
  - Use of resuscitative or ACLS drugs (e.g. amiodarone, atropine, epinephrine, phenylephrine, norepinephrine)
  - CPR
  - Prolonged recovery period greater than 3 hours
  - Unplanned admission to hospital as a direct result of procedural sedation
- □ Determine if there were there any equipment problems that need to be addressed
- □ Determine key concerns for recovery and monitoring of the patient
- □ Determine the appropriate immediate disposition for the patient

Persons/ Groups Consulted

Program Director Emergency and Access Services PHC

Corporate Director, Quality, Patient Safety, Risk Management, Patient Relations & Infection Prevention and Control

Professional Practice Leader –Respiratory Therapy

Regional Gastroenterology Physician Group

PHC ED Physician Group

VCH Department Head Anesthesia, PHC Department Head Anesthesia

Nurse Educators: Emergency Department, Cardiac Interventional Suite, GI Endoscopy, Interventional Radiology

BC Cancer Surgical Services

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