Learning Package

Paediatric Nitrous Oxide Sedation

Sites where Learning package applies	Emergency departments, paediatric wards and ambulatory care areas within HNELHD
Description	This learning package is part of an advanced skills training program which allows nurses to administer nitrous oxide to paediatric patients within HNELHD.
Target audience	Nursing staff working in emergency departments, paediatric wards and paediatric ambulatory care areas.
Learning Outcomes, On completion of this package you will be better able to:	1. Understand the principles of paediatric procedural sedation 2. Discuss the safety requirements of nitrous oxide delivery, including patient selection, equipment, monitoring and assessment 3. Describe the remaining credentialing process for administering Nitrous Oxide sedation.

Keywords	Nitrous oxide, paediatric, sedation
Document registration number	LP2018:11
Replaces existing document?	yes

Related Legislation, Australian Standard, NSW Ministry of Health Policy Directive or Guideline, National Safety and Quality Health Service Standard (NSQHSS) and/or other, HNE Health Document, Professional Guideline, Code of Practice or Ethics:

- JHH, JHCH Local Guideline and Procedure JHH_JHCH_0126: Nitrous oxide procedural sedation in paediatrics
- JHCH Local Guideline and Procedure JHCH 13.3 Safe Administration of Medications in JHCH
- JHCH Policy Compliance Procedure JHCH PCP 3.19 Recognition of the Deteriorating Paediatric Patient
- NSW Health Policy Directive PD2010_034 Children and Adolescents - Guidelines for Care in Acute Care Settings
- NSW Health Policy Directive PD2005_406 Consent to Medical Treatment - Patient Information
- NSW Health Policy Directive PD2009_060 Clinical Handover - Standard Key Principles
- NSW Health Policy Directive PD2007_036 Infection Prevention and Control Policy
- NSW Health Policy Directive PD2014_036 Clinical Procedure Safety
- NSW Health Policy Directive PD2013_043 Medication Handling in NSW Public Health Facilities
- NSW Health Guideline GL2016_009 Infants and Children: Management of Acute and Procedural Pain in the Emergency Department.

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Learning package contact person:	Margaret Allwood
Contact details:	49223372
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Author/s:	Margaret Allwood John Hunter Children's Hospital Clinical Nurse Educator
Peer reviewed by:	Elizabeth Newham John Hunter Children's Hospital Nurse Educator Lisa Gouldson The Maitland Hospital – Acting Paediatric CNE
Date:	

Purpose: this learning package provides the learner with the underpinning knowledge to deliver nitrous oxide to paediatric patients. Completing this package is part of the credentialing process for nurses to be able to deliver nitrous oxide to paediatric patients.

Date for Learning Package Review:
Learning packages should be reviewed every 3 years or earlier if changes in NSW Health or HNELHD policy or clinical practice change.

Acknowledgements:
Ebonny Mudford, CNS JHH Emergency Department
Kathryn Elston CNS JHCH Ward J2.

Contact details: *for further information please contact Margaret Allwood (JHCH Clinical Nurse Educator) on Margaret.allwood@hnehealth.nsw.gov.au*

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INTRODUCTION

This learning package is part of an advanced skills training program which will allow the accredited nurse to safely and competently administer nitrous oxide to the paediatric patient within HNELHD. The path for achieving accreditation in this skill is outline below.

DISCLAIMER

This learning package has been prepared by health professionals employed in Hunter New England Local Health District at the John Hunter Children's Hospital. While all care has been taken to ensure that the information is accurate at the time of development, the authors recommend that all information is thoroughly checked before use if utilised by another unit, context or organisation.

AIM

This package aims to provide the learner with the required knowledge to safely administer nitrous oxide to paediatric patients.

LEARNING OUTCOMES OR LEARNING OBJECTIVES

Completion of this learning package will enable the Nurse to complete the related nitrous oxide competencies, and therefore demonstrate an understanding of the following:

- Principles of procedural sedation in children
- The safety requirements of nitrous oxide delivery, including patient selection, equipment, monitoring, patient assessment and discharge criteria
- Management of adverse events

PRE-REQUISITES

In order to complete this package the registered nurse must have met the following requirement:

- Minimum 12 months nursing experience
- Completed their Between the Flags training including their DETECT Junior e-learning and face-to-face workshop
- Current (within the last 12 months) RESUS4KIDS practical course OR paediatric ALS

LEARNING PACKAGE OUTLINE

The package is designed to be a self-directed learning experience that will guide you through the literature and clinical issues related to paediatric nitrous oxide administration.

This package is developed within an adult learning framework so not all activities need to be documented but it is expected that you will complete them in order to facilitate your learning.

PROBLEM BASED LEARNING

This program is based on a problem-based approach to learning. This approach has been chosen to enhance critical thinking, and to create a body of knowledge that the RN can apply to practice. Problem based learning (PBL) is characterised by the use of patient specific problems or situations as a context for developing problem-solving skills and for acquiring clinical knowledge.

HOW TO USE THIS RESOURCE OR INSTRUCTIONS FOR PARTICIPANTS

Some possible items might include:

- Completion of this package is equivalent to 5 Continuing Professional Development (CPD) hours which is a requirement for National Registration. Completion of this package will be entered into My Health Learning and will appear on your learners transcript. Evidence of CPD can be generated using the Reflection on learning page at the end of the package.
- At the end of this learning package you are asked to complete questions or a problem based scenario related to the topic.
- There is a suggested reference list and it is by no means complete. Please read widely to facilitate your learning.
- This resource has been written from a Hunter New England Area Local Health District perspective so it is not specific to any one health facility. Throughout the package procedures and photos from the John Hunter Children's Hospital have been mentioned as an example of practice only.
- Throughout this self-directed learning package there are readings and activities that you will need to complete. You can access the readings online (journal articles) through CIAP. The online readings are not provided within this document due to copyright law restrictions. You will be provided with information on how to access the online readings. If you have any difficulty locating the readings please seek assistance from your hospital / health facility library.

ASSESSMENT PROCESS

When completed, you can return the package to relevant nurse educator/ CNS/CNC who will discuss it with you.

INTRODUCTION

This learning package is designed to complement the local policy for the administration of nitrous oxide to paediatric patients. The policy should be accessed prior to attending this learning package, and referred to for the following:

- Precautions
- Dosing and administration
- Adverse effects
- Fasting
- Sedation Assessment
- Steps for the procedure
- Post procedure care

Nitrous Oxide Procedural Sedation in Paediatrics

PROCEDURAL SEDATION IN PAEDIATRICS

Children who present to hospital frequently need to undergo painful and unpleasant procedures. Procedural pain refers to short lived pain associated with medical investigations and treatment such as blood tests, dressing changes, insertion or removal of catheters/tubes/intravenous lines, wound care and lumbar punctures (Royal Children's Hospital, 2008). Procedural sedation can significantly reduce the trauma associated with these procedures. Nitrous oxide is a form of procedural sedation.

Procedural sedation should only be used by medical and nursing staff who have appropriate training and where adequate equipment, facilities and staff are available. Successful sedation of paediatric patients requires recognition of potential issues associated with agent selection and safe administration. There should be an understanding of the nature of the procedure, the presence of co-morbidities and the impact of illness or injury. If managed well, procedural sedation of paediatric patients can be effective and safe. If not, there is a risk of adverse events such as airway obstruction or vomiting and aspiration due to depression of protective airway reflexes. Inadequate sedation can result in distress for the child and their parent/carer and may cause the procedure to be abandoned (NSW Health, 2017).

CREDENTIALING FOR THE USE OF NITROUS OXIDE

CREDENTIALING REQUIREMENTS FOR NURSES TO DELIVER NITROUS OXIDE AS A SOLE SEDATION AGENT:

1. **Minimum 12 months nursing experience**
2. **Current RESUS4KIDS OR Paediatric Advanced Life Support training and competency AND DETECT Junior**
2. **Possess the practical skills and equipment necessary to recognise, manage and reverse over sedation and patient deterioration (Australian and New Zealand College of Anaesthetists, 2014).**
3. **Completion of the Paediatric Nitrous Oxide Sedation Self Directed Learning Package.**
4. **Attendance at nitrous oxide workshop (Appendix 3) provided by local Paediatric Nurse Educator/CNE/CNC/CNS (or equivalent)**
5. **Deemed competent by a qualified assessor and meet the requirements of the competency assessment tool (Appendix 3) . A qualified assessor is a Nurse Educator, CNC/CNE/CNS who has previous experience administering nitrous oxide, meets the prerequisites of this document, and has completed the education requirements as laid out in this document or can demonstrate recognition of prior learning.**
6. **Regularly provides sedation to children and young people i.e. 4–6 times/year**

Additional requirements for Registered Nurses administering nitrous oxide and additional oral, buccal or nasal opioid or benzodiazepine OR working in the botulinum toxin clinic at JHCH:
Current paediatric ALS qualification

Recognition of prior learning: It is understood that some staff within HNELHD have previously completed nitrous oxide credentialing. Staff who can demonstrate previous competency in the delivery of nitrous oxide within HNELHD and have delivered nitrous oxide sedation in the last 12 months are not required to be re-credentialed.

PRINCIPLES OF SEDATION

Sedation is a continuum from reduced anxiety to a state of deep sedation, and may result in general anaesthesia.
Deep sedation has the potential for:

- depression of protective airway reflexes
- depression of respiration
- depression of the cardiovascular system
- adverse medication interactions

The University of Michigan sedation score (UMSS) is a validated and reliable tool that accesses depth of sedation in children (Malviya, Voepel-Lewis, Tait, Merkel, Tremper and Naughton, 2002). The UMSS classifies sedation as below:

Minimal sedation

A drug-induced state during which patients respond normally to verbal commands. Although cognitive function and physical coordination may be impaired, the airway reflexes, ventilatory and cardiovascular functions are unaffected. Refer to UMSS page 25.

Moderate sedation

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. Refer to UMSS page 25.

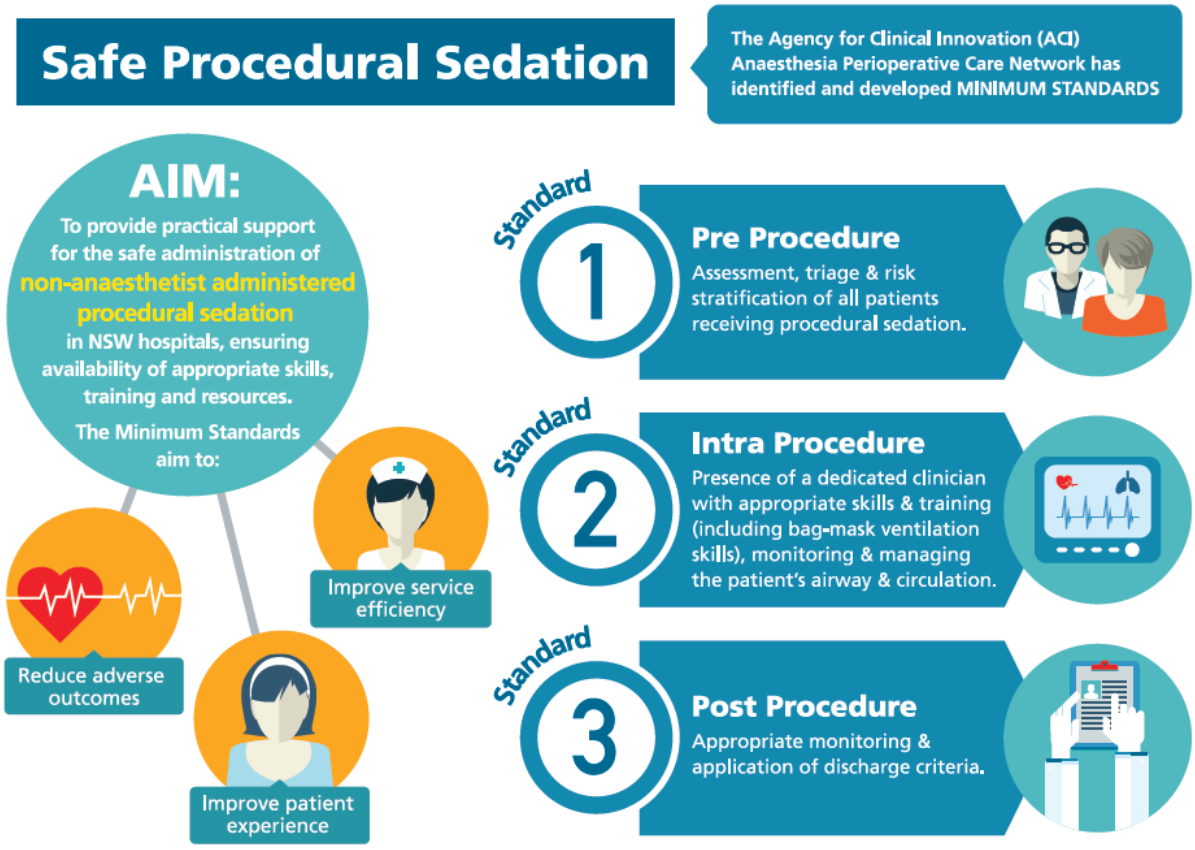
Deep sedation

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. Refer to UMSS page 25.

General anaesthesia

A drug-induced loss of consciousness during which patients are not rousable, 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 (NSW Health, 2017).

Minimum Standards of Safe Procedural Sedation



NSW Agency for Clinical Innovation, 2015.

WHAT IS NITROUS OXIDE?

Nitrous oxide is an anaesthetic gas, which can be delivered in variable concentrations with oxygen. Nitrous oxide causes modest analgesia and sedation with minimal respiratory and cardiovascular depression, the exact mechanism of action is unknown. It is absorbed and eliminated via the lungs (Hsu & Cravero, 2016).

Studies in children have shown nitrous oxide to be an effective and safe analgesic for use during painful procedures (Babl, Oakley, Seaman, Barnett and Sharwood, 2008). Importantly, it can be delivered painlessly through inhalation. Its quick onset of action (three to five minutes), quick reversal and recovery make it ideal for use in the emergency department (ED).

Administration:

Nitrous oxide can be administered as a mixture up to 70% when blended with oxygen. It can also be administered as a premixed solution known as Entonox™ (50% nitrous oxide: 50% oxygen). Both of these can be delivered via a free flow system or a demand system.

There are two types of nitrous oxide delivery systems - demand and free flow. The demand system is generally not suitable for children under eight years of age as they are unable to reliably create the necessary negative pressure to open the demand valve. The suitability of a child to use this system should be assessed including physical, cognitive and compliance. Nitrous oxide can be used where short-acting analgesia is required for procedures that may cause pain, discomfort or anxiety (NSW Health, 2017). Usually, concentrations of between 50-70% are used, and inhalation time of <15 minutes has been shown to provide the best results while minimising side effects (Hoeffe et al, 2017).

Indications:

- Suturing
- Injections
- Venepuncture
- IV cannula insertion
- PICC insertion
- Dressing changes
- Chest physiotherapy
- Plaster application or removal

If pain relief is required in addition to nitrous oxide, simple analgesia such as paracetamol or ibuprofen or local anaesthetic cream should be considered.

Nitrous oxide is not effective for procedures such as incision and drainage of complex or deep abscesses. It is difficult to administer nitrous oxide for children with perioral lacerations (NSW Health, 2017).

For information on precautions and administration please see the guideline Nitrous Sedation in paediatrics

Risk of expansion of air-filled closed spaces

Nitrous oxide is more soluble in blood than nitrogen. Thus, substantial amounts of nitrous oxide can leave the blood and enter the closed air filled space but only small amounts of nitrogen can leave the space to enter the blood. The result is that the volume of gas in the closed space increases (Akca et al, 2004). Nitrous oxide should be avoided in patients with gas-filled spaces where expansion or increased pressure would cause significant adverse effects. This includes:

- Chest injury with a suspicion of pneumothorax or lung cyst (10 minutes of nitrous oxide can double the size of a pneumothorax)
- Bowel obstruction
- Abdominal distension
- Recent head injury and cerebral oedema or neurosurgery
- Decompression sickness or air embolism
- Middle ear disease, including recent otitis media or middle ear surgery (Sydney Children's Hospital Network, 2015). This can cause tympanic membrane rupture (K De Vasconcellos, 2010)

Risks to staff

Nitrous oxide can also have adverse effects on staff. Occupational exposure should be minimised by ensuring a suitable scavenging system is used. For more information see Safe Work Australia Workforce Exposure Standards for Airborne Contaminants. Exposure to nitrous oxide should be avoided during pregnancy. The data on fertility risks of nitrous oxide are unclear, even in staff exposed repeatedly (Hsu & Cravero, 2016). Nurses who administer nitrous oxide frequently, for long periods or have symptoms of fatigue should have their vitamin B12 levels checked frequently. If there is no scavenging system in place, or the area using the nitrous oxide is not well ventilated then it could be advisable for a nurse to work in another area prior to falling pregnant to avoid fertility risks (The Joanna Briggs Institute, 2016). The level of exposure relates to the scavenging system and the delivery system (Messeri et al, 2016)

PRE PROCEDURE

Risk Assessment

All episodes of procedural safety require the completion of the Paediatric Procedural Sedation Checklist for ward and ambulatory care areas (Appendix 1), or the Procedural Safety Checklists for ED (Appendix 2). The Checklist includes a risk assessment to assist with identification of patients at a higher risk of complications. It also provides guidance for the pre-sedation assessment, required equipment, staffing, fasting and adverse events (NSW Health, 2017).

Components of risk assessment are listed below:

- *Is there increased risk of airway compromise leading to obstruction including the following factors?*
    - Infants under 12 months of age or less than 10 kilograms.
    - Obesity.
    - Nocturnal loud snoring, stridor or history suggestive of sleep apnoea.
    - Large potentially obstructive tonsils (most common 2-6 years).
    - Craniofacial abnormalities/cleft palate.
    - History that may predict airway difficulties e.g. Macroglossia/Down syndrome.

    - History of severe/recurrent croup, laryngomalacia or tracheomalacia.
    - Medication that may decrease level of consciousness or respiratory effort such as opioids, anti-epileptics or benzodiazepines.

- *Is there increased risk of hypoventilation including the following factors?*
    - Sedatives that may decrease level of consciousness or respiratory effort such as opioids, anti-epileptics or benzodiazepines.
    - Chronic lung disease e.g. ex-premature infants, cystic fibrosis.
    - Neuromuscular disorders e.g. cerebral palsy.
    - Central neurological abnormalities such as brainstem pathology.

- *Is there increased risk of aspiration including the following factors?*
    - Recent food or fluid intake.
    - Recent opioid administration.
    - Prior episodes of aspiration.
    - The procedure involves oral or pharyngeal stimulation.
    - Bowel obstruction, gastro-oesophageal reflux or vomiting.
    - Decreased level of consciousness.
    - Cerebral palsy or bulbar dysfunction.

- *Is there increased risk of bronchospasm or laryngospasm including the following factors?*
    - Asthma or a recent upper or lower respiratory tract infection.

- Is there increased risk of cardiovascular compromise including the following factors?
    - Cardiac disease,
    - Hypovolaemia,
    - Sepsis.
- *Is there a history of adverse reactions to sedation or an anaesthetic?*
- *Is there moderate or severe systemic disease which limits the activity of the child?*
- *Is there a medication specific contraindication?* (NSW Health, 2017).

Patient Selection

It is mandatory to ensure that the patient/parent/carer has received appropriate information to provide informed verbal consent and that patient identification, correct procedure and correct site process is completed prior to any procedure See Nitrous Oxide Parent Fact Sheet on HNEkidshealth website. A time out MUST be performed by the proceduralist and sedationist before the procedure commences.

- Patient selection is a major factor in achieving safe and successful sedation. Always consider patients who are extremely anxious prior to the procedure may need special consideration and may be more suitable for general anaesthesia
- Adequate preparation of the patient and the parent/carer increases effectiveness and it is desirable that the patient is familiarised (at an age appropriate level) with the equipment prior to its use
- Assessment of the suitability of a child to use the administration system considering their physical, cognitive development and compliance

- When the child's observations are outside the white zone before a procedure and it is the clinical judgement of the sedationist and proceduralist that this is entirely related to anxiety, the sedationist and proceduralist must use their clinical judgement about whether a clinical review is required before proceeding
- Children who are not suitable for nitrous oxide may need another form of sedation/pain relief and this needs to be discussed with the treating team

ALERT

Non-pharmacological interventions may appear to take unnecessary time to a busy physician but distraction and psychological preparation have proven efficacy in lessening the noxious experience of pain.

Patient preparation – Play and psychology

Well planned interventions before, during and after procedures can assist greatly in building the confidence and trust of children. Prior to performing procedures, consider:

- Performing the procedure in a child friendly environment away from the child's bed
- Using age appropriate distraction techniques
- Reducing parental anxiety if possible
- Using comfort positioning when possible
- Allocating one person to talk during the procedure. This person's role is to speak to the child, describing what is happening, and what is going to happen next (NSW Health, 2016).

ALERT

It is recommended that a child life therapist be present where available

Location

Nitrous oxide may be administered in a location such as a procedure room as long as a scavenging system and additional suction equipment is present and the equipment listed below is available. Paediatric resuscitation facilities and medications must be readily available.

Staffing

For the administration of nitrous oxide a minimum of TWO staff must be present – one to administer the sedation and one to conduct the procedure.

Nitrous oxide
A doctor or nurse credentialed in use of nitrous oxide and basic airway management.
A doctor or nurse to perform the procedure.

The sedationist is responsible for safety measures including:

- Ensuring both the patient and monitoring screen are in the direct line of vision of the sedationist
- Pre-sedation risk assessment and completion of the NSW Paediatric Procedural Sedation Checklist in paediatric ward and ambulatory care areas OR the Procedural Safety Checklists for ED areas (Appendix 1 and 2).
- Correct staff are present
- Correct fasting times observed
- The prescription of the sedation agent/s is correct
- The correct equipment is available
- The equipment has been checked and tested (although rare, deaths have been associated with mechanical failure and inadvertent administration of 100% nitrous oxide (Hsu and Cravero, 2016).
- Pre-sedation baseline observations are taken and recorded on the SPOC/PEDOC chart
- Administration of the sedation agent
- Monitoring the patient until they have recovered adequately for discharge
- A comprehensive clinical handover
- Documentation of verbal consent for sedation – see Policy 2014_036
- Ensuring a senior medical officer is on site and aware the sedation is occurring

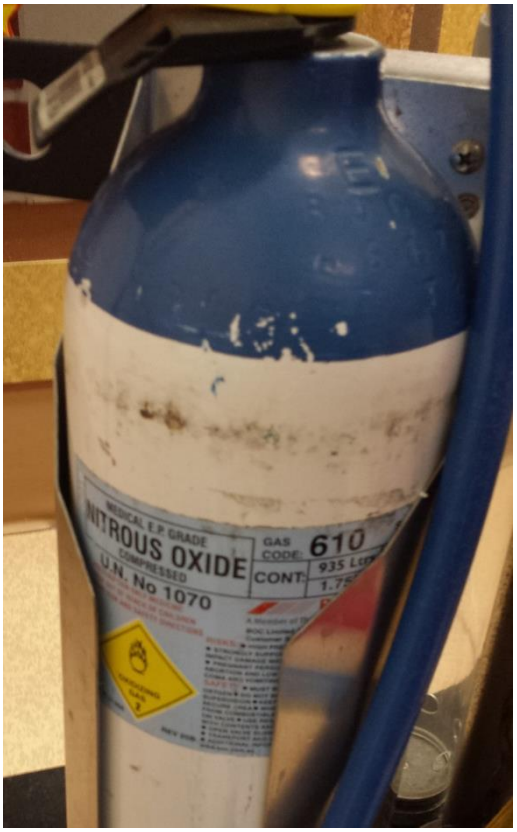
The proceduralist is responsible for:

- Preparation of the patient
- Preparation of equipment for the procedure
- Consent for the procedure (if required) – see Policy 2014_036
- Conducting the procedure

ALERT

The sedationist is only responsible for the administration of the sedation and the monitoring and cannot be asked to assist in the procedure

Equipment



Essential safety features required:

- Appropriate lighting (Australian and New Zealand College of Anaesthetists, 2014)
- Automatic cut off of nitrous oxide if oxygen delivery fails
- Emergency oxygen override
- Maximum nitrous oxide delivery limit of 70 percent
- Colour-coded tanks (Pictured right) with different pin assemblies to attach to the delivery system (Pictured over page) so that practitioners cannot mistake a nitrous oxide tank for an oxygen tank or wall outlet (NSW Health, 2016a)
- Adequate scavenger systems to prevent excessive occupational exposure to medical personnel (Hsu & Cravero, 2016).
- 2 sources of high suction – one for the scavenging and one for patient suction if required.
- Paediatric resuscitation trolley
- Alcohol-based hand rub
- Medication order for nitrous oxide
- Personal Protective Equipment
- A hard suction nozzle must be available, i.e. Yankauer
- Circuit and mouth piece or correct size mask to cover the child's nose and mouth
- Continuous HR and SaO_2 monitor with audible alarm
- Two sources of high flow O_2 in the room. One will be used in the administration of the nitrous oxide and the other source will be used for resuscitation
- Continuous SaO2 and pulse monitoring (NSW Agency for Clinical Innovation, 2015)
- Observations:
- Observations must be taken prior to the sedation period and recorded on the age appropriate Standard Paediatric Observation Chart (SPOC).

Pre-procedure Steps

Ensure the following are completed:

- Medication order – National Inpatient medication chart or MedChart
- Paediatric Procedural Sedation Checklist in paediatric ward and ambulatory care areas OR the Procedural Safety Checklists for ED areas and perform Time Out
- Verbal or written consent as per policy PD 2014_036

ALERT

If administering nitrous for the purpose of analgesia during a clinical procedure the procedure level will be determined by the procedure itself. Consent will be in accordance with the procedure level i.e. level 1 procedures verbal consent, level 2 & 3 written consent.

If administering nitrous oxide for the purpose of sedation – this is a Level 3 procedure and requires written consent for the sedation and the procedure.

When administering nitrous with an opioid or benzodiazepine – this is a level 3 procedure and requires written consent for the sedation and the procedure - PD2017_032.

1. Check oxygen and nitrous oxide hoses are connected to the wall outlets or that cylinder gauges have adequate supply available

2. Check circuit is correctly connected and functioning

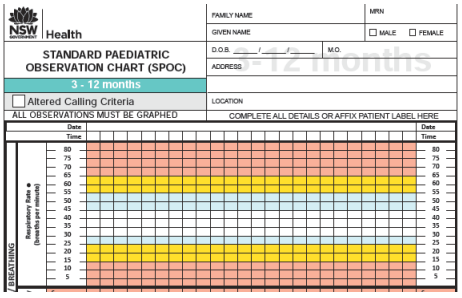
3. Select the appropriate face mask or mouthpiece. Consider applying scented lip balm on the inside of the mask for distraction

4. Check the scavenging system is functional and is being used
- Wall suction attached
- Hovering ball indicates appropriate suction level
- Scavenging tube (pink) from breathing circuit attached to scavenge system

5. Aim for the child to hold the mask or mouthpiece if possible. Time will need to be allowed for the child to become familiar with the equipment. Position the parent close to the child so they can provide comfort, reassurance and distraction during the procedure.

6. Set up continuous patient monitoring including attaching an oxygen saturation monitor to the patient. Monitor needs to be in line of sight of seditionist and have an audible alarm for HR and SaO2.

7. Complete pre-sedation observations on the age appropriate PEDOC/SPOC



8. Assess and document pre-sedation UMMS

University of Michigan Sedation Scale (UMMS)	
0	Awake and alert
1	Minimally sedated: Tired/sleepy, appropriate response conversation and/or sound
2	Moderately sedated: Somnolent/sleeping, easily arous stimulation or a simple verbal command
3	Deeply sedated: Deep sleep, rousable only with signifi simulation
4	Unrousable

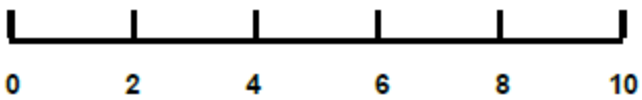
THE PROCEDURE

Pain Assessment

Pain assessment is an important part of caring for any patient undergoing a painful or uncomfortable procedure. It is well documented that many children are under treated for their pain and the associated management of painful procedures (NSW Health, 2016). There are several reasons for inadequate analgesia in paediatric patients. Assessing
the pain experienced by a young non-verbal child can be difficult. Children can also
have uncooperative behaviour during both assessment and treatment of pain. Many
children may refuse pain relief because of their fear about analgesia being administered by a needle. Inadequately treated pain may have both short and long term sequelae. Pain leads to the body releasing stress hormones which causes systemic changes in physiology such as an increase in heart rate, elevated blood pressure, reduced gastric motility, weakened immune function and delayed healing.

Many procedures within the ED and paediatric ward cause or increase patient's pain. Anticipating and pre-empting the need for analgesia for upcoming procedures is important (NSW Health, 2016). Pain should be assessed before, during and after the procedure. Children who are unable to communicate or to self-report pain add an additional challenge to pain assessment. These children are at increased risk of not receiving adequate pain relief (Anderson, Langius-Eklof, Nakstad, Bernklev & Jylli, 2017). There are several pain assessment tools used widely in paediatrics, including the revised faces pain scale, the FLACC pain score and the linear pain score.

Linear Scale (children > 7 years of age)



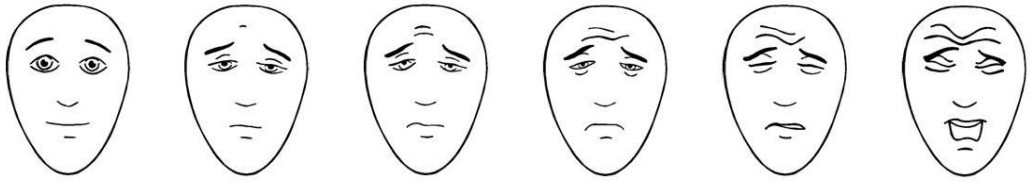
Adapted from Scott DA and McDonald WM (2008) Assessment, Measurement and History. In: Textbook of Clinical Pain Management 2E edn. Macintyre PE, Rowbotham D and Walker S (eds). Acute Pain.

Tip: Ask the child to point along the line saying the “0” end is “No Pain” and the “10” end is “Worst Pain”. Don’t ask them “what is their score out of 10” because children

Revised Faces Pain Scale

Is a self-report measure of pain intensity developed for children. It is easy to administer, and is suitable for children aged 4-16 years. It is particularly recommended for young children.

In the following instructions, say "Hurt" or "Pain," whichever seems right for a particular child:
"These faces show how much something can hurt. This face [point to left-most face] shows no pain. The faces show more and more pain [point to each from left to right] up to this one. [point to right-most face] It shows very much pain. Point to the face that shows how much you hurt [right now]."
Score the chosen face 0, 2, 4, 6, 8, or 10, counting left to right, so "0" equals "No pain" and "10" equals "Very much pain." Do not use words like "happy" and "'sad." This scale is intended to measure how children feel inside, not how their face looks.



International Study for the Study of Pain, 2017

FLACC Pain Scale

Face, legs, activity, cry, consolability scale, or FLACC, can be used to assess pain in young children or children who are non-verbal and unable to self-report pain. It is suitable for children aged 2 months – 10 years.
Instructions:

- Patients who are awake:
- Observe for at least 2-5 minutes.
- Observe legs and body uncovered.
- Reposition patient or observe activity; assess body for tenseness and tone.
- Initiate consoling interventions if needed.
- Patients who are asleep:
- Observe for at least 5 minutes or longer.
- Observe body and legs uncovered.
- If possible reposition the patient.
- Touch the body and assess for tenseness and tone.
- Each category is scored on the 0-2 scale which results in a total score of 0-10.

Assessment of Behavioural Score

- 0 = Relaxed and comfortable
- 1-3 = Mild discomfort
- 4-6 = Moderate pain
- 7-10 = Severe discomfort/pain

The following table provides the criteria for the FLACC Behavioural pain scale.

Behaviour	0	1	2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant quivering chin, clenched jow
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting, back and forth, tense	Arched, rigid or jerking
Cry	No cry (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams, sobs, frequent complaints
Consolability	Content, relaxed	Reassured by touching, hugging or being talked to, distractible	Difficult to console or comfort

Reference: Merkel S, Voepel-Lewis T, Shayevitz JR, et al: *The GLACC: A behavioural scale for scoring postoperative pain in young children.* Pediatric Nursing 1997; 23:293-797.

Assessment of Sedation

University of Michigan Sedation Scale:
During the procedure, the seditionist will use the UMSS to assess the depth of sedation of the patient. The aim of nitrous sedation is to maintain the sedation score between 0 and 1.

University of Michigan Sedation Scale (UMMS)	
0	Awake and alert
1	Minimally sedated: Tired/sleepy, appropriate response to verbal conversation and/or sound
2	Moderately sedated: Somnolent/sleeping, easily aroused with light tactile stimulation or a simple verbal command
3	Deeply sedated: Deep sleep, rousable only with significant physical simulation
4	Unrousable

For information regarding steps to take during the procedure, please see the guideline Nitrous Sedation in Paediatrics

ALERT

If the patient deteriorates during the procedure, the proceduralist will press the nurse assist button and ask for a Clinical Emergency Response (CERS).

The sedationist will maintain the child's airway and breathing. The sedationist should never be left alone.

The proceduralist will assist the sedationist and escalate care for the child.

Managing Adverse Effects

When managing adverse effects, it is important to administer 100% O2 once the nitrous oxide is ceased to avoid diffusion hypoxia (NSW Health, 2017).

Adverse Effect	Management
Nausea and vomiting	• Decrease the concentration of nitrous • Cease nitrous • Administer 100% O2 • Ensure clear airway • Consider alternate analgesia
Over sedation	• Cease nitrous • Administer 100% O2 • Maintain airway • Assess sedation using UMSS
Desaturation	• Decrease the concentration of nitrous/Cease nitrous • Administer 100% O2 • Activate CERS if required
Dizziness or disorientation	• Decrease the concentration/Cease nitrous • Administer 100% O2
Inadequate sedation or pain relief	• Assess pain using age appropriate pain assessment scale • Ensure nitrous is being effectively administered, with a good seal around the mask or mouthpiece • Check for leak in circuit • Re-assess if the procedure is suitable for nitrous sedation
Laryngospasm	• Administer 100% O2, maintain airway, and activate CERS.
Diffusion hypoxia	• May occur when reversing a patient from nitrous oxide. It is due to a large amount of nitrous oxide re-entering alveoli from the blood and diluting the available amount of oxygen. • Care should therefore be taken during the reversal phase of sedation with supplemental (100%) oxygen to limit this.
Ensure the patient is continuously monitored and activate the local CERS response according age appropriate PEDOC/SPOC parameters.	

POST PROCEDURE/DISCHARGE:

For information regarding steps to take after the procedure, please see the guideline Nitrous Sedation in paediatrics

Discharge Criteria

- Child is at their pre-sedation condition
- Parent/carer is satisfied with the child's conscious state, general wellness, behaviour and pain score
- The child is not complaining of adverse effects
- Child scores 0 on the UMMS

ALERT

Care should therefore be taken during the reversal phase of sedation and the provision of supplemental (100%) oxygen for 3 minutes with continued oxygen saturation monitoring is required

REFERENCES

Akça O, Lenhardt R, Fleischmann E, Treschan T, Greif R, Fleischhackl R, Kimberger O, Kurz A, and Sessler DI (2004). Nitrous oxide increases the incidence of bowel distension in patients undergoing elective colon resection. Acta Anaesthesiologica Scandinavica. 48 (7). 894-898.

Anderson, R; Langius-Eklof, A; Nakstad, B; Bernklev, T & Jylli, L. (2017). The measurement properties of pediatric observational pain scales: A systematic review of reviews. International Journal of Nursing Studies. 73. 93-101.

Australian and New Zealand College of Anaesthetists (ANZCA). (2014). PS09 "Guidelines on Sedation and/or Analgesia for Diagnostic and Interventional Medical, Dental or Surgical Procedures (http://www.anzca.edu.au/resources/professional-documents/pdf/PS9-2010.pdf/view) .

Babl E, Oakley E, Seaman C, Barnett P and Sharwood L, (2008) High concentration nitrous oxide for procedural sedation: Adverse events and depth of sedation. Pediatrics. 121 (3)

Banks, A. & Hardman, J. (2005) Nitrous oxide. Continuing Education in Anaesthesia, Critical Care & Pain 5(5) 145-148).

De Vasconcellos, K. (2010) Nitrous oxide in 2010: who will have the last laugh? (Part 3) South African Journal of Anaesthesia and Analgesia 16(3) 35-40

Hoeffe J, Doyon E, Trottier E, Bailey B, Shellshear D, Lagace M, Sutter C, Grimard G, Cook R, Babl F. (2017). Intranasal fentanyl and inhaled nitrous oxide for fracture reduction: The FAN observational study. American Journal of Emergency Medicine. 35, 710-715.

Hsu, D.C.& Cravero, J.P. (2016) Pharmacologic agents for pediatric procedural sedation outside of the operating room. www.uptodate.com.acs.hcn.com.au,

Malviya S, Voepel-Lewis T, Tait AR, Merkel s, Tremper,K, Naughton, N. (2002). Depth of sedation in children undergoing computed tomography: validity and reliability of the University of Michigan Sedation Scale (UMSS). British Journal of Anaestherics, 88 (2), 241-5.

Messeri A, Amore E, Dugheri S, Bonari A, Pompilio I, Arcangeli G, Rizzo G. (2016). Occupational exposure to nitrous oxide during procedural pain control in children: a comparision of different inhalation techniques and scavenging systems. Pediatric Anesthesia. 26 (9). 919-925.

NSW Agency for Clinical innovation (2015) Safe Procedural Sedation. Accessed 14th September 2017. https://www.aci.health.nsw.gov.au/__data/assets/pdf_file/0009/257499/ACI-SedationInfographic.PDF

NSW Health (2016). Guideline: Infants and Children: Management of Acute and Procedural Pain in the Emergency Department. http://www1.health.nsw.gov.au/pds/ActivePDSDocuments/GL2016_009.pdf

NSW Health (2016a) Safety Notice 010/16 – Medical Gas Cylinders. http://www.health.nsw.gov.au/sabs/Documents/2016-sn-010.pdf

NSW Health (2017). Paediatric Procedural Sedation Guide for Emergency Departments and Paediatric Wards – DRAFT

Royal Children's Hospital (2008). Procedural Sedation Learning guide for Health Care Professionals. Accessed 7th September, 2017. http://www.rch.org.au/uploadedFiles/Main/Content/comfortkids/Procedural%20Sedation%20learning%20guide%20for%20health%20care%20professionals.pdf

Safe Work Australia. Workforce Exposure Standards for Airborne Contaminants. April 2013

Sydney Children's Hospital Network (2015). Procedural Sedation (paediatric ward, clinic and imaging areas) Practice Guideline

The Joanna Briggs institute (2016). Recommended practice. Nitorus Oxide: occupational Hazards. The Joanna Briggs institute EBP Database. JB12463.

APPENDIX 1 – PAEDIATRIC PROCEDURAL SEDATION CHECKLIST

NSW Health

Facility:

PAEDIATRIC PROCEDURAL SEDATION CHECKLIST for EMERGENCY DEPARTMENTS AND PAEDIATRIC WARDS

FAMILY NAME	MRN
GIVEN NAME	☐ Male ☐ Female
D.O.B_____/_____/____	M.O
ADDRESS	
LOCATION/WARD	
COMPLETE ALL DETAILS OR AFFIX PATIENT LABEL HERE	

Procedure requiring sedation:

Date:

BEFORE SEDATION

1. PRE-PROCEDURE

- □ Required staff available *1 (see over page)
- □ Procedure location appropriate
- □ Patient fasted *2

Patient/carer has confirmed:

- □ Patient identification
- □ Procedure and site/side matches consent *4

2. SIGN IN
Led by sedationist

- □ Patient identification
- □ Procedure and site/side matches consent
- □ Allergies/adverse reactions checked
- □ Medication planned *3

□ Sedation/anaesthetic equipment checked

- Paediatric resuscitation trolley with full set of intubation equipment
- Oxygen (min 15L flow meter)
- Bag/valve/mask
- Suction with rigid sucker
- Oropharyngeal airway
- Oxygen saturation monitor with appropriate audible alarm settings

□ IV or IM agents also need:

- BP measuring device
- Access to electrocardiograph (ECG) monitoring
- Expired carbon dioxide monitoring available in facility

□ Check patient sedation risk *5, if identified consult specialist

□ Proceduralist available

3. TEAM TIME OUT
Led by proceduralist

- □ Team members introductions
- □ Patient identification
- □ Procedure and site/side matches consent *4
- □ Allergies/adverse reactions confirmed

If applicable:

□ Essential imaging reviewed

Possible events discussed:

- □ Adverse events
- □ Failed sedation
- □ Failed procedure

AFTER PROCEDURE

4. SIGN OUT
Led by sedationist, before the patient leaves the procedural area

- □ Team confirms procedure recorded
- □ Medication chart is complete *3

If applicable:

- □ Adverse events recorded *6
- □ Specimens/images labelled correctly
- □ Equipment problems documented and staff advised
- □ Advice for clinical handover

Sedationist name:

Assistant name:

Proceduralist name:

Assistant name:

Checklist completed by:
Name:

Designation:

Date:

DRAFT

NSW Health	FAMILY NAME	
	GIVEN NAME	
Facility:	D.O.B_____/_____/_____	M.O
	ADDRESS	
PAEDIATRIC PROCEDURAL SEDATION CHECKLIST	LOCATION/WARD	
	COMPLETE ALL DETAILS OR AFFIX PATIENT LABEL HERE	

	Nitrous oxide	Nitrous + sedative or analgesic	Ketamine
1. Staff	Two staff: • Sedationist (credentialed) • Proceduralist	Three staff: • Senior doctor on site and available to respond • Sedationist (credentialed) • Assistant to sedationist • Proceduralist	Four staff: • Senior doctor present • Sedationist (credentialed) • Assistant to sedationist • Proceduralist • Assistant to proceduralist
2. Fasting	2 hours for fluid and solids	2 hours for clear fluid 4 hours for milk/solids * Clinical risk/benefit may alter fasting times	2 hours for clear fluid 6 hours for milk/solids * Clinical risk/benefit may alter fasting times
3. Medication	30 -70% (4-10 L/min)	**Intranasal fentanyl** • 1- 2 microgram/kg (max 100 microgram/dose) at 5 min intervals • Up to total dose of 3 micrograms/kg (max 300 micrograms)	**Intravenous** 1-1.5 mg/kg then 0.5 mg/kg **Intramuscular** (if no IV access) • 3-4 mg/kg • If required, after 10 mins give further: IM 1.5-2 mg/kg *OR:* Obtain IV access and give further 0.5 mg/kg dose

4. Consent	• Nitrous oxide requires verbal consent • IV and IM agents require written consent		
5. Risk factors	• Under 12 months or less than 10kg • Airway obstruction e.g. sleep apnoea, anti-epileptics • Hypoventilation e.g. neuromuscular disorders • Aspiration e.g. prior episodes, bowel obstruction • History of laryngospasm/bronchospasm e.g. asthma • History of cardiovascular compromise e.g. sepsis, hypovolemia • Adverse reactions • Moderate or severe systemic disease • Medication contraindications		
6. Adverse events	**Minor** Rash Mild recovery agitation Vomiting post procedure	**Major** Airway – airway obstruction Breathing - apnoea, hypoventilation (RR <10/min), hypoxia ($Sa0_2$ < 92%) Circulation - anaphylaxis, hypotension Disability - seizure, emergence phenomena	**Failed** Insufficient sedation to perform planned procedure

DRAFT

APPENDIX 2 – PROCEDURAL SAFETY CHECKLIST FOR ED.

HUNTER NEW ENGLAND LOCAL HEALTH DISTRICT

Facility: _____

PROCEDURAL SAFETY CHECKLISTS

FAMILY NAME	MRN
GIVEN NAME	☐ MALE ☐ FEMALE
D.O.B. ___/___/___	M.O.
ADDRESS	
LOCATION / WARD	
COMPLETE ALL DETAILS OR AFFIX PATIENT LABEL HERE	

HNE033280

BINDING MARGIN – DO NOT WRITE

LEVEL 2 PROCEDURE CHECKLIST

Level 2 procedure definition (from PD2014_036 Clinical Procedure Safety)
- Proceduralist often supported by an assisting proceduralist/s
- Usually requires written consent
- Usually performed in wards, clinics, departments and radiology units
- e.g. lumbar puncture, insertion of chest tube, ascitic tap, stress test, Nuclear Medicine therapies, biopsies, IV or IT administration of chemotherapy, centrally inserted line
- Does NOT involve procedural sedation or general/regional anaesthesia

Date: ___/___/_____ Time: _____

Procedure performed: _____

If procedure requires sedation or general/regional anaesthesia use Level 3 checklist over page

Immediately pre-procedure		
Team introductions conducted	☐ Yes	☐ N/A (single proceduralist)
Written consent	☐ Yes ☐ Life threatening emergency	☐ No
Patient identification verified (name, DOB and 3rd identifier) against health care record, ID band for inpatients and verbally if patient able	☐ Yes	☐ Error*
Procedure verified (against health record and by patient if able)	☐ Yes	
Site verified with patient and/or health record including side/level where appropriate	☐ Yes	
Patient/site/side/level matches consent	☐ Yes ☐ Consent not required	☐ Error*
Patient position correct for procedure	☐ Yes	
Essential imaging reviewed and correct for patient/procedure	☐ Yes	☐ Not applicable
Allergy/adverse reaction checked and documented	☐ Yes	
Special medication/s given	☐ Yes	☐ Not required
Antibiotics given and/or charted	☐ Yes	☐ Not required
Implants and special equipment	☐ Yes	☐ Not applicable
Anticipated critical events/monitoring reviewed	☐ Yes	☐ Not anticipated
Post procedure:		
Advice for clinical handover (ISBAR)	☐ Yes	
Documented in patient's health care record	☐ Yes	
Specimen/images labelled correctly	☐ Yes	☐ Not applicable
Post procedure tests ordered	☐ Yes	☐ Not applicable

**If error identified report to unit manager and in IIMS*

Proceduralist Signature: _____

Print name: _____ **Designation:** _____

Assistant Signature (if applicable): _____

Print name: _____ **Designation:** _____

040515

DO NOT PRINT

HUNTER NEW ENGLAND LOCAL HEALTH DISTRICT

Facility: _____

PROCEDURAL SAFETY CHECKLISTS

GIVEN NAME	☐ MALE ☐ FEMALE
D.O.B. ___/___/___	M.O.
ADDRESS	
LOCATION / WARD	
COMPLETE ALL DETAILS OR AFFIX PATIENT LABEL HERE	

LEVEL 3 PROCEDURE CHECKLIST Note: Where i.PM theatre module is available use i.PM

Level 3 procedure definition (adapted from PD2014_036 Clinical Procedure Safety)
- At least one proceduralist and a procedural team and always requires written consent
- Involves procedural sedation or general /regional anaesthesia
- Usually performed in formal procedural suites such as theatres, endoscopy suites, radiology units and CCLs e.g. surgical procedure, ECT, angiography, coiling, stenting, interventional neuroradiology, endoscopy, cardioversion

Procedure performed (print): _____

SIGN IN ONE - Before starting procedural sedation / anaesthesia

Sedationist/Anaesthetist confirms

Patient Identity correct	☐ Yes		
Planned Procedure matches consent	☐ Yes	☐ No	
Life threatening emergency	☐ Yes	☐ No	
Site/side/level matches consent	☐ Yes		
Allergies/adverse reactions	☐ Yes	☐ No	
Sedation/ anaesthetic equipment checked	☐ Yes	☐ N/A	

Patient sedation risk/anaesthetic assessment attended	☐ Yes	☐ N/A
Significant airway or aspiration risk	☐ Yes	☐ No
Clinician airway monitor identified	☐ Yes	☐ N/A
Clinician skilled to manage airway identified	☐ Yes	☐ N/A
Pulse oximeter attached, working & audible	☐ Yes	☐ N/A
Risk of major bleeding	☐ Yes	☐ No

Sedationist / Anaesthetist Name (block letters): _____

Signature: _____ Date: ___/___/_____ Time: _____

SIGN IN TWO - Before starting procedural sedation / anaesthesia

Proceduralist confirms

Essential imaging available	☐ Yes	☐ N/A
Site marked	☐ Yes	☐ N/A

Implants and special equipment available and correct	☐ Yes	☐ N/A
Proceduralist available to complete procedure	☐ Yes	

Proceduralist name (block letters): _____

Signature: _____ Date: ___/___/_____ Time: _____

TEAM TIME OUT - Immediately before commencing the procedure

Team member introductions	☐ Yes	
Patient identification verified	☐ Yes	
Planned procedure matches consent	☐ Yes	☐ No
Site/side/level, where appropriate, matches consent	☐ Yes	☐ No
Patient position correct	☐ Yes	
Essential imaging reviewed	☐ Yes	☐ N/A
Allergy/adverse reaction	☐ Yes	☐ No
Special medication/s administered	☐ Yes	☐ N/A
Antibiotics needed	☐ Yes	☐ No
If yes, given	☐ Yes	☐ No

VTE prophylaxis needed	☐ Yes	☐ No
If yes, Anticoagulant	☐ Charted	☐ N/A
SCDs	☐ Applied	☐ N/A
Stockings	☐ Applied	☐ N/A
Anticipated critical events discussed		
Proceduralist briefs team on procedure, critical steps, anticipated events and equipment requirements	☐ Yes	
Sedationist/anaesthetist reviews any patient/procedure concerns	☐ Yes	☐ N/A
Nurse/midwife confirms sterility, implants and equipment requirements	☐ Yes	

Proceduralist Name (block letters): _____

Signature: _____ Date: ___/___/_____ Time: _____

SIGN OUT – before the patient/team leave the procedural area

Name of procedure recorded	☐ Yes	
Counts/tray list checks correct	☐ Yes	☐ N/A
Specimens/images labelled correctly	☐ Yes	☐ N/A
Blood loss documented/ongoing blood loss discussed	☐ Yes	☐ N/A

Equipment problems/issues documented/manager advised	☐ Yes	☐ N/A
Advice for clinical handover	☐ Yes	
Documented in patients healthcare record	☐ Yes	

Nurse/Midwife Name (block letters): _____ Designation: _____

Signature: _____ Date: ___/___/_____ Time: _____

040515

DO NOT PRINT

APPENDIX 3 – COMPETENCY ASSESSMENT TOOL

Clinician's Name: Designation:			Employee Number:		
Assessor's Name: Designation:			Date of assessment:		
Assessors signature:			Participant's signature:		
My Health Learning:		Date Entered:		Entered by:	

Pre-requisites prior to undertaking assessment

Completed Between the Flags training including their DETECT Junior e-learning and face-to-face workshop	
Current (12 months) RESUS4KIDS OR paediatric ALS	
Completion of the Paediatric Nitrous Oxide Sedation Learning Package	
Attendance at the Paediatric Nitorus Oxide workshop	

Assessment process

The achievement of the skill to a minimum standard (must score 3 or more) is demonstrated by performance of stated criteria in either a clinical or simulated environment, observed by a trained assessor. For the purposes of nitrous oxide administration, an assessor is a NE, CNE, CNC, CNS considered to practice this skill at a proficient or excellent standard (must score 4 or 5) according to the performance criteria within the assessment of practice tool.

It is recognised that some clinicians have expertise in this clinical skill and can have this acknowledged through RPL (recognition of prior learning).

It is the responsibility of the participant to identify any restriction that may have an impact on their demonstration of the practical procedure. The assessor is to document any reasonable adjustment taken.

Key: Performance standards

To achieve a score of 3 or above in any performance criteria, all listed elements of practice for that performance criteria must be demonstrated.

1 = Expected behaviours and practices not performed (Unsafe, requires constant verbal and physical guidance)	2 = Expected behaviours and practices performed below the acceptable/ satisfactory standard (Needs guidance to be safe, constant verbal cues)
3 = Expected behaviours and practices performed at a minimum/satisfactory standard (Safe, Independent with occasional supportive cues)	4 = Expected behaviours and practices performed at a proficient standard (Above minimum standard, infrequent cues)
5 = Expected behaviours and practices performed at an excellent standard (no supportive cues, displays excellence/sophistication in specific criterion, competently links theory to practise, displays appropriate reflection and insight)	N/A = Not assessed

Assessment item	Circle one number					
Thinks critically and analyses nursing practice						
Complies and practices according to relevant legislation and local policy	1	2	3	4	5	N/A
Maintains the use of clear and accurate documentation including the relevant procedural checklist, vital signs and consent	1	2	3	4	5	N/A
Engages in therapeutic and professional relationships						
Performs HAIDET	1	2	3	4	5	N/A
Collaborates with the health care team and ensures time out is performed	1	2	3	4	5	N/A
Identifies potential barriers to communication and engages appropriate services as required	1	2	3	4	5	N/A
Explains procedure to family/carer and ensures proceduralist has gained appropriate consent verbal consent						
Comprehensively conducts risk assessments						
Is able to identify contraindications and precautions to nitrous oxide sedation	1	2	3	4	5	N/A
Completes comprehensive and systematic assessments including: Age appropriate pain assessment sedation assessment vital signs fasting	1	2	3	4	5	N/A
Comprehensively conducts equipment checks						
Assembles appropriate equipment Paediatric resuscitation trolley Hard suction nozzle Monitor 2 sources of high flow O2 Appropriate size mask Nitrous oxide administration circuit	1	2	3	4	5	N/A
Demonstrates equipment checks Oxygen and nitrous oxide hoses	1	2	3	4	5	N/A

Circuit connected correctly Scavenging system functional						
Demonstrates adherence to Work Health and Safety						
5.1 Dons Personal Protective Equipment (PPE) as per patient and environmental requirements	1	2	3	4	5	N/A
5.2 Follows correct manual handling principles throughout procedure	1	2	3	4	5	N/A
5.3 Positions the patient appropriately and comfortably	1	2	3	4	5	N/A
5.4. Discards single use equipment and cleans re-usable equipment at the end of the procedure according to Infection Prevention & Control Standards"?	1	2	3	4	5	N/A
Provides safe and appropriate administration of nitrous oxide						
6.1 Ensures correct and appropriate monitoring is in place	1	2	3	4	5	N/A
6.2 Encourages patient to hold the mask/mouthpiece themselves	1	2	3	4	5	N/A
6.3 Commences sedation at appropriate nitrous oxide percentage	1	2	3	4	5	N/A
6.4 Allows nitrous sedation to take effect before allowing commencement of the procedure	1	2	3	4	5	N/A
6.5 Adjust percentage of nitrous as required, not exceeding 70%	1	2	3	4	5	N/A
6.6 Demonstrates active monitoring of patient during the procedure including pain and sedation levels as well as continuous observations	1	2	3	4	5	N/A
6.7 Responds appropriately to any adverse effects or signs of clinical deterioration that occur during or after the sedation	1	2	3	4	5	N/A
6.8 Delivers 100% O2 for 3 minutes after the procedure is finished	1	2	3	4	5	N/A
6.9 Ensures patient meets discharge criteria prior to discharge	1	2	3	4	5	N/A
Demonstrates correct legal documentation						
7.1 Records sedation on National Inpatient Medication Chart OR MedChart	1	2	3	4	5	N/A
7.2 Records vital signs on the age appropriate PEDOC or SPOC	1	2	3	4	5	N/A
7.3 Documents sedation episode in the patients progress notes	1	2	3	4	5	N/A
7.4 Completes appropriate procedural Sedation checklist	1	2	3	4	5	N/A

Overall assessment outcome:

In your opinion as an assessor of clinician performance, the overall performance of this person was: (please circle one)

Unsafe practice Requires reassessment Safe practice Proficient Excellent

Comments:

ACTIVITIES OR PROBLEM BASED SCENARIO

Ruby is a 4 year old who presents to the emergency department having fallen from her scooter. She has a wound to her foot which will require cleaning and dressing. Ruby is distressed on arrival, but her vital signs are Between the Flags on the age appropriate Paediatric Emergency Department Observation Chart (PEDOC).

Name 6 procedures which are suitable for the use of nitrous oxide sedation.

1.
2.
3.
4.
5.
6.

When does the person administering the nitrous oxide sedation also require paediatric ALS?

The medical staff who assesses Ruby suggests the dressing to Ruby's foot is performed under nitrous oxide sedation.
In which situations should nitrous oxide administration be avoided?

What things need to be completed before you can administer the nitrous oxide?

Describe some non-pharmacological strategies you can use to minimise distress to Ruby.

What information are you going to give Ruby and Ruby's mother?

What equipment checks need to be performed prior to administration?

What patient assessments need to be completed prior to administration of nitrous oxide?

You have assembled the equipment required for the administration of nitrous oxide in the treatment room and a colleague is ready to perform the dressing.
What is the maximum concentration of nitrous oxide you can deliver to Ruby?

How long will you deliver the nitrous oxide before your colleague begins the dressing?

How is the occupational exposure to nitrous oxide minimised?

During the procedure:
Ruby becomes nauseated and she tells you she is going to vomit. Describe your actions.

Ruby exhibits signs of moderate to severe pain and is crying and distressed. Describe your actions.

You assess Ruby's sedation using the UMMS scale, and it is 3. Describe your actions.

After commencing the procedure the proceduralist has asked you to leave Ruby and her mother holding the mask so you can set up a new sterile field for him as he has just contaminated his field… He will monitor Ruby for you while you do it? How would you respond?

You can see that your colleague has nearly finished the dressing.
How do you finish the sedation episode?

What discharge criteria does Ruby need to meet before going home?

Describe where and what you need to document.

LEARNING PACKAGE: REFLECTION ON LEARNING

This document guides your reflection on the extent to which the package meets your professional development needs, and how you plan to apply your learning into practice. This tool is not part of the assessment process, and has been included as a document that you may wish to include in your professional portfolio. Time taken to complete learning package:_____

What was your purpose in completing this learning package?

_____

_____

_____

Did you achieve this by completing the learning package?

_____

_____

_____

Reflecting on the content, what key learning have you obtained?

_____

_____

_____

What learning will you apply to your practice immediately? How will you do this?

_____

_____

_____

What learning needs have you identified as a result of completing this learning package?

_____

_____

_____

How do you plan to address these needs?

_____

_____

_____

Signature:_____Date:_____

LEARNING PACKAGE EVALUATION FORM

Your feedback regarding this learning package is important to ensure the package meets your learning needs. Please take 5 minutes to answer the following questions to facilitate any change required for future learning packages.

1. The learning outcomes of the learning package were clearly identified	Yes	No
2. The learning outcomes of the package were appropriate	Yes	No
3. The content provided enabled me to meet the learning outcomes?	Yes	No
4.The activities motivated my interest in the topic	Yes	No
5. Activities and workbook questions supported my understanding of the topic	Yes	No
6.The package was presented in a logical manner	Yes	No
7.The assessment process related to this package was clearly outlined (if applicable)	Yes	No

8. My most relevant learning outcomes from this package were:

_____

_____

_____

9. The key learning points from this package I can immediately apply to practice include::

_____

_____

_____

10. The least relevant component(s) of this package were:

_____

_____

_____

11 Some suggestions I would like made to improve the package would be:

_____

_____

_____

12. Further comments:

_____

_____

_____