SOSPOSA

SOCIETY OF SEDATION PRACTITIONERS OF SOUTH AFRICA

Guidelines for Safe

Airway Management

During Procedural Sedation

for Diagnostic and Therapeutic Procedures

2026 – 2030

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COMPILED BY

Dr JL Nienaber • Dr Anita Groenewald • Elzilda Becker

REVIEWED BY

Dr Nadia du Plessis • Dr De Wet • Dr Wels

Dr Anita Groenewald • Dr JL Nienaber

APPROVED BY

Prof James Roelofse

Chairman — SOSPOSA

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www.sosposa.co.za

Airway Management Guidelines **2026–2030**

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KEY FEATURES

- Evidence-based protocols
- Equipment standards
- Quality metrics
- Mallampati
- Naloxone titration
- MOANS (Difficult BMV)
- Sedation continuum definitions
- Emergency algorithms
- Training requirements
- STOP-Bang
- ASA Classification
- Capnography Waveforms
- Risk stratification
- Special populations
- NPO guidelines
- Upper Lip Bite Test
- PAWPER XL Tape
- Pre-oxygenation Protocol

IMPORTANT

This document must be read in conjunction with the SA Guidelines for PSA in Adults (2026-2030) and SOSPOSA Paediatric Sedation Guidelines.

SOSPOSA Guidelines for Safe Airway Management During Procedural Sedation for Diagnostic and Therapeutic Procedures: 2026-2030

AIRWAY MANAGEMENT GUIDELINES FOR PROCEDURAL SEDATION

Version 3.8 | 23 February 2026

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Evidence-based protocols • Sedation continuum definitions • Risk stratification • Equipment standards • Emergency algorithms • Special populations • Quality metrics • Training requirements • NPO guidelines • Mallampati • STOP-Bang • Upper Lip Bite Test • Naloxone titration • ASA Classification • PAWPER XL Tape • MOANS (Difficult BMV) • Capnography Waveforms • Pre-oxygenation Protocol

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EXECUTIVE SUMMARY

These comprehensive guidelines provide evidence-based recommendations for airway management during procedural sedation. All SOSPOSA members who are qualified and trained medical doctors (MBChB/MBBS) possess intubation skills from their undergraduate medical education. These guidelines standardize airway assessment, management protocols, and emergency procedures for the procedural sedation context.

This document should be read in conjunction with: - SA Guidelines for Procedural Sedation and Analgesia in Adults (2026-2030) - SOSPOSA Paediatric Sedation Guidelines (2021-2026)

SECTION 1: ANATOMY & PHYSIOLOGY

1.1 Adult Airway Anatomy

Structure	Key Points
Narrowest Point	Vocal cords (glottis) in adults; Cricoid ring in children <8 years
Laryngeal Position	C4-C5 vertebral level in adults; Higher (C3-C4) in children
Trachea	10-12cm length, 15-20 C-shaped cartilaginous rings, 2-2.5cm diameter
Right Main Bronchus	Wider, shorter, more vertical - higher aspiration risk
Left Main Bronchus	More horizontal, narrower, longer

Normal Variations: 20-30% of adults may have absent gag reflex. Airway size varies with gender, age, and body habitus.

1.2 Physiological Considerations

Time to Desaturation (SpO_2 <90%)

Patient Type	Pre-oxygenated	Room Air
Healthy adults	6-8 minutes	1-2 minutes
Obese adults (BMI >30)	2-3 minutes	<1 minute
Children	1-2 minutes	<30 seconds

Key Physiological Principles

- Reflex impairment sequence: Swallow reflex impaired BEFORE gag reflex during sedation
- Paediatric specifics: Obligate nasal breathers until 3 months of age
- Higher metabolic rate in children leads to faster desaturation
- Obesity reduces functional residual capacity (FRC)
- Pre-oxygenation significantly extends safe apnea time

SECTION 2: DEFINITIONS & SEDATION CONTINUUM

2.1 Definition of Procedural Sedation and Analgesia

The International Committee for the Advancement of Procedural Sedation (ICAPS) defines procedural sedation as:

> ***"The practice of procedural sedation is the administration of one or more pharmacological agents to facilitate a diagnostic or therapeutic procedure while targeting a state during which airway patency, spontaneous respiration, protective airway reflexes, and hemodynamic stability are preserved, while alleviating anxiety and pain."***

Procedural Sedation and Analgesia (PSA) is a drug-induced depression of consciousness, existing on a continuum varying from minimal sedation/anxiolysis through moderate sedation, dissociative sedation, deep sedation, and finally general anaesthesia.

2.2 The Sedation Continuum

Individual patients' responses to sedative medications are unpredictable. Patients may drift into a deeper level of sedation than intended. The sedation practitioner must be prepared to "rescue" patients who enter a deeper sedation state than planned.

Table I: Continuum of Procedural Sedation and Analgesia

Parameter	Minimal Sedation (Anxiolysis)	Moderate Sedation	Deep Sedation	General Anaesthesia
Responsiveness	Responds normally to verbal stimuli	Purposeful response to verbal or tactile stimuli	Purposeful response only after repeated or painful stimuli	Unable to rouse, even to painful stimuli
Cognitive Function	May be impaired	Impaired	Significantly impaired	Absent
Airway	Unaffected	No intervention required	Intervention may be required	Intervention often required
Spontaneous Ventilation	Unaffected	Adequate	May be inadequate	Frequently inadequate
Cardiovascular Function	Unaffected	Usually maintained	Usually maintained	May be impaired

⚠️ AIRWAY RISK INCREASES →

> **⚠️ CRITICAL: If a patient fails to respond to verbal commands and/or light touch, the standard of care must be identical to that for general anaesthesia.**

2.3 Sedation Endpoints

2.3.1 Minimal Sedation/Anxiolysis

A drug-induced state during which the patient responds normally to verbal commands. Cognitive function and physical coordination may be impaired, but airway reflexes, ventilatory and cardiovascular functions are unaffected. Sometimes referred to as "changing the mood" of the patient.

Airway implications: Minimal risk; standard monitoring sufficient for low-risk patients.

2.3.2 Moderate Sedation/Analgesia

Previously termed "conscious sedation," this is a drug-induced depression of consciousness during which purposeful response to verbal commands (either alone or accompanied by light tactile stimulation) is maintained. Interventions are usually not required to maintain a patent airway. Cardiovascular function is usually maintained.

Airway implications: Low risk in healthy patients; monitor for progression to deeper levels.

2.3.3 Deep Sedation/Analgesia

A drug-induced depression of consciousness during which patients cannot easily be roused but may respond purposefully following repeated or painful stimulation. May be accompanied by clinically significant ventilatory depression. Cardiovascular function is usually maintained.

Airway implications: Airway intervention may be required; enhanced monitoring mandatory; SP must have advanced airway skills.

> **⚠️ CRITICAL: In South Africa, deep sedation and analgesia should only be performed by medical doctors trained, and with significant experience in the field of anaesthesia.**

2.3.4 General Anaesthesia

A drug-induced loss of consciousness during which patients cannot be roused, even by painful stimulation. The ability to maintain independent ventilatory function is impaired. Cardiovascular function may be impaired.

Airway implications: Airway intervention often required; full anaesthetic support mandatory.

2.4 Dissociative Sedation

Dissociative sedation (produced by ketamine) is a unique state that does not fit the traditional sedation continuum. It causes a trance-like cataleptic state characterized by:

- **Intense analgesia**
- **Amnesia**
- **Sedation**
- **Retention of protective airway reflexes**
- **Spontaneous breathing maintained**
- **Cardiovascular stability**

Airway implications: Generally maintains airway reflexes; however, laryngospasm can occur. Enhanced monitoring recommended.

> **NOTE: Dissociative sedation with ketamine maintains spontaneous ventilation and airway reflexes, distinguishing it from other forms of deep sedation.**

2.5 Non-Dissociative Sedation

Non-dissociative sedative drugs operate on the sedation dose-response continuum. These include:

Drug Class	Examples	Airway Considerations
Benzodiazepines	Midazolam, diazepam, triazolam	Dose-dependent respiratory depression
Opioids	Fentanyl, alfentanil, remifentanil	Respiratory depression, chest wall rigidity at high doses
Propofol	Propofol	Rapid onset apnea, airway obstruction
Alpha-2 Agonists	Dexmedetomidine	Minimal respiratory depression
Barbiturates	Thiopental, methohexital	Profound respiratory depression
Etomidate	Etomidate	Brief apnea, myoclonus

2.6 Sedation Techniques

2.6.1 Basic/Standard Sedation

Basic/standard sedation is induced by a single agent only:

- **Oral, transmucosal, intramuscular, or rectal benzodiazepines, OR**
- **Inhalation of nitrous oxide (N_2O) ≤50% in oxygen, OR**
- **Titrated intravenous doses of midazolam, to a maximum dose of 0.1 mg/kg, a max bolus of 2 mg and a max recommended dose of 3 mg**

Airway equipment required: Basic airway adjuncts, BVM, suction, oxygen

> **⚠️ NB: The use of propofol (or any anaesthetic induction agent) is by definition an Advanced Sedation Technique, regardless of dose.**

2.6.2 Advanced Sedation

Advanced sedation is defined as:

- **Any combination of drugs, administered via any route, OR**
- **Any IV sedation (except titrated midazolam ≤0.1 mg/kg), OR**
- **Any inhalational sedation (except N_2O ≤50%), OR**
- **Propofol, ketamine, etomidate, dexmedetomidine (any dose), OR**
- **Infusion techniques (TCI)**

Airway equipment required: Full airway kit including SGAs, laryngoscope, ETTs, front of neck access (FONA) equipment; capnography mandatory

2.7 Failed Sedation

Failed sedation is defined as the failure to achieve a desired level of sedation such that: - The procedure cannot be completed safely, AND - The procedure must be abandoned, OR - Conversion to general anaesthesia is required

Airway implications: Do not escalate sedation technique in non-fasted patients; reschedule procedure.

2.8 Prolonged Sedation

Population	Prolonged Sedation Threshold	Recommendation
Adults	>4 hours	Consider GA in-hospital
Paediatrics	>1.5 hours	Consider staging or GA in-hospital

Prolonged sedation considerations: - Temperature monitoring - Glucose homeostasis (especially diabetics) - Protection of pressure points - Fluid balance and bladder management - DVT risk management - Cumulative drug effects on airway

2.9 ASA Physical Status Classification System

Class	Description	Suitability for Out-of-Hospital Sedation
ASA I	Normal, healthy patient; non-smoking, no or minimal alcohol use	✅ Office/clinic sedation allowed
ASA II	Well-controlled mild systemic disease (e.g., controlled hypertension, diabetes)	✅ Office/clinic sedation allowed
“Fragile ASA II”	Patient NOT controlled on morning/afternoon of procedure (e.g., hypertensive, uncontrolled diabetic, active asthmatic, symptomatic OSA)	⚠️ Hospital preferred; dedicated SP required
ASA III	Severe systemic disease that limits activity but is not incapacitating	❌ Hospital ONLY
ASA IV	Severe systemic disease that is a constant threat to life	❌ Hospital + Anesthesiologist
ASA V	Moribund patient not expected to survive 24 hours	❌ Hospital + Anesthesiologist
ASA-E	Emergency procedure (added to above classification)	Risk-benefit assessment required
ASA-P	Pregnant patient (added to above classification)	Special considerations apply

⚠️ **CRITICAL: Only ASA Class I and stable ASA II patients should be considered for sedation outside of a hospital operating theatre.**

2.10 Airway Risk by Sedation Level

Sedation Level	Airway Risk	Monitoring Required	Personnel Required
Minimal	Low	SpO_2, clinical observation; capnography recommended; NIBP if >10 min	Operator-SP + Observer
Moderate	Low-Moderate	SpO_2, NIBP, capnography (highly recommended; mandatory for enhanced-risk patients); ECG (fragile)	Operator + Dedicated SP + Assistant
Deep	Moderate-High	SpO_2, NIBP, capnography (mandatory), ECG	Operator + Dedicated SP (anesthesia-trained) + Assistant
Dissociative	Moderate	SpO_2, NIBP, capnography (recommended)	Experienced SP required

SECTION 3: SCOPE AND PURPOSE

3.1 Target Practitioners

- Qualified medical practitioners (MBChB/MBBS) - all have intubation training
- Dental practitioners (BChD/BDS) with additional airway training
- Current SOSPOSA membership required
- BLS certification (mandatory for all)
- SOSPOSA highly recommends ACLS or equivalent qualification (ICAPS)

3.2 Scope of Guidelines

These guidelines cover: - Pre-sedation airway assessment and risk stratification - Airway management during procedural sedation - Post-sedation recovery monitoring - Emergency airway protocols - Application in hospitals, clinics, and office-based practices - Adult and paediatric populations - Minimal, moderate, and deep sedation levels

3.3 Guidelines Not Applicable To

- Patients requiring intensive care sedation
- Sedation and analgesia for palliative care
- Sedation and analgesia in the home setting
- Premedication for general anaesthesia
- Night sedation
- Analgesia during labour and delivery
- Postoperative analgesia

3.4 NPO (Nil Per Os) Fasting Guidelines

MINIMUM FASTING TIMES

Intake Type	Minimum Time	Examples
Clear fluids	2 hours	Water, clear juice (no pulp), black tea/coffee
Breast milk	4 hours	For infants
Formula/infant food	6 hours	Infant formula, baby food
Light meal/solid food	6 hours	Toast, crackers, clear soup
Heavy/fatty meal	8 hours	Full breakfast, fried foods, meat

Fasting by Sedation Level

Sedation Level	Fasting Requirement
Basic/Standard sedation	Recommended but not mandatory
Advanced sedation	Mandatory
Moderate sedation	Mandatory
Deep sedation	Mandatory (standard anaesthetic guidelines)

Important Notes

- These are MINIMUM times - longer fasting may be appropriate for high-risk patients
- Emergency procedures: Risk-benefit assessment required; document decision
- Non-compliance: Document and adjust sedation plan accordingly
- Diabetic patients: Coordinate fasting with medical team
- Obese patients (BMI ≥30): Consider 8-hour minimum even for light meals

GLP-1 Receptor Agonists Warning

> ⚠️ CRITICAL: Patients taking GLP-1 receptor agonists (e.g., semaglutide/Ozempic, liraglutide/Victoza, tirzepatide/Mounjaro) may have significantly delayed gastric emptying, substantially increasing aspiration risk. Extended fasting periods (≥24 hours for liquids, ≥48 hours for solids) and/or gastric ultrasound assessment may be indicated. Consult current ANZCA/ASA guidance.

3.5 Alignment with SOSPOSA Guidelines

These airway guidelines must be read in conjunction with: - SA Guidelines for PSA in Adults (2026-2030) - comprehensive sedation protocols - SOSPOSA Paediatric Sedation Guidelines (2021-2026) - paediatric-specific guidance

3.6 Personnel Models

3.6.1 Operator-Sedation Practitioner (Operator-SP)

The SP performs both the procedure AND administers sedation.

Limitations: - Basic/standard sedation techniques ONLY - Minimal sedation/anxiolysis level ONLY - Procedures <30 minutes duration - ASA I and stable ASA II patients only - Trained observer MUST be present - Cannot simultaneously manage airways while performing procedures - Must STOP procedure immediately if airway intervention needed

3.6.2 Dedicated Sedation Practitioner

A separate SP focuses solely on sedation while another clinician performs the procedure.

Required for: - All advanced sedation techniques - Moderate and deep sedation - Fragile ASA II patients - Elderly patients (>70 years) - Patients with comorbidities - Prolonged procedures (>30 minutes) - Complex surgical procedures - Target-controlled infusions (TCI)

3.7 Personnel Requirements Summary

Sedation Level	Minimum Personnel
Minimal (basic technique)	Operator-SP + Trained Observer
Moderate	Operator + Dedicated SP + Trained Assistant
Deep	Operator + Dedicated SP (anesthesia-trained) + Trained Assistant

SECTION 4: PRE-SEDATION AIRWAY ASSESSMENT

4.1 Mandatory Assessment Components

History Taking

- Previous difficult airway experiences
- Previous sedation/anesthesia complications

⚠️ CRITICAL: STOP-Bang questionnaire with score calculation is MANDATORY when ANY suspicion of airway obstruction: snoring, overweight/obese BMI ≥25, breathing difficulties during sleep. For low-risk patients without these features, clinical judgment applies.

- Gastroesophageal reflux disease (GERD)
- Upper respiratory tract infection (past 2 weeks)
- Smoking history including pack-years
- Dental pathology (loose teeth, caps, dental appliances)
- Family history of anesthetic complications
- Current medications (especially anticoagulants, GLP-1 agonists)
- Allergies

Physical Examination Parameters

Parameter	Normal/Low Risk	Moderate Risk	High Risk
Mallampati Score	I-II	III	IV
Mouth Opening	≥4 cm (≥3 fingers)	3-3.5 cm (2 fingers)	<3 cm (<2 fingers)
Thyromental Distance	>6.5 cm	6-6.5 cm	<6 cm
BMI	<30	30–35	>35
Neck Extension	>35°	20-35°	<20°
Upper Lip Bite Test	Class I (above)	Class II (at)	Class III (cannot)

4.2 LEMON Law - Difficult Airway Prediction

Letter	Assessment	What to Look For
L	Look externally	Facial trauma, large incisors, beard/mustache, large tongue, short neck
E	Evaluate 3-3-2	3 fingers mouth opening, 3 fingers hyoid-mental, 2 fingers thyroid-floor of mouth
M	Mallampati	Class III-IV = increased difficulty
O	Obstruction	Stridor, muffled voice, difficulty swallowing, drooling
N	Neck mobility	Limited extension, cervical spine disease, rheumatoid arthritis

4.3 Mallampati Classification

Performed sitting upright, mouth fully open, tongue protruded maximally, WITHOUT phonation (not saying “Ah”).

Class	Structures Visible	Risk Level
Class I	Full visualization: tonsils, uvula, soft palate, hard palate	Low risk
Class II	Partial uvula visible, tonsils visible, soft and hard palate	Low risk
Class III	Soft and hard palate only (base of uvula only)	Moderate risk
Class IV	Hard palate only	High risk

⚠️ **CRITICAL: Class III shows only the BASE of the uvula - NOT the full uvula structure**

4.4 STOP-Bang Score Interpretation

STOP-Bang is an acronym questionnaire for Obstructive Sleep Apnea (OSA) screening:

- **S - Snoring (loud snoring)**
- **T - Tiredness (daytime fatigue/sleepiness)**
- **O - Observed apnea (witnessed breathing pauses)**
- **P - Pressure (high blood pressure/hypertension)**
- **B - BMI ≥30 kg/m²**
- **A - Age >50 years**
- **N - Neck circumference >40cm (16 inches)**
- **G - Gender (male)**

Score	Risk Level	Clinical Action
0–2	Low risk	Standard monitoring protocol
3–4	INTERMEDIATE RISK	Enhanced monitoring, capnography highly recommended. Second-step refinement: if STOP score ≥2 plus BMI >35 or male or neck >40 cm → treat as high risk
5–8	HIGH RISK	Capnography mandatory, hospital setting preferred, anaesthesiologist consultation recommended

⚠️ **CRITICAL: STOP-Bang score 3–4 = INTERMEDIATE RISK: enhanced monitoring and capnography highly recommended. STOP-Bang score ≥5 = HIGH RISK: capnography mandatory, hospital setting preferred. All patients with STOP-Bang ≥3 require dedicated SP and pre-sedation OSA risk assessment.**

4.5 Upper Lip Bite Test

Assesses jaw mobility and subluxation ability - important predictors of difficult intubation.

Class	Description	Risk Level
Class I	Can bite ABOVE vermillion border	LOW RISK
Class II	Can bite AT vermillion border	Moderate risk
Class III	CANNOT bite upper lip at all	High risk

4.6 Brodsky Classification (Paediatric Tonsils)

Grade	Airway Obstruction	Action Required
Grade 0	Absent tonsils (post-tonsillectomy)	Proceed normally
Grade 1	<25% obstruction	Proceed normally
Grade 2	25-50% obstruction	Proceed with caution
Grade 3	50-75% obstruction	Enhanced monitoring required

Grade	Airway Obstruction	Action Required
Grade 4	>75% obstruction	ENT REFERRAL REQUIRED

4.7 Risk Stratification

It is important to not only look at one parameter, but multiple parameters/criteria to make a thorough assessment of airway risk.

LOW RISK - All criteria met:

Mallampati I-II • Mouth opening ≥4cm • BMI <30 • ASA I-II • No previous difficult airway • STOP-Bang 0–2

Action: Standard sedation protocol and monitoring

MODERATE RISK - Any of:

Mallampati III • Mouth opening 3-3.5cm • BMI 30–35 • ASA III • Age >70 • Limited neck extension • STOP-Bang 3–4

Action: Skilled assistant mandatory, capnography highly recommended, consider lighter sedation, hospital preferred

HIGH RISK - Any of:

Mallampati IV • Mouth opening <3cm • BMI >35 • Previous difficult airway • ASA IV-V • STOP-Bang ≥5

Action: Hospital referral, anesthesiologist consultation required, enhanced airway equipment

4.8 MOANS - Difficult Mask Ventilation Predictors

> ⚠️ **CRITICAL: Predicting difficult bag-valve-mask (BVM) ventilation is as important as predicting difficult intubation. If you cannot ventilate, you cannot oxygenate.**

Letter	Factor	Clinical Assessment
M	Mask seal	Beard, facial trauma, NG tube, facial abnormalities
O	Obesity / Obstruction	BMI >30, OSA, pregnancy, upper airway tumour
A	Age >55 years	Decreased tissue compliance, loss of muscle tone
N	No teeth (edentulous)	Cannot create seal - consider leaving dentures in
S	Stiff lungs / Snoring	COPD, asthma, pulmonary fibrosis, OSA history

Risk Assessment

MOANS Score	Risk Level	Action
0-1 factors	Low risk	Standard preparation
2 factors	Moderate risk	Two-person BVM technique ready
3+ factors	High risk	Have SGA immediately available, consider dedicated SP

Tips for Difficult Mask Ventilation

1. **Optimise head position - “Sniffing position” with head extension**
2. **Two-person technique - One person holds mask with both hands, second squeezes bag**
3. **Jaw thrust - Lifts tongue off posterior pharynx**
4. **OPA/NPA - Use airway adjuncts early**
5. **Leave dentures in - Helps maintain facial structure for seal**
6. **Consider beard - May need to apply gel/lubricant or tape for seal**

4.9 RODS - Difficult Supraglottic Airway Predictors

⚠️ **CRITICAL: Supraglottic airways (SGA) are rescue devices. Know when they may fail BEFORE you need them.**

Letter	Factor	Clinical Assessment
R	Restricted mouth opening	<2.5cm (2 finger breadths) prevents SGA insertion
O	Obstruction	Supraglottic mass, epiglottitis, Ludwig's angina, foreign body
D	Disrupted / Distorted airway	Trauma, burns, radiation changes, surgical scarring
S	Stiff lungs / C-Spine	High airway pressures cause leak; immobilization limits positioning

Risk Assessment

RODS Score	Risk Level	Action
0 factors	Low risk	SGA is viable rescue option
1 factor	Moderate risk	Have alternative rescue plan
2+ factors	High risk	SGA may fail - prepare for surgical airway

4.10 SHORTS - Difficult Cricothyrotomy Predictors

⚠️ **CRITICAL: Cricothyrotomy is the last-resort rescue. Know the factors that make it difficult.**

Letter	Factor	Clinical Assessment
S	Surgery / Scarring	Previous neck surgery, radiation fibrosis
H	Hematoma / Infection	Neck swelling, abscess, bleeding
O	Obesity	BMI >30, cannot palpate landmarks
R	Radiation changes	Tissue fibrosis, altered anatomy
T	Tumour / Trauma	Distorted anatomy, tracheal deviation
S	Short neck / Spine immobilization	Cannot extend neck, limited access

Pre-Assessment for High-Risk Patients

If multiple SHORTS factors present: - Mark cricothyroid membrane with pen BEFORE sedation - Have scalpel and bougie immediately ready - Consider awake technique or hospital referral - Discuss with anesthesiologist

4.11 Complete Airway Assessment Summary

The "4 Difficult Airway" Predictions:

Assessment	Tool	High Risk If
Difficult Intubation	LEMON Law	≥2 factors
Difficult Mask Ventilation	MOANS	≥3 factors
Difficult SGA	RODS	≥2 factors
Difficult Cricothyrotomy	SHORTS	≥2 factors

⚠️ **RED FLAG: If ALL FOUR assessments predict difficulty = "Cannot Intubate, Cannot Oxygenate" (CICO) scenario likely. DO NOT proceed with sedation in out-of-hospital setting. MANDATORY referral to hospital with anesthesia support.**

SECTION 5: EQUIPMENT REQUIREMENTS

5.1 Equipment Requirements (All Sedation Levels)

⚠️ **NOTE: All airway equipment listed below must be immediately available for ALL sedation levels. Any sedation can unexpectedly deepen, requiring advanced airway intervention. The equipment listed under each level represents the MINIMUM monitoring and additional items for that level, but the full airway kit must always be present and checked.**

MINIMAL SEDATION - Low Risk Patients

- **O_2 source with capacity ≥15 L/min**
- **Pulse oximeter (mandatory)**
- **Face masks (adult sizes 3, 4, 5; paediatric sizes 0, 1, 2)**
- **Oropharyngeal airways (OPA sizes 000–5; select paediatric sizes appropriate to patient population)**
- **Nasopharyngeal airways (NPA 3–8 mm; paediatric sizes from 3 mm for infants)**
- **Suction apparatus with Yankauer tip**
- **Bag-valve-mask (BVM) device: Adult (1500 ml), Child (500 ml), Infant (250 ml) – stock all sizes**
- **Emergency medications**

MINIMAL SEDATION – Enhanced Risk (Capnography Highly Recommended)

Required when: BMI ≥30 • Age >70 years • STOP-Bang score ≥3 • ASA III • Any moderate-risk airway feature

MODERATE SEDATION

- **Capnography highly recommended (mandatory for enhanced-risk patients: BMI ≥30, Age >70, STOP-Bang ≥3, ASA III)**
- **Supraglottic airways (LMA sizes 1–5; i-gel sizes 1–5 – select paediatric sizes appropriate to patient population)**
- **ECG monitoring (3-lead minimum)**
- **Blood pressure monitoring (automated)**
- **All minimal sedation equipment**

DEEP SEDATION

- **Laryngoscopes (Macintosh blades 0–4; Miller blades 0–2 for neonates/infants)**
- **Endotracheal tubes (ETTs sizes 2.5–8.5 mm; uncuffed 2.5–5.5 for paediatrics, cuffed 3.0–8.5)**
- **Bougie/stylet (adult 60 cm and paediatric 35 cm)**
- **Video laryngoscope (strongly recommended)**
- **Cricothyrotomy / front of neck access (FONA) kit (highly recommended – training in surgical airway required for use)**
- **All moderate sedation equipment**

5.2 PAWPER XL Tape (Paediatric Weight Estimation)

The PAWPER XL tape (Paediatric Advanced Weight Prediction in the Emergency Room - Extra Long) is a South African-developed weight estimation system that is significantly more accurate for South African children than international alternatives.

⚠️ **CRITICAL: The PAWPER XL tape is the recommended weight estimation tool for paediatric patients in South Africa. It outperforms the Broselow tape in local populations.**

Why PAWPER XL is Superior

The Broselow tape and age-based formulas fail to account for body habitus variation - the wide range of body builds in children. A tall, thin child and a short, overweight child of the same length will have very different weights, but the Broselow tape gives them the same estimate.

The PAWPER system solves this by using a two-step process: 1. Length measurement (like Broselow) 2. Habitus assessment (body build modifier)

This habitus-modified approach dramatically improves accuracy, especially in populations with high variability in nutritional status - exactly the situation in South Africa.

Accuracy Comparison (South African Studies)

Method	Accuracy (within 10% of actual weight)	Time to Use
PAWPER XL-MAC	67.3%	~34 seconds
PAWPER XL tape	62.7%	~9 seconds
Mercy method	56.5%	~35 seconds
Broselow tape	43.9%	~11 seconds

Source: Baragwanath Hospital validation study, Wells et al. Clin Exp Emerg Med 2020

Key Finding: The Broselow tape correctly estimates weight in fewer than half of South African children.

PAWPER XL Tape Specifications

Feature	Detail
Length	1800mm (180cm)
Width	40mm
Colour zones	13
Weight divisions	34 (from 3kg to 70kg)
Age range	1 month to 16 years
Time to use	~9 seconds

PAWPER Tape Versions

Version	Year	Features
Original PAWPER	2009	145cm, 5 habitus scores
PAWPER XL	2014	180cm, 7 habitus scores, ideal body weight
PAWPER XL-MAC	2016	Adds mid-arm circumference for objective habitus

How to Use the PAWPER XL Tape - Step by Step

STEP 1: Measure Length - Position child supine (lying on back) - Place tape alongside child from top of head to heel - Note the colour zone where the heel falls - Each colour zone corresponds to a length segment

STEP 2: Assess Habitus Score (HS) - Visually assess the child's body build using gestalt impression - Compare to reference images on habitus assessment card (if available) - Assign a Habitus Score from 1-7:

Habitus Score	Description	Percentile	Visual Cues
HS 1	Very thin	5th	Prominent ribs, wasted muscles, thin limbs
HS 2	Thin	15th	Visible ribs, lean appearance
HS 3	Average	50th	Normal build, healthy appearance
HS 4	Above average	75th	Well-nourished, mild fullness
HS 5	Overweight	85th	Visible subcutaneous fat, rounded
HS 6	Obese	97th	Obvious obesity, fat folds
HS 7	Very obese	99th	Severe obesity

TIP: When uncertain, choose HS 3 (average) as starting point. Most children will fall into HS 2-4.

STEP 3: Read Weight - Find the intersection of colour zone (from Step 1) and habitus score (from Step 2) - Read the Total Body Weight (TBW) directly from the tape (bold numbers) - For drug dosing in obese children: use HS 3 weight as Ideal Body Weight (IBW)

PAWPER XL-MAC Method (Enhanced Accuracy)

For improved accuracy, especially in heavier/taller children or when visual habitus assessment is uncertain, combine with Mid-Arm Circumference (MAC):

Step 1: Complete length measurement (same as PAWPER XL)

Step 2: Measure MAC at midpoint of upper arm using the tape

Step 3: Use MAC cut-off values on the tape to determine habitus score objectively

MAC Measurement	Habitus Category
<115mm	Severely underweight (HS 1)
115-125mm	Underweight (HS 2)
125-160mm	Normal range (HS 2-4)
>160mm	Overweight (HS 5+)

Note: Exact cut-offs vary by length segment - refer to tape markings

Clinical Applications

Use	Application
Emergency drug dosing	Calculate weight-based doses rapidly
Equipment sizing	ETT size, LMA size, BVM selection
Fluid calculations	Resuscitation fluid volumes
Ideal body weight	Drug dosing in obese children (use HS 3)
Defibrillator settings	Energy doses for cardioversion

Equipment Sizing from PAWPER XL

The PAWPER XL tape provides direct equipment sizing recommendations:

Weight Zone	ETT (uncuffed)	ETT (cuffed)	LMA Size	BVM Size
3-5 kg	3.0-3.5	3.0	1	Infant
5-10 kg	3.5-4.0	3.0-3.5	1.5	Infant
10-20 kg	4.5-5.0	4.0-4.5	2	Paediatric
20-30 kg	5.5-6.0	5.0-5.5	2.5	Paediatric
30-50 kg	6.0-6.5	5.5-6.0	3	Adult small
50-70 kg	7.0-7.5	6.5-7.0	4	Adult

Common Errors to Avoid

Error	Consequence	Prevention
Not measuring to heel	Underestimate length/weight	Ensure tape reaches heel
Bent knees during measurement	Underestimate length	Straighten legs gently
Defaulting to HS 3 for all	Under/overestimate weight	Assess habitus carefully
Using TBW for obese children	Overdosing hydrophilic drugs	Use IBW (HS 3) for obese
Not having tape available	Resort to inaccurate formulas	Stock PAWPER XL in all areas

Where to Obtain PAWPER XL Tape

The PAWPER XL tape is available from SOSPOSA and can be ordered through www.sosposa.co.za

The Flipper resuscitation card (www.flippercard.co.za) provides a complementary pocket-sized reference for paediatric drug doses and equipment sizes, and may be used alongside the PAWPER XL tape.

> **NOTE: The PAWPER tape was developed by Prof. Mike Wells, Division of Emergency Medicine, University of the Witwatersrand, Johannesburg. Prof. Wells derives no financial benefit from the tape. It is validated for South African populations and recommended by SOSPOSA for paediatric procedural sedation.**

Why PAWPER XL is Essential for South African Children

The Broselow tape was developed using US population data from the 1980s and performs poorly in South African children due to:

Factor	Impact on Weight Estimation
Nutritional diversity	High rates of both undernutrition AND obesity
Genetic diversity	Multiple population groups with different growth patterns
Socioeconomic factors	Variable access to nutrition
Disease burden	HIV, TB affecting growth patterns in children

The PAWPER XL Solution: - Developed specifically for South African children (University of Witwatersrand, 2012) - Uses a two-dimensional system (length + habitus) vs one-dimensional (length only) - Accounts for thin, average, AND obese children - Validated at Baragwanath Hospital (Soweto) and multiple SA facilities

Comparison	Broselow	PAWPER XL
Developed for	US children (1980s)	SA children (2012)
Accounts for habitus	❌ No	✅ Yes (7-point scale)
Accuracy (within 10%)	43.9%	62.7-67.3%
Obese children	Poor accuracy	Good accuracy
Ideal body weight	❌ Not available	✅ Available (HS 3)
Time to use	11 seconds	9 seconds

⚠️ CLINICAL IMPACT: Using Broselow in SA can result in overdosing thin children and underdosing obese children. PAWPER XL reduces both risks significantly.

5.3 Emergency Medications

ADULT EMERGENCY MEDICATION DOSES

Drug	Indication	Dose
Propofol	Laryngospasm, anxiety	0.5-1 mg/kg IV
Succinylcholine	Break laryngospasm	0.1-0.2 mg/kg IV
Succinylcholine	Emergency intubation	1-2 mg/kg IV
Magnesium Sulfate	Bronchospasm	2g IV over 20 min
Flumazenil	Benzodiazepine reversal	0.2mg initial, then 0.1mg q1min (max 1mg)
Naloxone	Opioid reversal	0.08-0.2mg IV q2-3min (max 10mg)
Adrenaline/Epinephrine	Anaphylaxis	0.5mg IM or auto-injector
Adrenaline/Epinephrine	Severe bronchospasm	10-100mcg IV boluses
Atropine	Bradycardia	1 mg IV (minimum 1 mg, maximum 3 mg)
Salbutamol	Bronchospasm (FIRST-LINE)	4-8 puffs inhaled via spacer
Hydrocortisone	Bronchospasm, inflammation	100-200mg IV
Ketamine	Refractory bronchospasm	1–2 mg/kg IV load, then 1–2 mg/kg/hr infusion

SUCCINYLCHOLINE DOSING NOTE: The low dose (0.1-0.2 mg/kg) used to break laryngospasm is typically too small to cause significant paralysis in most patients. However, remain vigilant and prepared to provide bag-valve-mask ventilation if needed, as individual responses may vary.

NALOXONE TITRATION PROTOCOL

The range (0.08-0.2mg) reflects clinical titration practice to avoid precipitating acute opioid withdrawal while achieving adequate respiratory recovery.

Clinical Scenario	Starting Dose	Rationale
Opioid-naive patient	0.2mg IV	Standard reversal, low withdrawal risk
Suspected opioid dependence	0.04-0.08mg IV	Avoid precipitating withdrawal
Chronic pain patient	0.04-0.08mg IV	Preserve some analgesia
Unknown history	0.1mg IV	Cautious middle-ground

TITRATION GOAL: Titrate to adequate RESPIRATORY EFFORT, NOT full consciousness

Appropriate Endpoints: Respiratory rate >10 breaths/minute • Adequate tidal volume (visible chest rise) • SpO_2 >94% on room air or supplemental O_2 • Responds to verbal stimulation

> ⚠️ **CRITICAL: Duration of Action: Naloxone: 30-90 minutes | Most opioids: 3-6 hours. RISK of re-sedation after naloxone wears off. Extended monitoring minimum 2 hours.**

PAEDIATRIC EMERGENCY MEDICATION DOSES (per kg)

- **Propofol: 0.5-1mg/kg IV**
- **Succinylcholine (break laryngospasm): 0.1-0.3 mg/kg IV**
- **Succinylcholine (intubation): 2mg/kg IV or 4mg/kg IM**
- **Magnesium Sulfate: 50mg/kg IV over 20 min (maximum 2g)**
- **Flumazenil: 0.01mg/kg IV (max 0.2mg initial, max 1mg total)**
- **Naloxone: 1-2µg/kg IV (0.001-0.002mg/kg); max 2mg total**
- **Adrenaline/Epinephrine (bronchospasm): 0.01mg/kg IV (1:10,000)**
- **Adrenaline/Epinephrine (anaphylaxis): ≥25kg: 0.3mg IM; <25kg: 0.15mg IM**
- **Atropine: 0.02mg/kg IV (minimum dose 0.1mg)**
- **ETT Size (uncuffed): (Age in years ÷ 4) + 4**
- **ETT Size (cuffed): (Age in years ÷ 4) + 3.5**

⚠️ **NOTE: Age-based ETT formulas are estimates only and may not account for individual variation. Use PAWPER XL tape or Flipper resuscitation card for accurate sizing whenever available.**

SECTION 6: BASIC AIRWAY MANAGEMENT

6.1 Prevention Strategies

- **Maintain authorized sedation level - monitor for drift to deeper levels**
- **Monitor vital signs at appropriate intervals (see Section 11)**
- **Recognize and respond to early signs of oversedation**
- **Position patient with head elevated 30° (reverse Trendelenburg)**
- **Follow NPO fasting guidelines strictly**
- **Prophylactic oxygen supplementation for high-risk patients**
- **Pre-oxygenate before sedation (see 6.1.1)**
- **Avoid excessive sedative boluses**
- **Allow adequate time between drug administrations**

6.1.1 Pre-oxygenation Protocol

> ⚠️ **CRITICAL: Pre-oxygenation creates an oxygen reservoir in the lungs, extending the safe apnoea time from ~90 seconds to 8+ minutes in healthy adults.**

Standard Pre-oxygenation:

Parameter	Recommendation
Duration	3-5 minutes OR 8 vital capacity breaths
FiO_2	100% (high-flow oxygen)
Flow rate	≥10 L/min via face mask with reservoir
Target SpO_2	≥98% before commencing sedation

Parameter	Recommendation
End-tidal O_2 (EtO_2)	≥85% (if available)

Patient Positioning for Pre-oxygenation:

Patient Type	Position	Rationale
Normal BMI	25° head-up	Improves FRC
Obese (BMI ≥30)	25-30° head-up OR seated	Significantly improves FRC
Pregnant	Left lateral tilt + head-up	Prevents aortocaval compression
Paediatric	Age-appropriate positioning	Larger occiput in infants

Safe Apnoea Times (Well Pre-oxygenated):

Patient Group	Safe Apnoea Time	Notes
Healthy adult	8-10 minutes	May be much less if not well pre-oxygenated
Obese adult	2-4 minutes	Rapid desaturation
Pregnant	2-3 minutes	Increased O_2 consumption, reduced FRC
Child (1-8 years)	3-5 minutes	Higher metabolic rate
Infant (<1 year)	1-2 minutes	Highest risk - very rapid desaturation

6.1.2 Apnoeic Oxygenation

During airway management, continue oxygen delivery to extend safe apnoea time:

Technique	Method	Flow Rate
Standard nasal cannula	Leave in place during laryngoscopy	5-15 L/min
High-flow nasal oxygen (HFNO)	Humidified high-flow	40-70 L/min
Oral oxygen	O_2 tubing in corner of mouth	10-15 L/min

> **TIP: Leaving nasal cannula in place at 15 L/min during intubation attempts can significantly extend safe apnoea time.**

6.2 Basic Airway Maneuvers

Head-Tilt/Chin-Lift Maneuver

Place one hand on forehead, tilt head back. Place fingers of other hand under chin and lift anteriorly. Opens airway by lifting tongue off posterior pharynx.

> **⚠ CRITICAL: CONTRAINDICATION: C-spine injury or suspected cervical spine trauma**

Jaw Thrust Maneuver

Place fingers behind angles of mandible on both sides, lift jaw forward. Maintains C-spine neutrality. Preferred when C-spine injury suspected.

Triple Maneuver (Maximum Airway Opening)

Head extension + Jaw thrust + Mouth opening = Maximum airway patency

6.3 Optimal Airway Positioning - Sniffing Position

The “sniffing position” optimally aligns the oral, pharyngeal, and laryngeal axes for best visualization during laryngoscopy.

Component	Angle/Position	Clinical Landmark
Neck Flexion	35°	Lower cervical spine (C5-C7) flexed forward
Head Extension	15°	Atlanto-occipital joint extended backward
Overall Alignment	Horizontal	Ear to sternal notch parallel to floor

Technique: Place 7-10cm pad/pillow under patient's occiput • Flex lower cervical spine (neck forward) • Extend atlanto-occipital joint (head tilted back) • Check: External auditory meatus horizontal with sternal notch

RAMPED POSITION (Obese Patients BMI ≥30)

- **Stack blankets/foam pads under shoulders AND head**
- **Create gradual ramp from table to shoulders to occiput**
- **Achieve same horizontal ear-to-sternum alignment**
- **Improves functional residual capacity and mask seal**

6.4 Airway Adjuncts

OROPHARYNGEAL AIRWAY (OPA)

Sizing: Measure from corner of mouth to angle of mandible. Adult sizes: 80mm (#3), 90mm (#4), 100mm (#5). Paediatric sizes: 40mm (#000), 50mm (#00), 60mm (#0), 70mm (#1), 80mm (#2).

Adult insertion: Insert inverted, rotate 180° as advanced. Paediatric: Insert upright with tongue blade.

⚠ CRITICAL: CONTRAINDICATION: Intact gag reflex (may cause vomiting/laryngospasm)

NASOPHARYNGEAL AIRWAY (NPA)

Sizing: Diameter = patient's little finger; Length = nostril to earlobe

Insert perpendicular to face along floor of nose with lubrication.

CONTRAINDICATIONS: Skull base fracture, severe coagulopathy, nasal obstruction

6.5 Bag-Valve-Mask (BVM) Ventilation

Parameter	Target Value
Respiratory Rate	10-12 breaths/minute (adult)
Tidal Volume	6-7 mL/kg (NOT full bag squeeze)
Peak Inspiratory Pressure	<20 cmH_2O (avoid gastric insufflation)

Single-Person Technique: EC-clamp technique for mask seal. Squeeze bag with other hand. 1-second breath duration. Watch for chest rise.

Two-Person Technique (Superior): First person: Both hands maintain mask seal. Second person: Squeezes bag. Preferred for obese patients and difficult airways.

Paediatric BVM ventilation rates: Infant – 1 breath every 2 seconds (30 breaths/min); Child – 1 breath every 3 seconds (20 breaths/min). Use only enough volume to produce visible chest rise.

6.6 Video Laryngoscopy

⚠ CRITICAL: Video laryngoscopy is the modern standard for airway management. It provides superior glottic visualization and is recommended for all difficult airways.

Indications for Video Laryngoscopy

Primary Indications	Description
Predicted difficult airway	LEMON score ≥2, Mallampati III-IV, limited mouth opening
Failed direct laryngoscopy	First attempt unsuccessful
Cervical spine immobilization	Reduces cervical movement during intubation
Teaching/supervision	Allows supervisor to see what operator sees
Documentation needs	Records airway anatomy for future reference
Obese patients	Better visualization through soft tissue

Types of Video Laryngoscopes

Type	Blade Shape	Best Use
Hyperangulated* (e.g., GlideScope, McGrath X)	60° curve	Difficult airways, anterior larynx
Standard geometry (e.g., C-MAC, McGrath MAC)	Macintosh-like	Routine use, allows direct and video view
Channeled (e.g., Airtraq, King Vision)	Built-in tube channel	Novice users, anatomical guidance

*** It is very important to use a stylet and shape the endotracheal tube the same as the hyperangulated blade to ensure a successful endotracheal intubation**

Video Laryngoscopy Technique

Step 1: Preparation - Check equipment: Screen, light source, battery - Anti-fog preparation if needed - Have bougie and stylet ready - Pre-shape ETT with appropriate stylet curve (hyperangulated = more curve)

Step 2: Insertion - Insert blade in MIDLINE (unlike direct laryngoscopy) - Follow curve of blade - do NOT lever on teeth - Advance slowly, following tongue contour - Do NOT lift - follow blade angle

Step 3: Visualization - Aim to see vocal cords on screen - Avoid “screen tunnel vision” - maintain awareness of patient - Optimal view: Cords fill middle third of screen - Do NOT push blade too deep (common error)

Step 4: Tube Delivery - Insert ETT along side of blade (not through channel unless channeled device) - Watch BOTH screen AND mouth - Rotate ETT 90° counterclockwise as it approaches cords (helps navigate) - Remove stylet early once tip enters glottis - Advance to appropriate depth (21-23cm at teeth for adult)

TIP: Maintain continuous visualisation of the vocal cords during tube advancement. If the ETT catches on the anterior commissure, rotate 90° counterclockwise under direct vision to navigate past the obstruction.

Step 5: Confirmation - Confirm with capnography (GOLD STANDARD) - Bilateral chest rise – 5-point Auscultation (if time permits)

Video Laryngoscopy Pitfalls

Pitfall	Problem	Prevention/Solution
Over-reliance on screen	Miss oral trauma, lose situational awareness	Look at patient regularly, not just screen
Blade too deep	“Red out” - screen filled with pink mucosa	Withdraw blade slowly until cords visible
Insufficient curve on	Cannot direct tube anteriorly to	Pre-shape with 60-90° bend at distal end

Pitfall	Problem	Prevention/Solution
stylet	cords	
Fogging of lens	Obscured view	Pre-warm blade, use anti-fog, suction
Blood/secretions	Cannot see	Suction before/during, may need to clear repeatedly
Poor tube delivery	Can see cords but cannot pass tube	Bougie-assisted technique, reduce stylet curve

Bougie-Assisted Video Laryngoscopy

For difficult tube delivery:

1. Visualize cords on screen
2. Pass bougie under vision into trachea
3. Confirm tracheal placement (clicks over cartilage rings, hold-up at carina)
4. Railroad ETT over bougie
5. Confirm with capnography

TIP: The bougie-first technique has higher first-pass success rate than direct tube insertion in difficult airways.

Training Requirements

Practitioner Level	Minimum Video Laryngoscopy Experience
Minimal sedation	Awareness only - not expected to intubate
Moderate sedation	10 successful video-assisted intubations
Deep sedation	20 successful video-assisted intubations
Instructor/ Supervisor	50+ video-assisted intubations

SECTION 7: SUPRAGLOTTIC AIRWAYS

7.1 Competency Requirements

- Minimal sedation: Awareness of SGAs only
- Moderate sedation: Required competency in SGA insertion
- Deep sedation: Proficiency required in SGA insertion and troubleshooting

7.2 Indications for SGA Use

- Failed mask ventilation despite optimal positioning
- Bridge device during emergence/recovery
- Rescue device in cannot intubate, cannot ventilate situation
- Prolonged procedures requiring hands-free ventilation

7.3 SGA Sizing

Patient Weight	SGA Size (LMA/i-gel)
2–5 kg (neonate)	Size 1
5–10 kg (infant)	Size 1.5
10–20 kg (child)	Size 2
20–30 kg (child)	Size 2.5
30-50 kg	Size 3
50-70 kg	Size 4
70-100 kg	Size 5

7.4 Insertion Technique (LMA Classic)

- Lubricate back surface of LMA
- Position patient in sniffing position
- Hold LMA like a pen, deflate cuff completely
- Insert with tip against hard palate, advance along palate
- Advance until resistance felt
- Inflate cuff as suggested by the manufacturer's recommendations
- Confirm ventilation with chest rise and capnography

7.5 SGA Troubleshooting

⚠️ CRITICAL: Knowing how to troubleshoot SGA problems is as important as knowing how to insert them. A misplaced SGA provides false reassurance.

Problem	Signs	Cause	Solution
Air leak	Audible leak, inadequate chest rise, low tidal volumes	Undersized, malposition, low cuff pressure, patient too light	Upsize device, reposition, add cuff pressure (max 60 cmH_2O), deepen sedation
Gastric insufflation	Epigastric gurgling, abdominal distension	Overinflated cuff, malposition, excessive airway pressures	Deflate cuff slightly, reposition, reduce ventilation pressures
No ventilation	No chest rise, no $EtCO_2$, flat capnograph	Downfolded epiglottis, obstruction, esophageal placement	Remove completely, jaw thrust, reinsert with different technique
Blood in airway	Blood visible on SGA or in secretions	Trauma during insertion	Gentle suction, check for ongoing bleeding, consider smaller size
Patient biting	Damage to device, obstruction	Light sedation, emergence	Insert bite block, deepen sedation if procedure ongoing
Regurgitation	Gastric contents visible	Aspiration risk	Head-down, lateral position, suction, remove SGA, protect airway
High airway	Peak pressure >20	Bronchospasm,	Treat underlying cause,

Problem	Signs	Cause	Solution
pressures	cmH₂O	obstruction, light patient	consider ETT if persistent

SGA Repositioning Techniques

If ventilation inadequate after initial placement:

1. **Jaw thrust while ventilating - May lift epiglottis off SGA aperture**
2. **Slight withdrawal - Pull back 1-2cm, may reseat more optimally**
3. **Head repositioning - Slight flexion or extension may improve seal**
4. **Cuff adjustment - Deflate, advance/withdraw, reinflate**
5. **Remove and reinsert - If above fail, start fresh with jaw thrust maintained**
6. **Different airway device – endotracheal intubation**

SGA vs ETT Decision

Consider ETT Instead If	Reason
SGA fails twice	Unlikely to succeed on third attempt
Persistent leak despite troubleshooting	Cannot achieve adequate ventilation
Ongoing aspiration risk	ETT with cuff provides better protection
Prolonged procedure anticipated	ETT more secure for extended cases
Patient requires muscle relaxation	SGA may become dislodged

7.6 i-gel Specific Guidance

The i-gel is increasingly popular due to its non-inflatable cuff and ease of insertion.

Feature	Advantage
No cuff inflation	Faster insertion, no cuff pressure to manage
Anatomical shape	Self-sealing, conforms to larynx
Gastric channel	Allows gastric decompression
Bite block integrated	Protects device from occlusion

i-gel Sizing:

Patient Weight	i-gel Size
2–5 kg (neonate)	Size 1
5–12 kg (infant)	Size 1.5
10–25 kg (child)	Size 2
25–35 kg (child)	Size 2.5
30-60 kg	Size 3
50-90 kg	Size 4

Patient Weight	i-gel Size
>90 kg	Size 5

SECTION 8: EMERGENCY PROTOCOLS

8.1 Laryngospasm Management

IMMEDIATE STEPWISE ACTIONS

1. **STOP PROCEDURE immediately**
2. **100% O_2 with CPAP (10-20 cmH_2O)**
3. **Larson's Maneuver (see Section 8.2)**
4. **If persists >30 seconds: Propofol 0.5-1 mg/kg IV**
5. **If still not resolved: Succinylcholine 0.1-0.2 mg/kg IV**
6. **Call for help if not responding**
7. **Prepare for intubation if complete obstruction**

Signs of Laryngospasm

- **High-pitched inspiratory stridor (partial obstruction)**
- **Complete silence (complete obstruction)**
- **Paradoxical chest/abdomen movement ("rocking")**
- **Rapid desaturation**

8.2 Larson's Maneuver - Detailed Technique

Anatomical Location - The Laryngospasm Notch

Located BEHIND the mandibular rami (jaw angles), in the soft tissue depression between mastoid process and angle of mandible. Must be performed on BOTH sides simultaneously.

Technique Steps

- **Place index fingers behind BOTH mandibular angles**
- **Place middle fingers behind mastoid processes**
- **Thumbs rest on maxilla (cheekbones) for stability**
- **Apply firm INWARD pressure (toward spine/midline)**
- **Apply firm ANTERIOR pressure (lifting jaw forward)**
- **Maintain steady pressure for 10-30 seconds**

NOTE: Pain is a FEATURE - the painful stimulus confirms correct location and helps break the laryngospasm reflex.

8.3 Succinylcholine Use for Laryngospasm

For Minimal/Moderate Sedation Practitioners

- **Can use succinylcholine in emergency situations**
- **All medical doctors have intubation training from medical school**
- **Call anesthesiology for backup if not recently practiced**
- **Document event and rationale thoroughly**

For Deep Sedation Practitioners

- **Current intubation proficiency expected**
- **Succinylcholine use routine for persistent laryngospasm**

8.4 Bronchospasm Management

STEPWISE BRONCHOSPASM PROTOCOL

1. **100% oxygen administration**
2. **Salbutamol 4-8 puffs via spacer (FIRST-LINE)**
3. **Magnesium Sulfate 2g IV over 20 minutes**
4. **Ketamine 1–2 mg/kg IV loading dose, then 1–2 mg/kg/hr infusion if bronchospasm persists**
5. **If severe: Adrenaline/Epinephrine 10-100mcg IV boluses**
6. **Hydrocortisone 100-200mg IV**

8.5 Cannot Intubate Cannot Oxygenate (CICO)

For Most Practitioners

- **DECLARE EMERGENCY immediately**
- **Stop procedure and sedation**
- **CALL emergency services: 10177 (landline) or 112 (mobile)**
- **Continue BVM with or without airway adjuncts like NPA and OPA/SGA attempts**
- **Two-person BVM technique**
- **Prepare for emergency services arrival**
- **Document timeline**

If Trained in Surgical Airway: Cricothyrotomy may be performed if trained and equipment available. Last-resort life-saving procedure.

8.6 Single Operator Emergency Protocol

> ⚠️ **CRITICAL: During ANY airway emergency: STOP the procedure and sedation IMMEDIATELY. Cannot continue procedure while managing airway. Call for help (assistant, colleague, emergency services). Focus exclusively on airway management. Transfer care to arriving help if needed. Document event fully after resolution.**

SECTION 9: RECOVERY AND POST-SEDATION

9.1 Recovery Monitoring

PHASE I RECOVERY (Immediate Post-Procedure)

- **Continuous SpO_2 monitoring**
- **Vital signs every 5 minutes**
- **Clinical observation (consciousness, airway patency, breathing, circulation)**
- **Capnography for moderate/deep sedation until fully awake**
- **Supplemental O_2 until SpO_2 >94% on room air for 10 minutes**
- **Position patient in lateral recovery position if appropriate**

PHASE II RECOVERY

- **Vital signs every 15 minutes**
- **Head lift test for 5 seconds**
- **Baseline cognition restored**
- **Able to ambulate with minimal assistance**
- **Responsible adult present for discharge**

9.2 Discharge Criteria

- Modified Aldrete score ≥9/10
- Patent airway maintained spontaneously for ≥30 minutes
- Return to baseline mental status
- Stable vital signs for ≥30 minutes
- Responsible adult present
- Written discharge instructions provided
- Emergency contact information provided

9.3 Post-Airway Event Management

- Extended observation: Minimum 2 hours
- If succinylcholine used: Minimum 4 hours observation
- If reversal agents used (naloxone/flumazenil): Minimum 2 hours extended monitoring
- Document event fully in medical record
- Provide Difficult Airway Letter to patient
- Report to SOSPOSA within 48 hours
- Consider follow-up contact within 24 hours

9.4 Post-Sedation Instructions

Following PSA, the patient must NOT for 24 hours: - Drive a motor vehicle - Operate machinery - Drink alcohol - Sign any legal documents - Make important decisions - Care for dependents unsupervised

Mandatory: Responsible adult must accompany patient home and remain with them.

SECTION 10: TRAINING REQUIREMENTS

10.1 Foundation Training

All SOSPOSA medical practitioners have intubation training from undergraduate medical education.

MINIMAL SEDATION Requirements

- Basic intubation skills from medical school
- BLS certification (mandatory)
- 10 supervised sedation cases required
- Emergency succinylcholine permitted

MODERATE SEDATION Requirements

- SGA competency REQUIRED (hands-on training)
- 20 supervised moderate sedation cases required
- ACLS or equivalent certification highly recommended
- Capnography interpretation competency

DEEP SEDATION Requirements

- Current intubation proficiency required
- 50 supervised deep sedation cases required
- ACLS or equivalent certification REQUIRED
- Advanced airway management competency
- Regular intubation practice (minimum 10/year)

10.2 Maintenance of Competency

Two-year recertification cycle required for all practitioners.

Sedation Level	Cases Required Per Year
Minimal Sedation	12 cases/year minimum
Moderate Sedation	24 cases/year minimum
Deep Sedation	36 cases/year minimum

SECTION 11: QUALITY ASSURANCE

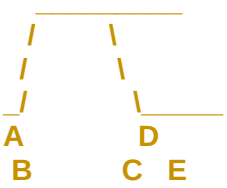
11.1 Monitoring Intervals

Sedation Level	Vital Signs Interval	Rationale
Minimal sedation	≤10 minutes	Lower risk, stable patients
Moderate sedation	≤5 minutes	Higher vigilance required
Deep sedation	≤5 minutes (or continuous)	Maximum vigilance
Recovery Phase I	Every 5 minutes	Until discharge criteria approached
Recovery Phase II	Every 15 minutes	Until discharge

11.2 Capnography Waveform Interpretation

> ⚠️ **CRITICAL: Having capnography equipment is useless if you cannot interpret the waveforms. Capnography detects hypoventilation BEFORE oxygen desaturation occurs.**

Normal Capnography Waveform



A: Baseline (start of expiration) – should be at zero
B: Expiratory upstroke – CO_2 rises as dead space gas is replaced by alveolar gas
C: Alveolar plateau – relatively uniform CO_2 from alveolar gas
D: End-tidal point ($EtCO_2$) – peak CO_2 at end of expiration; the measured value
E: Inspiratory downstroke – CO_2 falls rapidly as fresh gas is inspired

Normal Values: - $EtCO_2$: 35-45 mmHg (4.5-6.0 kPa) - Respiratory rate: 12-20 breaths/min (adult)

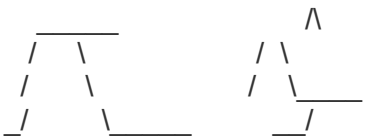
Abnormal Waveform Patterns

Pattern	Waveform Change	Cause	Action
Hypoventilation	↑ $EtCO_2$ (>45 mmHg), ↓ Rate	Oversedation, opioids	Stimulate patient, reduce sedation, support ventilation
Hyperventilation	↓ $EtCO_2$ (<35 mmHg), ↑ Rate	Pain, anxiety, hypoxia	Assess cause, treat underlying issue
Apnoea	Flat line (no waveform)	Complete airway obstruction, respiratory arrest	IMMEDIATE airway intervention

Pattern	Waveform Change	Cause	Action
Partial obstruction	Prolonged upstroke, “shark fin” shape	Bronchospasm, partial obstruction	Jaw thrust, suction, bronchodilator
Rebreathing	Elevated baseline (>0)	Inadequate fresh gas flow, faulty circuit	Check equipment, increase O_2 flow
Esophageal intubation	Waveform absent or rapidly diminishing	ETT in esophagus	Remove tube, re-oxygenate, reattempt
Cardiac arrest	Sudden loss of waveform with flat line	Loss of circulation	Start CPR immediately

“Shark Fin” Pattern - Bronchospasm/Obstruction

Normal: Shark Fin (obstruction):



The shark fin pattern indicates increased airway resistance - look for: - Bronchospasm - Partial upper airway obstruction - Kinked ETT - Mucus plug

Action: Suction, bronchodilators, check for obstruction

Sudden Loss of Waveform

If preceded by…	Consider…	Action
Desaturation	Apnoea/airway obstruction	Stimulate, open airway, BVM
Normal SpO_2	Equipment disconnection, sensor dislodged	Check connections
Bradycardia	Cardiac arrest	Check pulse, start CPR
Nothing (sudden)	ETT dislodgement, circuit disconnect	Check ETT position, reconnect

REMEMBER: Capnography is an EARLY warning system. Act on waveform changes BEFORE SpO_2 drops.

11.3 Process Indicators (Target: 100% Compliance)

- **Pre-sedation airway assessment documented for all patients**
- **Equipment checks documented before each case**
- **Monitoring at appropriate intervals documented**
- **Capnography used when indicated**
- **Discharge criteria met and documented**
- **Consent obtained and documented**

11.4 Outcome Indicators

Complication	Target Rate
Laryngospasm (Adults)	<1%
Laryngospasm (Paediatrics)	<5%
Hypoxemia (SpO_2 <90%)	<5%
CICO events	<0.01%

11.5 Incident Reporting

All significant adverse events must be reported to SOSPOSA within 48 hours via www.sosposa.co.za

Reportable Events

- **Laryngospasm requiring pharmacological intervention**
- **Desaturation <85% for >60 seconds**
- **Failed airway requiring emergency intervention**
- **Aspiration (witnessed or suspected)**
- **Unplanned hospital admission**
- **Succinylcholine use**
- **Cardiac arrest**
- **Death**
- **Any event requiring activation of emergency services**
- **Any event where patient required advanced airway intervention (SGA, intubation)**
- **Any unanticipated difficult airway (Mallampati I-II requiring multiple attempts)**
- **Bronchospasm requiring more than first-line salbutamol therapy**
- **Equipment failure contributing to patient care issue**

Reporting Rationale

Comprehensive adverse event reporting allows SOSPOSA to:

- **Identify practice trends and training needs**
- **Provide aggregate safety data to members**
- **Improve guidelines based on real-world experience**
- **Support practitioners involved in events**
- **Maintain quality assurance standards**

NON-PUNITIVE REPORTING: Event reporting is for quality improvement and learning, not disciplinary purposes. Reports are confidential and used to enhance overall sedation safety in South Africa.

SECTION 12: SPECIAL POPULATIONS

12.1 Paediatric Patients

- **Laryngospasm risk 5x higher than adults**
- **Rapid desaturation (1-2 minutes even when pre-oxygenated)**
- **Age <1 year represents highest risk group**
- **Brodsky Grade 4 tonsils = HIGH RISK (ENT referral required)**
- **PALS/APLS or equivalent certification strongly recommended**
- **Obligate nasal breathers until 3 months of age**
- **ETT size (uncuffed): (Age ÷ 4) + 4 | (cuffed): (Age ÷ 4) + 3.5**

⚠️ NOTE: Age-based ETT formulas are estimates only and may not account for individual variation. Use PAWPER XL tape or Flipper resuscitation card for accurate sizing whenever available.

- **Minimum atropine dose: 0.1mg**
- **Use PAWPER XL tape for weight estimation (see Section 5.2)**
- **Refer to SOSPOSA Paediatric Sedation Guidelines (2021-2026)**

Paediatric Weight Estimation

> ⚠️ **CRITICAL: Use the PAWPER XL tape for weight estimation in South African children. It is significantly more accurate than the Broselow tape for local populations (62.7% vs 43.9% accuracy within 10% of actual weight).**

Quick Weight Estimation (if PAWPER tape unavailable): - Infants (1-12 months): Weight (kg) = (Age in months + 9) ÷ 2 - Children 1-5 years: Weight (kg) = (Age in years × 2) + 8 - Children 6-12 years: Weight (kg) = (Age in years × 3) + 7

⚠️ These formulas are less accurate than PAWPER XL - use tape when available.

12.2 Pregnant Patients

- **Increased aspiration risk (delayed gastric emptying)**
- **Sodium citrate (Pneucid) 30ml per os within 20-30 minutes of sedation, ideally just before induction**
- **Difficult airway more common (tissue edema)**
- **Functional residual capacity reduced**
- **Avoid supine positioning >20 weeks (aortocaval compression)**
- **Left lateral tilt 15-30° recommended OR left uterine displacement**
- **Consider obstetric consultation for >24 weeks gestation**

12.3 Geriatric Patients (>70 years)

- **Reduced physiological reserve**
- **Multiple comorbidities common**
- **Polypharmacy (drug interactions)**
- **Dentures (remove before sedation)**
- **Decreased protective reflexes**
- **Prolonged drug effects**
- **Reduced doses required - titrate carefully**
- **Consider lighter sedation levels**
- **Edmonton Frail Scale assessment recommended**

12.4 Obese Patients (BMI >30)

- **Difficult mask ventilation**
- **Rapid desaturation (reduced FRC)**
- **OSA highly prevalent**
- **Ramped positioning essential**
- **Consider hospital setting for BMI >35**
- **Capnography mandatory**
- **Two-person BVM technique preferred**
- **STOP-Bang assessment mandatory**

SECTION 13: SETTING-SPECIFIC CONSIDERATIONS

Office-Based Practice

Enhanced risk assessment, immediate access to emergency equipment, transfer protocols established with local hospital.

Hospital-Based Practice

Anesthesiology backup available, full resuscitation capabilities, ICU access if needed.

Clinic Setting

Appropriate for low-risk patients only, emergency transfer protocols mandatory, regular equipment checks.

Low-Resource Settings

In low-resource settings, safe PSA is achievable through: - Rigorous patient selection (ASA I-II only) - Provider competence (BLS minimum, ALS preferred) - Minimal dosing with careful titration - Essential monitoring (SpO_2, NIBP, clinical observation mandatory) - Emergency preparedness (oxygen, BVM, suction, emergency drugs) - Explicit referral and transfer plan

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SECTION 14: MEDICO-LEGAL CONSIDERATIONS

14.1 Informed Consent

- **Written consent required for all sedation**
- **Explanation of risks, benefits, alternatives**
- **Airway risks specifically discussed**
- **Documentation of patient understanding**
- **Consent obtained before day of procedure when possible**
- **Consent must NOT be obtained after administration of sedative drugs**

14.2 Documentation Requirements

- **Complete pre-sedation assessment**
- **Informed consent**
- **Sedation plan and drugs administered**
- **Time-stamped vital signs (per monitoring intervals in Section 11.1)**
- **Any adverse events and management**
- **Recovery assessments**
- **Discharge criteria met**
- **Post-operative instructions given**

14.3 Difficult Airway Letter

Any patient who experiences difficult airway management MUST receive a written Difficult Airway Letter to carry for future healthcare encounters. Template provided in Appendix E.

APPENDIX A: PRE-SEDATION AIRWAY ASSESSMENT FORM

(See separate fillable PDF form)

APPENDIX B: EMERGENCY ALGORITHMS

LARYNGOSPASM ALGORITHM

LARYNGOSPASM RECOGNIZED

↓

STOP PROCEDURE
↓
100% O_2 + CPAP (10-20 cmH_2O) + Larson's Maneuver
↓ >30 seconds?
Propofol 0.5-1 mg/kg IV
↓ Still not resolved?
Succinylcholine 0.1-0.2 mg/kg IV

ALL DOCTORS CAN USE SUCCINYLCHOLINE IN EMERGENCY

BRONCHOSPASM ALGORITHM
WHEEZE + PROLONGED EXPIRATION
↓
100% OXYGEN
↓
SALBUTAMOL 4-8 PUFFS (FIRST-LINE)
↓
MAGNESIUM SULFATE 2g IV over 20 min
↓
KETAMINE 1–2 mg/kg IV load (if bronchospasm persists)
↓ **If severe**
Adrenaline/Epinephrine 10-100mcg IV + Hydrocortisone 100-200mg IV

CICO ALGORITHM
CANNOT INTUBATE, CANNOT OXYGENATE
↓
DECLARE EMERGENCY
↓
CALL 10177 or 112
↓
Continue BVM/SGA attempts
↓
IF TRAINED: Surgical Airway | IF NOT: Await EMS

ANAPHYLAXIS ALGORITHM
SUSPECTED ANAPHYLAXIS
(Urticaria, angioedema, bronchospasm, hypotension)
↓
STOP SEDATION/PROCEDURE
↓
CALL FOR HELP
↓
ADRENALINE 0.5mg IM (anterolateral thigh)
↓
High-flow oxygen + IV access + Fluids
↓
Repeat Adrenaline q5-15min if needed
↓
Consider: Antihistamines, Corticosteroids, Bronchodilators

APPENDIX C: QUICK REFERENCE CARD

EMERGENCY DOSES - ADULT

- **Propofol (laryngospasm): 0.5-1mg/kg IV**

- **Succinylcholine: 0.1-0.2 mg/kg (break spasm) | 1-2 mg/kg (intubation)**
- **Magnesium Sulfate: 2g IV over 20 minutes**
- **Flumazenil: 0.2mg, then 0.1mg q1min (max 1mg)**
- **Naloxone: 0.08-0.2mg q2-3min (max 10mg)**
- **Adrenaline/Epinephrine (bronchospasm): 10-100mcg IV**
- **Adrenaline/Epinephrine (anaphylaxis): 0.5mg IM or auto-injector**
- **Atropine: 1 mg IV (minimum 1 mg, maximum 3 mg)**
- **Salbutamol: 4-8 puffs inhaled (FIRST-LINE for bronchospasm)**

EMERGENCY DOSES - PAEDIATRIC (per kg)

- **Propofol: 0.5-1mg/kg**
- **Succinylcholine (laryngospasm): 0.1-0.3mg/kg IV**
- **Succinylcholine (intubation): 2mg/kg IV or 4mg/kg IM**
- **Flumazenil: 0.01mg/kg (max 0.2mg initial, max 1mg total)**
- **Naloxone: 1-2µg/kg (0.001-0.002mg/kg); max 2mg**
- **Adrenaline/Epinephrine (anaphylaxis): ≥25kg: 0.3mg IM; <25kg: 0.15mg IM**
- **Atropine: 0.02mg/kg (minimum 0.1mg)**
- **ETT (uncuffed): (Age ÷ 4) + 4 | (cuffed): (Age ÷ 4) + 3.5 (estimates only – use PAWPER XL tape / Flipper card for accurate sizing)**

PAWPER XL TAPE - PAEDIATRIC WEIGHT ESTIMATION

Use PAWPER XL tape for South African children (more accurate than Broselow)

Step	Action
1	Measure length: head to heel
2	Assess Habitus Score (1-7): 1=very thin, 3=average, 7=very obese
3	Read weight at intersection of colour zone and HS

Quick Equipment Sizing from PAWPER XL:

Weight	ETT (uncuffed)	ETT (cuffed)	LMA
3-5 kg	3.0-3.5	3.0	1
5-10 kg	3.5-4.0	3.0-3.5	1.5
10-20 kg	4.5-5.0	4.0-4.5	2
20-30 kg	5.5-6.0	5.0-5.5	2.5
30-50 kg	6.0-6.5	5.5-6.0	3
>50 kg	7.0-7.5	6.5-7.0	4

ASA CLASSIFICATION

- **ASA I & Stable ASA II: Office sedation ALLOWED**
- **Fragile ASA II & ASA III: Hospital ONLY (or dedicated SP)**
- **ASA IV-V: Hospital + Anesthesiologist**

MONITORING INTERVALS

- **Minimal sedation: ≤10 minutes**
- **Moderate/Deep sedation: ≤5 minutes**
- **Recovery Phase I: Every 5 minutes**
- **Recovery Phase II: Every 15 minutes**

CAPNOGRAPHY GUIDANCE

- **Minimal sedation: recommended. Moderate sedation: highly recommended (mandatory for enhanced-risk patients). Deep sedation: mandatory.**
- **Enhanced-risk criteria: BMI ≥30, Age >70, STOP-Bang ≥3, ASA ≥III**

FASTING TIMES

- **Clear fluids: 2 hours**
- **Breast milk: 4 hours**
- **Solids/light meal: 6 hours**
- **Heavy/fatty meal: 8 hours**

EMERGENCY NUMBERS

- **EMS: 10177 (landline) or 112 (mobile)**
- **Netcare: 082 911**
- **ER24: 084 124**

APPENDIX D: COMPREHENSIVE EQUIPMENT CHECKLIST

(See separate document)

APPENDIX E: DIFFICULT AIRWAY LETTER TEMPLATE

(See separate document)

APPENDIX F: SEDATION SCORING SYSTEMS

Wilson Sedation Scale

Score	Description
1	Fully awake and oriented
2	Drowsy
3	Eyes closed but rousable to command
4	Eyes closed but rousable to mild physical stimulation (earlobe tug)
5	Eyes closed but unrousable to mild physical stimulation

University of Michigan Sedation Scale (UMSS)

Score	Level	Description
0	Awake and alert	
1	Minimally sedated	Drowsy, rousable to verbal command
2	Moderately sedated	Easily aroused by light tactile stimulation
3	Deeply sedated	Only rousable by significant physical stimulation

Score	Level	Description
4	Unrousable	No response

Modified Aldrete Score (Discharge Criteria)

Parameter	Score 2	Score 1	Score 0
Activity	Moves 4 extremities	Moves 2 extremities	Unable to move
Respiration	Deep breath, cough	Dyspnea, shallow breathing	Apnea
Circulation	BP ±20% baseline	BP ±20-50% baseline	BP ±50% baseline
Consciousness	Fully awake	Arousable	Not responding
O_2 Saturation	SpO_2 >92% on room air	Needs O_2 to maintain >90%	SpO_2 <90% with O_2

Maximum Score: 10 | Discharge when ≥9

REFERENCES

1. Apfelbaum JL, et al. 2022 ASA Practice Guidelines for Management of the Difficult Airway. Anesthesiology. 2022;136(1):31-81.
2. Frerk C, et al. DAS 2015 guidelines for management of unanticipated difficult intubation in adults. Br J Anaesth. 2015;115(6):827-848.
3. Practice Guidelines for Moderate Procedural Sedation and Analgesia 2018. ASA. Anesthesiology. 2018;128(3):437-479.
4. Green SM, Roback MG, Krauss BS, et al. Unscheduled Procedural Sedation: A Multidisciplinary Consensus Practice Guideline. Ann Emerg Med. 2019;73(5):e51-e65.
5. SOSPOSA Sedation Guidelines: Adults (2026-2030) & Paediatrics (2021-2026). www.sosposa.co.za
6. Higgs A, et al. Guidelines for the management of tracheal intubation in critically ill adults. Br J Anaesth. 2018;120(2):323-352.
7. Leroy PL, Krauss BS, Costa LR, et al. Procedural sedation competencies: a review and multidisciplinary international consensus statement on knowledge, skills, training, and credentialing. Br J Anaesth. 2025;134(3):817-829.
8. Chrimes N. The Vortex: a universal high-acuity implementation tool for emergency airway management. Br J Anaesth. 2016;117(S1):i20-i27.
9. Chung F, et al. STOP-Bang Questionnaire: A Practical Approach to Screen for OSA. Chest. 2016;149(3):631-638.
10. Larson CP Jr. Laryngospasm—the best treatment. Anesthesiology. 1998;89(5):1293-1294.
11. Green SM, et al. International multidisciplinary consensus statement on fasting before procedural sedation. Anaesthesia. 2020;75(3):374-385.
12. Silva CR, Pereira T, Henriques D, Lanca F. Comprehensive review of laryngospasm. Update in Anaesthesia (WFSA). 2020;35:1-6.
13. HPCSA. Guidelines for Good Practice in the Health Care Professions. www.hpcsa.co.za
14. [Reference removed - duplicate of Reference 7]
15. Oprea AD, et al. GLP-1 RA perioperative management. Br J Anaesth. 2025;135(1):48–78.
16. Hocking SL, Scott DA, Remedios ML, et al. 2025 ADS/ANZCA/GESA/NACOS clinical practice recommendations on the peri-procedural use of GLP-1/GIP receptor agonists. Anaesth Intensive Care. 2025;53(5):300-306.
17. Rolfson DB, Majumdar SR, Tsuyuki RT, et al. Validity and reliability of the Edmonton Frail Scale. Age Ageing. 2006;35(5):526-529.

18. **Wells M, et al. The PAWPER tape: A new concept tape-based device that increases the accuracy of weight estimation in children through the inclusion of a modifier based on body habitus. Resuscitation. 2013;84(2):227-232.**
19. **Wells M, Goldstein LN, Bentley A. A validation study of the PAWPER XL tape: accurate estimation of both total and ideal body weight in children up to 16 years of age. Trauma Emerg Care. 2017;2(4):1-8.**
20. **Georgoulas VG, Wells M. The PAWPER tape and the Mercy method outperform other methods of weight estimation in children at a public hospital in South Africa. S Afr Med J. 2016;106(9):933-939.**
21. **Nwosu CM, et al. Pediatric weight estimation: validation of the PAWPER XL tape in a South African hospital. Clin Exp Emerg Med. 2020;7(4):290-301.**

DOCUMENT CONTROL

Compiled by:
Dr JL Nienaber
Dr Anita Groenewald
Elzilda Becker

Reviewed by:
Dr Nadia Sarah du Plessis
MBChB (UFS), FCA (SA), MMed Anaes (UFS), PGDip Interdisciplinary Pain Management (UCT)
Specialist Anaesthesiologist ~~| Associate Professor, University of the Free State~~
nadia.vonwielligh@gmail.com | 082 340 4688

Dr De Wet
Dr Wels
Dr Anita Groenewald
Dr JL Nienaber

Approved by:
Prof James Roelofse

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Approved by	Prof James Roelofse
Overseen by	Dr De Wet, Dr Nadia du Plessis
Next Review	December 2026

Contact Information: - Phone: +27 79-880-772 - Website: www.sosposa.co.za - Email: admin@sosposa.co.za

SIGN-OFF

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Each signatory confirms that they have reviewed the document and approve its content for publication.

_____ **Dr Nadia du Plessis Overseen by / Reviewed by**
Signature: _____ **Date:** 26 February 2026

_____ **Dr De Wet Overseen by / Reviewed by Signature:**
_____ **Date:** _____

_____ **Dr Wels Reviewed by Signature:**
_____ **Date:** _____

_____ **Dr Anita Groenewald Compiled by / Reviewed by**
Signature: _____ **Date:** _____

_____ **Dr JL Nienaber Compiled by Signature:**
_____ **Date:** _____

_____ **Elzilda Becker Compiled by Signature:**
_____ **Date:** _____

_____ **Prof James Roelofse Approved by Signature:**
_____ **Date:** _____