



**SOUTH AFRICAN SOCIETY
OF ANAESTHESIOLOGISTS (SASA)**

SASA Practice Guidelines 2022



SOUTH AFRICAN SOCIETY OF ANAESTHESIOLOGISTS (SASA)

Please Note

SASA does not recommend the administration, prescription, or mixture of any medication outside of what is specified by the individual manufacturer and licensed for usage in South Africa, or as per their respective package insert and local registration. Should a medication be used off-label, SASA urges its members to ensure that all required and appropriate consent processes are followed prior to the administration of such medication, and that sufficient peer reviewed and accepted evidence exists to support the utilisation of such medication in this manner as constituting best practice.

In the case of any lipid emulsion, SASA further cautions its members to adhere to best practice in the preparation, management, administration, and any post-manufacture mixture of these emulsions, specifically. Package inserts are individualised per preparation and clearly outline safety recommendations and approved licensing of each medication. Mixing of lipid emulsions with additional medications can result in significant alteration and instability of the pharmacokinetics and dynamics of the original drugs. In addition, lipid emulsions carry a significant risk of bacterial contamination and therefore the preparation and administration thereof should maintain aseptic conditions.

SASA therefore strongly recommends that any medications used as mixtures or synergistic combinations be administered through separate syringes or mode of administration, and via a free-flowing intravenous line in order to avoid sedimentation, prolonged mixing due to stasis within the line, micelle formation, and inadvertent pharmacokinetic and/pharmacodynamic denaturing.



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GUIDELINE INFORMATION

Previous publications and revisions

First published: 1987

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Future revision

Suggested future complete document revision: 2026

Suggested topics for future revision:

Scope of anaesthesia practice for family medicine physicians

Environmentally friendly anaesthesia and sustainable practice

Medication: specifically with regards to updates on advances made in drug labelling both locally and internationally

Guidelines on the use of ultrasound and echocardiography in anaesthesia

Monitoring and care standards

Guidelines for ageing anaesthetists

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Errata

Errata will be published online on www.sasaweb.com.

Disclaimer

While every effort has been made to ensure scientific accuracy, SASA shall not be responsible or in any way liable for errors, omissions or inaccuracies in this publication, whether arising from negligence or otherwise or for any consequences arising therefrom. These guidelines are intended to provide a guide to the minimum standards that should be applied to achieve best clinical care. However, as all patients, environments, and situations are unique, it remains the individual clinician's responsibility and duty of care to the patient to exercise independent, informed clinical judgement.

List of abbreviations

AA	Agent analysis	NEMLC	National Essential Medicines List Committee
AAGBI	Association of Anaesthetists of Great Britain and Ireland	NHA	National Health Act
ADR	Adverse drug reaction	NIBP	Non-invasive blood pressure
APPSA	Association for Peri-Operative Practitioners in South Africa	NIRS	Near-infrared spectroscopy
ASA	American Society of Anesthesiologists	NMT	Neuromuscular transmission
BIS	Bispectral index	NORA	Non-operating room anaesthesia
BP	Blood pressure	NSAIDs	Nonsteroidal anti-inflammatory drugs
CanMEDS	Canadian Medical Education Directives for Specialists	O ₂	Oxygen
CEUs	Continuing education units	OECD	Organization for Economic Cooperation and Development
CIG	Common Issues Group	OR	Operating room
CMSA	College of Medicine of South Africa	PAC	Preoperative anaesthesia clinic
CPA	Consumer Protection Act	PACSA	Paediatric Anaesthesia Community of South Africa
CPD	Continuing professional development	PACU	Postanaesthesia care unit
CPU	Central processing unit	PAIA	Promotion of Access to Information Act
CVC	Central venous catheters	PCA	Patient-controlled analgesia
CVS	cardiovascular system	POC	Point-of-care
CXR	Chest X-ray	PONV	postoperative nausea and vomiting
DA	Diploma in Anaesthetics	POPIA	Protection of Personal Information Act
DCS	Day-case surgery	PPE	Personal protective equipment
DoH	Department of Health	PRDN	Procedure-related death notification
ECG	Electrocardiogram	PSA	Procedural sedation and analgesia
ECT	Electroconvulsive therapy	PSHR	Perioperative Shared Health Record
EDP	Essential Drugs Programme	RA-UK	Regional Anaesthesia United Kingdom
EEG	Electroencephalogram	RCOA	Royal College of Anaesthetists
EML	Essential medicines list	RTs	Transversal tenders
ESMOE	Essential Steps in the Management of Obstetric Emergencies	SA	South Africa
F _I O ₂	Inspired oxygen fraction	SABS	South African Bureau of Standards
FV	Femoral vein	SAFE	Safer Anaesthesia from Education
HARD	Humanitarian, austere, remote and disaster	SAHPRA	South African Health Products Regulatory Authority
Hb	Haemoglobin	SANC	South African Nursing Council
Hct	Haematocrit	SANS	South African National Standards
HPCSA	Health Professions Council of South Africa	SASA	South African Society of Anaesthesiologists
ICU	Intensive care unit	SC	Subclavian
IJ	Internal jugular	SIGs	Special interest groups
IM	Intramuscular	SOP	Standard operating procedure
ISO	International Organization for Standardization	SpO ₂	Blood oxygen saturation
IUSS	Infrastructure Unit Support Systems	SSSA	Safe Surgery SA
IV	Intravenous	TCI	Target-controlled infusion
LA	local anaesthetic	TIVA	Total intravenous anaesthesia
MAC	Minimum alveolar concentration	TNT	trinitroglycerin
MDNF	Maternal death notification form	TTE	Transthoracic echocardiography
MMRatio	Maternal mortality ratio	UPS	Uninterruptible power supply
N ₂ O	Nitrous oxide	US	Ultrasound
NADEMC	National Adverse Drug Event Monitoring Centre	VL	Videolaryngoscope
NCS	National Core Standards	WFSA	World Federation of Societies of Anaesthesiologists
NDoH	National Department of Health	WHO	World Health Organization
NDP	National Drug Policy	WMA	World Medical Association

1. INTRODUCTION

2022 review by A de Goede, T Hlongwane and N Zimmelman

The South African Society of Anaesthesiologists' (SASA) mission is "leading the science and practice of safe anaesthesia at the highest standard and ensuring the sustainability of anaesthesiology services. SASA is dedicated to further the discipline of anaesthesia at both academic and clinical levels". While SASA members adhere to a code of conduct for anaesthesia professionals (Appendix A[i]), these guidelines provide practical guidance for the safe practice of anaesthesia within our diverse clinical settings.

SASA as a professional organisation

SASA is an independent professional body that is the voice for the profession and practice of anaesthesia, both in the public and private sectors and the academic environment. It is a powerful lobbying platform for patient care and safety and better working conditions for all anaesthetists, incorporating the benefit of peer experience, support, and review.

It is the only collective body representing the interests of South African members of the anaesthesia profession. It has five business units, six branches, and seven special interest groups (SIGs), all serving the profession's interests and our patients. More information on SASA is available at www.sasaweb.com.

SASA has full membership status of the World Federation of Societies of Anaesthesiologists (WFSA) and is a member of the African Regional Section within the WFSA. More information is available at www.wfsahq.org.

SASA is a member of the Common Issues Group (CIG), a collaboration of the Societies of Anaesthesia for Great Britain and Ireland, America, Canada, Australia, New Zealand, and South Africa.

1.1 Goals of the guidelines

These anaesthesia practice guidelines aim to set the same standard for the practice of safe anaesthesia at all levels in the context of the South African healthcare system, which is complex and heterogeneous.

In the public sector, the custodians of anaesthesia services (including anaesthetists at all levels, facility managers, and supporting personnel) must be well versed with the standards outlined in practice guidelines and regulations supported by written policies and peer review policies. Stakeholders can incorporate these guidelines as a measure to rate the quality of anaesthesia care. In the private sector, the facility and each professional entity are required to uphold this responsibility.

1.2 Establishment of guidelines (methodology)

Authors and reviewers for the 2022 SASA Practice Guidelines were chosen according to their individual involvement and expertise in specific areas and by recommendation from colleagues. SASA members are represented by reviewers to cover a wide range of work and academic experience, demographics

and geography.

With permission, the conveners have adopted and adapted the layout of the 2022 revision of the Canadian Anesthesiologists' Society's Practice Guidelines. This structure supports: (i) the "living document" format that the panel of reviewers agreed upon to enable review of individual sections as necessary and (ii) easier navigation by members of sections relevant to clinical practice.

1.3 Format of practice guidelines

Most reviewers agree that we should aim for electronic publication rather than hardcopy. The aim will be to create a 'living document' as an online platform where sections of the document can be updated as the need arises and when new evidence demands it. The conveners aim to have the finalised guidelines ready for publication by the second half of 2022 in the South African Journal of Anaesthesia and Analgesia and on the SASA website.

1.4 Date of next review

The conveners and the panel of reviewers agreed that revision of the guidelines should ideally follow international timelines. However, a lack of human resources necessitates that a full review is done less frequently. Prioritising the flexibility that a web-based editable 'living' document enables allows for regular updates of specific individual sections as new evidence arises. A complete document review is provisionally set for 2026.

1.5 Outline of the 2022 revision

The 2022 revision aimed to clarify and elaborate on the strength of recommendations substantiated by updated references as far as possible. Sections reviewed include:

- Position statements circulated in the SASA newsletter
 - Ketamine clinics
 - Ampoule sharing
 - Power outage
 - Sugammadex
 - Haemodynamic printouts
- Guidelines specific to certain SIGs have been incorporated in relevant sections
 - Pain
 - Sedation
 - Regional anaesthesia
 - ICU
- Delegation of care
 - It is of utmost importance to note that SASA does not support the practice of "double doping" under any circumstances.
- Highlights of 2022 reviews
 - Guidelines on professional health and wellbeing

The anaesthesia provider of the 21st century is expected to be up to date on the latest literature and technical developments, practice evidence-based medicine, always

be alert and vigilant when the patient is under their care, and maintain a compassionate demeanour throughout. The working environments are often highly stressful, with multiple demands from patients, families, other physicians, co-workers and administrators. Other stressors include long and unpredictable working hours, minimal relief breaks, exposure to biological, chemical and radiation hazards, noise pollution, lack of natural light, isolation and lack of social interactions. Consequently, professional health and wellbeing are paramount and steps to follow to ensure this are covered in this section.

- Day-case surgery
This guideline defines day-case surgery (DCS) in South Africa, describes the ideal patient population for DCS, and discusses various practical aspects of DCS like preoperative preparation, admission procedures, monitoring and equipment, and discharge procedures. The document discusses DCS in specific patient populations like elderly patients, obese patients and paediatric patients. Our guideline is aimed at stand-alone day-case facilities and does not cover non-operating room anaesthesia (NORA) or procedures performed in practitioners' rooms.
- Anaesthesia support personnel
With the recent increase in research literature on teamwork in the operating theatre and during medical emergencies, it will be unthinkable not to include a section on anaesthesia support personnel. Safety in anaesthesia has improved tremendously with peri-anaesthesia assistance from the anaesthetist. Peri-anaesthesia assistance includes, among other things, the management of anaesthesia services; conducting a knowledgeable preoperative handover with informed consent; preparation and assistance in the theatre and provision of a safe recovery room. Without a current accredited anaesthetic assistant qualification available, the training and development of anaesthetic nurses and assistants remain the responsibility of the whole community of anaesthesia practice.
- Low flow anaesthesia
The delivery of anaesthesia gases in the most efficient, economical, and environmentally friendly manner is a requirement of modern anaesthesia practice. This practice requires an understanding of the physics of the delivery system and the properties of the agents being used. Low flow anaesthesia is an appropriate technique for the current administration of most volatile-based anaesthetics.
SASA co-signed a [Sustainability Statement](#) with other common interest group (CIG) countries in support of sustainable practice.
- Hours of work
Clinical services in anaesthesia are provided 24 hours a day, 7 days a week. Services should adopt a shift system that considers regular and after-hours work; shift duration and frequency; periods of rest between shifts; elective versus after-hours procedures; and the complexity of tasks, while allowing staff members to maintain a good work-life balance. Clinical platforms for training specialists need to allocate time for teaching during working hours. Service planning should include and encourage continuing professional development (CPD) as the regulatory authority requires.

- Records
This section encompasses the standards to which anaesthetic records and prescriptions are kept and speaks to those who own an anaesthetic record. It gives direction in terms of the Protection of Personal Information Act (POPIA) and guides anaesthesia-patient relations regarding access to records and confidentiality. It includes practical advice around electronic records, adverse incidents, and maternal mortalities.
- Anaesthesia outside the hospital setting
This section describes the requirements to perform anaesthesia safely in humanitarian, austere, remote and disaster (HARD) settings. Anaesthesia equipment should be modular, adequately packaged, and well-tailored to the environment. The availability of medical gases and the use of specialised techniques for safe draw-over and intravenous anaesthesia are of paramount importance. Patients should be adequately assessed, cared for, and provided with the safest anaesthesia and post-procedural care, preferably by two different anaesthesia practitioners. Clinical governance should be promoted by accurate record-keeping and case records.
- Equipment and facilities
In the review of this section, more clarity on the availability of videolaryngoscopes (VL) in various clinical settings is provided. Also, preanaesthetic clinics are defined and addressed. Members are encouraged to note and familiarise themselves with the SASA facilities agreement with some of our private facilities and the use of electronic record-keeping in some instances.

1.6 Strength of recommendations

The reviewers used three categories to indicate the strength of recommendations. For ease of viewing, colour coding was used to emphasise the strength of recommendation as follows:

- i. Essential/mandatory (RED)
- ii. Highly recommended (ORANGE)
- iii. Recommended/desirable (GREEN)

Where applicable, a summary of the key points was added at the end of each section.

1.7 Conclusion

Although a disclaimer is added to this document, the Society is not ignorant of the fact that the standards set here can be, and have been, interpreted in several ways by individuals outside of the profession. It is, however, crucial that the Society continues to guide the profession of anaesthesia and related services in South Africa, which is the aim of this document. The Practice Guidelines will always be a work in progress, a guide that must stay relevant to the context and situation where care is provided and in changing social and economic circumstances. Any dispute over interpretation or guideline recommendation, as well as comments on the Practice Guidelines can be sent to the SASA Office via email to sasa@sasaweb.com, and will be considered during the next revision, or included as erratum where applicable.

2. ORGANISATION OF ANAESTHESIA SERVICES

In medicine, including anaesthesia, teamwork is emphasised. A proposed ideal surgical team would include:

- Surgeons
- Surgeon assistants
- Anaesthesiologists
- Anaesthesia assistants
- Nursing personnel (including a scrub nurse and floor nurse)
- Clinical technicians
- Clinical anaesthesia technologists
- Cleaners
- Theatre administration
- Porters

In addition, ward personnel and allied professionals such as dietitians, physiotherapists and occupational therapists may form part of the team. This team may function as different compositions in different situations.

2.1 Duties of an anaesthesia provider

2022 review by E Cloete

The practice of anaesthesia is unique in the provision of healthcare services in that:

- Providers are often not based at one facility and commute between different facilities.
- Providers are service providers and have little control over their daily bookings.
- Providers, as a group, may be faced with more urgent and emergent situations.
- Providers may have less time to establish rapport with the patient preoperatively.
- Anaesthesia is procedure-associated.
- Providers usually do not make the primary diagnosis.

The duties of the anaesthesia provider include:

- Maintaining personal knowledge and skills.
- Providing anaesthesia services or supervising trainees who provide anaesthesia services.
- Anaesthetists may be directly responsible for only one anaesthesia at any specific time unless acting in a supervisory capacity.
- Carrying out a preoperative risk assessment and management for all types of patients and surgery.
- Delegating responsibility for patient supervision to a suitably trained substitute when a local anaesthetic technique is used for pain relief without concomitant surgery, e.g., labour epidural.
- Supervising the recovery room activities.
- Participating in postoperative management where appropriate.
- Managing or supervising the management of patients in the intensive care unit (ICU).

- Providing services related to the management of acute pain.
- Providing services related to resuscitation and advanced airway management in adults and children.
- Taking responsibility for supervising the maintenance of anaesthesia, monitoring, and other life-support equipment relevant to anaesthesiology and critical care. This must occur in conjunction with a suitable technical or biomedical engineering service.
- Taking responsibility for the safe use of anaesthetic drugs.
- Providing anaesthesia services that relate to obstetrics, including pain relief in labour.
- Providing monitored anaesthesia care services in and out of the hospital.
- Keeping complete documentation and records of the anaesthesia administered to patients.
- Obtaining informed consent to all invasive procedures, including those performed under local anaesthesia, spinal- or epidural anaesthesia, monitored anaesthesia care or general anaesthesia, and specific non-anaesthesia interventions such as blood transfusion or HIV testing.
- Maintaining personal and professional wellbeing.

Further duties may include:

- Providing services related to chronic pain management and consulting in pain clinics.
- Providing consultative anaesthesia and ancillary services.
- Carrying out administrative, educational, and managerial duties locally or regionally.
- Providing information and training on methods of handling mass casualties, trauma, and basic life support techniques to:
 - paramedical staff,
 - interested community groups (particularly basic life support), and
 - contributing to the activities of professional associations.
- Auditing and reviewing the quality of care and participating in hospital-based, regional and/or national efforts to improve patient safety.
- Participating in theatre complex management.
- Involvement in the conduct and/or supervision of research on drugs, equipment, clinical management methods, and physiological and pharmacological matters relevant to anaesthesiology and intensive care and keeping up to date with such research.
- Providing and/or taking part in advisory services to hospital committees, health commissions and other organisations to improve health care services.
- Encouraging and supervising research.
- South African adapted CANmeds competencies in training a medical expert include being a medical expert, communicator, collaborator, leader, health advocate, scholar and professional.

Anaesthesia providers

This section attempts to categorise physician anaesthesia providers based on training and experience. Given the risks

involved in providing anaesthesia services and the possibility of simple errors that result in severe adverse outcomes, the scope of practice for the various classes of medical practitioners is defined. The scope of practice should not vary according to the facility level of care. Health Professions Council of South Africa (HPCSA) regulations regarding training and accreditation are only restated to provide context or when alternative recommendations are made. The two main groups of relevance are supervised practice and independent practice.

Supervised practice

Medical practitioners from countries that do not meet local requirements/equivalence for anaesthetic training must practice under supervision. These may be, for example, non-South African doctors who have not completed the South African two-month anaesthesia intern programme. **It is recommended that medical interns receive direct supervision by a diplomate anaesthetist or, if not available, an anaesthetist designated as intern supervisor (see below).**

Interns

- An intern is a doctor in training.
- An intern relies on the undergraduate curriculum for training in anaesthesia at medical school. **It is recommended that undergraduate teaching outcomes in anaesthesia at different training institutions across South Africa be standardised.**
- **Interns must receive a minimum of two months of supervised anaesthesia training (4–6 months is desirable).** We emphasise here the HPCSA training requirements with regards to supervision:

“Adequate supervision: Constant supervision of the intern is of critical importance. The most acceptable form of “adequate” supervision is the presence of a specialist anaesthesiologist or a registrar in anaesthesiology. In the absence of a specialist, the supervisor should preferably possess the Diploma in Anaesthetics (DA) of the College of Medicine of South Africa (CMSA), or at a minimum, have three (3) years full-time experience of administering anaesthesia as a medical officer.” **Irrespective of the qualification, the constant presence of the senior physician on a one-to-one basis is strongly recommended.**

- **It is considered mandatory that interns are trained in the anaesthesia module of the Essential Steps in the Management of Obstetric Emergencies (ESMOE) training programme.**

Community service medical officers

Community service doctors are often required to administer anaesthesia because no other trained medical practitioner is available. A community service doctor relies on both undergraduate and internship training in anaesthesia. **Provision of anaesthesia must be supervised.**

- **It is recommended that supervision of community service doctors in a training institution is done by either an anaesthesiologist or a diplomate anaesthetist.**
- **It is recommended that a diplomate anaesthetist supervises at all other facility levels of care.**
- **It is recommended that the option for 6 months training in anaesthesia be available in institutions accredited for DA training.**

- Even though the community service period is a period of service, and not of training, it is advisable that community service doctors keep a logbook of all supervised completed cases for these to be recognised toward qualifying to write the DA examination.

Independent practitioners/general practitioners

SASA recommends that general practitioners with less than three years experience and less than 75% working time spent in anaesthesia, and who have had no additional training in anaesthesia and rely on undergraduate, internship and community service training when performing anaesthesia services, should not be involved in the independent administration of anaesthesia. The only exception would be in a dire emergency, where a patient of the American Society of Anesthesiologists (ASA) class VE requires urgent anaesthesia, and no other clinician trained in anaesthesia is available. As soon as feasible, every effort should be made to transfer the patient to a centre where more specialised care is available.

To gain experience when there is no recourse to supervised training, a newly qualified general practitioner is advised to join SASA as an associate member to benefit from guidance and contact with diplomate anaesthetists and specialists and CPD activities in the local SASA branch and nationally.

It should be noted that proof of experience in anaesthesia care may be required in peer-review processes or medico-legal investigations. Therefore, **SASA recommends keeping a professional portfolio, including a registered logbook of cases before and after being registered as an independent practitioner with the HPCSA.**

Practitioners should inform patients of their level of experience and qualification during their first encounter with the patient.

Diplomate anaesthetists with less than three years of full-time anaesthesia practice or ‘experienced’ anaesthetists without DA

‘Experience’ for non-diplomate anaesthetists is defined as at least 3 years of anaesthesia practice and at least 75% of working time spent in anaesthesia. This experience may be limited to specific surgical categories or anaesthesia domains, e.g., obstetric anaesthesia, and this practice category is included here. **It is highly recommended that evidence of CPD activities relating to anaesthesia practice be kept up to date.**

The training requirement for a diplomate anaesthetist is a minimum of 6 months of supervised practice in an accredited institution. The DA is awarded by the CMSA after the required training has been completed, and the candidate has successfully passed the DA(SA) examination.

The diplomate anaesthetist is eligible for the independent practice of general and regional anaesthesia in fit and healthy patients (ASA class I) and patients with controlled systemic disease (ASA class II). Patients with poorly controlled systemic disease or functional limitations should only be anaesthetised in consultation with a specialist anaesthesiologist (ASA class III), i.e., with a supervisor. The nature of the surgery must not be major.*

It is reasonable to expect the diplomate to provide safe anaesthesia for fit and healthy (ASA class I & II) paediatric patients over the age of two years, provided the practitioner has

maintained the necessary skills and the nature of the intended surgery is minor and elective. If that is not the case, supervision or referral should be sought.

In an emergency, or where no alternative exists, the diplomate may administer anaesthesia to patients with severe systemic disease (ASA class IV and V) in consultation with a specialist anaesthesiologist. This constitutes supervised practice.

*Surgical severity or grading is done according to the definitions used in large international and national studies on surgical outcomes (i.e., not facility or outcome specific):

Minor surgery includes procedures lasting less than 30 minutes that are performed in a dedicated operating room, which would often involve extremities or body surface, or brief diagnostic and therapeutic procedures, e.g., arthroscopy without intervention, removal of a small cutaneous tumour, diagnostic proctology, biopsy of small lesions, etc.

Intermediate procedures are more prolonged or complex and may pose the risk of significant complications or tissue injury. Examples include laparoscopic cholecystectomy, arthroscopy with intervention, bilateral varicose vein removal, tonsillectomy, inguinal hernia repair, breast lump resection, haemorrhoidectomy, appendectomy, partial thyroidectomy, cataract surgery, uvuloplasty, minimally invasive repair of vaginal prolapse, vaginal hysterectomy, tendon repair of hand, fixation of mandibular fracture, etc.

Major surgical procedures are expected to last more than 90 minutes. They include major gut resection, major joint replacement, mastectomy, extensive head and neck tumour resection, abdominal aortic aneurysm repair, major vascular bypass procedure, procedures involving free flap to repair tissue defects, amputation, total thyroidectomy, cystectomy, transurethral resection of the prostate, resection of liver tumour, carotid endarterectomy, nephrectomy, total abdominal hysterectomy, spinal discectomy, etc.

Experienced diplomate anaesthetists

Experienced diplomate anaesthetists may have extensive experience in specific surgical categories or types but not in others. If experienced and spending at least 75% of their time providing anaesthesia care, the diplomate may be responsible for ASA III patients or patients undergoing major surgery. The provider must realise that peer review for this practice will be assessed at a specialist level.

Family physicians

The family physician practitioner has an invaluable role in the perioperative care of patients, especially at the district level. We recognise that due to the diverse background of training, experience, and competence, they might be in different categories above, e.g., experienced without a diploma or experienced with a diploma. Therefore, we cannot make specific recommendations about family physicians.

Specialist trainees (registrars)

The anaesthetic registrar is permitted to administer anaesthesia under specialist supervision. Although the revised recommended ratio by the HPCSA ratio is set at 4:1, i.e., four registrars to each specialist for elective procedures, SASA recommends that a ratio of 2:1, i.e., two registrars to one specialist, is preferable. In

circumstances where the anaesthesia is classified as "high risk", the ratio may be reduced to 1:1.

Specialist anaesthetists (anaesthesiologists)

The specialist anaesthetist can be expected to provide anaesthesia services independently to all patients, irrespective of the state of health or co-existing disease (ASA classes I, II, III, IV, V and VI). It behoves the individual practitioner to confine their practice to those areas where they have maintained the necessary advanced skills. This applies particularly to cardiac, thoracic, neuro- and paediatric anaesthesia sub-specialities.

- It is recommended that medical practitioners who do not meet local requirements/equivalent for anaesthetic training receive direct supervision by a diplomate anaesthetist or, if not available, an anaesthetist designated as an intern supervisor.
- It is recommended that undergraduate teaching outcomes in anaesthesia at different training institutions be standardised.
- Interns must receive a minimum of two months of supervised anaesthesia training (4–6 months is desirable).
- Irrespective of the qualification, the constant presence of a senior physician supervising interns on a one-to-one basis is strongly recommended.
- It is considered mandatory that interns are trained in the anaesthesia module of the ESMOE training programme.
- Community service doctors must be supervised when providing anaesthesia.
- It is recommended that supervision of community service doctors in a training institution is done by either an anaesthesiologist or a diplomate anaesthetist.
- It is recommended that a diplomate anaesthetist supervises at all other facility levels of care.
- It is recommended that the option for 6 months training in anaesthesia be available in institutions accredited for DA training.
- SASA recommends that general practitioners with less than three years experience and less than 75% working time spent in anaesthesia, and who have had no additional training in anaesthesia and rely on undergraduate, internship and community service training when performing anaesthesia services, should not be involved in the independent administration of anaesthesia.
- It is advised that a newly qualified general practitioner join SASA as an associate member to benefit from guidance, contact with diplomate anaesthetists and specialists, and CPD activities in the local SASA branch and nationally.
- SASA recommends keeping a professional portfolio, including a registered logbook of cases before and after being registered as an independent practitioner with the HPCSA.
- It is highly recommended that evidence of CPD activities relating to anaesthesia practice be kept up to date.
- The anaesthetic registrar is permitted to administer anaesthesia under specialist supervision.
- SASA recommends that a ratio of 2:1, i.e., two registrars to one specialist, is preferable.

2.2 Training and accreditation

2022 review by D Gopalan

Background

Education and training of anaesthesia care providers in South Africa needs to take cognisance of the social setting within which such practice occurs, making them sensitive to both the system and individual needs. Such education and training must be patient-centred, allow for reflective learning and foster lifelong learning by the practitioners. The adequacy of training in respect of preset goals and competencies is seen to be of greater importance than just the training period. Upon completion of appropriate education and training, practitioners need to be certified for an appropriate level of practice. Such practitioners must then register with the HPCSA.

Education and training

Education and training in anaesthesia involves four key role players:

1. HPCSA – regulations and accreditation
2. Universities – academic (teaching and learning, training, research)
3. Departments of Health (DoH) – clinical training platforms and training posts
4. CMSA – assessments/examinations

Education and training in anaesthesia is expected to occur at any healthcare facility (hospital) where anaesthesia is delivered. However, formal, accredited education and anaesthesia training may only occur at HPCSA-accredited hospitals. The HPCSA determines the criteria for such accreditation. Each training institution/site needs to be accredited for training in that discipline and for that competency.

Diploma in Anaesthetics

The purpose of the DA is to encourage postgraduate training and raise the standards of practice of anaesthesia by evaluating candidates at the level of safe, good, practical general practitioner anaesthetists. The objective of the training programme is to produce medical officer anaesthetists who will be able to provide safe and quality care to their patients.

The full DA curriculum is available at https://www.cmsa.co.za/view_exam.aspx?QualificationID=46.

Sites

Anaesthesia training in fulfilment of the DA(SA) examination regulations may be undertaken in:

- Anaesthetic training posts under the supervision of university departments in teaching hospital complexes, as well as in teaching hospital equivalents or in university satellite departments of non-teaching hospitals.
- Post-internship anaesthesia training posts at any of the list of hospitals throughout South Africa.
- Post-internship anaesthesia posts at some hospital sites in Zimbabwe and Namibia.

The list of CMSA-accredited South African hospitals is reviewed periodically and may change from time to time and is available on the CMSA website.

Time

The candidate must hold a post-internship qualification to practice medicine, which is registered or registrable with the HPCSA **and** have six months of training in anaesthesia, either at a recognised site or via a prescribed logbook. Community service doctors are eligible to be trained and write this examination during their year of community service.

Portfolio/logbook

All trainees are encouraged to keep a detailed portfolio of their training and experience. Except in the case of certified supervised training at a teaching or CMSA-approved hospital, a completed logbook is required to substantiate training and/or credit points claimed.

Supervision

A designated supervisor, either a specialist anaesthesiologist or a diplomate, is responsible for training. The level of supervision varies according to the trainee's experience, and the complexity of patients managed. In the early stages, in-theatre or on-site supervision is mandatory. When the trainee is assessed as having achieved a level of competence, the supervision may then be off-site, with the proviso that the supervisor is readily available for complex cases and emergencies.

Assessments

Trainees are expected to be continually evaluated by supervisors during their training, such evaluation focusing on knowledge, skills, attitudes, and behaviours achieved. The final assessment occurs as the DA examination under the auspices of CMSA.

Fellowship training for the specialist anaesthesiologist

Sites

- Training may only take place in an HPCSA-accredited academic department in a teaching hospital under the control of a university with a Faculty of Health Sciences or Medical School.
- The following nine anaesthesiology departments affiliated with universities across the country have been accredited by the HPCSA to train specialist anaesthesiologists:
 1. Sefako Makgatho Health Sciences University
 2. Stellenbosch University
 3. University of Cape Town
 4. University of KwaZulu-Natal
 5. University of Pretoria
 6. University of the Free State
 7. University of Limpopo
 8. University of the Witwatersrand
 9. Walter Sisulu University
- Each university department consists of one or more training sites, such sites being either accredited for full-time training or as a satellite site where only part of the training may be

conducted. The HPCSA accredits all facilities involved in training against a set of predetermined criteria every five years.

- Each trainee trains against a specific training number awarded to the training institution by the HPCSA.

Time

Anesthesiology trainees must spend a minimum duration of education and training equal to 48 months in an HPCSA-accredited registrar post under the control of an academic teaching department in a teaching hospital.

Portfolio/logbook

All trainees must keep a detailed electronic portfolio of their training and experience, including a logbook. The portfolio is inspected periodically by the supervisor and signed off before entry into the examination.

Supervision

Trainees function under the supervision of specialist anaesthesiologists at the training institution. The level of supervision varies according to the trainee's experience, and the complexity of patients managed. When the trainee is assessed as having achieved a level of competence, the supervision may be off-site, with the proviso that the supervisor is readily available for complex cases and emergencies. In more specialised domains (such as anaesthesia for cardiac surgery), constant, on-site supervision is necessary.

Assessments

Trainees are expected to be continually evaluated by supervisors during their training, such evaluation focusing on knowledge, skills, attitudes, and behaviours achieved as per the College of Anaesthetists' curriculum. The FCA Part 1 examination consisting of three subjects (Physiology, Pharmacology, and Physics & Clinical Measurement) must be completed before entry to the exit FCA Part 2 examination.

MMed research

The HPCSA requires the completion of a research component for registration as a specialist. The HPCSA does not prescribe the nature or the types of research to be undertaken, other than making the following statements:

"All specialist trainees will be required to complete a relevant research study, under the supervision of the Head of Department or nominee".

"The assessment criteria of the research study would be that appropriate theoretical knowledge is demonstrated; a research protocol is compiled according to required norms; a progress report on the research project is given regularly".

"Research results should be reported in a dissertation format according to acceptable scientific norms".

"The research study, which will be assessed at university level, may be used as a credit for Part III of the MMed degree".

Universities across the country may vary on how the MMed research requirements are instituted. Please refer to the respective university websites.

Sub-speciality training: critical care

The only sub-speciality domain that is fully accredited for training postanaesthetic specialisation is critical care.

Critical care training may only occur in an accredited intensivists-run ICU under the auspices of a university. It may either be full-time over a two-year period or part-time over a four-year period. The final assessment occurs as the Fellowship (previously Certificate) in Critical Care examination under the auspices of CMSA.

Certification

- Certification in respect of competencies is collectively completed by the training facility and the CMSA.
- The trainee needs to be evaluated and certified as having met the training programme's requirements by the supervisor/director of training.
- The trainee needs to complete the required assessment by CMSA to be certified as a diplomate anaesthetist, specialist anaesthesiologist or a critical care sub-specialist.

Registration

The HPCSA defines criteria and processes for the registration of practitioners.

Upon completing all training requirements and successfully completing the respective CMSA examination, the practitioner may register the qualification against their name on the HPCSA register. It is essential that all practitioners must:

- be registered in the appropriate category before embarking on clinical practice,
- only practice within the scope defined by their registration category, and
- ensure that their registration is current.

General training

- CPD

All anaesthesia practitioners are responsible for continually updating their professional knowledge and skills. In compliance with the HPCSA CPD programme, practitioners must accumulate continuing education units (CEUs) per twelve-month period, including ethics, human rights, and medical law.

- Courses

Anaesthesia practitioners may also complete specific national and international accredited courses (e.g., ultrasound, echocardiography) that may enhance their competency and skill in those areas.

Useful sites for further information

- **CMSA** https://www.cmsa.co.za/view_exam.aspx?QualificationID=46
- **HPCSA** <https://www.hpcsa.co.za>

2.3 Hours of work

2022 review by A Rantloane

Background

The basis for consideration of working hours in anaesthesia care is the need for clinical services to be provided 24 hours a

day, 7 days a week. This necessitates a shift system with regular and after-hours work, as well as work on weekends and public holidays.

For clinical platforms training specialists, the hours of work must also accommodate the teaching and learning responsibilities to ensure sustainable practice.

For all clinical staff, opportunities must also be provided for CPD as this is a requirement by the regulatory authority for maintaining one's licence to practice. Service planning must be mindful of these non-clinical obligations.

Importantly though, the allocation of duties and scheduling of providers must ensure the maintenance of work-life balance for all categories of departmental staff.

In scheduling providers for clinical services, consideration must be given to shift duration and frequency, periods of rest between shifts, whether elective or after-hours scheduling, and the complexity of the tasks being undertaken.

Recommendations

Working hours

Providers should not work for continuous periods exceeding 12 hours or more than 16 hours in a 24-hour period as this has been shown to result in fatigue, and, if unchecked, leads to burnout of clinicians and compromises patient safety.

A minimum 8-hour period should be allowed between shifts for rest and personal needs.

The cumulative hours worked in a one-week cycle should not exceed 60 hours.

Elective procedures should be scheduled for completion within the normal 8-hour working day.

Providers must be allowed to take bio-breaks after every four to five hours of continuous service.

Context

The following recommendations assume that provision has been made for all providers, regardless of rank, to take vacation leave due to them as per the contract with their employer.

The guidelines are also predicated on the assumption that providers would be discouraged from routinely accepting additional clinical shifts for financial gain, as such practice undermines the purpose of the protections being advocated in these guidelines.

For purposes of these guidelines, the same meaning shall be given to the concepts of commuted overtime and after-hours emergency scheduling, and implies work undertaken outside the regular working hours, i.e., nights, weekends and public holidays.

Frequency of scheduling

The frequency of scheduling for after-hours shifts should not exceed once every four days as a higher frequency is associated with burnout risk and carries the potential to compromise patient safety. More specifically, providers should not be scheduled for more than two calls per week as frequent night shifts preclude

effective participation in the training programme and related professional activities.

Categories of staff and level of hospital

These guidelines apply to all categories of staff in the current public sector healthcare delivery model, irrespective of service rank or the hospital level where they are employed, as recent evidence suggests a similar negative impact irrespective of the hospital level. Some of the responsibilities do apply to the private sector with regards to self-management of work hours and wellbeing.

The recommendations hereunder are premised on the current South African healthcare delivery model, in which delivery at the point of care defaults to medical officers and registrars, with specialists providing direct or remote supervision depending on the circumstances.

Department heads

The head of department is primarily responsible for the effective and efficient functioning of the department as it pertains to the provision of clinical services and delivery of its academic and professional mandates. The balance of their responsibilities entails their own contribution to clinical service provision and supervision of junior staff.

For heads of departments, it is recommended that 30–50% of non-clinical time is allowed for this management function.

- In clinical departments with academic programme responsibilities, up to 50% of total time should be dedicated to non-clinical time. Non-clinical time should be allowed for the training programmes' administration, professional development, and academic management.
- In service departments without teaching responsibilities at undergraduate and postgraduate levels, up to 30% of total time should be dedicated to non-clinical time. Non-clinical time should be allowed for administration, training, and professional development.

Specialist staff

Specialist consultant staff share the clinical service, academic and professional responsibilities of the department, but with a lesser administrative load compared to the head of department. They are largely responsible for the clinical supervision of junior staff, the daily scheduling of staff and allocation of duties, delivery of the training programme and assessment of performance, and undertaking related professional activities within and outside the clinical department, e.g., societal work, essential medicines list (EML) participation and work on transversal tenders (RTs).

For specialist staff, it is recommended that:

- 25–30% of non-clinical time be provided for these activities in facilities that have academic responsibilities pertaining to teaching, training, and research.
- Up to 20% of non-clinical time be allowed for specialists at facilities without academic responsibilities for undergraduate and postgraduate students.

Registrars

Unique to specialist trainees is that they must balance the competing goals of clinical service provision, academic

performance, and personal needs whilst in the training programme. In tertiary level hospitals, registrars are the backbone of the anaesthesia service as they constitute most of the clinical staff establishment in any academic department. However, as postgraduate students, registrars also carry a huge responsibility for their studies, which must be completed successfully within the period allowed whilst also achieving the milestones set by the programme during training. If not managed carefully for registrars, clinical workloads can negatively impact clinical training and academic performance.

For registrars, it is recommended that:

- Protected academic time is provided for registrars to ensure success in training.
- 20% non-clinical time be allowed for academic purposes per 60-hour week of contracted service.
- Attendance of elective procedures should not exceed 10 hours at a time. Should elective lists extend beyond 10 pm and up to midnight, the provider must not be scheduled for clinical work the next morning but could be considered for scheduling in the afternoon.
- Should an elective list extend beyond midnight, the provider should not be scheduled for work the next day.
- The duration of after-hours calls should be capped at 16 hours where the main activity is the provision of anaesthesia (as per the employment contract with the State), but this may extend to 24 hours when service is being provided in ICU.
- After-hours emergencies that extend beyond the 16-hour shift should be handed over to the day staff commencing duty after the call.

Medical officers

Similarly to registrars, medical officers provide front-line services under the supervision of specialists, depending on the hospital level or geographical location. In tertiary academic hospitals, they work alongside registrars and function to a large extent like registrars, but in non-teaching hospitals or some academic affiliated hospitals with little or no specialist presence, they undertake most of the anaesthesia services without the benefit of specialist cover. As the only clinician with some anaesthesia expertise in these environments, these providers often do not work to rule but tend to work for as long as there is service demand, with potentially detrimental effects to themselves and the safety of their patients.

For medical officers, it is recommended that:

- Scheduling for medical officers be guided by the principles elucidated above, regardless of local conditions.
- Scheduling for elective clinical work be for 40 hours per week (not more than 10 hours/day).
- After-hours emergency shift duration should not exceed 16 hours at a time. Cases that extend beyond this time should be handed over to the day staff commencing duty after the call.
- Providers should not be scheduled for a longer than 16-hour after-hours shift within 24 hours of completing a previous 16-hour after-hours emergency shift.

Medical interns

Interns represent the entry point into the professional ranks for graduates in medicine. Internship implies training, and the

aim and purpose of internship are to equip these new medical graduates to function as safe and competent practitioners upon completion of their training. They are therefore not equipped to work independently and must be under constant supervision by an appropriate clinician during training. Internship training is regulated, and there are defined outcomes for the successful completion of training. For this to be realised, interns must at the very least be afforded the same protection accorded their senior colleagues in their domain of training.

For medical interns, it is recommended that:

- Medical interns be subject to the same guidelines as medical officers.
- The cumulative hours worked per week be capped at 60 hours. If work circumstances dictate otherwise, the total number of hours worked is not to exceed 80 hours per week in a rolling three-week period.
- Overtime scheduled be capped at a maximum of 80 hours per month.
- 5–10% of time should be allocated to non-clinical time to allow for professional development.

Staff-to-workload ratios

The concerns with overwork and fatigue of anaesthetists in public hospitals are often due to a mismatch between staff and workload. This may be due to staff shortages in absolute terms or sometimes the result of poor planning by staff or managers. The mismatch between anaesthesia providers and workload not infrequently results from the organic growth of the surgical disciplines being serviced, without a commensurate increase in the number of providers from anaesthesia. This is particularly evident in the development of surgical subspecialties or speciality clinics.

For anaesthesia as a support service to keep pace with these developments, it is recommended that staffing models be used to properly align staffing needs with the basket of clinical services being offered on the platform. Such an approach would not only help to correct the current misalignment but can be used to predict what staff ratios would be required in future when new services are being contemplated. Staff planning must anticipate provider absences due to maternity or sick leave, and consideration must be given to the provision of alternative cover through job-sharing or locums.

Useful sites for further information

- **Australian Medical Association.** National code of practice – hours of work, shiftwork and rostering for hospital doctors. Available from: https://ama.com.au/sites/default/files/documents/FINAL_NCP_Hours_of_work_2016.pdf
- **The Association of Anaesthetists of Great Britain and Ireland.** Working arrangements for consultant anaesthetists in the United Kingdom. Available from: <https://anaesthetists.org/Home/Resources-publications/Guidelines/Working-arrangements-for-consultant-anaesthetists-in-the-UK>

- **For heads of departments, it is recommended that 30–50% of non-clinical time is allowed for this management function.**

- In clinical departments with academic programme responsibilities, up to 50% of total time should be dedicated to non-clinical time. Non-clinical time should be allowed for the training programmes' administration, professional development, and academic management.
- In service departments without teaching responsibilities at undergraduate and postgraduate levels, up to 30% of total time should be dedicated to non-clinical time. Non-clinical time should be allowed for administration, training, and professional development.

- **For specialist staff, it is recommended that:**

- 25–30% of non-clinical time be provided for these activities in facilities that have academic responsibilities pertaining to teaching, training, and research.
- Up to 20% of non-clinical time be allowed for specialists at facilities without academic responsibilities for undergraduate and postgraduate students.

- **For registrars, it is recommended that:**

- Protected academic time is provided for registrars to ensure success in training.
- 20% non-clinical time be allowed for academic purposes per 60-hour week of contracted service.
- Attendance of elective procedures should not exceed 10 hours at a time. Should elective lists extend beyond 10 pm and up to midnight, the provider must not be scheduled for clinical work the next morning but could be considered for scheduling in the afternoon.
- Should an elective list extend beyond midnight, the provider should not be scheduled for work the next day.
- The duration of after-hours calls should be capped at 16 hours where the main activity is the provision of anaesthesia (as per the employment contract with the State), but this may extend to 24 hours when service is being provided in ICU.
- After-hours emergencies that extend beyond the 16-hour shift should be handed over to the day staff commencing duty after the call.

- **For medical officers, it is recommended that:**

- Scheduling for medical officers be guided by the principles elucidated above, regardless of local conditions.
- Scheduling for elective clinical work be for 40 hours per week (not more than 10 hours/day).
- After-hours emergency shift duration should not exceed 16 hours at a time. Cases that extend beyond this time should be handed over to the day staff commencing duty after the call.
- Providers should not be scheduled for a longer than 16-hour after-hours shift within 24 hours of completing a previous 16-hour after-hours emergency shift.

- **For medical interns, it is recommended that:**

- Medical interns be subject to the same guidelines as medical officers.
- The cumulative hours worked per week be capped at 60 hours. If work circumstances dictate otherwise, the total number of hours worked is not to exceed 80 hours per week in a rolling three-week period.
- Overtime scheduled be capped at a maximum of 80 hours per month.
- 5–10% of time should be allocated to non-clinical time to allow for professional development.
- For anaesthesia as a support service to keep pace with these developments, it is recommended that staffing models be used to properly align staffing needs with the basket of clinical services being offered on the platform.

2.4 Anaesthesia support personnel

2022 review by I Vorster

The availability of competent assistance to the anaesthesiologist/anaesthetist/anaesthesia provider (hereafter called anaesthesiologist) by an anaesthetic/anaesthesia assistant, i.e., a dedicated anaesthetic nurse or theatre technician, is considered fundamental to the safe conduct of anaesthesia. Research by Künzle et al. has shown that shared leadership, teamwork, anaesthesia-specific training and skilled assistance can minimise harm from adverse incidents. Conversely, inadequate or incompetent anaesthesia assistance has been shown to contribute to and/or fail to mitigate harm during peri-anaesthesia periods.

SASA strongly recommends that competent assistance by an anaesthetic nurse and/or theatre technician (hereafter called anaesthetic assistant) should always be available on site where an anaesthesiologist is expected to provide anaesthesia. Anaesthesia includes the perioperative (pre-, intra- and post-operative included) period of any anaesthetic procedure, also known as the peri-anaesthesia period. The anaesthetic procedure can be of a general, regional, local, sedative or observational nature done in a theatre unit or complex, but also includes anaesthesia in remote locations, e.g., cardiac catheterisation labs, radiology suites, etc. The anaesthetic assistant is an essential team member of the theatre staff in all locations where anaesthesia is administered.

Hospital and theatre managers should be aware of the critical importance of anaesthetic assistance and the potential safety hazards due to the lack of trained and competent anaesthetic nurses and/or theatre technicians. Until accredited courses for anaesthetic assistants are available in South Africa, it remains the combined responsibility of hospital institutions, anaesthesiologists and the nursing fraternity to provide and ensure adequate training and mentorship in acquiring knowledge and skills to ensure a safe environment for all anaesthesia patients. Anaesthetic assistants should also take responsibility and ensure that their knowledge and skills are at a competent level. This can be achieved by using current available resources in their institutions, the Association for Peri-Operative Practitioners in South Africa (APPSA) guidelines, SASA

guidelines, conferences, and informal work-based training by anaesthesiologists and peers.

The staff allocation practices of hospitals and health institutions should include the provision of a trained and skilled anaesthetic assistant for every case where anaesthesia is administered. Anaesthetic assistants should work under supervision until they are adequately trained and their actions competent and safe in the anaesthesia environment. The anaesthetic assistant must be available and present before the procedure, during the procedure (induction, anaesthesia maintenance and emergence), and assist with the transfer of the patient to the recovery area, with no other obligations or duties during these mentioned periods.

Nursing staff

Anaesthesiologists, in both the private and public sectors of South Africa, rely heavily on the assistance of nursing staff for optimal patient care during the peri-anaesthesia period. SASA remains committed to collaborating with all nursing stakeholders, especially APPSA, SA nursing colleges and universities, public and private hospital institutions and the South African Nursing Council (SANC), to define and uphold the principles of safe perioperative care, to ensure optimal quality of peri-anaesthesia assistance and postanaesthesia care.

The nature of anaesthesia practice has advanced and become increasingly more complex due to the expanded knowledge in anaesthesia, significant innovations in equipment and surgical procedures, technology and new pharmacotherapeutics. Though not limited to these examples, anaesthesia is provided during surgical, obstetric, diagnostic and therapeutic procedures and occurs in various inpatient and outpatient settings. Surgical procedures have become more complex, and more patients with critical and complex diseases are being operated on and thus anaesthetised. The practice of anaesthesia has evolved into a specialised field of medicine, and therefore, anaesthetic assistants should be adequately trained in the necessary skills and knowledge to be able to assist in the administration of safe and advanced anaesthesia. Patient safety is prioritised by all stakeholders in the health system.

There is no formal or accredited training available in South Africa for anaesthetic nurses. However, appropriate training is needed to provide effective and safe support to the patient and the anaesthesiologist. Until accredited training is established, the responsibility of training (formal or informal) lies with the hospital, nursing management, theatre managers, operating theatre nurse specialists (scrub sister) and the anaesthesiologist in each respective theatre.

The responsibility of training and acquiring the necessary knowledge and skills lies with the relevant institutions and bodies and the individual anaesthetic assistant. All anaesthesia assistants should have a basic knowledge of applicable anatomy, physiology and pharmacology, and be familiar with the nursing guidelines of APPSA, SASA, WHO and the institution where they are employed. These guidelines should be readily available in all theatre complexes or units where anaesthesia is administered.

SASA guidelines for anaesthetic nursing staff are discussed under the following:

- Management, supervision and organisation of anaesthesia services
- Anaesthetic nurses/assistants
- Recovery room nurses

Management, supervision and organisation of anaesthesia services

Preferably, the supervisor/head of anaesthetic nursing services in larger hospitals with multiple multidisciplinary theatres should be a competent and experienced registered nurse with anaesthesia experience, as well as management and leadership qualities/qualifications. As many of these hospitals offer remote location anaesthesia where several anaesthetic assistants are employed, optimal leadership and management are needed. *SASA recommends that such a supervisor of anaesthetic services has at least been trained in anaesthesia and gained experience, knowledge and competencies in the field as an anaesthetic assistant and recovery room (RR) nurse.* The head of anaesthesia nursing services usually has an administrative role which involves planning, preparing, prioritising and providing anaesthesia nursing services while simultaneously maintaining safety and health standards; identifying, maintaining and utilising resources; collaborating and communicating with multidisciplinary team members to ensure the efficient running of the anaesthesia environment. The anaesthesia nursing manager might also have other managerial and clinical roles in smaller hospitals or clinics.

Organisation of anaesthesia services

To ensure the smooth and safe running of the anaesthesia environment in the facility, the anaesthesia nursing manager plays a pivotal role in theatre, and should routinely:

- Monitor quality and safety standards of anaesthetic care throughout the facility.
- Organise and coordinate the servicing and repair of anaesthesia-related equipment in collaboration with biomedical engineering and/or health technological department.
- Assist with the capital equipment budget by conducting an equipment needs assessment and a procurement plan. This should be done in collaboration with the department of anaesthesia and/or anaesthesiologists practising at the facility.
- Oversee a stock or supply inventory and ensure adequate supplies of sundries and pharmaceuticals in collaboration with stock controllers.
- Ensure and encourage the teaching, training and assessment of anaesthetic nurses.
- Ensure that all relevant guidelines for anaesthesia assistance and patient safety are readily available as sources of reference.
- Ensure safe anaesthesia care through the allocation of personnel with experience and competency to handle specific patient needs, as well as the complexity of the anaesthetic and procedure involved.
- Ensure that written policies on the practice of anaesthesia are available and applied in practice.
- Apply a systematic roster for anaesthetic assistance.

- Communicate regularly with all anaesthesiologists practising at the hospital facility regarding their anaesthetic needs and suggestions for improvement.

Anaesthetic nurses/assistants

Role

The anaesthetic assistant works in collaboration with the anaesthesiologist and assists with the preparation, management and safe delivery of general, regional, local or sedation anaesthesia for surgical procedures. Effective communication between the anaesthesiologist and the anaesthetic assistant is therefore of the essence. This anaesthesia assistance role covers and embraces the total period of peri-anaesthesia, i.e., preoperative, intraoperative and postoperative anaesthesia care. It includes, but is not limited to, preoperative assessment (according to the scope of practice); consent verification; preparation of the theatre; checking and preparation of the anaesthesia machines, monitors, drugs, and all anaesthesia-related equipment needed for the different procedures. It is also the responsibility of the anaesthetic nurse to protect and respect the privacy, diversity, vulnerability and culture of the patient, as well as provide emotional and psychological support during the peri-anaesthesia period. At the end of a procedure, the anaesthetic nurse should assist the anaesthesiologist with transferring the patient from the theatre to the RR and form part of the patient care handover to the RR nurse.

Core responsibilities

SASA views the following as some of the core responsibilities of the anaesthetic assistant. It is by no means a comprehensive list and should be read to enhance knowledge in conjunction with the guidelines of APPSA on *Anaesthetics and Recovery Room Nursing Procedures*.

These core responsibilities are to:

1. Provide a safe perioperative environment by
 - Ensuring clean anaesthesia equipment and environment
 - Adequately replenishing and organising stock in theatres
 - Preparing and checking the theatre, anaesthesia machine, monitors and all anaesthesia-related equipment
 - Preparing equipment, drugs and intravenous fluids
 - Observing all medicolegal requirements
 - Ensuring accurate record-keeping and adherence to schedule 5 and 6 drug policies and regulations
2. Assist with the administration of a safe and optimal anaesthetic by
 - Applying acquired knowledge and skills in anatomy, pharmacology, anaesthetic techniques and/or procedures, and surgical procedures
 - Understanding the physiological responses to anaesthesia and surgery
 - Understanding the potential implications of surgery and anaesthesia for individual patients
 - Developing and maintaining professional competence, knowledge and skills

- Competently supporting and assisting the anaesthesiologist
 - Monitoring the patient in the perioperative period
 - Recognising a problem and assisting in an emergency
 - Acquiring knowledge about and taking care of anaesthesia-related equipment
3. Be an advocate for the patient by
 - Ensuring the patient's privacy, dignity and rights are respected at all times
 - Applying a patient-centred approach
 4. Uphold the reputation of nursing and the work environment/institution at all times through
 - Professionalism
 - Diligence and efficiency
 - Administrative organisation
 - Leadership
 - Effective and respectful communication
 - Confidentiality
 - Responsibility and reliability
 - Personal accountability
 - Punctuality
 - High level of commitment
 - Attitude
 - Enthusiasm
 - Teamwork
 5. Identify healthcare needs in anaesthesia and assist in the development of more efficient systems through
 - Situational awareness
 - Pro-activeness
 - Participation in audits and research

Qualifications, training requirements and core competencies

The anaesthetic nurse is a member of the theatre team and must be registered with the SANC. Although qualified theatre technicians can act as anaesthesia assistants, they do not currently need to register with a regulatory body.

As there are currently no existing registered training courses for anaesthesia nurses or assistants in South Africa, there are also no defined compulsory core competencies needed to be considered a trained and competent anaesthetic nurse or assistant. The registered operating theatre nurse specialist (scrub sister) is expected to be the most knowledgeable and experienced member of personnel amongst the nursing team with regard to theatre management, including aspects of the anaesthesia service. They are regarded as competent in the application of critical thinking, planning, clinical judgment and implementation as underpinned by scientific, biomedical and technological knowledge obtained from their theatre training and/or qualification.

SASA is aware that there are various in-hospital and other training programmes to specifically train anaesthetic nurse assistants. However, the training of these assistants varies

widely throughout SA, and it is the view of SASA that the lack of a national standard could contribute to adverse perioperative events.

Recommendations for anaesthetic assistant training

In the interim, and until a registered anaesthetic assistant training course is established, all hospital managers, nursing managers and operating theatre nurse specialists should accept responsibility to ensure that staff delegated to the position of anaesthetic assistants are competent and have undergone in-service training.

SASA highly recommends that hospital facilities, in collaboration with hospital and operating theatre managers, should have an established training programme for the teaching and subsequent assessment of anaesthetic assistant trainees. It is advised that the assistance of APPSA, anaesthesiologists and/or anaesthesia departments at tertiary institutions are sought in the design of a course curriculum and course content. The specific anaesthetic department or anaesthesiologist concerned should be available for support and guidance to determine the required knowledge and technical and non-technical skills of a competent anaesthetic nurse. Trainee assistants must be supervised until they are assessed and competent enough to work independently.

The scope of clinical anaesthetic assistant practice

SASA regards the following as part of the scope of practice of the anaesthetic nurse/assistant. It is not a comprehensive list and must be read in conjunction with the SANC regulations and APPSA guidelines.

- Pre-assessment of a patient within the scope of practice (if applicable, with parent/caregiver) before surgery
- Validation of preoperative assessment information on the day of surgery
- Validation of consent
- Preparing and checking the theatre, anaesthetic machine and anaesthesia-related equipment according to the theatre list and preferences of the anaesthesiologist
- Ensuring availability of anaesthetic agents, resuscitation drugs and all other applicable drugs in theatre
- Assistance to the anaesthesiologist in the delivery of anaesthesia/sedation/analgesia
- Continuous patient assessment, monitoring and intervention in collaboration with the anaesthesiologist
- Professional handover to RR personnel

Core competencies

To perform the role of the anaesthetic nurse or assistant, they should be able to demonstrate a level of competence based on applied knowledge and continuous development of skills. Core competencies include both technical and non-technical (soft) skills. These suggested core competencies should be read in conjunction with the APPSA guidelines on *Anaesthetics and Recovery Room Nursing Procedures*.

The expected knowledge base for an anaesthetic assistant includes, but is not limited to, the following:

- Comprehensive knowledge of the different types of anaesthesia techniques and their principles
- Applied clinical pharmacology relating to anaesthesia, emergency intervention or surgical procedures
- Applied anatomy and physiology, relating to anaesthesia and surgical intervention, especially of the following systems – airway; respiratory; cardiovascular; central and peripheral nervous; thermoregulation; pain; nausea and vomiting
- Knowledge of surgical and anaesthetic procedures and their effect on the patient
- Analysis and meaning of invasive and non-invasive monitoring data
- Cardiopulmonary resuscitation, respiratory care, and other acute emergency care
- Age-related anaesthesia considerations, e.g., for paediatric and geriatric patients
- Surgical procedure considerations, e.g., ENT, cardiothoracic, neurosurgery, burns
- Effects of comorbidities on anaesthesia and surgical procedures
- Equipment required for specific anaesthetic procedures
- Function, care, cleaning and maintenance of anaesthetic equipment
- Principles of infection control and waste management
- Resource management
- Medicolegal requirements
- Good communication and professionalism

Recovery room nurses

The purpose of a RR or postanesthetic unit (PACU) in a theatre suite is to provide a safe environment for an anaesthetised patient emerging from anaesthesia, whether it be general, regional or sedational. For these guidelines, the term RR, and not PACU, will be used as this is more prevalent in South Africa. The patient, transferred from theatre to the RR by the anaesthesiologist and assistant, is handed over for safe monitoring, observation and care by efficient, competent and trained RR nursing staff. An adequate, effective and safe handover prevents and/or diminishes the occurrence of adverse events postoperatively. Please note that the discharge of a patient from RR remains the responsibility of the anaesthesiologist, and the length of stay in the RR is determined by such. Therefore, the duration of stay in the RR is not predetermined but individualised for each and every patient.

The institution must ensure that staff members appointed to the RR are trained and competent. Unfortunately, there is no current standardised curriculum for RR nursing available in South Africa. SASA supports the development of such a curriculum in collaboration with the nursing fraternity and APPSA.

SASA guidelines for RR nursing must be read in conjunction with the APPSA *Anaesthetics and Recovery Room Nursing Procedures Guidelines*.

Role

The RR must be prepared and checked daily by RR staff according to policy, equipment and safety rules. A written policy regarding

the checking of equipment and drugs must be available. The RR nurse must ensure that all the necessary equipment is available, checked and in working order. Specific roles of RR nurses must be identified daily or more often if necessary.

A specific area must be allocated, prepared and functional for paediatric cases.

The patient is handed over to the RR nurse by the anaesthesiologist, assisted by the anaesthetic nurse, and the scrub sister.

- The patient should be identified during the handover.
- The RR nurse should take note of the procedure, patient condition, anaesthetic given, pain control needed and any other specific orders (written/verbal) given by the anaesthesiologist or scrub sister.
- The RR nurse should not accept full responsibility for the patient if they are not satisfied with the patient's condition or before the patient is extubated, unless otherwise expressly agreed with the anaesthesiologist. Extubation remains the responsibility of the anaesthesiologist.
- All essential monitors, e.g., SaO₂, BP, pulse, capnograph (if applicable), should be connected, and observations should be documented. The RR nurse must be vigilant in monitoring physical changes and assessing their significance.
- Life-threatening situations and anaesthetic-related problems should be recognised, acted on and reported to the anaesthesiologist, e.g., return of protective reflexes, circulation/haemodynamic shifts, varying levels of consciousness, nausea and vomiting, pain level and airway dysfunction.
- The effect of all interventions must be evaluated.
- Pain control as prescribed by the anaesthesiologist should be administered.

The RR nurse provides continuity of a safe anaesthesia during the postanaesthesia period through responsible discharge from the RR and professional handover of the patient to the ward staff. The patient is only transferred to the ward after verbal confirmation and written consent from the anaesthesiologist.

The RR nurse should also:

- Safeguard the patient against injury
- Prevent medicolegal incidents
- Communicate with the patient about any complaints, fears or anxiety and provide psychological support
- Protect the dignity and privacy of the patient at all times
- Keep accurate records
- Practice correct waste management

All RR personnel must develop, update and maintain their professional knowledge and skills.

Core competencies

SASA views the following as core competencies for a RR nurse. It is not a comprehensive list and must be read in conjunction with the APPSA guidelines.

The RR nurse should:

- Be adequately trained in RR procedures and the prevention of adverse events

- Be able to assess and identify anaesthetic-related problems regarding the airway and haemodynamic system
- Be able to identify the loss of protective reflexes during the different stages of postanaesthesia emergence
- Have a compulsory knowledge of anatomy and physiology of the airway, which is very relevant to airway management in the RR
- Have acquired skills and knowledge of direct laryngoscopy, intubation and placement of a Guedel airway
- Be able to maintain an airway with bag-mask ventilation
- Be able to assess breathing and identify upper airway obstruction, laryngospasm, hypoventilation, apnoea, bronchospasm and aspiration
- Possess basic knowledge of pharmacology regarding anaesthetic agents, analgesics, cardiovascular and emergency drugs and their effects
- Be aware of the existence and position of the emergency alarm, which should be checked daily
- Have received training and possess knowledge regarding emergency procedures, protocols and CPR

Management in the recovery room

- A registered nurse proficient in anaesthesia and RR nursing should be in charge and manage the RR
- Special situations or patients, e.g., critically ill, paediatric, geriatric patients, should be recovered by a competently trained senior RR nurse
- All inexperienced staff should work under direct supervision of qualified staff

Recovery room staffing requirements

- The RR must be adequately staffed during operational periods of the theatre unit
- A registered or enrolled nurse, who is trained and competent in RR care, must be present in the RR during all operational periods
- **An appropriately trained and registered nurse, who is experienced and competent in RR procedures, should be in charge of the RR**
- **The ratio of nursing staff who are trained in RR care to patients needs to be flexible to provide:**
 - **no less than one nurse to two (1:2) patients**
 - **one nurse to each (1:1) patient who has not recovered protective reflexes**
- **Ideally, a ratio of 2:1 (nurse:patient) in compromised or critically ill patients in the RR should be sought – one appropriately qualified nurse must take care of the patient, while the second should document and monitor observations. The anaesthetist must be available immediately to extubate the patient that still has an airway device in situ and should not start another case until such time.**
- If there is no RR nurse available at handover, the scrub sister should remain with the patient and perform the RR duties until the patient has been handed over to the ward staff

- Special adjustments should be made for paediatric and geriatric patients as well – two nurses per patient until the patient is calm with full return of protective reflexes
- A specifically allocated nurse with the necessary competency should take responsibility for daily checks of the resuscitation trolley, drugs and equipment. A recheck should be done after any use of drugs and/or equipment. All checks should be recorded.

Please note that the RR nurse should always act in the patient's best interest. The patient must never be left unattended and always treated with respect. Confidentiality remains of the utmost importance. Noise and traffic in the RR should also be kept to a minimum.

Conclusion and recommendations regarding anaesthesia support personnel

It is of the utmost importance that continuous education and evaluation of knowledge and skills of anaesthesia and RR personnel are developed and maintained to support safe anaesthesia and minimise medicolegal/adverse incidents.

Therefore, SASA highly recommends that all stakeholders in the community of anaesthesia practice collaborate and address the empowerment and education of anaesthesia nursing by establishing a registered course curriculum for anaesthesia assistants and RR personnel in the near future.

- SASA strongly recommends that competent assistance by an anaesthetic nurse and/or theatre technician (hereafter called anaesthetic assistant) should always be available on site where an anaesthesiologist is expected to provide anaesthesia.
- SASA recommends that such a supervisor of anaesthetic services has at least been trained in anaesthesia and gained experience, knowledge and competencies in the field as an anaesthetic assistant and recovery room (RR) nurse.
- SASA highly recommends that hospital facilities, in collaboration with hospital and operating theatre managers, should have an established training programme for the teaching and subsequent assessment of anaesthetic assistant trainees.
- SASA highly recommends that all stakeholders in the community of anaesthesia practice collaborate and address the empowerment and education of anaesthesia nursing by establishing a registered course curriculum for anaesthesia assistants and RR personnel in the near future.

2.5 Guidelines on professional health and wellbeing

2022 review by C Lee

Introduction

Many factors can contribute to the provider's inability to function at their highest performance level, which ultimately impacts patient safety. These include work-related factors, organisational- and health system-related factors, as well as personal factors: issues such as uncontrolled working hours resulting in excessive

fatigue; workplace harassment and bullying; discrimination; stress; inadequate rest and nutrition while working; burnout; physical health, personal and mental health issues; substance abuse and addiction challenges.

The HPCSA Guidelines on Good Ethical Practice under "Duties to themselves" focus on the ethical duty of physicians and anaesthesia care providers to maintain sound professional knowledge and skills and good professional practice.

Sound clinical data over recent years have highlighted the need to prioritise physician health and wellness as well as knowledge and skills. The ethical responsibilities to promote and maintain the health of anaesthesia providers can be considered in three main areas: (i) personal responsibilities, (ii) institutional responsibilities, and (iii) individual responsibilities towards other healthcare workers, trainees and colleagues.

All recommendations listed below are not comprehensive and not restricted to what is recommended.

Personal responsibilities of the anaesthesia provider

The ethical requirement to promote and maintain one's own health and wellbeing must address all aspects of physical, mental and emotional health. As noted previously, there are many health and wellness challenges, and anaesthesia provision is particularly prone to stress in the workplace, excessive fatigue and higher risks of isolation, addictions and suicide.

Like everyone else, anaesthesia providers inevitably get older, bringing on a diminution of physical, mental and special sensory faculties. This may be counterbalanced to some degree by the wisdom that comes with experience. There is also much variation between individuals in the ageing process, not only in the degree of functional impairment with age but also in areas of functioning. For example, highly capable in elective surgery or education but highly stressed in after-hours and emergency scenarios.

All anaesthesia providers should monitor themselves and their colleagues for signs and symptoms of functional impairment so that impairments can be detected early and support and professional help can be offered.

Recommendations

1. Be aware of the general and specific health issues that may impact your own professional life.
2. Be aware of your own issues with health and wellbeing. Know yourself.
3. Seek timely and appropriate help if concerned about your own physical, mental, emotional, or special sensory health.
4. Take time to look after your own health and wellbeing:
 - take time off work for recreation and recuperation
 - ensure adequate and appropriate nutrition
 - maintain physical fitness
 - ensure adequate sleep
 - maintain social connections
 - practice mindfulness, meditation, and other forms of relaxation

- develop and enjoy other interests and hobbies
 - look after your emotional wellbeing
 - have timely and regular physical check-ups and ensure medication compliance
5. Be particularly aware of fatigue. Avoid commitment to a quantity of clinical work that may result in excessive fatigue. If fatigue is leading to unsafe practice, this should be addressed with the department and institution, and clinical work should be reduced.
 6. Limit or modify your own practice if patients and/or co-workers are being placed at undue risk, until personal physical, mental, and emotional health issues are resolved or adequately managed.
 7. Maintain adequate investments, disability insurance or contingency plans to ensure your ability to attend to personal health and wellbeing issues without major financial penalty or disarray.
 8. Seek help if feeling hopeless, needing drugs or alcohol, or if life is spiralling out of control.

The following **Helplines** are available:

SASA Wellness in Anaesthesia Support Group: dreamdocs@gmail.com

If you want to speak to anaesthesia colleagues that know what you are going through.

Healthcare Workers Care Network (0800 212 121)

If you wish to talk to registered psychology professionals.

Discovery Healthy Doctors (0800 323 323)

For self-assessment and self-reading. This resource has financial, legal, physical health and mental health support.

Institutional responsibilities

“Institution” in this instance refers to the hospital, faculty and/or departmental administration that has authority over the provision of anaesthesia and the practice of anaesthesia providers. It is recognised that the HPCSA has authority over the anaesthesia physician provider and has a stake in regulating, promoting and supporting physician wellness.

Anaesthesia and/or faculty leadership must support physician health and wellness through administrative structures that promote and support a healthy workplace.

Creating and sustaining a culture of **psychological safety** is essential. Psychological safety is the shared belief held by members of a team or department that the team is safe for interpersonal risk-taking. These risks include the ability to show and be oneself without fear of negative consequences to self-image, status or career advancement. It also includes speaking up when a problem or mistake arises, without fear of being blamed, punished or humiliated, voicing opinions without fear of being judged, and reporting issues without fear of negative repercussions. When team members feel psychologically safe at work, it is easier for them to engage fully, participate in meetings, solve problems, report issues, collaborate on projects and support each other. It helps create a much more trusting and respectful organisational climate, which leads to higher

psychological safety, a self-fulfilling cycle. More information can be found on the [SASA website](#).

Peer support mechanisms are helpful to identify those at risk or in difficulty, activate support systems and encourage maintenance of compliance and safety. It alleviates isolation and alienation and creates a team-based culture of collaboration and support. More information can be found on the [SASA website](#).

Recommendations

Daily work hours

- Regulation of work hours and shift patterns taking into consideration the dangers of chronic and excessive fatigue. The specific number of prescribed working hours is covered in section 2.3.
- Structuring of operating room schedules to permit necessary breaks for everyone for personal physiological needs and nutrition.
- Implementation of staffing flexibility to allow for taking unexpected leave for personal health or family responsibility reasons, for exhausted physicians after a difficult list or call and for unforeseen events such as after critical incidents.
- Encourage departments and facilities to create anaesthesia care teams to improve both patient safety and healthcare provider health.
- Always encourage the availability of appropriately skilled help (at the very least, a phone call away), especially in out-of-operating room (OR) locations and after-hours for emergency cases.

On-call commitments

- Transparent and equitable scheduling policies should be followed.
- Schedule adequate rest and recuperation post-call, and if possible, provide support to get home safely if unfit to drive a vehicle post-call due to fatigue and exhaustion.
- Discourage scheduling of non-urgent procedures during after-hours to minimise the demand for OR resources during periods of minimal staff coverage.

Ensure transparent and equitable policies

- Vacation and leave
- Exam and study leave
- Scheduling of shifts and calls
- Appointments and promotions

Build psychologically safe departments and have appropriate mechanisms to report and deal with issues such as

- Workplace harassment and/or bullying
- Discrimination based on gender, race, culture, sexuality, religion, or disability
- Enforce a clear zero-tolerance policy

Create a formal response and support system to address fall-out in personnel after stressful events (e.g., critical adverse events, unexpected deaths, disasters such as terrorism and fire, patient complaints and violence, etc.)

- Appropriate critical incident debriefing training for appropriate senior consultants
- Access to trained critical incident support personnel
- Peer support mechanisms
- Formal policies on the timing and follow-up of critical incident management to ensure follow-through
- Please see critical incident debriefing section on <https://www.sasaweb.com>.

Substance abuse and other functional impairment rehabilitation

- Formal and transparent structure and policy on supervision and rehabilitation of impaired physicians
- Encourage compassion and support
- Zero tolerance for judgment, bullying, and humiliation

Dignified retirement pathway

- Formal structure and policy on retirement pathway based on transparent functional impairment assessments and reporting
- Access to lower acuity and complex cases where appropriate and available
- On-call duty reduction strategies

Responsibilities toward healthcare workers, trainees and colleagues

Health and wellness

Every anaesthesia provider has a role in helping colleagues with significant health or wellness problems, especially as it impacts the safe, ethical and caring delivery of medical services to patients.

1. Be aware of warning signs of significant illness, addiction, excessive stress, or burnout.
2. Approach colleagues with serious concerns about health or wellness and encourage them to seek help or advice from an appropriate source. Please see the support section on the [SASA website](#).
3. Encourage colleagues whose ability to practice medicine becomes temporarily or permanently impaired to appropriately modify or discontinue practice.
4. Be supportive and compassionate towards those who have sought help with a health or wellness problem and are recovering or undergoing treatment or rehabilitation for that problem.
5. Respect the confidentiality of those who have health or wellness issues.
6. Realise that it is a legal obligation to report such concerns to the HPCSA if there is reason to believe a fellow clinician is in danger.

Trainees

The period of training is fraught with challenges: long working hours, stressful working conditions, difficult shifts, relationship challenges, new parental responsibilities, exams stress coupled with inadequate time for studying. Compassion and support are not only helpful but essential in promoting health and wellness among the trainees.

1. Avoid bullying, shaming, and blaming behaviour. Trainees are still learning, and mistakes are unavoidable. Mistakes are opportunities for learning and adjustment rather than punishment and shaming. Encourage openness and honesty and empower conversations and discussion to achieve learning.
2. Create supportive and flexible work environments for those facing stressful challenges: exams and intense study periods, new parenthood (e.g., baby and breastfeeding challenges) and family responsibilities, added work responsibilities (new consultants), etc. Have transparent structures and policies to allow leave and flexibility for these periods.
3. Have an open-door policy and ensure a psychologically safe culture to allow feedback and suggestions within the department. Every group of trainees is different, and their needs differ. Be prepared for adaptation and flexibility.

Legal responsibilities

The HPCSA Guidelines on Ethical Rules stipulate the following:

Reporting of impairment or unprofessional, illegal or un-ethical conduct.

A student, intern, or practitioner shall –

1. report impairment in another student, intern, or practitioner to the board if they are convinced that such student, intern, or practitioner is impaired,
2. report their own impairment or suspected impairment to the board concerned if they are aware of their own impairment or have been publicly informed, or have been seriously advised by a colleague to act appropriately to obtain help in view of an alleged or established impairment, and
3. report any unprofessional, illegal, or unethical conduct on the part of another student, intern, or practitioner.

This is a legal requirement.

2.6 Peer review

2022 review by N Zimmelman

Clinical governance is defined as a system through which health services are responsible and accountable for:

- continuously improving services,
- safeguarding high standards of care, and
- ensuring the best clinical outcomes for patient care.

The system of governance includes the following aspects of clinical risk management:

- Mortality and morbidity reviews.
- Adverse events and near-misses reporting and reviews.
- Patient record reviews and **peer reviews**.
- Clinical audits on various aspects of anaesthesia processes in various anaesthesia practices, measuring compliance with best practice.

Peer review is a voluntary process and a function of SASA's Regulation Business Unit. SASA has a comprehensive peer review policy and procedures that have been established to manage such requirements. Queries can be sent to sasa@sasaweb.com.

Please refer to the 2020 published peer review policy and procedure (Appendix A(v))

The SA DoH's new policy on patient safety incident reporting for all adverse events is available in Appendix A(iii).

An **adverse event** can be defined as harm, an injury or complication associated with medical treatment. This may or may not be because of error. A **near-miss** is a possible injurious event that is intercepted before it reaches the patient.

Errors can be categorised as *serious* or *minor* and may be because of a mistake by a doctor, another health team member or a systems error.

When documenting events around a medical error, the documentation must be factual and exhaustive. It is essential to avoid speculation regarding cause or blame.

Should a death occur, The Health Professions Amendment Act of 2007 states the following:

“Death of a person undergoing a procedure of therapeutic, diagnostic, or palliative nature or of which any aspect of such a procedure has been a contributory cause, shall not be deemed to be a death from natural causes as contemplated in the Inquests Act, 1959 (Act 58 of 1959), or the Births, Marriages, and Deaths Registration Act, 1963 (Act 81 of 1963).”

This means that all doctors and nurses who work in operating theatres must be made aware of the law, and that all unnatural (perioperative) deaths must be reported, regardless of the sentiments of the medical team and/or the next of kin.

This same group of medical personnel needs to be instructed to the effect that all unnatural deaths must be reported, regardless of the length of time that has elapsed since the administration of the anaesthesia. Documents regarding the report are discussed in the Records section of these guidelines.

It is strongly advised that one's indemnity insurance company should be notified immediately, particularly in cases where the death has been sudden and unanticipated.

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3. ANAESTHESIA EQUIPMENT AND ANAESTHETISING FACILITIES

3.1 Facilities

2022 review by P Bettings

Introduction

The requirements for healthcare facilities providing surgical services are described in the Infrastructure Unit Support Systems (IUSS) Health Facility Guides: Facilities for Surgical Procedures (Gazetted 30 June 2014 – Appendix B) that supersedes regulation R158 on Infrastructure and should be interpreted in conjunction with the current National Core Standards (NCS) Regulations (Appendix A[iv]).

Please note: Recommendations have been adopted to accommodate the legislation providing for the designation of hospitals as Gazetted on 2 March 2012 by the National Department of Health (NDoH), "Regulations relating to categories of hospitals" in which hospitals are designated according to the number of beds, the staffing skills and registration of both medical and nursing staff, ability to provide critical care, and the outreach and support services that the facility undertakes and receives.

District hospital (Level 1)

This category is divided into small (50–150 beds), medium (150–300 beds) and large (more than 300 beds). District hospitals provide a 24-hour service staffed by general practitioners and clinical nurse practitioners, on an inpatient, ambulatory and emergency basis. A district hospital receives outreach and support from general specialists based at regional hospitals.

Regional hospital (Level 2)

It has between 200–800 beds and provides 24-hour service in internal medicine, paediatrics, obstetrics and gynaecology, and general surgery, with additional services in at least one of the following: orthopaedic surgery, psychiatry, anaesthesia, and diagnostic radiology. Services include trauma and emergency services, and the facility must provide short-term ventilation in a critical care unit. A regional facility receives referrals from several district hospitals in its geographic area and should receive outreach and support from tertiary hospitals.

Tertiary hospital (Level 3)

It has 400–800 beds, provides the services of a regional hospital, and has subspecialties of internal medicine, paediatrics, obstetrics and gynaecology, and general surgery. The critical care unit will provide intensive care under the supervision of a specialist or specialist intensivist. Tertiary hospitals receive referrals from regional hospitals and may provide training for healthcare professionals.

Central hospital (Level 4)

It has a maximum of 1 200 beds and provides tertiary services. In addition, it provides central referral and national referral services,

must conduct research, must provide training for healthcare professionals, and must be the main teaching platform for a medical school.

Specialised hospital

It has a maximum of 600 beds and provides specialised services like psychiatry, infectious diseases, tuberculosis or rehabilitation services.

Private facilities

The Health Act (2012) only provides for "for-profit" and "not-for-profit" categories of private hospitals. For the purposes of these guidelines, the committee regards most private healthcare facilities with inpatient beds to meet the criteria of at least a regional hospital. Therefore, the facility needs to meet the applicable standards.

Stand-alone, day-care facilities

Stand-alone, day-care facilities providing sedation and anaesthesia in a theatre must be equipped to the level expected of a regional hospital.

Facilities for office-based sedation

Facilities that provide office-based sedation only must be equipped according to the standards required in the SASA "Guidelines for the safe use of procedural sedation and analgesia for diagnostic and therapeutic procedures in adults: 2021." (Appendix C)

Note:

- Where hospitals provide a combination of levels of care, the facilities and equipment must meet the requirements for the higher level of care.
- Private practitioners should familiarise themselves with requirements by some hospital groups/facilities for facility agreements and electronic record keeping. (Appendix D).

3.2 Equipment

2022 review by G Davies, A Reed and D Shmukler

- Every item on the list of essential equipment should be available at every site where anaesthesia is provided, even if anaesthesia is only provided occasionally.
- **Essential items are equivalent to a mandatory standard of care.**
- **Recommended/desirable items should be available where resources allow and if appropriate for the surgical/anaesthesia services delivered.**
- **Private facilities** will generally be equipped at the level of regional (level 2) hospitals, except where these facilities provide specialised services (e.g., cardiothoracic surgery, shoulder surgery, etc.) where they will need to meet the requirements for tertiary/central (level 3/level 4) hospitals.

- Day surgery and office-based facilities are discussed in the relevant portion of the practice guidelines (Appendix E).
- It remains the duty of the anaesthesia provider to ensure that all relevant anaesthesia equipment required in the perioperative period is available, in working order and appropriate for the case being performed.

Anaesthesia equipment

- Essential anaesthesia equipment requirements will differ between institutions depending on the nature of the surgery undertaken and the surgical services offered. The availability of maintenance and repair services is also a key consideration when procuring anaesthesia equipment. Referral hospitals are usually in large centres and must meet higher standards.
- **Regional (Level 2) hospital requirements will include most of the recommended equipment.**
- **Tertiary (Level 3) and central/specialised hospital requirements must include all items listed as "Recommended".**

Anaesthesia mixture components

No anaesthetic machine must be capable of delivering a hypoxic mixture of gases under any circumstance.

Essential items

Gas sources exclusively from cylinders must have:

- Pin-index yokes with pressure-reducing valves for both oxygen, air and nitrous oxide. These should be marked with the name or the chemical symbol of the gas and colour-coded in accordance with international standards.
- Pressure indicators for all cylinders must be available.
- One nitrous oxide cylinder and one full spare per machine, or one medical air cylinder and one full medical air cylinder spare per machine.
- Two oxygen cylinders and two full spares per machine.
- A suitable spanner or key must be available to open and close gas cylinders, even if the cylinders have finger-control knobs. The spanner should be attached to the anaesthesia machine.

Gas sources from pipelines with backup cylinders must have:

- **SASA recommends that all new facilities be provided with piped medical air and oxygen and nitrous oxide.**
- Non-interchangeable wall points and connectors for nitrous oxide, oxygen and any other gases, conforming to national standards.
- Colour-coded pipeline hoses capable of withstanding pressures of up to 1 000 kPa affixed to anaesthesia machines by non-interchangeable fittings. Colour-coding according to international standards: oxygen (white), nitrous oxide (blue) and medical air (black).
- Pressure indicators for each line, either outside the operating theatre, or in the gas pipeline before the anaesthesia machine. (South African National Standards [SANS] 7396-1:2009 Medical gas pipeline system).
- Non-return valves fitted at the machine connection point of the pipeline.

- One backup cylinder with pin-index yoke for oxygen attached to the anaesthesia machine.
- One spare oxygen cylinder, in addition to the spare on the machine's yoke.
- A suitable spanner or key must be available to open and close gas cylinders, even if the cylinders have finger-control knobs. This should be attached to the anaesthesia machine.
- Medical air pipelines should be fitted with a water trap between the wall supply and the anaesthesia machine.

An oxygen-failure device with an audible alarm, preferably continuous, must be fitted to the anaesthesia machine.

Appropriate flow controllers for all available gases:

- The flow meter for oxygen must be accurate to 100 ml/minute or less for flows up to 1 l/minute and accurate to 500 ml/minute for higher oxygen flows.
- Where there is a sequence of gas control knobs, oxygen must be positioned on the right, as seen from a position facing the machine.
- Oxygen must always be the final gas delivered to the common gas pathway.
- Machines with electronic flow controllers must have a manual device for oxygen delivery, independent of electrical supply.

One volatile delivery system that can deliver accurate, controllable partial pressures of volatile anaesthesia agents at varying fresh gas flows, and under the full range of normal clinical conditions. The graduations of the control should not exceed 0.5 minimum alveolar concentration (MAC) and should provide at least three times the MAC of the selected agent.

The breathing system pressure relief valve should be set to 6 kPa/60 cm H₂O.

An oxygen flush system, delivering at least 35 l/minute of oxygen to the machine outflow and controlled by a prominent, recessed, non-lockable button.

Outflow point connector of 22 mm International Organization for Standardization (ISO) standard male taper.

These components must be mounted on a rigid frame that maintains the flow meters in a vertical position and the volatile delivery system in a level position.

The mounting frame for a mobile anaesthesia machine must be sufficiently stable to prevent it from being accidentally tipped over. All ancillary monitoring equipment should be mounted on a suitable horizontal surface, or securely attached to the machine.

Oxygen analyser with an audible low-concentration warning device which should be adjustable, but with a minimum of 18%.

Where a potentially hypoxic gas mixture could be delivered, a hypoxic guard must be fitted to ensure a minimum oxygen concentration of 25%.

High-pressure gas supply master/slave switches, whereby low oxygen pipeline or cylinder pressure cuts off hypoxic gas sources (fail-safe device).

All major theatres must have a pipeline supply of medical air. **SASA recommends a medical air supply for all new operating**

theatres, including theatres for minor procedures/occasional use.

Appropriate delivery system for the supply of compressed air.

Gas delivery systems capable of delivering accurately proportioned fresh gas mixtures at flow rates down to 250 ml/minute. It should be noted that low flow anaesthesia using a fresh gas flow less than the patient's minute ventilation, mandates the use of real-time capnography and anaesthetic agent analysis (AA). SASA recommends anaesthetic AA at all sites.

Breathing circuits

Essential items

- A suitable breathing system for adult patients fitted at all junctions with ISO-standard tapered fittings.
- Paediatric anaesthetic breathing systems must be available in institutions where children might be anaesthetised.
- One set of face masks per machine in a suitable range of sizes that are appropriate for the patient population.
- Ready availability of sufficient stock of single-use, Guedel-type oral airways, available in every size, for all patients to be anaesthetised on any given day in each operating theatre.
- Complete set of supraglottic/laryngeal mask airways per theatre complex, as appropriate for the caseload (e.g., full range of adult sizes (3–5) for adults or paediatric sizes (1–2^{1/2}) for children).
- An appropriate range of different endotracheal tube sizes with standard connectors which are immediately available.
- Breathing circuit pressure gauge.
- A self-inflating resuscitation bag (Ambu® or similar), with reservoir bag and adaptors/oxygen cylinder for administering supplementary oxygen.
- A ventilator suitable for the cases anaesthetised at that location.

Recommended items

- Anaesthesia workstation with central processing unit controlling electronic flow meters, electronic vaporisers and integrated multi-mode anaesthesia ventilator, e.g., rising bellow or piston-driven, with integrated patient monitoring and a circle breathing circuit with a carbon dioxide absorber.
- Venturi® injector for airway inflation within the theatre complex.

Ancillary equipment per theatre

Essential items

Laryngoscopes (preferably with fibre-optic light carrier and light-emitting diode light source)

Two functional handles with

- Full range of adult blade sizes, preferably Macintosh pattern.
- Appropriate range of paediatric laryngoscope blades when providing paediatric anaesthesia.

Video-assisted laryngoscope (considered essential in all large level 1, level 2 and level 3 hospitals and high turnover obstetric units).

Magill adult and paediatric endotracheal tube-introducing forceps.

Nonmetallic or plastic-coated, malleable endotracheal tube-introducing stylettes.

Inflating device (syringe and a cuff pressure manometer) for endotracheal tube cuffs.

Two kidney dishes as receivers for clean and dirty oral and endotracheal instruments.

Designated difficult airway management trolleys with appropriate equipment should be in every theatre complex.

Anaesthesiologist's chair on wheels with backrest.

A wall clock with a sweep second hand or digital equivalent should be present in each theatre.

Suction unit for exclusive use by the anaesthesiologist, generating a minimum negative pressure of 50 kPa at a minimum airflow of 25 l/minute into a reservoir bottle of at least one-litre capacity. Adequate length of suction tubing and an appropriate range of cannulas/catheters for oral and endotracheal suction.

Anaesthesia and surgical suction bottles should be graduated for volume.

A monitor-defibrillator with adult and infant electrodes per theatre suite must be available. **The ability to provide external cardiac pacing is desirable in all age groups, including neonates and paediatric patients.**

Operating table with Trendelenburg-position controls at the head of the table.

- Two lateral padded straight arm supports.
- Appropriate padding and equipment for the positioning of patients to prevent injury.

Drug trolley for exclusive use by the anaesthesiologist.

Topical anaesthesia spray.

Two intravenous (IV) infusion poles.

An appropriate selection of IV fluids and IV cannulas must be available.

In-line warmer for blood and IV fluids.

Pressure infuser for both 500 ml (blood) and 1 000 ml IV bags.

Infusion devices: volumetric pumps and/or syringe drivers.

A pair of strong scissors.

A method of securing the anaesthesia breathing system to the operating table.

Warming blankets/convection warmers for use in the theatre. **Availability of warming blankets/convection warmers is an absolute requirement for neonates and infants.**

Where infants and small children are to be anaesthetised, a full range of the necessary paediatric equipment (as outlined above) must be available.

Electrical generator backup for hospital and/or theatre complex.

Uninterruptible power supply (UPS) or battery backup for life-support equipment.

In the event of a power outage (failure of main Eskom power supply), the following guidelines should be followed:

1. If the theatre complex only has one electrical backup system (generator/UPS), current elective cases should be completed as soon as possible, and all other cases postponed until the main power is restored. Urgent emergency cases may continue (See Appendix F[iii]).
2. If a theatre complex has a second backup power supply, e.g., a second generator or UPS unit, elective cases can continue if it is verified that the second backup supply has adequate capability for the duration of the power outage.
3. Equipment battery backup is not deemed to be a second backup power supply as the duration of the battery supply is not dependable enough to continue with an elective list.

Recommended items

A telephone in each theatre for communication.

Individual illumination of the anaesthesiologist's area, including an emergency backup, battery-powered illumination source.

Blood salvage system.

High-flow blood/fluid warmer.

Syringe drivers programmed to administer target-controlled IV anaesthesia.

Intermittent pneumatic calf compressors and related consumables.

Low amperage peripheral nerve stimulator to assist with regional anaesthesia techniques per theatre suite.

Equipment for patient-controlled analgesia (PCA).

Transportable ventilator and monitor.

Video-assisted or normal light source fibre-optic bronchoscope.

A rigid bronchoscope (this need not be for exclusive use by the anaesthesiologist) with attachments for ventilating apnoeic patients (available in the theatre suite).

All electrical equipment should be able to operate from batteries, particularly when a reliable emergency electrical supply is not available.

Monitors

Essential items

A stethoscope.

A multi-parameter vital signs monitor, incorporating and displaying:

- An electrocardiogram (ECG) channel with 3- and/or 5-lead ECG monitoring. The unit must incorporate a diathermy filter.

- Heart rate: Derived from ECG, pulse oximetry or non-invasive blood pressure (NIBP) readings.
- An automated electronic NIBP module displaying systolic, mean, and diastolic blood pressure (BP), with an appropriate range of cuffs.
- Pulse oximetry, displaying oxygen saturation and a plethysmograph.
- Anaesthetic agent analyser and capnography, displaying end-tidal anaesthetic agent concentrations and CO₂ in mmHg, kPa or a percentage, and a capnograph.
- Patient temperature for oropharyngeal, oesophageal, rectal, bladder or tympanic use, reading 22–42 °C minimum range.
- Alarms: adjustable alarm limits for all parameters.

Oxygen monitor (inspired and expired), with a low-limit alarm (may be incorporated in the multi-parameter vital signs monitor or the anaesthesia machine).

Whenever an automatic ventilator is used, a breathing circuit pressure monitor with high- and low-limit alarms must be incorporated.

A peripheral nerve stimulator to monitor neuromuscular function when muscle relaxants are used, with double burst stimulation, train-of-four and post-tetanic count facilities.

A point-of-care (POC) device to estimate blood glucose.

A POC device to measure haemoglobin and/or haematocrit.

A thermometer that permanently displays the operating theatre temperature.

Recommended items

Invasive pressure module for intra-arterial/IV pressure monitoring incorporated in the multi-parameter vital signs monitor or anaesthesia machine.

Portable ultrasound device for guided nerve blocks and vascular access.

Blood gas analyser.

Transportable vital signs monitor.

Scale for weighing swabs.

Processed electroencephalogram (EEG) depth of anaesthesia monitor.

Non-invasive cardiac output monitor.

Coagulation monitoring device. (Essential in a theatre where heparin is used, e.g., cardiac surgery, vascular surgery).

Transoesophageal echocardiography equipment.

Near-infrared spectroscopy (NIRS) cerebral oximetry monitor.

See Table I for essential equipment list (anaesthesia).

Table I: Essential equipment list

Equipment description	District hospital	Regional hospital	Tertiary/central hospital
Anaesthesia machine (basic)	X	X	X
Anaesthesia machine, with O ₂ , air and N ₂ O flow meters, with vaporisers, anaesthesia rising bellow ventilator, absorber and closed circuit, masks, suction unit, aneroid BP apparatus (with obese, adult and child cuffs) and oxygen monitor			
Anaesthesia workstation		X	X
Anaesthesia workstation: CPU controlled with electronic flow meters, electronic controlled vaporisers, integrated multi-mode ventilator (rising bellow or piston-driven), may include integrated patient monitor with ECT, ST-segment analysis, NIBP, invasive pressure, pulse oximetry, multi-gas analyser, spirometry, NMT, BIS or entropy			
Anaesthesia trolley, mobile	X	X	X
Processed EEG depth of anaesthesia monitor (if not part of patient monitor)		X	X
Blood/fluid warmer	X	X	X
Blood salvage system		X	X
Cerebral oximeters (NIRS)		X	X
Diagnostic set complete	X	X	X
Defibrillator, complete, mounted on a mobile trolley (adult and paediatric paddles)	X	X	X
Defibrillator with external pacing		X	X
Difficult airway management equipment	X	X	X
Forced-air warmer	X	X	X
Fibre-optic laryngoscope		X	X
Glucometer	X	X	X
Haemoglobinometer/centrifuge (Hct)	X	X	X
High-flow blood/fluid warmer		X	X
Intermittent pneumatic calf compressors		X	X
Jet ventilator		X	X
Laryngoscope set, complete	X	X	X
Non-invasive cardiac output monitor		X	X
PCA pump (reusable or disposable)		X	X
Peripheral nerve stimulator	X	X	X
Platelet function monitor (access to)			X
POC diagnostics (blood gas, electrolytes, glucose and lactate)		X	X
Portable ultrasound		X	X
Pressure infusion devices (for blood, 500 ml and 1 000 ml fluid bags)	X	X	X
Pulse oximetry – advanced (Hb, non-invasive cardiac output, etc.) (access to)			X
Resuscitator, pulmonary, manual, adult, complete	X	X	X
Resuscitator, pulmonary, manual, child/infant, complete	X	X	X
Scale for weighing swabs (access to)		X	X
Syringe drivers	X	X	X
Suction unit, mobile, 1x 2-litre bottle / disposable bag, wall outlet	X	X	X
Suction unit, mobile, 1x 2-litre bottle/disposable bag, electrical	X	X	X
TCl syringe drivers (for TCl anaesthesia)		X	X
Trans-oesophageal echocardiography			X
Transport ventilator		X	X
Transport vital signs monitor		X	X
Thromboelastography (access to)			X
Video bronchoscope		X	X
Videolaryngoscope (for district, if high volume obstetrics)		X	X
Vital signs monitor: capnograph	X	X	X
Vital signs monitor with ECG, SpO ₂ , NIBP, temperature, capnography, multi-gas analysis, invasive BP		X	X
Vital signs monitor with ECG, SpO ₂ , NIBP, temperature, capnography, multi-gas analysis	X	X	X
Vital signs monitor with SpO ₂ and NIBP	X	X	X
Volumetric infusion pump	X	X	X

BP – blood pressure, BIS – bispectral index, CPU – central processing unit, ECG – electrocardiogram, Hb – haemoglobin, Hct – haematocrit, NIBP – non-invasive blood pressure, NIRS – near-infrared spectroscopy, NMT – neuromuscular transmission, N₂O – nitrous oxide, O₂ – oxygen, PCA – patient-controlled analgesia, POC – point-of-care, SpO₂ – blood oxygen saturation, TCl – target-controlled infusion

Recovery room equipment

An area within the theatre suite, preferably with easy access from each theatre, must be provided for the recovery of patients from anaesthesia before discharge to the wards.

Equipment and drugs

Each bed space should be provided with:

1. An oxygen flow meter with attachment for oxygen tubing for mask or nasal prongs.
2. A hook, or pole, for suspension of IV fluids
3. Suction equipment, including a receiver, tubing, a rigid handpiece and a range of suction catheters, including Yankauer.
4. An automated NIBP monitor with appropriately sized cuffs.
5. A stethoscope.
6. A pulse oximeter.
7. Means of measuring body temperature.

Within the RR, there must be:

1. A range of devices for the administration of oxygen to spontaneously breathing patients.
2. A self-inflating manual resuscitator, e.g., Ambu® bag or similar, able to deliver 100% oxygen and allow manual ventilation. A minimum of two per recovery room complex is required.
3. Equipment and drugs for airway management and endotracheal intubation.
4. Emergency drugs.
5. A range of IV equipment and fluids.
6. Drugs and equipment for acute pain management.
7. A range of syringes and needles.
8. An ECG monitor.
9. Patient-warming devices.

There should be immediate access to:

1. A monitoring defibrillator, preferably with pacing capability.
2. A blood warmer.
3. A thermostatically controlled warming cupboard for IV solutions.
4. A refrigerator for drugs and blood.
5. A procedure light.
6. A range of appropriate anaesthesia and emergency drugs.
7. A surgical tray for procedures, including tracheostomy and chest drains.
8. POC access to diagnostic services, e.g., blood glucose, blood gases and radiology.
9. A peripheral nerve stimulator.
10. Other equipment as appropriate to the patient's condition, e.g., wire cutters.
11. A ventilator.

The recovery trolley or bed must:

- Have a firm base and mattress.
- Tilt from either end, both head up and head down, to at least 15 degrees.
- Be easy to manoeuvre.
- Have functional and accessible brakes.
- Have provision for the patient to be able to sit up.
- Have straps or side rails capable of being dropped below the base or easily removed.
- Include provision for a pole from which IV solutions may be suspended.
- Include provision for monitoring, mounting portable oxygen cylinders, underwater seal drains and suction apparatus for use during transport.

Routines for checking, cleaning, servicing and storage of equipment

Any institution at which anaesthesia is administered must provide efficient and reliable maintenance and repair services for all anaesthetic equipment. A suitable mechanism must exist whereby faulty essential equipment can be replaced immediately.

Regular sterilising, cleaning, and housekeeping routines for the care of anaesthesia equipment should be established in accordance with the SASA Guidelines for Infection Control in Anaesthesia in South Africa 2021 (Appendix G).

Service by an appropriately certified organisation or persons should be carried out on a regular and appropriate basis. Life-support equipment should be serviced by a manufacturer-approved license-holder company at intervals recommended by the manufacturer.

To promote maximum safety in relation to service procedures, the following points are important prerequisites:

- Individual anaesthetic machines should be clearly identified, either by the maker's serial number, or preferably by a hospital marking. This identification must extend to all the readily removable components, such as canisters and vaporisers, so that the performance and checking of these can be followed without confusion.
- A record of service procedures performed on each machine, signed by the person responsible for the service, must be provided to the appropriate hospital personnel, e.g., department of anaesthesia, anaesthetic technical staff or theatre nursing staff, depending on local circumstances.
- In newly built operating theatres, where operating suites have undergone major structural alterations, before the commissioning of the area, all new and existing gas lines are pressure-tested, followed by gas flow and purity testing. This must be carried out by a third party licensed to install, and test medical gas lines.
- When any medical gas installation is tested, the persons that should be present are the mechanical engineer from public works/hospital group, the mechanical engineer from health infrastructure, the hospital/facility engineer; the medical engineer; the medical gas engineer and the third party doing the testing.

- The installation of new or altered gases requires certification once the installation is completed and deemed operational.
- Adequate time must be available for service personnel to perform regular and emergency servicing without compromising safety.
- Storage facilities should be available for nitrous oxide and oxygen within the operating theatre suite. This storage area should fulfil the criteria described in the appropriate South African Bureau of Standards (SABS) Code of Practice.

- **Essential items are equivalent to a mandatory standard of care.**
- **Recommended/desirable items should be available where resources allow and if appropriate for the surgical/ anaesthesia services delivered.**
- **Regional (Level 2) hospital requirements will include most of the recommended equipment.**
- **Tertiary (Level 3) and central/specialised hospital requirements must include all items listed as "Recommended".**
- **SASA recommends that all new facilities be provided with piped medical air and oxygen and nitrous oxide.**
- **SASA recommends a medical air supply for all new operating theatres, including theatres for minor procedures/occasional use.**
- **SASA recommends AA at all sites.**
- **Video-assisted laryngoscope is considered essential in all large level 1, level 2 and level 3 hospitals and high turnover obstetric units.**
- **The ability to provide external cardiac pacing is desirable in all age groups, including neonates and paediatric patients.**
- **Warming blankets/convection warmers are an absolute requirement for neonates and infants.**

3.3 Low flow anaesthesia guidelines

2022 new addition by E Welch

The delivery of anaesthesia gases in the most efficient, economical, and environmentally friendly manner is a requirement of modern anaesthesia practice. This practice requires an understanding of the physics of the delivery system and the properties of the agents being used. It is an appropriate technique for the current administration of most volatile-based anaesthetics.

Definition

Low flow anaesthesia is anaesthetic gas delivery using a fresh gas flow less than the patient's minute volume.

Classification of fresh gas flow rates

High-flow: greater than 4 litres per minute

Moderate flow: 2–4 litres per minute

Low-flow: less than 2 litres per minute

Basal flow: 250–500 ml per minute

250 ml/min is the minimal basal oxygen requirement for met-

abolic processes at rest in a normothermic patient and must therefore be administered as 100% O₂.

Equipment

Anaesthesia delivery system

Standard anaesthesia equipment as per SASA guidelines with an emphasis on:

- Anaesthesia machine capable of delivering accurate, fresh gas flow of less than 1 L per minute
- Flow meters capable of increments of less than 100 ml
- Leak of fewer than 100 ml on machine and circuit check done immediately before the case
- Carbon dioxide absorber
- Circle system with unidirectional flow valves

Monitoring

- Standard routine monitors as required for any anaesthetic (ECG, pulse oximeter, BP and other monitoring according to the case)
- Inspired oxygen monitor
- Capnography
- Agent analyser
- Ventilatory pressure and tidal volume

CO₂ absorber

- Canister containing between 450 ml and 3 L of carbon dioxide absorbent that undergoes a colour change when exhausted (Soda lime or Baralyme undergo a colour change when exhausted).
- When the absorber is exhausted, a rise in the inspired CO₂ (F_iCO₂) is seen on the capnograph.
- Absorber must be changed once F_iCO₂ is greater than 4 mmHg (0.5 kPa)

Volatile delivery

- Vaporiser out of circuit
- Desflurane, isoflurane and sevoflurane are the agents of choice
- Older, soluble, highly metabolised agents like halothane and enflurane cannot be delivered at high enough concentrations to be easily delivered with flows less than 1 L
- Poorly metabolised gases like desflurane may accumulate during lengthy procedures at very low flows
- The use of nitrous oxide is not recommended when using low flows as it increases the risk of hypoxia

Gas delivery

- Gas delivery using a standard anaesthetic machine
- Flow meters must be able to deliver flows from 250 ml to 10 L per minute
- Flow meters must be graduated to measure accurately at flows less than 1 L, preferably in 50 ml to 100 ml increments

Closed circuit

- Often called a circle system as gas flow is in a single direction from machine to patient and back from patient to machine

- Circuit to be able to deliver constant gas flow at low resistance with minimal leak
- Circuit to be checked before use for leaks during spontaneous and assisted ventilation
- Do not proceed if leak is greater than 100 ml/min at 30 cmH₂O

Unidirectional valves

- Circuit requires two unidirectional valves that move freely with low resistance to flows down to less than 250 ml
- Valves must delineate the circuit's inspiratory and expiratory limb, allowing flow to occur through the circuit in one direction only without mixing inspiratory and expiratory gases

Oxygen delivery

- Inspiratory and expiratory oxygen concentration needs to be monitored constantly
- Hypoxia can occur due to inadequate fresh gas flow, delivery of a low F_iO₂, changes in patients' metabolic rate, and dilution by accumulating gases such as N₂O, CO₂, CO, and methane

Set up of the circuit

- Fresh gas must be delivered into the reservoir bag or ventilator bellows and not directly into the circuit
- Gas is delivered to the patient and returned via the CO₂ absorber in a circular pattern using a "closed system". The same gas is continuously recycled with small amounts released from the ventilator or breathing valve to allow for additional fresh gas to be introduced, with one-way valves producing unidirectional flow around the circuit.

How to do it

The basic principle is that it takes a long time for any change in gas concentration to occur at low flows. The lower the fresh gas flow, the longer this change takes.

What to give

1. **Oxygen:** A minimum of 250 ml of oxygen is needed to meet the basic metabolic requirements of a normothermic, awake patient at rest. The delivery of at least this amount of oxygen per minute is required in an anaesthetised patient. This replacement will be constant, provided the metabolic rate remains constant. At flows of less than 1 L per minute, a F_iO₂ of at least 50% is recommended. If the monitored F_iO₂ decreases, the minimum amount of oxygen delivered will need to be increased.
2. All circuits have a **small leak** that will usually be detected by the preoperative machine check (most machines will allow a leak of fewer than 40 ml per minute to pass this test). In addition to the gas loss from sampling lines and uncuffed tubes, this leak needs to be added to the minimal amount of gas delivered. Most people are comfortable with a minimum of 300–500 ml per minute fresh gas flow.
3. **Volatiles** are delivered from a vaporiser out of circuit. This gas replaces metabolised and absorbed volatile agent and gas vented to the atmosphere. A variable replacement is needed as it depends on the solubility and amount of agent metabolised.

4. **N₂O**, when used as an adjuvant anaesthetic agent, must always be added to at least 250 ml of oxygen. Saturation occurs quickly, and metabolism is minimal, so N₂O will start to accumulate over time. It is not recommended to use nitrous oxide with low flow.
5. **Air** is often added to flows above 250 ml of oxygen to avoid complications from using 100% oxygen, provided the F_iO₂ is maintained.

Principles of altering gas concentrations

The following are the principles behind establishing or changing any gas concentration using low flow:

1. The entire circuit comprises about 6 L—the tubing makes up about 1.5 L, the ventilator or rebreathing bag about 2 L, the carbon dioxide absorber 2 L, and the patient's tidal volume 0.5 L.
2. The aim is to obtain a constant concentration of volatile agent throughout this 6 L at the MAC value we require.
3. This 6 L needs to be changed five times to reach a steady gas state, so a total of 30 L of circuit gas needs to be changed.
4. If we introduce the volatile agent at 1 L per minute, it will take 6 minutes to change all the gas in the circuit once, and 6 x 5 = 30 minutes to reach steady state. At 250 ml, it takes 120 minutes to reach steady state.
5. One can also speed this up by setting a greater volatile concentration than is desired until the agent is at the required concentration on the agent analyser.

Starting a case

Use the above principles at the beginning of a case. The circuit contains no volatile agent. The aim is to saturate it with a certain MAC of volatile agent in a patient who will awaken quickly from the initial dose of the induction agent.

- Following an initial IV and opiate induction.
- Fresh gas flow of 2 L/minute and desflurane at 12% or sevoflurane at 4% until the end-tidal agent concentration reaches the desired concentration (6% desflurane or 2% sevoflurane).
- Lower fresh gas flow to 250–500 ml and monitor oxygen and volatile concentration. Adjusting the vaporiser as needed.

Changing gas concentration

- Using the above principles shows that changing the concentration of volatile to a higher or lower MAC while at low flow can take quite a long time.
- Rapid changes in concentration can be achieved by increasing the fresh gas flow to 2 litres.

Maintenance of anaesthesia

- Due to the metabolism and absorption of volatile agents, the concentration of volatile agent in the entire system will slowly decrease over time. While the circuit receives low fresh gas flow, the absorbed and metabolised agent is not completely replaced; the result is a further decrease in alveolar volatile concentration. This may result in the patient becoming aware.
- Therefore, a higher vaporiser setting than the desired end-tidal agent concentration is needed.

- Minimally metabolised agents like desflurane, isoflurane and sevoflurane require a vaporiser setting of 10–20% higher than required to accommodate for this but may also start to accumulate over time.
- An agent analyser eliminates this guesswork.
- Nitrous oxide in a closed circuit will start to accumulate over time as it is minimally metabolised, resulting in hypoxia.

Switching off

1. The same principles apply to waking the patient at the end of the procedure. If the volatile agent is switched off and low fresh gas flow maintained, the patient can take between 10 and 20 minutes to wake up while the volatile concentration slowly decreases.
2. A fresh gas flow of 6 L will rapidly flush the circuit of residual volatile agent.

Paediatrics

In paediatric anaesthesia, the same principles apply but use smaller bore tubing, size-appropriate filters and cuffed tubes.

Troubleshooting

1. **Hypoxia** – due to low delivered F_iO_2 , dilution from other gases, increased metabolic rate.
2. **Tachycardia** – due to rapid changes in gas concentration with desflurane (the rule is fresh gas flow x volatile concentration should be less than 24, i.e., 2 L x 12% = 24).
3. **Overdose** – due to prolonged high fresh gas flow and high vaporiser setting.
4. **Awareness** – due to circuit leak or low vaporiser setting.
5. **Hypercapnoea** – carbon dioxide absorber exhaustion.
6. **Prolonged awakening** – fresh gas flow still low during emergence.
7. **Low circuit volume** – due to leaks in the circuit and can lead to inadequate ventilation as bellows and reservoir bag are not refilled, hypoxia and awareness.

3.4 Medication

To be reviewed in 2026

Essential Drugs Programme

To provide equal access to medicines for all South Africans, whilst improving the supply of listed items at a lower cost, the Essential Drugs Programme (EDP) of South Africa was established in terms of the National Drug Policy (NDP) in 1996.

The World Health Organization (WHO) defines essential medicines as those that satisfy the priority healthcare needs of the population. Essential medicines must always be available within health systems in adequate quantities, in the appropriate dosage forms, with assured quality and adequate information, and at a price the individual and the community can afford.

In the health objectives of the NDP, the government of South Africa clearly outlines its commitment to ensuring the availability and accessibility of medicines for all people.

The criteria for selecting essential medicines in South Africa were based on the WHO guidelines for drawing up a national

EML. Essential medicines are selected with due regard to disease prevalence, evidence of efficacy and safety, and comparative cost.

The implementation of the concept of essential medicines is intended to be flexible and adaptable to many different situations. It happens by means of the ministerial appointment of a National Essential Medicines List Committee (NEMLC), which draws up and revises the national list of essential medicines for three levels of care: primary health care, secondary and tertiary hospital level.

Table II summarises **current** recommendations of essential drugs for anaesthesiology. The list indicates agents that should be available to provide safe anaesthesia at regional hospital level.

Table II: Summary of current recommendations of essential drugs for anaesthesiology

Premedication	
Benzodiazepines	Lorazepam Midazolam
Induction agents	Propofol Etomidate Ketamine Thiopental
Volatiles	
Induction	Halothane Sevoflurane
Maintenance	Isoflurane
Muscle relaxants	
Depolarisers	Suxamethonium
Non-depolariser	Cisatracurium Vecuronium
Rapid sequence intubation	Suxamethonium Rocuronium
Reversal agents	Neostigmine with either atropine or glycopyrrolate
Analgesics	
Oral	Paracetamol NSAIDs, e.g. ibuprofen
IV	Fentanyl Morphine Ketamine
Postoperative	Morphine Tramadol Diclofenac IM
Fluids	Ringer's lactate 0.9% NaCl
Treating anaesthesia complications	
Malignant hyperthermia	Dantrolene CVS support – adrenaline (epinephrine)
LA toxicity	Lipid emulsion (20%)
Acute hypotension	Ephedrine IV, 3–5 mg Phenylephrine IV, 50–100 mcg

Acute hypertension	Alfentanil (obtain the hypertensive response) Magnesium sulfate Labetalol
PONV	
Prophylaxis	Dexamethasone Ondansetron Promethazine
Treatment	Metoclopramide Promethazine, deep IM, 25–50 mg
Regional neuraxial	
Spinal	Bupivacaine 0.5% (spinal use) plain or hyperbaric (+glucose)
Epidural	Bupivacaine 0.5% Lidocaine 2% (preservative-free)
Regional blocks	Lidocaine 1% or 2% Bupivacaine 0.5%
Topical anaesthesia	Lidocaine jelly Lidocaine topical spray Lidocaine/prilocaine, topical cream, 2.5/2.5%
Chronic neuropathic pain	Amitriptyline Carbamazepine
Emergency medication	In addition to drugs used to provide anaesthesia, the following need to be available
Cardiac arrest	Adrenaline
Antidysrhythmics	Amiodarone Dopamine Dobutamine Lignocaine Verapamil Adenosine
Bronchodilators	Salbutamol Aminophylline
Corticosteroids	Hydrocortisone Dexamethasone Methylprednisolone
Vasopressor	Phenylephrine and ephedrine/ etilephrine Labetalol
Vasodilators	TNT
Antibiotics for prophylaxis	As per current recommendations Cefazolin Metronidazole Gentamicin Clindamycin
Others	Sodium bicarbonate Calcium chloride/gluconate Beta blocker (propranolol, atenolol) Digoxin Furosemide Mannitol Dextrose 50% Oxytocin
Reversal agents	Naloxone Flumazenil

NSAIDs – nonsteroidal anti-inflammatory drugs, IV – intravenous, IM – intramuscular, CVS – cardiovascular system, LA – local anaesthetic, PONV – postoperative nausea and vomiting, TNT – trinitroglycerin

The drugs listed are the minimum requirement for safe anaesthesia that should be available in all facilities.

In addition, see Table III for a list of highly desirable drugs in regional, tertiary and central hospitals.

Table III: Drugs which are highly desirable in regional, tertiary and central hospitals

Inhalants	Sevoflurane Desflurane
Analgesics	Alfentanil Sufentanil Remifentanil
Relaxants	Rocuronium Atracurium
Other	Dexmedetomidine Esmolol Noradrenaline Ketorolac Paracetamol IV Sugammadex
Chronic neuropathic pain	Gabapentin Duloxetine Pregabalin

Off-label drug use

Off-label prescription and/or use refers to the prescription or use of a medicine or medical device outside of its approved label, i.e., outside of the indication for which the manufacturer has submitted studies to the satisfaction of regulators and which has therefore not been proven at all or to the level at which it would satisfy regulators to register the product for that particular indication or use.

Medicines are not always tested or registered for certain patient groups or diseases. Medicines are sometimes used in contexts or for conditions other than for which they have been registered. Medicines registration processes in South Africa are sometimes slower than those in other markets, and sometimes, there are no alternatives available to patients.

Medicines (and medical devices) are registered based on their safety profile being acceptable, and on their proven efficacy (or performance).

Off-label use of medicines may be indicated if sufficient evidence (defined as peer-reviewed acceptance of indication) exists for such use. Medicines are often used in such a manner in the paediatric population.

Under South African law, informed consent should be provided for the specific healthcare intervention. The World Medical Association (WMA) requires that, in the case of off-label prescriptions, the patient must be informed about the character of the prescription.

The Consumer Protection Act (CPA) requires patients to be informed of the nature of the specific goods or services they are to receive, and the conditions under which they are to be provided. Furthermore, this information is to be provided in plain language, which means that the patient should understand what an off-label prescription and use means.

The National Health Act (NHA) requires the patient to be informed about the benefits, risks and consequences of, in this case, off-label use. The CPA has more stringent tests in relation to warnings about risks and requires that the patient's attention be drawn to the specific risks conspicuously, and where there is a risk that is 'serious' or 'unusual', that the consent be provided in writing.

Where there are no alternatives available to patients, or where off-label use is, in the opinion of the profession, the best for certain patients, this fact should be explained to the patient as well.

It must be borne in mind that, under consumer legislation, the practitioner shares the legal liability for any possible harm that results from the use (or off-label use) of a product with all others in the supply chain. This harm may be because the product is unsafe, due to product failure or due to inadequate instructions or warnings being issued.

The CPA states that goods must be "reasonably suitable" for the purpose for which they were intended. Products registered for specific indications in other jurisdictions may be easier to justify as "reasonably suitable" than those not registered anywhere for the particular indication and/or with limited data on their safety and efficacy.

Due to pharmacovigilance (postmarketing surveillance) requirements on pharmaceutical companies (similar provisions exist for medical device companies), practitioners are advised to contact the medical departments of such companies to enquire as to the recorded safety profile of the product when used off-label, as well as whether there is information available on whether the product is, or could be, reasonably suitable for the off-label purpose.

Ampoule labelling standard

SASA deems the standard SANS 44/2014: Labelling of small-volume (50 ml or less) parenteral drug containers, as essential and to be adopted.

The key feature of this standard is that labels will be much more legible in the clinical arena. The standard focuses on font size, text legibility and orientation, text contrasts, ordering of label content, and language. It mandates the use of the drug's generic name on the label and states that, if used, the trade name may not exceed the size of the generic name. To create space for clearer labelling on small ampoules, English is now the only mandatory language. The standard also recommends that, where applicable, manufacturers should on part of the label utilise the colours specified for identifying specific drug classes on syringe labels, as per the SABS SANS 26825.

Substitution of medicines and devices

The substitution of health goods occurs in resource-constrained settings because of healthcare priorities in formularies and treatment guidelines. Legislation relating to substitution in health care (and in general consumer goods) impacts this practice.

The WMA has serious concerns about the practice of substitution.

There is a difference between generic and therapeutic substitution, with generic substitution generally permitted by South African law, but therapeutic substitution is not. The WMA recommends that national medical associations lobby for therapeutic substitution to be declared illegal, where the practitioner does not issue a new and valid prescription.

Drug therapy should be individualised based on a complete clinical patient history, current physical findings, all relevant laboratory data, and psychosocial factors.

Where generic products are on the market, the WMA recommends that practitioners ensure that there are quality assurance procedures in place to ensure their lot-to-lot bioequivalence and their chemical and therapeutic equivalence.

The Medicines and Related Substances Act only permits generic substitution within the criteria set by the section 22F:

1. Pharmacists must inform patients *with a prescription* for dispensing of the benefits of the substitution.
2. When substitution has taken place, the pharmacist must take reasonable steps to inform the prescriber of such substitution.
3. Pharmacists may dispense the generic instead of the prescribed medicine, unless expressly forbidden by the patient.
4. The prescriber has written in their own hand on the prescription the words "no substitution" next to the item prescribed.
5. The retail price of the generic is higher than that of the prescribed medicine.
6. The product has been declared not substitutable by the South African Health Products Regulatory Authority (SAHPRA).
7. Although there was, in the past, a list of non-substitutable products issued by SAHPRA, the current list only contains rules relating to biologics. SASA, however, strongly recommends that practitioners who deem that the generally accepted circumstances under which substitution should not take place, are present in a particular case, should ensure that a non-substitutable order is issued to clearly indicate the opinion of the practitioner.

The CPA also prohibits the substitution of any goods without the consent of the consumer (patient).

Therefore, the WMA, the Medicines Act, and the CPA, read with the NHA, make it clear that:

1. Information must be provided on drug choices and the patient's condition to enable the practitioner to select medicines carefully.

2. Once the patient consents to the medicine selected, that medicine should not and cannot be changed without the patient's consent.
3. In the case of therapeutic substitution, practitioners should re-evaluate the patient and the options and issue a new prescription.

The WMA and South African postmarketing surveillance of medicines require that all adverse drug reactions (ADRs) or therapeutic failures be reported. This is and should also be the case in instances of generic substitution.

The WMA recommends that practitioners document ADRs and report it to appropriate drug regulatory authorities.

The WMA recommends that medical practitioners and pharmacists cooperate within the definitions set by their respective roles, making it clear that the practitioners assess and prescribe based on an assessment of the patient's pharmacological needs. It furthermore states that pharmacists have the role of "reviewing prescription orders to identify interactions, allergic reactions, contraindications and therapeutic duplications." They should, however, discuss "concerns with the prescribing physician, but the pharmacist should not change the prescription without consulting the prescriber".

SASA recommends that, in the practical theatre setting, the practitioner be able to issue an advanced instruction to the hospital pharmacist that generic substitution would not be indicated for a particular patient or patient group, and that a specific medicine should therefore be available in theatre.

SASA does not support the practice where third parties, even if they are pharmacists, contact patients to recommend therapeutic or generic substitution.

National Pharmacovigilance Programme

SAHPRA is responsible for ensuring the safety, efficacy and quality of all medicines used by the South African public. The National Pharmacovigilance Programme is coordinated by SAHPRA and has a dedicated unit, The National Adverse Drug Event Monitoring Centre (NADEMC), in Cape Town, which monitors the safety of all registered medicines in South Africa.

What is pharmacovigilance?

Pharmacovigilance is defined as the science and activities concerned with the detection, assessment, understanding and prevention of adverse reactions to medicines (i.e., ADRs). This activity aims to improve the safe and rational use of medicines, thereby improving patient care and public health.

What is an adverse drug reaction?

SAHPRA defines an ADR as a response to a medicine that is noxious and unintended, including lack of efficacy, and which occurs at any dosage and can also result from overdose, misuse, or abuse of medicine.

Who should report adverse drug reactions?

All healthcare workers, including doctors, dentists, pharmacists, nurses, and other health professionals, are encouraged to report all suspected adverse reactions to medicines (including vaccines,

X-ray contrast media, traditional and herbal remedies), especially when the reaction is not in the package insert, potentially serious or clinically significant.

What happens to a report?

All ADR reports are entered into a national ADR database. Each report is evaluated to assess the causal relationship between the event and the medicine. A well-completed ADR/product quality form submitted could result in any of the following:

- additional investigations into the use of the medicine in South Africa;
- educational initiatives to improve the safe use of the medicine;
- appropriate package insert changes to include the potential for the reaction, and
- changes in the scheduling or manufacture of the medicine to make it safer.

ADR reporting aims to reduce the risks associated with using medicines and ultimately improve patient care.

Will reporting have any negative consequences on the health worker or the patient?

An ADR report does not constitute an admission of liability or that the health professional contributed to the event in any way. The outcome of a report, together with any important or relevant information relating to the reaction, will be sent back to the reporter as appropriate. The details of a report are stored in a confidential database. The names of the reporter or any other health professionals named on a report and that of the patient will be removed before any details about a specific ADR are used or communicated to others. The information is only meant to improve the understanding of the medicines used in the country.

Is the event possibly an adverse drug reaction?

The following factors should be considered when an ADR is suspected:

- What exactly is the nature of the reaction? (*Describe the reaction as clearly as possible and, where possible, provide an accurate diagnosis.*)
- Did the reaction occur within a reasonable time relationship to starting treatment with the suspected medicine? (*Some reactions occur immediately after administration of a medicine while others take time to develop.*)
- Is the reaction known to occur with the medicine as stated in the package insert or other reference? (*If the reaction is not documented in the package insert, it does not mean the reaction cannot occur with that medicine.*)
- Did the patient recover when the suspected medicine was stopped? (*Some reactions can cause permanent damage, but most reactions are reversible if the medication is stopped.*)
- Did the patient take the medicine again after the reaction abated (i.e., rechallenge)?
- If so, did the same reaction occur again? (*In most situations, it is not possible or ethical to rechallenge the patient with the same medicine. If such information is available or if such a rechallenge is necessary, recurrence of the event is a strong indicator that the medicine may be responsible.*)

- Can this reaction be explained by other causes, e.g., underlying disease/s; other medicine/s; toxins or foods? (*It is essential that the patient is thoroughly investigated to decide the actual cause of any new medical problem. A medicine-related cause should be considered when other causes do not explain the patient's condition.*)

What types of reactions should be reported?

The following ADRs should be reported:

- all ADRs to newly marketed drugs or new drugs added to the EML,
- all serious reactions and interactions,
- ADRs that are not clearly stated in the package insert, and/or
- all adverse reactions or poisonings to traditional or herbal remedies.

Report even if you are not certain that the medicine caused the event.

What product quality problems should be reported?

The following product quality problems should be reported:

- suspected contamination,
- questionable stability,
- defective components,
- poor packaging or labelling, and/or
- therapeutic failures.

How can adverse drug reactions be prevented from occurring?

Some ADRs are unavoidable and cannot be prevented. However, most ADRs can be prevented by following the basic principles of rational use of medicines.

How are adverse drug reactions reported?

1. Reporting of suspected ADRs can be done via the eReporting link on the SAHPRA website (<https://www.sahpra.org.za>). Alternatively, an ADR/product quality report form should be completed and emailed to adr@sahpra.org.za. The form can be obtained from the SAHPRA website. Report forms may also be accessed via the following website: <http://www.mccza.com>.
2. The National Adverse Drug Event Monitoring Centre
C/o Division of Pharmacology, University of Cape Town,
Observatory, 7925
(021) 447 1618; Fax: (021) 448 6181

Ampoule sharing

Ampoule sharing (Appendix F[iii]) is prevalent in public and private sector anaesthesia practice and refers to withdrawing multiple doses of drug from a single-use ampoule. This practice mostly relates to “expensive drugs” and paediatric anaesthesia – an attempt at cost saving in the first instance, and time-saving or convenience in paediatric cases. From the clinical governance point of view, there is little doubt that ampoule sharing is certainly not in our patients’ best interests. The inability to maintain sterility once an ampoule is opened, the risk for cross

infection with subsequent sepsis, the possibility of mistakes in labelling or administration, and the risk of theft from an open ampoule negate the small cost benefit of sharing a single large ampoule between patients.

- **SASA deems the standard SANS 44/2014: Labelling of small-volume (50 ml or less) parenteral drug containers, as essential and to be adopted.**
- The WMA recommends that practitioners document ADRs and report it to appropriate drug regulatory authorities.
- The WMA recommends that medical practitioners and pharmacists cooperate within the definitions set by their respective roles, making it clear that the practitioners assess and prescribe based on an assessment of the patient's pharmacological needs. It furthermore states that pharmacists have the role of “reviewing prescription orders to identify interactions, allergic reactions, contraindications and therapeutic duplications.” They should, however, discuss “concerns with the prescribing physician, but the pharmacist should not change the prescription without consulting the prescriber”.
- SASA recommends that, in the practical theatre setting, the practitioner be able to issue an advanced instruction to the hospital pharmacist that generic substitution would not be indicated for a particular patient or patient group, and that a specific medicine should therefore be available in theatre.

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4. THE PREANAESTHESIA PERIOD

4.1 Preoperative anaesthesia clinic

2022 review by P Bettings

Introduction

Value in health care has been described as quality divided by cost, where quality is the sum of patient outcomes and experience. A well-run preoperative anaesthesia clinic (PAC) offers many opportunities to improve the value of the care delivered to patients by reducing the associated costs and improving the quality of care, i.e., reduction in excessive preoperative testing, reduction in subspecialty consults, delay in surgery and others. Innovative ways of preoperative evaluation methods include questionnaires, telephonic interviews, automated interviews, and computerised interviews and interviews via virtual platforms such as Zoom or Skype.

The gold standard is still face-to-face evaluation.

1. Location of PAC
 - It should be easily accessible
 - Preferably in the same hospital complex as where surgery is done
 - It should have easy access to diagnostic and other support services
2. Physical design of PAC
 - Reception and registration area
 - Patient interview and examination area
3. Staffing requirements of PAC
 - Administrative staff
 - Registered sister
4. Appointments to PAC
 - Usually 2–30 days before surgery
 - Importantly, it should not be on the same day as surgery
5. Referring and feedback system to subspecialties
6. Data collection and recording of PAC
 - Computer database
7. Equipment
 - Basic vital signs:
 - BP, ECG, SpO₂
 - Other equipment depends on comorbidities and availability:
 - Respiratory function tests – flow loops
 - Heart – transthoracic echocardiography (TTE)
 - Chest X-ray (CXR), bloods
 - Other equipment as may be deemed necessary
If this does not form part of the clinic equipment itself, it should be available as near as possible to the PAC.

4.2 Preoperative consultation

2022 review by A Burke

These standards apply to all patients who receive general or regional anaesthesia, sedation or monitored anaesthesia care.

Under unusual circumstances, e.g., extreme emergencies, these standards may be modified. When this is the case, the circumstances must be documented in the patient's record. At a minimum, a focused **preoperative evaluation** of the airway, lungs and heart must be carried out and vital signs documented.

The anaesthetist shall be responsible for determining the **patient's medical status**, developing a **plan of anaesthesia care** and acquainting the patient or the responsible adult with the proposed plan, including financial implications.

Appropriate **informed consent** for anaesthesia should be obtained.

Information is obtained by reviewing the medical record, interviewing the patient regarding the medical history, previous anaesthesia experience, drug therapy, current disease and aspects that may influence perioperative decisions, physical examination and results from special investigations, medical tests or consultations.

Further **consultation or investigations** may be ordered at this stage, and specific preparation may be implemented.

Results should also be **reviewed** before anaesthesia. Unnecessary testing may lead to patient harm.

The responsible anaesthetist shall verify that the above has been properly performed and documented in the patient's record.

Patients with high severity of disease and/or high invasiveness of surgery should be evaluated before the day of surgery. Patients with low severity of disease and medium or low invasiveness of surgery could be evaluated on or before the day of surgery.

Ideally, the anaesthetist who will conduct the anaesthesia should visit the patient before the operation.

At the time of the preoperative consultation, **drugs for pre-medication** should be prescribed in writing and signed for on the appropriate document by the anaesthetist or the staff member taking the anaesthetist's orders.

Premedication may be indicated for sedation, pain management or treatment of underlying disease. This prescription should be available for other persons in the perioperative team to prevent incompatible or duplicate treatment administration.

Clinical assessment

Medical history

The anaesthetist should obtain and record the information by taking a formal history, which may be supplemented with a questionnaire. Electronic/internet questionnaires to elicit patient information may be helpful in providing the anaesthetist with information but must be supplemented by a face-to-face encounter and examination. The patient's history should include previous or present illnesses, previous anaesthesia and/or surgical complications, current and recent drug therapy, unusual reactions to drugs, adverse effects in family members to anaesthesia and any further information deemed necessary for the assessment of the individual patient. The patient's ASA physical status category should be documented.

Physical examination

The above history should be supplemented by a complete physical examination during the preoperative consultation. This includes evaluation of the airway and appropriate systems.

Additional information that might be necessary should be included, e.g.:

- Accurate measurement of the patient's weight and height should be provided.
- Clinical assessment of cardiovascular and respiratory status should be carried out as considered appropriate by the anaesthetist.
- BP reading should be taken.
- A further systemic examination should be conducted, as is relevant.
- Side-room urine examination should be undertaken, if indicated.

Preoperative testing

Preoperative tests should not be carried out routinely. Taking blood can be a traumatic experience in children. Tests should only be done if they are crucial for optimising patients for surgery. Indications should be documented and based on medical records, history, and physical examination information. Unless the patient's condition changes acutely, results of tests carried out up to six months before the procedure should be acceptable.

Special investigations are expensive and should only be considered if they change your management of the patient. Duplication of information should be avoided, e.g., information gained from a cardiac echocardiogram in some clinical scenarios may make the need for an ECG and CXR unnecessary.

A 12-lead electrocardiograph

This is not routinely indicated, but in the case of a history that is suggestive of cardiac or pulmonary disease may be indicated in the following circumstances or when symptomatic:

- Recent myocardial infarction or angina
- Congenital heart disease
- Arrhythmia, particularly if symptomatic
- Any previous heart disease or condition predisposing to cardiovascular disease
- Longstanding hypertension
- History of dyspnoea, blackouts and palpitations
- Poorly controlled diabetes
- Older age
- Chronic respiratory disease
- Other risk factors

A chest X-ray

This should be available where:

- Clinical examination indicates lung pathology with remaining functional impairment
- There is a history of haemoptysis
- There is a recent history of thoracic injury

- Clinical grounds to suspect pulmonary hypertension
- Other indications

Preoperative haemoglobin

This should not be carried out routinely but may be indicated by:

- Type and invasiveness of surgery
- Liver disease or renal disease
- Clinical anaemia
- Extremes of age
- Bleeding
- Other haematological diseases

Other special investigations

Other special investigations, such as electrolytes, blood sugar, blood urea and creatinine, coagulation studies, pulmonary function tests, functional tests of cardiac function and echocardiography, should be considered in the light of the findings of the preoperative assessment.

Consent and explanation

1. Informed consent must be obtained.
2. *SASA highly recommends that a facility or provincial policy guide the processes/procedures for obtaining informed consent* (an example of such a policy can be found as Appendix H). *SASA further recommends that anaesthesia-specific consent forms related to all aspects of the anaesthesia service are available* (an example of such a form can be found as Appendix H).
3. The patient or guardian must be fully informed regarding all aspects of the planned anaesthesia, including the financial implications. A written fee estimate is required to facilitate this communication in the private sector.
4. The anaesthetist may need to confirm that proper arrangements have been made regarding the scheduling of the procedure.
5. The patient's fears must be allayed, and information and reassurance should be given. The technique of anaesthesia must be discussed with the patient or caregiver.
6. Only the more common and relevant risks of anaesthesia need to be explained to the patient and/or their family. Explanation of risks should not necessarily include rare and uncommon outcomes that could incur undue anxiety. However, catastrophic outcomes, e.g., death or paralysis, should be mentioned, even if extremely rare. The anaesthetist should, however, explain relatively rare or low-impact risks if this may impact a patient specifically.
7. Explanations and answers to questions posed by the patient should be frank but must be tailored according to:
 - The ability of the patient to grasp the implications fully.
 - The patient's existing medical knowledge and medical background.
8. It is preferable that a written information sheet with simple information on fasting, anaesthesia, and pain relief is provided to elective patients before hospital admission.

9. The patient is entitled to know the qualifications and experience of the anaesthetist. *SASA recommends that the patient is informed about the qualifications and experience of the anaesthetist during the preoperative consultation.*

Telephonic and electronic prescription of premedication drugs

Ideally, the patient should be seen in person to prescribe premedication. If the patient is admitted on the same day of surgery and the anaesthetist is busy in theatre, premedication can be prescribed telephonically. A detailed history of the patient, as well as the admission criteria, such as age, weight, and gender, must be available to the anaesthetist. The patient must be attended to by a registered nurse who will observe the patient after premedication. The overall responsibility will remain with the anaesthetist.

- *SASA highly recommends that a facility or provincial policy guide the processes/procedures for obtaining informed consent.*
- *SASA further recommends that anaesthesia-specific consent forms related to all aspects of the anaesthesia service are available.*
- *SASA recommends that the patient is informed about the qualifications and experience of the anaesthetist during the preoperative consultation.*

4.3 Preoperative fasting

2022 review by A Burke

In adults

The following fasting guidelines have been adopted from the Canadian Anesthesiologists' Society, with permission:

Fasting policies apply to all forms of anaesthesia, including sedation. Emergent or urgent procedures should be undertaken after considering the risk of delaying surgery vs the risk of aspiration of gastric contents. Pre-existing medical conditions like delayed gastric emptying in diabetes and gastrointestinal reflux disease should also be considered.

Unless contraindicated, adults should be encouraged to drink clear fluids (including water, pulp-free juice, and tea or coffee without milk) up to two hours before elective surgery.

Table IV: Preoperative fasting times before elective general anaesthesia and sedation in adults

Meat and fried foods	Light meal, toast and dairy	Clear fluids
8 hours	6 hours	2 hours

In children

The Association of Paediatric Anaesthetists of Great Britain and Ireland, the European Society for Paediatric Anaesthesiology, and L'Association des Anesthésistes-Réanimateurs Pédiatriques d'Expression Française agreed, in a joint consensus statement that *it is safe and recommended for all children to take clear fluids up to 1 hour before elective general anaesthesia, unless*

there is a clear contraindication. This '1-hour clear fluid policy' is also endorsed by the Paediatric Anaesthesia Community of South Africa (PACSA).

The '1-hour clear fluid policy' does not increase the risk of pulmonary aspiration. Children are less thirsty, hungry, irritable and nauseous perioperatively. In children less than 36 months, this leads to positive physiological and metabolic effects. Prolonged fasting may be associated with lower systolic BP during anaesthesia.

Unless contraindicated, children should be encouraged to drink clear fluids (including water, pulp-free juice, and tea or coffee without milk) up to one hour before elective surgery.

Table V: Preoperative fasting times before elective general anaesthesia and sedation in children (0–16 years)

Solid food Cow's milk Formula milk Fortified milk	Breast milk	Clear fluids
6 hours	4 hours	1 hour

Other recommendations

1. Fortified breast milk does not prolong gastric emptying and can be encouraged in infants 4 hours before anaesthesia.
2. Fasting instruction in children with gastro-oesophageal disease does not differ from healthy children.
3. Obese children follow the same fasting guidelines as non-obese children.
4. Children with repaired oesophageal atresia or tracheal-oesophageal fistulas without documented gastric delay follow the same fasting guidelines as healthy children.
5. Children with isolated type I diabetes follow the same guidelines as healthy children.
6. Children with gastrostomies follow the same guidelines as healthy children.
7. Early and liberal postoperative fluid intake should be encouraged, if not contraindicated by the surgical procedure.
8. Gastric ultrasound to assess gastric volume is helpful in clinical decision-making. The cross-sectional area of the antrum is used as a surrogate for gastric content, in the right lateral decubitus position.
9. Jelly is not considered a clear fluid.
10. Sweets and chewing gum are considered solid food, although chewing gum does not increase gastric volume or change gastric pH.

Useful sites for further information

- South African Society of Anaesthesiologists: www.sasaweb.com
- The American Society of Anesthesiologists: <https://www.asahq.org/>
- Difficult Airway Society: <https://das.uk.com/guidelines/downloads.html>

- *It is recommended for all children to take clear fluids up to 1 hour before elective general anaesthesia, unless there is a clear contraindication.*

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5. THE ANAESTHETIC PERIOD

Consideration of principles of safe anaesthesia care provision is given elsewhere in the document as it pertains to professionalism, equipment and monitoring, medication, etc. The following are guidelines on issues not addressed elsewhere.

5.1 Delegation of care

2022 review by A de Goede and T Hlongwane

The anaesthetist's primary responsibility is to the patient currently under their care. **The anaesthetist shall always remain with the patient throughout the conduct of all general anaesthesia, major regional anaesthesia, and procedural sedation and analgesia (PSA) until the patient is transferred to the care of personnel in an appropriate care unit.**

If the attending anaesthetist leaves the operating room temporarily, care of the patient must be delegated to another anaesthesia provider. When the attending anaesthetist delegates care to an anaesthesia assistant (untrained physician, nurse, technician, etc.), the attending anaesthetist always remains responsible for the management of the patient under anaesthesia. Before delegating the patient's care to an anaesthesia assistant, the anaesthetist must ensure that the patient's condition is stable, and that the anaesthesia assistant is competent, experienced, and familiar with the operative procedure and the operating room environment and equipment. The attending anaesthetist must remain immediately available when care is delegated to an anaesthesia assistant.

An anaesthetist may briefly delegate routine care of a stable patient to a competent person who is not a trained anaesthesia provider only under the most exceptional circumstances, e.g., to provide lifesaving emergency care to another patient. That person's only responsibility would be to monitor the patient during the anaesthetist's absence and to keep the anaesthetist informed until returning to the theatre. In this situation, the anaesthetist remains responsible for the patient's care and must inform the operating room team.

An intraoperative handover of care between two anaesthetists should be documented in the anaesthesia record and follow a structured protocol. **It is unacceptable for one anaesthetist to simultaneously administer general anaesthesia, major regional anaesthesia, or moderate to deep procedural sedation (as classified in the SASA Guidelines for the safe use of procedural sedation and analgesia for diagnostic and therapeutic procedures in adults: 2020–2025 and the SASA paediatric guidelines for the safe use of procedural sedation and analgesia for diagnostic and therapeutic procedures in children: 2021–2026) on more than one patient.**

Where only mild procedural sedation is administered, and provided an additional appropriately trained, qualified, and accredited individual, approved by the healthcare institution, is in constant attendance with each patient receiving care, it may be acceptable under these specific circumstances for one anaesthesia provider to supervise more than one patient.

In an obstetric unit, it is acceptable for one anaesthesia provider to supervise more than one patient receiving regional analgesia

for labour, but only once the patient has been assessed to be stable and handed over to a qualified and experienced registered maternity unit nurse for monitoring.

The anaesthetist remains primarily responsible for extubation of the patient

5.2 Perioperative temperature management

To be reviewed in 2026

Monitoring patient core temperature is strongly recommended during cases of general and neuraxial regional anaesthesia lasting 30 min or longer. In the absence of surgical or patient indications for intraoperative hypothermia, active patient warming systems, control of the operating room ambient temperature, and other methods, should be used to target a central core temperature of 36–37 °C.

Monitoring patient core temperature is strongly recommended during cases of general and neuraxial regional anaesthesia lasting 30 min or longer.

5.3 Guidelines on the use of ultrasound in anaesthesia

To be reviewed in 2026

The use of ultrasound (US) has significantly improved patient safety. It is sufficiently pervasive in both the training of anaesthetists and usage among SASA members to warrant the drafting of some guidance.

Vascular access

Based on available evidence, using real-time US during internal jugular (IJ) cannulation improves success and reduces the incidence of complications associated with the insertion of central venous catheters (CVC).

In adults, complications during performance of femoral vein (FV) cannulation are less severe than those that occur with subclavian (SC) and IJ vein cannulation. US guidance for FV access may improve the success rate and reduce complications for FV cannulation. However, this benefit may be more important with novice operators, paediatric patients, or patients with difficult anatomical landmarks. It should be noted that prolonged FV cannulation is associated with a higher incidence of DVT. An individualised and holistic patient risk-benefit assessment for site and type of line should always be considered.

Obese and coagulopathic patients should have US screening of the SC vein before attempted cannulation to identify vessel location and patency. If real-time US is not used as the initial technique for SC vein cannulation, it should be used as a rescue device.

Static US with skin marking is useful for identifying vessel anatomy and thrombosis but may not improve cannulation success or reduce complications as real-time US needle guidance does.

The major advantages of US-guided venous access are correct identification of the target vessel, confirmation of successful cannulation, avoidance of inadvertent arterial puncture and damage to juxtavenous anatomy, reduction in procedure time and a reduction in serious complications.

Current published evidence implies that adult and paediatric patients may benefit from using US when placing intra-arterial pressure monitoring lines. US reduces the number of attempts, shortens the procedure time and increases the rate of successful cannulation. It may be particularly advantageous in patients with abnormal anatomy, low perfusion states or previous unsuccessful cannulation attempts.

The cost-effectiveness of using US, particularly during CVC has been studied and well described. The calculated cost of managing potential complications outweighs the cost of incorporating this technology into the practice of anaesthesiology.

It is thus the opinion of SASA that, based on currently available evidence, the following recommendations relating to US-guided vascular access can be made:

1. Support its use whenever available for the cannulation of IJ veins. There is clear, high-quality evidence that the use of US is superior to a landmark technique.
2. It may be used for the cannulation of SC and FVs.
3. Equivocal evidence supports the use of the US for arterial cannulation.

There have already been several cases where adverse incidents have occurred, and the affected doctors were specifically questioned as to whether they used US. If the answer was negative, their cases were deemed less likely to be defensible and against international best practices. Such cases have led to an essential precautionary application of US.

Transthoracic echocardiography

Focused assessment using TTE may be an invaluable peri-operative extension to the clinical examination, and the skill can be acquired relatively easily. It should, however, not be seen as replacing a complete echocardiographic examination by an experienced operator if the indication for a thorough examination exists.

The use of US is now standard such that it is included in the training of anaesthesiologists from the outset. There have also been, and will continue to be, many CPD programmes and courses for people to get up to date with the latest usage and available equipment. Technology is advancing, in all areas, including new drugs and other equipment. It is part of the daily maintenance of an anaesthetist's skill. This is a specific skill, but certainly not outside of a member's normal capability to assimilate. No different mechanism of staying abreast of technology is needed for US over any other form of advancement in the field of medicine.

It is now an expected standard skill of an anaesthesiologist and should be included as part of the basic skill set. There should, therefore, be no different or additional accreditation required.

There is additional work required in applying this skill in practice, and an anaesthesiologist should be able to be reimbursed for this additional time and skill applied in the interests of patient safety.

It is thus the opinion of SASA that, based on currently available evidence, the following recommendations relating to US-guided vascular access can be made:

- Support its use whenever available for the cannulation of IJ veins. There is clear, high-quality evidence that the use of US is superior to a landmark technique.
- It may be used for the cannulation of SC and FVs.
- Equivocal evidence supports the use of the US for arterial cannulation.

5.4 Monitoring and care standards

To be reviewed in 2026

The following tables have been taken from the International Standards for the Practice of Safe Anaesthesia.

Please note that facilities in South Africa where anaesthesia is delivered should comply with Hospital Level 2–3 standards in these tables.

Please note that international levels of care do not exactly correlate to South African levels of care. This table should be merely used as a guideline.

Table VI: Characteristics and clinical practice recommendations for Level 1–3 facilities

Level 1 hospital	Required standards	Peri-anaesthetic care and monitoring standards – highly recommended
Rural hospital or a health centre with a small number of beds; sparsely equipped operating room (OR) for "minor" procedures	All that are highly recommended	<ol style="list-style-type: none"> 1. Continuous, direct presence in the anaesthetising location of a vigilant anaesthesia professional. 2. Appropriate "pre-check" of the anaesthesia system, facilities, equipment, and supplies. 3. Use of the relevant components of the WHO Safe Surgery Checklist (Appendix I). 4. Supplemental oxygen administered to all patients undergoing general anaesthesia. 5. Continuous use of pulse oximetry. 6. Continuous monitoring of airway and ventilation by observing the bag and with a stethoscope. 7. Confirmation of the correct placement of an endotracheal tube by auscultation. 8. Continuous monitoring of the pulse by clinical examination and with a pulse oximeter. 9. Availability of a defibrillator. 10. Continuous monitoring of tissue perfusion by clinical examination and with a pulse oximeter. 11. Monitoring of non-invasive arterial blood pressure at appropriate intervals. 12. Use of a disconnect alarm if mechanical ventilation is employed. 13. Audible signals, e.g. pulse oximeter, and alarms activated at all times. 14. All patients should remain where anaesthetised until recovered or be transported safely to a specifically designated recovery location. 15. Immediate availability of oxygen, suction, and a means of ventilation in recovery. 16. Continuous use of pulse oximetry until recovery of consciousness. 17. Adequate pain relief, including narcotics when needed.

Level 2 hospital	Required standards	Peri-anaesthetic care and monitoring standards – <i>highly recommended plus recommended</i>
District or provincial hospital, e.g. with 100–300 beds, with adequately equipped major and minor operating rooms	All highly recommended (Level 1) plus these recommended items	<ol style="list-style-type: none"> 1. Monitoring of inspired oxygen concentration with an instrument fitted with a low oxygen concentration alarm. 2. Use of a device protecting against the delivery of a hypoxic gas mixture. 3. Use of capnography to verify the correct placement of the endotracheal tube or other airway device and the adequacy of ventilation. 4. Use of a continuous electrocardiograph. 5. Continual measurement of temperature. 6. Use of a peripheral neuromuscular transmission monitor when neuromuscular blocking drugs are given. 7. Sufficient trained staff in the postanaesthesia recovery area to manage patients recovering from anaesthesia and surgery.
Level 3 hospital	Required standards	Peri-anaesthetic care and monitoring standards – <i>highly recommended plus recommended plus suggested</i>
A referral hospital of 300–1 000 or more beds with basic intensive care facilities	All highly recommended (Level 1) plus recommended (Level 2) plus these items	<ol style="list-style-type: none"> 1. Continuous measurement of the inspiratory and/or expired gas volumes, and of the concentration of volatile agents. 2. Continuous measurement and display of arterial pressure in appropriate cases. 3. Use of continuous electronic temperature measurement. 4. Monitoring of urine output during prolonged procedures or when significant administration of intravenous fluids is anticipated.

5.5 Prevention of wrong-side surgery

2022 review by M Blackburn

Wrong-side procedures are classified as ‘*never events*’. However, they still occur at an unacceptable rate. As integral members of the surgical team and advocates for patient safety, anaesthesia providers are critical to processes that aim to prevent these.

Of note, it is estimated that wrong-side **blocks** are performed with an incidence 10 times those of wrong-side **procedures**. The factors below contribute to this.

Table VII: Factors that contribute to wrong-side procedures

Physician factors

- High-pressure environment
- Fatigue
- Lack of clear hierarchy/responsibility
- Staff change during the procedure
- Failure to check or mark site

Patient factors

- Sedated/confused or block sited after induction
- Similar patient names
- Language/communication barriers
- Abnormal anatomy
- Multiple blocks in the same patient
- Haemodynamic instability leading to distraction

Procedural factors

- Change in patient position
- Change in order of theatre list
- Wrong site marked
- Marking erased
- Distractions – verbal, phone call, teaching, etc.

While the WHO checklist (Appendix I) offers some protection from wrong-side procedures, it is recommended that further safeguards are put into place. The attending anaesthetist should take the following steps to prevent incorrect side procedures:

1. Verbally confirm the site and side of the surgery with the patient during the preanaesthesia consultation and document the discussion and confirmation of site/side against the booked procedure.

2. Ensure that the correct side is marked clearly. While this is primarily the responsibility of the consenting surgeon, as patient advocates, it falls to anaesthesia providers to confirm that this has been done. Options include:

- Indelible marker – consider marking the actual needle insertion site – be aware that this **may** lead to confusion with previously placed surgical side markers, so ensure this is clearly marked as a block site.
- Brightly coloured armband (of a colour different to those typically used by nursing staff)—visible at all times before skin incision—not necessarily on the limb to be operated on but lateralised to the correct side and visible.

Prevention of incorrect side block performance

Previously, the ‘STOP before you block’ model was developed to reduce the risk of wrong site/side blocks. However, the number of incidents was not significantly decreased. The model has been adjusted in the interim and has been produced as a ‘Prep, Stop, Block’ model.

The model is presented as a standard operating procedure (SOP) and has the following steps:

Prep

1. The performing anaesthetist **prepares** the local anaesthetic solution in a clearly marked syringe with a suitable block needle. This is then handed off to the assistant, out of reach of the person doing the block.
2. The anaesthetist then cleans and drapes, making sure to leave the previously placed mark visible.

Stop

1. The **stop** moment happens after preparation is completed. When ready, the anaesthetist announces that all preparation is completed, and they are ready to block.
2. At this stage, the anaesthetist and the assistant view the surgical site mark and verbally confirm the correct side, and the assistant reconciles this with the consent form.

Block

1. Only after the correct side is confirmed does the assistant hand the prepared tray to the anaesthetist, who immediately performs the **block**.
2. Any delay or interruption requires beginning the process from step 1.

The most important aspect of this updated model is that it is performed **immediately** before needle placement. The Prep, Stop, Block approach was devised by Regional Anaesthesia United Kingdom (RA-UK). It is currently endorsed by the Royal College of Anaesthetists (RCOA), Safer Anaesthesia from Education (SAFE), Royal College of Surgeons and the Association of Anaesthetists of Great Britain and Ireland (AAGBI).

General

It is critical to appreciate the role of distraction in the performance of checklist-based procedures like the WHO and anaesthesia safety checklists – should these be interrupted for any reason, the checklist should be started from the top. Extreme care should be taken if the patient is to be positioned in positions other than supine after induction. Ultimately the creation and curation of strong team dynamics in the operating theatre will go a long way toward decreasing the risk of wrong-side procedures in the context of the provision of medical and surgical care.

5.6 Records

2022 review by R Davids, C Lundgren, A Roux, D Shead and N Zimmelman

SASA supports the following WFSA standards:

- A record of the details of each anaesthetic (preoperative assessment, anaesthetic plan, intra- and postoperative course) should be made (highly recommended).
- It is recommended that individuals, departments, and regional and national groups collect cumulative data to facilitate the progressive enhancement of the safety, efficiency, effectiveness, and appropriateness of anaesthesia care.

Anaesthesia records

A full contemporaneous record relating to the continuum of anaesthetic care, i.e., records relating to preanaesthesia, intraoperative and postanaesthesia care, should be made by the practitioner delivering an anaesthetic. Any anaesthesia-related complications should be documented in the patient file. The following has been adopted from the Canadian Anesthesiologists' Society guidelines, with permission:

All monitored physiologic variables should be charted at intervals appropriate to the clinical circumstances. Heart rate and BP should be recorded at least every five minutes. O₂ saturation must be monitored continuously and should be recorded at frequent intervals for all patients. End-tidal carbon dioxide concentration must be constantly monitored and recorded at frequent intervals. Reasons for deviation from these charting guidelines should be documented in the anaesthetic record. Monitors, equipment, and techniques, as well as time, dose, and route of all drugs and fluids should be recorded. Intraoperative care should be recorded.

The anaesthesia record should include the patient's level of consciousness, heart rate, BP, O₂ saturation, and respiratory rate as first determined in the PACU.

All practitioners must provide and maintain documentation to support the execution of any tasks as set out in these Practice guidelines in as much detail as is practical and useful. The practitioner may be required to submit this information to named authorities willingly if patient confidentiality is maintained.

The HPCSA states that "healthcare practitioners should enter and maintain at least the following information for each patient consulted":

- Personal (identifying) particulars of the patient.
- The bio-psychosocial history of the patient, including allergies and idiosyncrasies.
- The time, date, and place of every consultation.
- The assessment of the patient's condition.
- The proposed clinical management of the patient.
- The medication and dosage prescribed (all prescriptions must comply with the provisions of the Medicines Act and regulations).
- Details of referrals to specialists, if any (including the reports from such specialists, or any other conversations had with such specialists).
- The patient's reaction to treatment or medication, including adverse effects, bearing in mind that the Medicines Act makes the reporting of adverse events to the manufacturer of the product, or directly to SAHPRA, compulsory.
- Test results.
- Imaging investigation results.
- Information on the times the patient was booked off from work and the relevant reasons.
- Where applicable, written proof of informed consent or some record or note in the patient file that consent has been obtained.

The entity holding and processing the information must consider and adhere to the following:

- The patient is entitled to see data being stored.
- The information being collected and processed must be adequate and necessary in view of the purpose to which the patient has consented.
- The holder of the information is obliged to ensure the accuracy, quality and security of the information they hold.
- Haemodynamic printouts or electronic data collected by facilities concerned as documentation of patient vital signs during anaesthesia can only be collected with the patient's and anaesthetist's prior consent.

Each record and printout must possess clear identifiable patient details. Any patient data collected that would reasonably be considered to be part of the patient-doctor notes may only be reviewed by or shared with any party other than the clinician or patient directly with prior written consent of the patient and, when shared, with notification to the clinician concerned (and this includes any legal representatives of facility groups).

Ownership of records

- The information on a health record belongs to the patient.
- The record itself, however, belongs to the entity. However, this does not give the entity the right to disclose the information contained in the record in any manner other than as is determined by law.
- The entity referred to above is the person/persons legally holding the patient's record.
- For state practice, standard documents approved by the authority, e.g., provincial administration, are used.
- Outside of the public sector, records on personally owned stationery guarantees the anaesthetist's ownership of the record. *SASA recommends that anaesthetists in private practice, as far as is permissible, enter medical records onto personally owned stationery.*
- All recorded patient information, both written and digital, should be preceded by an informed consent process.
- The patient has a right to the information as contained in their record and may petition under the Promotion of Access to Information Act (PAIA) for a copy of said record.
- *SASA recommends that where records are made available to patients, the responsible practitioner personally discloses/ explains the shared information.*
- The only acceptable grounds for refusal of access to patients' records is if access might cause serious harm to their physical or mental wellbeing.

Signing of records and official documents

- Practitioners are, through the ethical rules, obliged to sign official documents and instructions generated by them. According to the HPCSA's ethical rules, this signature must be accompanied by the initials and surname of the practitioner in block letters. This also validates the instruction or record and the date it was issued.
- Sick certificates must comply with the requirements of the ethical rules. They can only include the diagnosis in a lay person's language if the patient has provided written consent to such disclosure.

The anaesthetist's prescription

The HPCSA's ethical rule 23 stipulates that the medical practitioner "shall not engage in or advocate the preferential use or prescription of any medicine or medical device which would not be clinically appropriate or the most cost-effective option" and that such prescription or supply shall be based on "the diagnosis of the patient concerned through a personal examination of the patient or by virtue of a report by another practitioner under whose treatment the patient is or has been and such medicine or medical device is clinically indicated, considering the diagnosis and the individual prognosis of the patient, and affords the best possible care at a cost-effective rate compared to other available medicines or medical devices and the patient is informed of such other available medicines or medical devices". This ethical rule means that:

Practitioners may prefer certain products over others, provided that:

1. Diagnoses should precede prescriptions.
2. Prescriptions must be clinically indicated.
3. Patients must be informed of the medicines available to them.

Ethical rule 27A requires practitioners to respect patients' choices, and read with the NHA, requires practitioners to give patients the options generally available to them.

Ethical rule 17 requires all prescriptions to be issued under the personal and original signature of the medical practitioner. The format of a prescription, i.e., whether on a separate sheet entitled "prescription" or whether in the form of a medicines record as kept by anaesthetists in theatre, is not prescribed.

The Medicines and Related Substances Act 101 of 1965 (the Medicines Act) stipulates the conditions under which the various scheduled medicines may be prescribed and supplied to the public. Section 22A determines that:

1. Schedule 2, 3 or 4 substances may only be repeated if the person who issued the prescription has indicated thereon the number of times it may be dispensed, but not for longer than six months.
2. Schedule 5 substances shall not be repeated for longer than six months, and only if the authorised prescriber has indicated on the prescription the number of times and the intervals at which it may be dispensed. Where the Schedule 5 substance is used for:
 - its anxiolytic, anti-depressant, or tranquillising properties, it shall not be prescribed for longer than six months unless the authorised prescriber has consulted a registered psychiatrist before issuing a new prescription; or
 - its analgesic properties, it shall not be prescribed for longer than six months unless the authorised prescriber has consulted another medical practitioner before issuing a new prescription.
 - Schedule 6 substances shall not be repeated without a new prescription being issued.
 - Schedule 7 or 8 substances may only be acquired by the Director-General, who may provide a medical practitioner therewith, on the prescribed conditions for the treatment or prevention of a medical condition in a particular patient.

Regulation 28 of the General Regulations to the Medicines Act requires certain particulars to be on a prescription or order for a medicine:

1. the name, qualification, practice number and address of the prescriber;
2. the name and address of the patient;
3. the date of issue of the prescription or order;
4. the approved name or the proprietary name of the medicine;
5. the dosage form;
6. the strength of the dosage form and the quantity of the medicine to be supplied;
7. in the case of a prescription, instructions for the administration of the dosage and frequency of administration;
8. the age and sex of the patient;
9. the number of times the prescription may be repeated; and

10. the International Classification of Diseases code (ICD code) should be stated where a prescription is to be funded by a third-party funder.

In SASA's opinion, the medicines record in theatre constitutes a lawful format in which regulation 28 is complied with, provided that the information set out above is included in the record.

A prescription constitutes an order to a pharmacist to dispense medication to a patient or guardian who will then administer the medication and/or a delegation of authority to a registered nurse to dispense/administer a medication to a patient on the medical practitioner's behalf. A prescription per patient is not required for drugs directly administered by the anaesthetist perioperatively. It is, however, incumbent on the anaesthetist to accurately record all drugs administered to each patient (time, dosage, route and relevant information).

Regulation 28 also requires pharmacists to verify the authenticity of telephonic, faxed, or electronic prescriptions, requiring that it be followed by the original prescription or order within seven working days.

Regulation 28 also stipulates that the prescriber must keep records of the diagnosis relevant to the prescription and indicate the diagnosis on the prescription where the patient consents.

Practitioners should not demand any valuable consideration in return for prescribing products and/or for supporting suppliers of medicines.

Prescription data shall only be made available to third parties (even if through intermediaries such as switching or clearing houses and software companies) with the patient's informed consent that data may be passed on and reworked by other companies.

Records of incident and death reporting

The requirements for reporting adverse incidents (an institutional process) and death (a statutory process) are discussed in the Peer review and Incident Reporting sections of these Guidelines.

South African law requires any death considered unnatural to be reported for medicolegal investigation. Unnatural death related to anaesthesia is provided for in the Health Professions Act. In July 2008, a revised version of this statutory obligation came into effect with the proclamation of the Health Professions Amendment Act.

Previously the law stated that "the death of a person whilst under the influence of a general anaesthetic or local anaesthetic, or of which the administration of an anaesthetic has been a contributory cause, shall not be deemed to be a death from natural causes as contemplated in the Inquests Act 58 of 1959, or the Births, Marriages and Deaths Registration Act 81 of 1963". This has now been amended and states that "the death of a person undergoing, or as a result of a procedure of a therapeutic, diagnostic or palliative nature, or of which **any aspect of such a procedure has been a contributory cause**, shall not be deemed to be a death from natural causes as contemplated in the Inquests Act 58 of 1959, or the Births and Deaths Registration Act 51 of 1992".

It is essential that the following documentation is completed and made available to the state pathologist who will perform the autopsy in the instance of a procedure-related death:

- Contemporaneous anaesthetic record and notes.
- GW7/24 medicolegal form (The current South African [SA] procedure-related death notification [PRDN] instrument), the GW7/24 form (Report of person whose death is associated with the administration of an anaesthetic or a diagnostic or therapeutic procedure), originally published in the 1970s.
- Relevant documents from the patient's file.

Maternal deaths

In cases of a maternal death where an anaesthetic was involved, the following is essential:

- Completion of the same documentation as with a procedure-related death and completion of the maternal death notification form (MDNF) with the entire maternity team.

Definition: The maternal mortality ratio (MMRatio) is the annual number of female deaths per 100 000 live births from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes). The MMRatio includes maternal deaths occurring during pregnancy and childbirth. This also includes deaths occurring within 42 days of termination of pregnancy, irrespective of the duration of the pregnancy.

Integrated reporting of an adverse incident and procedure-related death

It is recommended that the processes of adverse incident and procedure-related death reporting is integrated for the following reasons:

1. To improve the quality of record keeping.
 - A. The **anaesthetic record**, whether in electronic or printed/handwritten format, should be the basis of all record-keeping contributions from the anaesthesia provider.
 - i. It is recommended that supervisors or other colleagues guide less experienced providers to ascertain that the record contains all relevant information. This may be facilitated in the process of adverse incident reporting, as described by the NDoH in their **policy document**, with regards to Step 4 to 7: Notification, Investigation, Classification and Analysis.
 - ii. It is highly recommended that the anaesthetic record is attached to the GW7/24 medical report to the forensic investigator in case of a procedure-related death.
 - iii. It is also highly recommended that the names of senior colleagues that reviewed (Ensuring that relevant information is included) the anaesthetic record AND the full report is added to the GW7/24.
 - iv. It is recommended that individuals and institutions participate in the collection of adverse event data using the tool developed by the NDoH, or a similar tool.
 - B. Incorporating record keeping in a standard workflow process for incident reporting may improve the quality of the record.

2. To facilitate root-cause analysis and the institution of quality improvement programmes.

Aggregated clinical data and registries

The Perioperative Shared Health Record and Integration with a Perioperative Clinical Registry

The Perioperative Shared Health Record (PSHR) is a web-based platform administered by Safe Surgery SA (SSSA) that enables patient-centred information exchange between different members of the care team for a patient undergoing a surgical procedure. Central to its function is its interoperability – the ability to integrate with other data sources using similar health data standards, or to integrate existing electronic case- or administrative perioperative information. It will contribute to the basic dataset for a Perioperative Clinical Registry – a clinician-driven platform inclusive of all physician service providers. The PSHR will allow for individual practice benchmarking. Using appropriate governance mechanisms, the Perioperative Clinical Registry will allow for clinician-driven quality assessment and research.

The final results of this were published in the 2019 South African Health Review, and SASA continues to engage with all stakeholders on this and other platforms.

Personal information and health data: confidentiality and access

The ethical duty of healthcare professionals to preserve patient confidentiality is intrinsically related to the trust that patients place in practitioners. Laws such as the NHA, PAIA and POPIA all address the right to confidentiality and the circumstances under which disclosure would be authorised. Record-keeping is critical in risk management in medical practices and health establishments. The following section is informed by **POPIA**.

Summary of the act

- to promote the protection of personal information processed by public and private bodies;
- to introduce certain conditions so as to establish minimum requirements for the processing of personal information;
- to provide for the establishment of an Information Regulator to exercise certain powers and to perform certain duties and functions in terms of this Act and the Promotion of Access to Information Act, 2000;
- to provide for the issuing of codes of conduct;
- to provide for the rights of persons regarding unsolicited electronic communications and automated decision making;
- to regulate the flow of personal information across the borders of the Republic; and
- to provide for matters connected therewith.

Types of data and information that are protected

1. According to the NHA all information about a person's stay and/or visit to a health establishment, as well as information relating to his/her health status, treatment and care are confidential. This includes information provided by the

patient, as well as information generated by healthcare professionals (e.g., prescriptions, notes in a patient file, etc.)

2. In addition, all names, addresses, and similar personal information, as well as financial and biometric information and the likes are protected by POPIA. Information that is truly de-identified and cannot be relinked to an identifiable person is excluded from this protection. However, consent must be obtained from a person whose information starts out (e.g., is collected) as identifiable information, and then subsequently becomes de-identified. The person must know that information will be reworked, and what the purpose of that reworking will be.
3. The above means that all recordings, written and/or typed notes, documents or reports, x-rays, prescriptions, laboratory test results, certificates, clinical research records, etc. are included in the definition of information that is protected.
4. Information relating to health is considered "special information" within POPIA, attracting greater expectations for confidentiality.

Patient consent to disclosure

1. POPIA and NHA state that patients may consent to disclose their information, but such consent must be in writing. The HPCSA ethical rules require consent to be 'explicit'. **SASA recommends that consent to disclosure be made in writing.**
2. Third-party access: Under the terms of POPIA, the arrangements around third-party access to patient information broadly match the guidelines set out by the HPCSA. This means that patient consent is essential.
3. Exceptions to consented disclosure of personal information must align with NHA 2003, particularly sections 15 and 16.
4. Please note that both the NHA and POPIA provide automatic exemption on the sharing of information for the purposes of providing the service. This specifically includes sharing clinical information with the healthcare team providing care to the patient and the information required to be shared to bill for services provided. Please note that this exemption **does not** extend beyond this, such as sharing clinical information with family members, or information gathered for clinical and/or other research. **Although billing processes are implicitly included in the permissions, it is recommended that patients be made aware that you use an external billing company,** if this is the case, and that you will be submitting an invoice to their medical scheme. The **SASA Green Consent Form** includes such a statement.

Legal requirement or court order to disclose

- The NHA also authorises disclosure if a law explicitly requires disclosure. For example, notifiable diseases are declared as such by law and disclosure to the specific authorities can then be made. Another example is the medical schemes regulation that requires disclosure of an ICD-10 code on a bill to a medical scheme.
- The same applies if someone obtains a court order – such an order may compel the disclosure of the information.
- Practitioners may rely on ethical principles to not disclose under these circumstances. They may even challenge the

constitutionality of the court order or the law that authorises or requires the disclosure.

The anaesthesiologist and other practitioners and facilities

- Each entity collecting and recording personal information is bound by the provisions of POPIA, and each entity must preserve the confidentiality of the information it holds in its possession. Entities cannot share information without the patient's written consent, and the entity must ensure that the receiving party has the same or similar protections for confidentiality in place.
- POPIA advocates that all personal information held must be protected from loss, damage or unauthorised destruction, and unlawful access. The legal expectation is the implementation of reasonable technical and organisational measures to ensure information protection.
- In the public sector, the employees of a hospital are bound with the hospital in relation to matters of confidentiality, disclosure, and information processing. In the private sector, the practitioners and the hospital are two different legal entities, and the provisions of consent and similar protections must be adhered to by both, i.e., two separate sets of forms may be required to give effect to consent to disclosure, and there may be two sets of policies relating to how health records are handled, shared, etc.

Collection, use, dissemination, and reworking of information

No personal information may be collected, recorded, stored, reworked or otherwise dealt with, without compliance with the following criteria as set by POPIA, all of which the patient must consent/agree to:

- The patient must know that their information is collected, reworked, stored, or disseminated ("processing").
- The patient must know what the purposes of the processing are, and such purposes must be lawful (e.g., a research protocol must be in place, or the information is collected and sent on based on the provisions of the Medical Schemes Act, etc.). The description of these purposes must be clear and delineated and not overbroad and vaguely described.
- The patient must know if there will be further processing of their information (e.g., a record used for health research purposes, inclusion in any clinical review panels, even if internal, etc.).
- The duration for which the record will be kept: Normally, records would have to be destroyed after they have served the purpose(s) for which they were created, reworked, or stored. See section 16 of POPIA for the required duration of record keeping.
- Should the practitioner share information with another entity to provide services (such as a billing agency), the practitioner remains the "responsible party" in terms of the definitions within POPIA. The other entity becomes the "operator" in POPIA terms. It is essential that the responsible party has a written agreement in place with the operator that addresses confidentiality and confirms that the operator is POPIA compliant. If the operator is an international organisation (as is

the case if your information is stored through companies like Google or Amazon), the international company must comply with legislation equivalent to or more stringent than POPIA. Most international companies, including Google and Amazon, comply with General Data Protection Regulations (GDPR) in Europe, which is considered sufficient.

- The confidentiality requirements extend to any staff working for a clinician. It is expected that employment contracts for staff exist and explicitly include confidentiality clauses. It is also required that staff are trained in POPIA and that such training is recorded.
- Failure to comply with POPIA may lead to complaints lodged with the Information Regulator, resulting in civil and/or criminal prosecution.

Information storage: duration, type/nature, and destruction

- The HPCSA requires records to be stored for at least seven years, and for children's records to be kept until they reach maturity (18 years of age). The NHA requires records to be stored for 20 years.
- The HPCSA permits storage in electronic format. It should, however, be borne in mind that unless reputable electronic storage mechanisms are used, the document's authenticity might be placed in dispute.
- The HPCSA requires that records be kept in non-erasable ink, erasure fluid should not be used, and changes should be made on the original, erroneous document, with a signature and date next to the amendment.
- The words "no substitution" next to a line item on a prescription may not be electronic or affixed by a stamp and must be in the practitioner's own handwriting.

Children and confidentiality

The HPCSA ethical rules and the 2005 Children's Act award children the right to confidentiality from the age of 12 years onwards, insofar as treatment is concerned. With surgical interventions, as the parents/legal guardians support the child in reaching the decision, they would have to have access to the child's personal information.

Additional POPIA requirements

1. The promulgation of POPIA has created some specific additional requirements for every entity. This is based on the entity being a juristic entity. In the public sector, the hospital is likely to be the juristic entity, and it would be the responsibility of the hospital management to ensure compliance with these requirements. In the private sector, each juristic entity would be required to comply. This would, therefore, apply to every partnership, association, solus practitioner or individual member of an association if the association is not a legal or juristic entity.
2. Over and above the items outlined above, the specific requirements include, but are not limited to:
 - i. A PAIA Manual (a template is available from SASA sasa@sasaweb.com) and its lodging with the Information Regulator

- ii. The designation and registration with the Information Regulator of an Information Officer (which would likely be the practitioner themselves)
- iii. The training of the Information Officer for their role and a record of such training
- iv. A data breach policy, whereby the steps that will be taken in the event of such a breach are outlined. This must include how the affected people will be notified of the breach.

Example of policy document

This document is only available as part of the online publication of the SASA Practice Guidelines 2022 Revision.

- A record of the details of each anaesthetic (preoperative assessment, anaesthetic plan, intra- and postoperative course) should be made (highly recommended).
- It is recommended that individuals, departments, and regional and national groups collect cumulative data to facilitate the progressive enhancement of the safety, efficiency, effectiveness, and appropriateness of anaesthesia care.
- SASA recommends that anaesthetists in private practice, as far as is permissible, enter medical records onto personally owned stationery.
- SASA recommends that where records are made available to patients, the responsible practitioner personally discloses/explains the shared information.
- It is essential that the following documentation is completed and made available to the state pathologist who will perform the autopsy in the instance of a procedure-related death:
 - Contemporaneous anaesthetic record and notes.
 - GW7/24 medicolegal form (The current South African [SA] procedure-related death notification [PRDN] instrument), the GW7/24 form (Report of person whose death is associated with the administration of an anaesthetic or a diagnostic or therapeutic procedure), originally published in the 1970s.
 - Relevant documents from the patient's file.
- In cases of a maternal death where an anaesthetic was involved, the following is essential:
 - Completion of the same documentation as with a procedure-related death and completion of the maternal death notification form (MDNF) with the entire maternity team.
- It is recommended that the processes of adverse incident and procedure-related death reporting is integrated for the following reasons:
 1. To improve the quality of record keeping.
 - i. It is recommended that supervisors or other colleagues guide less experienced providers to ascertain that the record contains all relevant information.
 - ii. It is highly recommended that the anaesthetic record is attached to the GW7/24 medical report to the forensic investigator in case of a procedure-related death.

iii. It is also highly recommended that the names of senior colleagues that reviewed (Ensuring that relevant information is included) the anaesthetic record AND the full report is added to the GW7/24.

iv. It is recommended that individuals and institutions participate in the collection of adverse event data using the tool developed by the NDoH, or a similar tool.

2. To facilitate root-cause analysis and the institution of quality improvement programmes.

- SASA recommends that consent to disclosure be made in writing.
- Although billing processes are implicitly included in the permissions, it is recommended that patients be made aware that you use an external billing company.

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6. THE POSTANAESTHESIA PERIOD

6.1 Care of patients recovering from anaesthesia

To be reviewed in 2026

- Recovery from anaesthesia must occur under appropriate supervision in an area designed for this purpose.
- This area should either be in the theatre itself or close to where anaesthesia was administered.
- The staff members who work in this area must be appropriately trained. When the need arises, staff must be able to contact the anaesthetist or designate promptly. See [Section 2.4 Anaesthesia support personnel](#).
- It is desirable for patients to have regained consciousness and be stable before they are transported any distance.
- If patients must be transported within and from the operating suite when not fully recovered, they must be moved on a suitably designed trolley or bed capable of a head-down tilt. The bed or trolley should be provided with oxygen, a means of inflating the patient's lungs, equipment for suctioning and an appropriate monitor. The patient must be accompanied by qualified staff to deal with problems that may occur during transport.

6.2 Transfer from theatre to recovery room

To be reviewed in 2026

It must be noted that the safe transfer of the anaesthetised patient from the theatre to the RR is of the utmost importance.

1. A roller board should be used, if available, and the patient should be gently transferred from the theatre bed to trolley/bed.
2. An adequate number of staff should be available to transfer the patient from the theatre bed to the patient trolley/bed.
3. All lines and equipment should be handled with care.
4. The oxygen mask, filter and suction tip should accompany the patient to the RR.

5. An IV infusion stand should be available on all trolleys/beds.
6. The dignity and privacy of the patient should always be protected.
7. The bed should be tidy and clean.
8. All trolleys/beds should be fitted with safety straps or cot sides. These should be in working order.
9. The anaesthetic nurse/specifically appointed person should assist the anaesthetist with transferring the patient to the RR.

6.3 Guidelines for the handover of postoperative patients to the staff of the theatre recovery area

To be reviewed in 2026

- The responsibility of the anaesthetist does not end with the handover to the recovery staff. The anaesthetist or an appointed designate should be available in the theatre complex until it can be reasonably assumed that anaesthesia has worn off.
- The anaesthetist must formally hand over a patient's care to a RR nurse or other appropriately trained staff members.
- The patient should be breathing spontaneously, and oxygen saturation should be appropriate.
- The patient should have recovered from the neuromuscular blocker, as determined by the return of the train-of-four or by appropriate clinical signs of recovery, e.g., head lift or hand squeeze.
- The patient should be haemodynamically stable. If excessive blood loss has occurred, the anaesthetist should remain with the patient until adequate volume resuscitation has occurred and appropriate measures to test haemoglobin level and blood products have been ordered if necessary and the ordering of homologous blood has been carried out.
- The patient should have adequate control of pain and PONC.

Safe handover of postoperative adult patients to RR staff is easily remembered with the use of the STAMPED acronym.

S	T	A	M	P	E	D
Stable patients in all respects	Tell the recovery staff about preoperative and intraoperative condition/problems	Airway secured	Muscle relaxants adequately reversed	Pain and nausea under control	Ensure that fluids and haemoglobin are adequately replaced	Discharge the patient from recovery room

Airway patency remains the responsibility of the anaesthetist until patients can maintain their own airways. Patients should not be left unattended with an airway device in situ. The airway should remain the responsibility of the physician anaesthetist until such time that conscious control is taken back over by the patient or the responsibility is handed over to another responsible physician anaesthetist. SASA strongly recommends that endotracheal tubes and supraglottic devices should be removed by the attending

anaesthetist.

The anaesthetist should authorise discharge from the recovery area to the ward. Patients should not be discharged until they have regained airway control, are haemodynamically stable, and can communicate adequately. If the modified Aldrete score is used to assess the patient before discharge, it is reasonable to expect that the patient must score $\geq 9/10$ before discharge, unless there is a good reason for failure to meet these criteria.

Aldrete score

Should be 2/2 for each parameter depending on circumstances and at least 9/10 before discharge from the recovery area.

Activity	Able to move four extremities voluntarily or on command	= 2
	Able to move two extremities voluntarily or on command	= 1
	Unable to move extremities voluntarily or on command	= 0
Respiration	Able to deep breathe and cough freely	= 2
	Dyspnoea or limited breathing	= 1
	Apnoeic	= 0
Circulation	BP 20% of preanaesthetic level	= 2
	BP 20–50% of preanaesthetic level	= 1
	BP 50% of preanaesthetic level	= 0
Consciousness	Fully awake	= 2
	Arousable on calling	= 1
	Not responding	= 0
Colour	Pink (SaO ₂ > 92% on room air)	= 2
	Pale, dusky blotchy (O ₂ required for SaO ₂ > 90%)	= 1
	Cyanotic (SaO ₂ < 90% despite supplementary oxygen)	= 0
Total		

If the patient requires admission to an ICU or high care unit, the anaesthetist should remain in attendance until the transfer has taken place and handover to the appropriate personnel has occurred.

The time at which the responsibility of the anaesthetist for a particular patient ends is not possible to determine precisely. It is reasonable to expect an anaesthetist to be in attendance, or at least available, until the patient has fully recovered from the anaesthetic and until the anaesthetist is satisfied that there are no sequelae from the delivery of the anaesthetic. In addition, if the patient is to be handed over to other medical personnel, it is the responsibility of the anaesthetist to ensure that the patient is stable, that the medical personnel are competent to take over the management of the patient, and that the handover is done clearly and concisely to ensure continuity of information.

6.4 Management and supervision

To be reviewed in 2026

Written protocols for safe management should be established.

A written daily routine for checking the equipment and drugs must be established.

Observations should be recorded at appropriate intervals and, at the very least, should include state of consciousness, colour, respiration, oxygen saturation, pulse, BP, and pain level. The record should form part of the patient's clinical notes.

All patients should remain in the RR until the anaesthesiologist considers it safe to discharge them from the RR according to validated criteria, which include return of protective airway reflexes, stable cardiovascular and respiratory function, full reversal of neuromuscular blockade, absence of nausea and vomiting, and absence of pain.

The anaesthesiologist is responsible for:

- Supervising the recovery period and authorising the patient's discharge.
- Accompanying the patient to the RR and adequately handing them over to the nursing staff, who will document the patient's condition on arrival and subsequent course in recovery.
- Providing appropriate written and verbal instructions and information to the RR staff for each case.
- Specifying the type of apparatus and the flow rate to be used in oxygen therapy.
- Remaining in the facility until the patient meets the criteria detailed above or delegating this responsibility to another anaesthetist or intensivist (after providing appropriate information to such a doctor).

The airway should remain the responsibility of the physician anaesthetist until such time that conscious control is taken back over by the patient or the responsibility is handed over to another responsible physician anaesthetist. SASA strongly recommends that endotracheal tubes and supraglottic devices should be removed by the attending anaesthetist.

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7. REGIONAL ANAESTHESIA

This guideline is available at: [SASRA guidelines](#)

8. ACUTE PAIN MANAGEMENT

This guideline is available at: [Guidelines for the management of acute pain in specific scenarios 2022](#)

9. ANAESTHESIA OUTSIDE A HOSPITAL SETTING

2022 new addition by R Hofmeyr

Introduction

Clinicians may be called upon to provide services including patient assessment, monitored care, sedation, anaesthesia and resuscitation outside of the traditional hospital environment. This is not limited to sedation/anaesthesia in day surgery units and consulting rooms for proceduralists but extends to the prehospital and interfacility transfer environments, and 'HARD anaesthesia' conditions in the humanitarian, austere, remote, and disaster settings.

Whilst the conditions and context may vary dramatically, fundamental principles for the provision of safe anaesthesia are universal and reflect the core tenets of in-hospital anaesthesia as detailed in the established practice guidelines. Importantly, it is essential to understand that resource limitations are common in the out-of-hospital setting, but adverse environments are not an excuse for poor quality anaesthesia care.

Context

Practice guidelines for procedural sedation and anaesthesia in consulting rooms and similar settings are well described and beyond the scope of this guideline. The specific case of getting infusions for psychiatric indications is also discussed separately. This document will provide basic guidance for anaesthesia in the prehospital, remote, humanitarian and disaster settings. Practitioners are encouraged to read this in the context of the greater body of the SASA Practice Guidelines. They are encouraged to undertake specific study and training if anticipating practising within this field.

International guidelines exist for the practice of anaesthesia within the hospital, outside of the operating theatre, in the prehospital environment, as well as in the disaster setting. Practitioners developing protocols and systems for out-of-hospital anaesthesia are encouraged to read these international resources in conjunction with this document, in order to adjust the guidance to their specific South African context.

Guidance

Clinical governance

The ethical and medicolegal requirement to maintain adequate clinical notes is not obviated by the austere environment. In all cases where anaesthesia services are provided, a record must be kept, even if this is limited to a retrospective progress note. Increasingly, pro forma case report forms which can be completed electronically using a mobile device or tablet, are being integrated with automated patient monitoring and dictated voice notes. In the absence of such technological solutions, practitioners can use simple paper notes or the notes feature of their mobile device, including photographs of vital signs, to create a contemporaneous record.

Ideally, all cases should be recorded in a central database or registry, and all adverse events should be subjected to a

morbidity and mortality review process. Mechanisms must be in place to disseminate lessons learnt through case review into clinical practice.

Knowledge, skills and personal preparation

Outside of the unanticipated emergency, practitioners planning to perform anaesthesia in the prehospital or 'HARD' (humanitarian, austere, remote or disaster) settings should undertake specific training in the field. This may be through specific courses or while working in the environment under supervision. Simulation training is of particular value in learning to adapt in-hospital anaesthesia skills to the out-of-hospital setting. Prehospital and disaster anaesthesia is frequently simplified and protocolised to streamline equipment requirements, improve the reproducibility of care, and enhance safety. Simulation is an ideal tool to learn and practice protocols in a safe environment.

Anaesthesia practitioners working in the out-of-hospital environment may need enhanced general medical and procedural skills to cope with complications of anaesthesia care which might be managed by other specialities in a more well-resourced environment. For instance, percutaneous or surgical tracheostomy and tube thoracotomy for placement of intercostal drainage are skills less commonly performed by anaesthesiologists in the in-hospital setting. But in the austere environment, this falls within the realm of skills required.

Recognising that the out-of-hospital environment can be adverse, even in an urban setting, is important. This is amplified to the point of discomfort or personal danger when practising in an austere or disaster setting. Practitioners must fully understand the environment's and mission's demands, including duration, working conditions, baseline infrastructure requirements of self-care, self-sustainability, physical demands, what personal protective equipment (PPE) is required, environmental hazards, endemic diseases, and requirements for vaccination. Critically, the practitioner must be competent to work and care for themselves in the environment so as not to be an additional burden on other staff, or in turn, become a casualty.

Protective clothing and equipment

Enhanced personal clothing and equipment to protect the practitioner from both the environment and the patient is frequently required in the out-of-hospital setting. This may be limited to sun protection and more robust disposable gloves but can include specialised clothing such as exposure or Nomex® suits, respirators or other breathing apparatus, height protection and fall arrest equipment, and enhanced PPE for infectious diseases. Again, training in simulations in providing anaesthesia care while using enhanced PPE is essential to adjust practices to the adverse environment.

Equipment for out-of-hospital anaesthesia

Equipment for out-of-hospital anaesthesia is subject to multiple and often contradictory requirements. These include ruggedness (including resistance to vibration, droppage, dust and water), ability to operate for extended periods without electrical power, user interfaces which can be interpreted and

operated easily while wearing a range of PPE, displays which are readable in daylight conditions outdoors but do not place excessive drain on battery systems, interoperability with readily available disposables, integration with telemedicine systems, ability to be recharged from conventional and vehicle power systems, compact size and limited weight, field serviceability, and longevity. Devices with integrated interventional and monitoring capability (such as multi-parameter monitor-defibrillators with pacing capacity or ventilators with integrated capnography) are advantageous.

Where a full spectrum of patient ages and body masses is anticipated, a careful selection of devices which require a specific size (such as laryngoscope blades or IV cannulas) to bridge the full spectrum with a smaller number may be effective. When packing equipment, items which must be used together must always be packed together.

Equipment should be packaged and transported according to the envisaged usage. Where it will be deployed at a fixed remote location, transportation should occur in robust containers which allow equipment to be fully secured and protect against dust and water ingress while allowing equalisation of atmospheric pressure. Dedicated rigid cases or crates may double as mounting systems at the point of deployment. Where designed for use in a vehicle or plane, equipment must be firmly secured and accessible to the practitioner without requiring disconnection of seat belts or safety harnesses. In the prehospital or a wilderness setting, equipment that must be carried should be packaged in well-padded and ergonomic backpacks or bags designed for the specific purpose. Typically, such bags allow clamshell opening and immediate access to all content within themed sub-containers.

Equipment and monitoring for out-of-hospital anaesthesia should aim to replicate the same standards of care and safety as are achieved in a traditional operating theatre setting.

Recommended minimum equipment for providing anaesthesia in an out-of-hospital setting includes:

1. Patient monitoring devices which can read and display heart rate, O₂ saturation and NIBP. ECG and capnography monitoring and the ability to automatically record measurements for later recall are highly advisable.
2. Basic diagnostic equipment including stethoscope, pupil torch and blood glucose test kit. Expanded POC diagnostics including handheld blood gas and chemistry, Hb concentration, core temperature and field US are desirable.
3. Advanced airway equipment and adjuncts which allow the full standard spectrum of airway management, including face mask ventilation, intubation, rescue supraglottic airway device placement, and front-of-neck access.
4. Provision for suctioning is essential, whether using a handheld manual device or pump apparatus.
5. A means of providing ventilation independent of pressurised gas supplies must be present.
6. A means of providing supplemental O₂ is highly recommended. This may be from cylinder supply or through the use of an O₂ concentrator.
7. Equipment for IV access, including disposables and appropriate fluids. In transport environments where height

limitations reduce the ability to achieve sufficient gravity pressure for infusions, pressure bags and/or infusion pumps are advisable.

8. A securely packaged and well-selected range of anaesthetic, analgesic and resuscitation medications is essential. Specific reversal agents such as naloxone and flumazenil should be included. Careful consideration should be given to whether a specific antidote to rare anaesthetic complications can or should be included (such as provision for malignant hyperthermia or local anaesthetic systemic toxicity).
9. Equipment must be available for patient positioning. This may be a portable operating table, gurney or bed, or may be improvised using a stretcher, cot or wilderness equipment. Ideally, it must allow 360-degree access to the patient, leg elevation, and the ability to rapidly put the patient in the left lateral position.
10. An independent, hands-free light source of sufficient (ideally adjustable) brightness and suitable colour temperature is essential. This may be a simple commercially available headlamp, adequate room lighting or portable theatre lights.

Medical gasses in the austere/remote setting

Outside of the hospital, it is very rare to have access to pipeline gasses. Prehospital ventilators usually rely on pressurised O₂ from cylinders but may incorporate a piston or turbine, which allows varied inspired oxygen fraction (F_IO₂), or ventilation with air in the absence of an O₂ source. Care must be given to the estimation of the duration of ventilation depending on the O₂ demand and capacity available, especially when ventilators use O₂ as a drive gas. In the austere setting, it often falls to the anaesthetist to assess and manage gas supplies and scavenging/vacuum. Medical air, N₂O and scavenging are rare. Where electrical power is available, O₂ concentrators are an excellent alternative to cylinders, require little maintenance and have excellent service lifetimes but are limited in output flow and pressure to drive many conventional anaesthesia devices. In this setting, even low flow rates can give a high F_IO₂ when used in conjunction with a draw-over anaesthesia system (see next section). Suction may be manual or by using stand-alone pumps, and scavenging may be limited to venting exhaust gasses into the atmosphere. Attention should thus be given to good ventilation of anaesthesia spaces.

Draw-over anaesthesia

Draw-over anaesthesia is rare outside of the military, humanitarian or disaster medicine setting, and is thus unfamiliar to most practitioners. However, it offers significant advantages where general anaesthesia is required in severely resource-constrained conditions. Therefore, practitioners should undergo specific training and initial supervised practice on draw-over systems before use for anaesthesia. The application of standardised checklists before use is highly recommended. Inhalational methoxyflurane analgesia using the commercially-available disposable draw-over device should be according to the existing indications.

Intravenous anaesthesia

Total intravenous anaesthesia (TIVA) has advantages in the out-of-hospital setting, of which the avoidance of requirement for vaporisers and complex gas administration systems is paramount.

In the prehospital emergency anaesthesia, this may be limited to induction for airway management with post-intubation sedation, or it can be for total operative anaesthesia. In the latter context, approaches range from simple hand boluses and protocolised infusions to TCI pumps. In very constrained settings, ketamine by intramuscular bolus or drip-controlled infusion is widely used, but the increasing capability and compactness of TCI syringe drivers make this option attractive and familiar where electrical power is available.

Performance of out-of-hospital anaesthesia

It is beyond the scope of this guideline to define standards for the practice of out-of-hospital anaesthesia in all settings. However, there are unifying general principles of technique which are common to most contexts:

1. Patients should be assessed before anaesthesia. In the prehospital environment, this may amount to a primary survey concurrent with resuscitative efforts; in a humanitarian setting, it may occur with screening days before surgery.
2. Preparation of the area and patient should occur before the provision of anaesthesia. This may include positioning, creation of 360-degree access, and equipment preparation using a standardised 'kit dump' so that all items are immediately at hand.
3. Out-of-hospital anaesthesia care should not be initiated without a dedicated practitioner, who is ideally supported during critical phases (such as peripheral nerve blockade or airway management) by a suitably trained assistant. Patients under anaesthesia in the out-of-hospital setting must always have a dedicated practitioner providing care who is not also undertaking other clinical interventions (such as surgery).
4. Before or concurrent with preparation, the care team should be briefed on the plan, anticipated steps, and initial responses to adverse events.
5. **The use of algorithms and challenge-response checklists is highly recommended during the preparation, briefing and performance phases.**
6. Local, regional and neuraxial anaesthesia are desirable in highly resource-constrained settings. The core prerequisites are practitioner experience and capability with the chosen technique, and having suitable skills, equipment, and medications immediately available to deal with complications (such as LA systemic toxicity or high spinal anaesthesia). The absence of skills or equipment to perform general anaesthesia or advanced resuscitation is a contraindication, not an indication, to use loco-regional anaesthesia. Field-expedient peripheral nerve blocks which do not require needle positioning adjacent to critical structures (such as the pleura or large vessels) should be preferred.
7. Where available, O₂ supplementation and preoxygenation should always be provided. Exceptions include procedures purely under regional anaesthesia, and where draw-over anaesthesia is provided in the absence of supplemental O₂ supplies. Ideally, adequate time for preoxygenation or measurement of end-tidal expired O₂ fraction of > 0.8 should always be achieved before induction of general anaesthesia.

8. Agent selection for general anaesthesia should be based on safety, titratability, and broad utility across various settings. Ketamine is favoured as IV anaesthesia for its preservation of spontaneous ventilation, relative cardiovascular stability, wide therapeutic index, and multiple administration methods. Sevoflurane is attractive as an inhalational agent using conventional plenum or draw-over vaporisers, although the utility of halothane and isoflurane to be used interchangeably in the same vaporiser is desirable in some settings.
9. Advanced airway management in the out-of-hospital setting should follow the accepted guidelines in the field. Attempts at intubation should be limited, and progression through the airway algorithm prompted by the assistant according to the preanaesthesia team briefing. Equipment for the entire airway algorithm must be immediately at hand (prepared in the kit dump) if not already open and prepared. It is not necessary to wait for the onset of hypoxaemia to progress through the chosen algorithm if attempts are unsuccessful.
10. Airway device placement must be confirmed by at least two modalities (for example, auscultation and capnography).
11. Post-intubation anaesthesia or critical care should commence immediately. This may include lung-protective ventilation to achieve normocarbida, analgesia and correction of haemodynamic instability. Depth-of-anaesthesia and neuromuscular blockade monitoring is seldom performed in the out-of-hospital setting.
12. Recovery from anaesthesia must occur in an environment with the same monitoring level as anaesthesia care if the patient is not being transferred to a higher level of care. The use of a validated recovery score is advisable.

- Recommended minimum equipment for providing anaesthesia in an out-of-hospital setting includes:
 - Patient monitoring devices which can read and display heart rate, O₂ saturation and NIBP. ECG and capnography monitoring and the ability to automatically record measurements for later recall are highly advisable.
 - Basic diagnostic equipment including stethoscope, pupil torch and blood glucose test kit. Expanded POC diagnostics including handheld blood gas and chemistry, Hb concentration, core temperature and field US are desirable.
 - Advanced airway equipment and adjuncts which allow the full standard spectrum of airway management, including face mask ventilation, intubation, rescue supraglottic airway device placement, and front-of-neck access.
 - Provision for suctioning is essential, whether using a hand-held manual device or pump apparatus.
 - A means of providing ventilation independent of pressurised gas supplies must be present.
 - A means of providing supplemental O₂ is highly recommended. This may be from cylinder supply or through the use of an O₂ concentrator.

- Equipment for IV access, including disposables and appropriate fluids. In transport environments where height limitations reduce the ability to achieve sufficient gravity pressure for infusions, pressure bags and/or infusion pumps are advisable.
- A securely packaged and well-selected range of anaesthetic, analgesic and resuscitation medications is essential. Specific reversal agents such as naloxone and flumazenil should be included. Careful consideration should be given to whether a specific antidote to rare anaesthetic complications can or should be included (such as provision for malignant hyperthermia or local anaesthetic systemic toxicity).
- Equipment must be available for patient positioning. This may be a portable operating table, gurney or bed, or may be improvised using a stretcher, cot or wilderness equipment. Ideally, it must allow 360-degree access to the patient, leg elevation, and the ability to rapidly put the patient in the left lateral position.
- An independent, hands-free light source of sufficient (ideally adjustable) brightness and suitable colour temperature is essential. This may be a simple commercially available headlamp, adequate room lighting or portable theatre lights.
- Practitioners should undergo specific training and initial supervised practice on draw-over systems before use for anaesthesia. The application of standardised checklists before use is highly recommended.
- The use of algorithms and challenge-response checklists is highly recommended during the preparation, briefing and performance phases.

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10. APPENDICES

Appendix A: Governance

i. Code of conduct

SASA member code of conduct for anaesthesia professionals

Health Professions Council guidelines

SASA expects its members to adhere to all Health Professions Council of South Africa (HPCSA) rules and regulations regarding good professional and ethical practice. This document is to be read in conjunction with the HPCSA guidelines pertaining to good practice, ethical rules, etc. (<http://www.hpcsa.co.za/conduct/ethics>). This incorporates the Generic Ethical Rules, Good Practice Guidelines, Patients' Rights Charter, and other relevant guidelines.

Oath of care

Anaesthesia professionals are bound by the shared spirit and principles underlying the various oaths subscribed to by newly qualified healthcare professionals (i.e., revised Hippocratic Oath, and others). This social contract holds healthcare providers to a strict code of professional and personal conduct, forming the pillars of the SASA Code of Conduct for Anaesthesia professionals.

The practice of anaesthesia has its own, inherently unique demands and challenges regarding the nature of patient interaction, standards of care, quality of service delivery, safety requirements, and inter-collegial relationships. This Code of Conduct outlines the commitment every SASA member makes to ethical practice.

Basic components of ethical practice

An anaesthesia professional has ethical responsibilities to:

- Patients
- Colleagues and community
- Him-/herself
- Healthcare fraternity
- Workplace

Responsibilities to patients

- Always place the patient's interests foremost.
- Be truthful to patients.
- Appreciate and respect the patient's supreme rights in medical decision-making, appropriate to the patient's developmental capacity and medical circumstances. Medical knowledge and skills should never be used to coerce or restrain patients with adequate decision-making capacity.
- Appreciate that patients are extremely vulnerable in the perioperative period. Take care of the patient's physical and psychological wellbeing. The patient's right to dignity, privacy, and comfort is paramount. Patients should always be treated with respect, regardless of their state of consciousness.

- Honour confidentiality regarding medical and personal information.
- Honour and respect religious and cultural beliefs and be sensitive in this regard in the provision of treatment.
- Provide appropriate postanaesthesia care, as and when applicable.
- Provide emergency care for all patients, irrespective of the patient's financial status.

Responsibilities to colleagues and community

- Promote respectful and cooperative relationships with colleagues and healthcare workers to the benefit of patients.
- Consult with colleagues as and when appropriate.
- Cooperate and participate with colleagues to improve the quality and efficiency of anaesthesia care, and medical care in general.
- Advise and assist impaired/suspected impaired colleagues within the boundaries of your own abilities, to the benefit of patients.
- Immediately and adequately address any dangerous/negligent practices that potentially endanger patients and/or healthcare personnel. This includes reporting a colleague to the relevant authority, sooner rather than later.
- Participate in keeping potentially dangerous substances secure from illicit use.

Responsibilities to yourself

- Maintain competence and skill as is necessary in your practice.
- Take responsibility for your own mental and physical wellness.
- Seek timeously assistance, evaluation, and care when in doubt about your own health and wellness.
- Seek timeous assistance and support when in doubt about your own clinical competence, be this in general, case or skill(s) specific.
- Modify or cease practice when incapacitated in any way that has the potential to be detrimental to patients.
- Take responsibility for your personal financial protection and wellbeing, preventing financial needs from interfering with clinical decision-making.

Responsibilities to the healthcare fraternity

- Refrain from seeking or accepting potentially compromising donations, gifts, or sponsorships from any source.
- Avoid placing yourself in a position of perversity, potential position of perversity, or potentially perceived perversity.
- Declare all donations, gifts, or sponsorships where the potential exists for undue influencing, or perceived influencing. This is specifically expected from faculty at events, conferences, and congresses. Any interest, whether perceived as a direct influence on the topic or not, should be declared at the start of a presentation.
- Adhere to ethical and consistent billing practices, refraining from overreaching and overservicing practices. Additionally,

appreciate your responsibility as an anaesthesia professional in seeking cost-saving treatment mechanisms.

- Appropriately inform patients regarding cost and your billing practices, where possible, in order for the patient to make an informed financial decision.
- Refrain from participating in exploitative financial relationships.

Responsibilities in the workplace

- Dress appropriately and always maintain yourself in a clean, dignified, and presentable manner.
- Treat your co-workers with respect, including colleagues, nursing staff, cleaners, porters, etc.
- Refrain from using inappropriate and derogatory language and behaviour, in whatever situation.
- Maintain absolute professional conduct in theatre and in the workplace and refrain from doing anything that may make co-workers unhappy or uncomfortable.

This code of conduct represents the principles, values, and norms to be practised and maintained by all anaesthesia professionals as SASA members. The purpose of the code is to provide a clear framework within which SASA members are expected

to conduct themselves. Continuous self and peer assessment against this code of conduct serves the best interest of patient and practitioner, contributing towards a healthy and prosperous anaesthesia community in South Africa.

ii. Scarce skills: anaesthetic services

Specialist anaesthesiologists in SA

South Africa has an overall skills shortage, a problem significantly visible in the healthcare sector. The figure below published in 2015 by Econex on behalf of the Hospital Association of South Africa expresses the number of doctors per 100 000 citizens in various countries in 2013.

On average, South Africa has far fewer doctors per 100 000 population than any other BRICS (Brazil, Russia, India, China and South Africa) country – by 10 when compared to India and less than half of that of Brazil.

Importantly, from a SASA perspective, as a majority specialist representative society, the number of specialists per 100 000 citizens paints a woeful picture. When compared with multiple Organization for Economic Cooperation and Development (OECD) countries and resource-rich countries providing forms of national health insurance, the South African workforce of

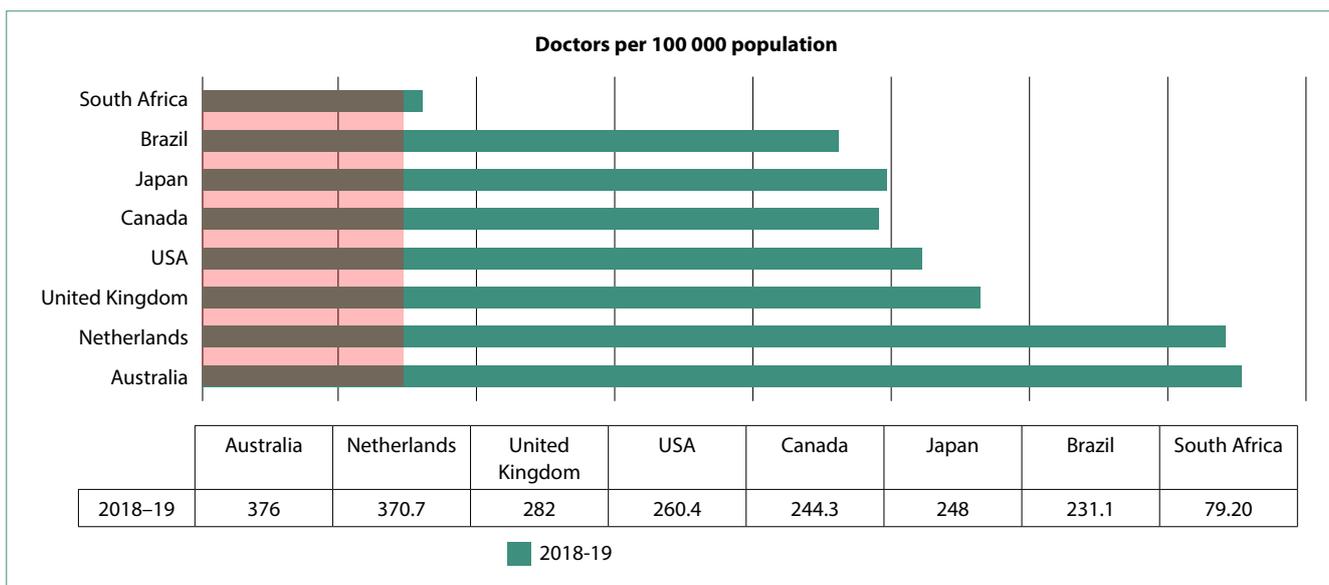


Figure 1: Country comparison – All doctors per 100 000 citizens (2018-19)

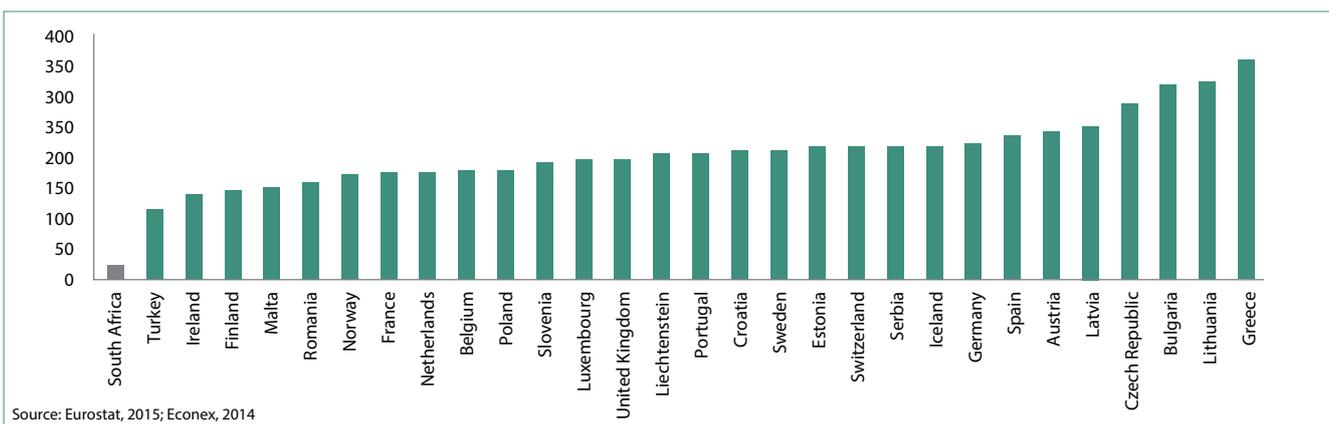


Figure 2: Number of specialists per 100 000 citizens in developed countries and South Africa (2011)

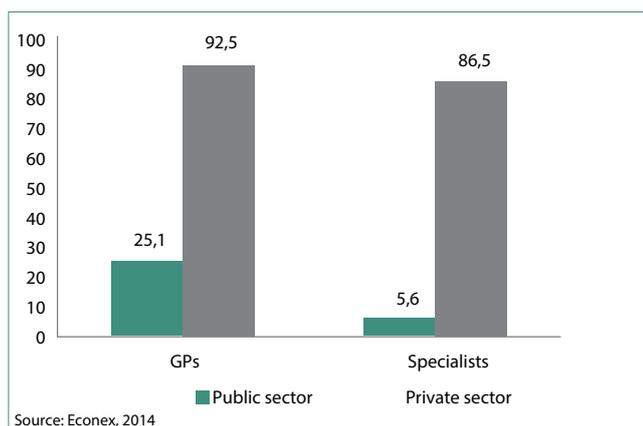


Figure 3: Number of doctors in the public sector per 100 000 citizens, relative to the number of doctors in the private sector per 100 000 beneficiaries (2013)

specialists is one-eighth to one-tenth of countries whose public health systems are considered to function effectively under a national health insurance scheme.

When considering public vs private sectors, there remains a considered opinion that a high-capacity workforce exists in the private sector that may, or is likely to, be able to meaningfully work and cope with the shortfall of service available in the public sector. While various options may exist to address such a shortfall, the figure above indicates that approximately 86.5 specialists per 100 000 citizens currently exist in the privately insured/funded market of 8 800 000 lives. When assessing this number in conjunction with the prior figure, it is clear that at this ratio in the private sector, the number of specialists to population ratio remains less than half of almost all OECD countries' ratios that

provide social national health insurance.

This skills shortage has a significant impact on the number of people receiving surgery, especially in the public sector in South Africa. The comment published in *The Lancet* by Dare, Onajin-Obembe and Makasa, on the perioperative patient outcomes in the African Surgical Outcomes Study: (ASOS): a 7-day prospective observational cohort study by Biccard et al., quantifies this issue for Africa:

"In the study countries, the average provider-to-population density of specialist surgeons, anaesthetists, and obstetricians (another core surgical indicator) was around 30 times lower than the recommended global minimum."

Although the main aim of Biccard and colleagues' study was to quantify surgical outcomes, the most alarming finding was how few people received surgery. Surgical volume (the number of operations per 100 000 population) is an indicator of met need for surgical care. The ASOS findings suggested that this is unacceptably low in Africa. Among the 25 countries that contributed data, only a median of 212 operations (IQR 65–578) were done per 100 000 catchment population. These numbers are 20 times lower than the crucial surgical volume required to meet a country's essential surgical needs each year (defined as 5 000 operations per 100 000 people).

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iii. Safety incident reporting and learning

This document is only available as part of the online publication of the SASA Practice Guidelines 2022 Revision on www.sasaweb.com.

iv. Core standards

This document is only available as part of the online publication of the SASA Practice Guidelines 2022 Revision on www.sasaweb.com.

v. Peer review document

This document is only available as part of the online publication of the SASA Practice Guidelines 2022 Revision on www.sasaweb.com

Appendix B: Standard for equipment/facilities guides

IUSS Health Facilities Guides

This is available at: <https://www.sasaweb.com>

Appendix C: Sedation

These guidelines are available at:

- [SASA Guidelines](#) for the safe use of procedural sedation and analgesia for diagnostic and therapeutic procedures in adults: 2020–2025
 - [SASA paediatric guidelines](#) for the safe use of procedural sedation and analgesia for diagnostic and therapeutic procedures in children: 2021–2026)
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Appendix D: Facilities agreements

This is available at:

[SASA Facilities Group Agreement](#)

[SASA Clinical Service Provider Facilities Group Agreement](#)

Appendix E: Day-case surgery

This is available at: <https://www.sasaweb.com>

Appendix F: Position statements

i. Ketamine clinics

2022 review by Sekai Ndemera

Ketamine administration for severe depression as either a stand-alone therapy or in combination with electroconvulsive therapy (ECT) has been widely accepted in South Africa and worldwide as an evidence-based treatment modality.

Anaesthesiologists are increasingly being asked to assist with delivering ketamine as *therapy* in these specific situations.

Typically, the psychiatrist treating the patient will prescribe and monitor the effects of ketamine on the patient's general mood and condition, using the anaesthesiologist to administer the ketamine therapy after organising a suitable facility for the therapy to take place.

Initially, this was a hospital-based treatment provided only in standard operating theatres. Over time there has been a proliferation of satellite and "stand-alone" clinics offering ketamine infusions.

SASA has addressed this development with patient safety as a primary concern.

Ketamine is classified as an anaesthetic drug, and as a result, its use requires qualified sedationists.

The use of ketamine in this manner falls under the practice of procedural sedation and anaesthesia.

The SASA Sedation Guidelines published in April 2020 clearly address the conditions necessary for the use of anaesthetic drugs during procedural sedation. The Society believes the same should be extrapolated to the use of ketamine infusions.

General anaesthesia induction agents (propofol, ketamine, etomidate, dexmedetomidine) and short-acting opioids (fentanyl, alfentanil, sufentanil, remifentanil) should only be used by those formally trained in anaesthesia or intensive care medicine, or by experienced sedation practitioners with experience in anaesthesia who are trained in specific advanced sedation techniques. Sedation practitioners using these drugs must have at least a qualification in advanced life support.

Any practitioner involved in these ketamine infusions must ensure that the facilities in which they practice comply with SASA Sedation Guidelines, SASA Practice Guidelines and SASA Private Practice Guidelines.

The monitoring, equipment needed, safety requirements and staff needed for these therapy sessions are dealt with in the SASA sedation guidelines and are typically the same as those needed for routine ECT.

Proper history taking, examination and consent should be standard practice. Appropriate monitoring should be utilised. The dose quoted in the literature ranges from 0.10–0.75 mg/kg, administered over about 40 minutes. Repeat sessions are common and guided by the psychiatrist.

A responsible adult must accompany the patient home, and only once the patient meets the required discharge criteria. Sedation must not be administered if an escort is not available. Carers must be advised to seek immediate help in case of complications.

Contact details of a physician, hospital, and ambulance service in case of any procedure- or sedation-related adverse events in the first 24 hours after sedation must be included in the information package on discharge.

Patient safety, avoidance of adverse events and the appropriate response should they occur underline the recommendations around the use of ketamine infusions for depression.

Essential

1. Adherence to SASA sedation guidelines in terms of monitoring and equipment
2. One patient at a time per sedationist
3. Sedationists must at least have a qualification in advanced life support

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- ii. **Ampoule sharing**
 - iii. **Power outage**
 - iv. **Use of sugammadex**
 - v. **Haemodynamic printouts**
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Appendix G: Infection control

This guideline is available at: <https://www.sasaweb.com>

Appendix H: Consent policy/Green formy

These are available at:

[Green form](#)

[Consent blurb](#)

Appendix I: WHO checklist

This checklist is available at: <https://www.who.int>

Appendix J: ICU

These guidelines are available at: <https://www.sasaweb.com>

