RECOMMENDATIONS FOR PATIENT SAFETY AND MINIMAL MONITORING STANDARDS DURING ANAESTHESIA AND RECOVERY (5TH EDITION) 2022

COLLEGE OF ANAESTHESIOLOGISTS
ACADEMY OF MEDICINE OF MALAYSIA

IN COLLABORATION WITH

MALAYSIAN SOCIETY OF ANAESTHESIOLOGISTS

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Published by
College of Anaesthesiologists, Academy of Medicine of Malaysia

In collaboration with
Malaysian Society of Anaesthesiologists

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PREFACE TO 5TH EDITION

It is a basic human right for all patients to received safe anaesthesia for essential surgery. These recommendations are relevant to any healthcare facility in Malaysia in which general anaesthesia, sedation or regional anaesthesia is administered.

These recommendations replace the 4th edition of the Recommendations for Patient Safety and Minimal Monitoring Standards during Anaesthesia and Recovery published in 2013**.** The aim of this document is to provide guidance on the minimum monitoring standards for all patients undergoing anaesthesia or sedation under the care of an anaesthesiologist.

The addition of statements in this document includes changes of title in Section 5 to Patient Monitoring in the Non-operating Room Anaesthesia (NORA) Setting and additions of Section 10 discussing Quality Assurance and Section 11 which elaborates on Safe Surgery Saves Lives.

SECTION 1: PRINCIPLES OF ANAESTHESIA CARE

1.1 Anaesthesiologist in this document refers to registered medical practitioner who is either a qualified specialist anaesthesiologist or a medical officer/trainee who administers an anaesthetic.

1.2 All anaesthetics should be administered by a registered medical practitioner with recognized certified training in anaesthesia and resuscitation or by medical officers under adequate supervision of qualified specialist anaesthesiologist. The specialist anaesthesiologist shall be responsible for the overall anaesthetic care / monitored anaesthesia care of the patient.

1.3 The anaesthesiologist cannot provide direct care for more than one patient receiving anaesthesia or sedation. The anaesthesiologist should be present with the patient from induction until safe transfer to the recovery room or the intensive care unit has been accomplished.

1.4 However, the anaesthesiologist may delegate temporarily, the monitoring of the patient to an appropriately qualified person who is judged by the anaesthesiologist to be competent for the task. The anaesthesiologist may leave only if the patient is stable and no potentially adverse event is likely to occur and must be available to return at short notice. The presence of a skilled assistant is no substitute for the anaesthesiologist.

1.5 Every patient presenting for anaesthesia should have a pre-anaesthetic consultation by a registered medical practitioner who has appropriate training in anaesthesia. It is the duty of the anaesthesiologist to obtain informed consent from the patient or guardian for administration of anaesthesia. This should be carried out in accordance with guidelines provided by the Malaysian Medical Council.

1.6 The anaesthesiologist must provide adequate and legible minimal standard monitoring records of the anaesthesia, and this must be part of the patient's medical records.

1.7 Skilled assistance for the anaesthesiologist must be available at all times during the conduct of the anaesthesia.

1.8 The anaesthesiologist must ensure that all equipment(s) used for the administration of anaesthesia are functioning properly before the start of each anaesthetic. The respective health facility shall be responsible for maintenance and servicing of anaesthetic equipment used.

1.9 There must be adequate manpower assistance for transfer and positioning of the patient on the operating table with the anaesthesiologist taking the main responsibility for care of patient's airway, head, and neck. The use of proper devices that allows horizontal transfer of patients without lifting of the patient is recommended to avoid injury to staff.

1.10 Pre-anaesthetic consultation is an important aspect of safe anaesthesia practice as it allows medical assessment of a patient prior to surgery or any other procedure. Its purpose is to identify medical illnesses and anaesthesia risks with the aim of reducing anaesthesia and surgery-related morbidity and mortality.

1.11 The anaesthesia technique and risks involved should be made known to the patient or guardian and an informed consent obtained during pre-anaesthetic consultation.

1.12 It is important for anaesthesiologists to identify fatigue in themselves and other team members in providing safe and effective perioperative care to patients.

1.13 In exceptional circumstances, an anaesthesiologist may be called upon to assist with or perform a life-saving procedure nearby and may be temporarily separated from their primary patient. This situation calls for individual judgement of the attending anaesthesiologist. The anaesthesiologist may need to leave the patient under the care of the trained assistant and ensure the person monitoring the patient knows how to recall them. The anaesthesiologist should return to the primary patient under his care as soon as possible.

SECTION 2: THE ANAESTHETIC MACHINE / ANAESTHETIC WORKSTATION

2.1 Provision, maintenance, calibration, and renewal of anaesthetic machines are the responsibilities of the institution in which anaesthesia is delivered.

2.1.1 Institutions should involve their anaesthesiologists in any decision-making policies regarding procurement and maintenance of the anaesthetic machines.

2.1.2 It is an institutional and individual responsibility that anaesthesiologists are adequately trained in the use and checking of the anaesthetic machines.

2.2 The anaesthesiologist is responsible to **CHECK** the anaesthetic machine **BEFORE** the start of **EACH** anaesthetic procedure that they are involved, in addition to the automatic (manufacturer's) machine check. Anaesthesia machine checks should include:

2.2.1 Gas supply pipelines.
2.2.2 Anaesthetic machine.
2.2.3 Airway devices, breathing systems and circuits.
2.2.4 Ventilators.
2.2.5 Vaporisers.
2.2.6 Suction device.
2.2.7 Monitoring and ancillary equipment.
2.2.8 Scavenging system.

2.3 Alternative device to provide oxygenation and ventilation (e.g., self-inflating bag) with separate source of oxygen from the anaesthetic machine should be readily available.

2.4 The anaesthetic machine must be equipped with the following safety features:

2.4.1 Minimum oxygen ratio device (O2/N2O proportioning system).
2.4.2 Oxygen failure safety ("fail safe") device.
2.4.3 Oxygen supply pressure failure alarm.
2.4.4 Vaporiser interlock device.

2.4.5 Pin Index Safety system.

2.4.6 Non-interchangeable, gas specific connectors on the gas pipeline inlets.

2.5 Existing anaesthetic machines in any institution that do not have the safety features as enumerated above are to be replaced.

SECTION 3: INTRAOPERATIVE MONITORING OF THE PATIENT

3.1 The anaesthesiologist should ensure proper functioning of anaesthetic equipment, and monitor oxygenation, adequacy of ventilation, circulation, and the depth of anaesthesia from induction of anaesthesia to the emergence from anaesthesia and until transfer to the recovery room or post anaesthesia care unit.

3.2 Clinical observations of vital signs must be supplemented by appropriate monitoring equipment wherever possible.

3.3 The following parameters for monitoring for oxygenation, circulation, and ventilation in the patient are essential and must be monitored at all times which includes

3.3.1 Oxygenation

- Oxygenation may be monitored by noting the colour of the patient's mucous membranes and colour of the operative site. The use of pulse oximeter to supplement clinical observations is mandatory. The pulse oximeter shall have a variable pulse tone and a low alarm limit that shall be audible to the anaesthesiologist or the anaesthesia care personnel.

- The oxygen concentration of the anaesthetic gas mixture must be continuously monitored when a general anaesthetic is administered.

3.3.2 Circulation

- The circulation must be monitored by observation of the pulse, heart rate, and blood pressure.

- The blood pressure and heart rate must be measured and recorded regularly at a frequency appropriate to the clinical condition of the patient.

- The electrocardiogram should be continuously displayed throughout the anaesthetic. It is recognised that a normal electrocardiogram may be present even when the circulation or oxygenation is grossly inadequate. The electrocardiogram may provide early warning of impending circulatory failure due to arrhythmias and myocardial ischaemia.

3.3.3 Ventilation

- The adequacy of ventilation must be monitored at all times by observing:

  - Excursion of the chest wall.
  - Movement of the reservoir bag.
  - Auscultation of breath sounds by a pre-cordial or oesophageal stethoscope.
  - A tidal volume monitor.

3.4 The use of capnography / capnometer is mandatory when a general anaesthetic is administered:

3.4.1 As a quantitative assessment of ventilation.
3.4.2 As a detector of adverse clinical events such as air embolism or pulmonary embolism.
3.4.3 As an indicator of correct placement of a tracheal tube or laryngeal mask airway.
3.4.4 As an indicator of the presence or absence of circulation.

3.5 Pressure, volume monitoring and spirometry

3.5.1 When available airway pressure monitoring should be used during controlled ventilation and recommended during spontaneous ventilation, which it provides breath-by-breath information about chest-lung mechanics.

3.6 Temperature

3.6.1 The means to measure body temperature should be readily available and must be monitored in situations where change of temperature is intended, anticipated, or suspected.

3.6.2 When appropriate body temperature should be monitored in the neonatal and paediatric patients, additionally in patients where an active warming device (e.g., forced air warming, radiant heater) is used.

3.7 Neuromuscular function

3.7.1 A peripheral nerve stimulator should be available when muscle relaxants are used to monitor neuromuscular function.

3.8 Depth of Anaesthesia Monitor

3.8.1 Anaesthetic gas concentration monitoring with a minimum alveolar concentration indicator is mandatory when inhalation anaesthetic gases are used.

3.8.2 Depth of anaesthesia monitoring (e.g., BiSpectral Index, Auditory Evoked Potential, and Entropy) is indicated:

- In patients who are at high risk of developing awareness.
- When total intravenous anaesthesia technique is administered especially if it is used together with neuromuscular blockade.

3.9 Specialised Monitors

3.9.1 Specialised monitoring may be required under certain circumstances, for example:

- In complicated operations or specialised procedures.
- During special techniques such as induced hypotension or one lung ventilation.
- In patients with coexisting medical diseases.

3.9.2 Specialised monitoring includes:

- Invasive arterial and central venous pressure monitoring.
- Cardiac output monitor.
- Neurological function monitoring.
- Transoesophageal echocardiography.
- Point of care blood investigations (e.g., ACT, ABG, Glucose, and TEG).

3.10 Caveats

3.10.1 Brief interruptions of continuous monitoring may be unavoidable. It is recommended that when this occurs, appropriate documentation must be made in the patient's anaesthetic record.

3.10.2 In certain rare or unusual circumstances some of these methods of monitoring may be clinically impractical and appropriate notations must be made in the patient's anaesthetic record to reflect this.

3.10.3 The use of these methods of monitoring is to encourage quality patient care. However even when appropriately used, they may fail to detect untoward clinical developments and observing them cannot guarantee any specific outcome.

SECTION 4: RECOVERY FROM ANAESTHESIA

4.1 Recovery of the patient from anaesthesia should be carried out in a designated area (i.e., the recovery area / bay) which is appropriately staffed and equipped. The minimum staffing ratio should be appropriate for the planned number of beds that are operational.

Staff working in Recovery Unit are expected to be trained for their role. When necessary junior staff who rostered here should be placed under the direct supervision of experienced nurses, preferably someone who has post basic training in Anaesthesia. The care of the patients who require more thorough clinical observations and management will need the presence of the most experienced nurses to be available. They must be competent to manage and identify problems early.

4.2 The minimum requirements for recovery area / bay are:

- 4.2.1 Suitable beds / trolleys which are capable of head down tilt.
- 4.2.2 Oxygen supply with appropriate airway equipment e.g., masks, laryngeal masks, endotracheal tubes, etc.
- 4.2.3 Facilities for anaesthetizing patients if necessary (e.g., Anaesthetic machine).
- 4.2.4 Facilities for ventilation if necessary.
- 4.2.5 Equipment and drugs for resuscitation including access to a defibrillator.
- 4.2.6 Easy access to monitoring equipment similar to the operating room. (Refer Section 3).
- 4.2.7 Suction apparatus.
- 4.2.8 Patient warming devices (e.g., forced air warmer, radiant heater) and temperature monitor devices.
- 4.2.9 Fluid and blood warming devices.
- 4.2.10 Trained and dedicated staff.
- 4.2.11 Facilities for easy and rapid communication to summon for medical help.

4.3 All patients in the recovery area / bay must be appropriately monitored according to patient's condition (See Section 3).

4.4 There should be a proper handover for the transfer of patient's care.

4.4.1 From operating room staff/doctor to recovery area / bay staff.
4.4.2 From the recovery area / bay staff to the ward staff.

4.5 The handover of the patient's care should include clear instructions on

4.5.1 Monitoring for that patient
4.5.2 Line of management for unexpected and expected complications

4.6 Discharge from recovery.

4.6.1 The use of recovery scoring system is encouraged.

4.7 These instructions must be documented on the anaesthesia form or the case notes so that all staff are clear with the plan and can be referred to later if needed.

4.8 Medical assistance should be immediately available in case of an emergency in the recovery area.

4.9 The patient must be reviewed by an anaesthesiologist before discharge from the recovery area.

4.10 Transport of patient:

4.10.1 From the operation theatre to the recovery area.

- Transfer of the patient from theatre to recovery should be under the supervision of the anaesthesiologist.
- Supplemental oxygen should be provided if necessary.
- The bed or trolley should have supportive side rails and a mechanism for placing the patient in a head-down position.

4.10.2 From the recovery area to the ward or Intensive Care Unit.

- A checklist should be established to document that patient is fit to be discharged from the recovery area safely. The patient should be received by a qualified nurse during the handover and with documentation.

SECTION 5: PATIENT MONITORING IN THE NON-OPERATING ROOM ANAESTHESIA (NORA) SETTING

5.1 As procedural medicine undergoes rapid technological advancements in recent years, non-operating room anaesthesia (NORA) procedures continue to increase in type and complexity. Patients for NORA procedures are presenting at the extremes of age, and in graver health. They are more likely to present as emergencies and may be at advanced stages of diseases previously considered not suitable for diagnostic or therapeutic interventions. In addition, duration required for complex and multiple procedures may be prolonged.

5.2 Anaesthesia administered outside the operating room environment is associated with greater risks to the patient as well as environmental risks to healthcare providers. This may be due to physical separation from the patient (e.g., radiological suites), specific hazardous environment (e.g., radiotherapy) or inability to use certain monitors (e.g., MRI rooms).

5.3 There is no difference in the monitoring standard between an anaesthetic administered in an operating room and in a remote location. Patients receiving NORA care are entitled to receive the equivalent standard of care of monitoring during anaesthesia and recovery as they would receive within the operating room. Monitoring must meet the standards for basic monitoring and advanced monitoring (e.g., invasive haemodynamic monitor) must be made available for more complex procedures and unstable patients. In addition, specialized monitoring devices have been introduced into NORA settings (e.g., depth of anaesthesia, respiratory monitoring). These can improve patient safety and push the boundaries of procedures which may be accomplished in this setting.

5.4 Physical separation between a patient and the anaesthesiologist in NORA settings (e.g., cardiac catheter laboratory, MRI, and radiological suites) mandates reliable, appropriately positioned and procedure-specific monitoring equipment. In some cases, or when there are uncertainties regarding extent of interventions, advanced monitors placed pre-procedure may be prudent, rather than in response to catastrophic complications.

5.5 There are two critical components to monitoring physiological status in the sedated or anesthetised patients: the equipment measuring and displaying data, and the healthcare providers who reads, interprets, and acts on the information displayed. For reasons outlined above, vigilance and special skillset of the anaesthesiologist responsible for assessing and acting on the monitor feedback is extremely important to maintain patient safety in NORA settings.

5.6 Due to incapacity of proximity to the patient, the anaesthesiologist is unable to use clinical assessment tools using sight, sound, and touch to monitor patients (airway, oxygenation, ventilation, circulation, and temperature) and anaesthesia equipment. Strategically placed video camera monitoring can be helpful in detecting changes in patient ventilatory patterns and movement, in addition to monitoring equipment functions.

5.7 Appropriate location with appropriate monitoring facilities for post-anaesthetic recovery of patients must be made available for NORA patients, with equivalent standard of care of monitoring during recovery as they would receive within the operating room.

5.8 Where NORA is provided, skilled and dedicated assistance for the anaesthesiologist is essential during the procedure and in the recovery room.

SECTION 6: REGIONAL ANAESTHESIA

6.1 Patients who undergo regional anesthesia must receive the equivalent standard of care and monitoring as for those undergoing general anesthesia throughout the perioperative period.

6.2 Pre-operative assessment

6.2.1 Apart from the routine preoperative assessment, enquiry into any possible contraindications to regional anaesthesia should be undertaken. Patient's refusal is an absolute contraindication for regional anaesthesia.

6.3 Ultrasound guidance with or without nerve stimulator is encouraged for the safe conduct of regional blocks when necessary.

6.4 All staff must recognize symptoms and signs of local anaesthesia toxicity and recovery room should have 20% Intralipid available at all times and administer the recommended dosing if required until clinical improvement is noted. (Refer to Section 9 for further details on resuscitation).

SECTION 7: MONITORED ANAESTHESIA CARE AND MONITORED SEDATION

The objectives of sedating a patient are to bring about anxiolysis, produce a degree of amnesia and maintain co-operation of the patient so that uncomfortable diagnostic and minor surgical procedures may be performed.

During Monitored Sedation, sedatives and/or analgesia are administered to allay anxiety and manage pain during a procedure. The proceduralist may be tasked to deliver these drugs personally while supervising its delivery during the procedure. While Monitored Anaesthesia Care (MAC) may utilise drugs with similar effects, MAC is conducted by an anaesthetic doctor who focuses exclusively on the patient for any airway (would be prudent to mention/add oxygenation, haemodynamic or physiological derangements. The provider of MAC must be prepared and qualified to convert MAC to general anaesthesia when required.

7.1 A patient who is to be given any form of sedation for a procedure should be assessed and informed consent must be obtained.

7.2 The person administering sedation must have adequate knowledge of the pharmacology of drugs used. He or she should be able to detect and manage appropriately any complications due to the actions of these drugs. For procedures under MAC, the person administering these drugs should be the one monitoring the patient and must not assume the additional role of the operator.

7.3 The procedure should be performed in a location which is suitable in size and environment. It should be staffed and equipped to deal with any cardiopulmonary emergency. The following facilities should be available:

7.3.1 An operating table or trolley which can be tilted to Trendelenburg position.

7.3.2 Adequate lighting and suction equipment.

7.3.3 Supply of oxygen and oxygen delivery devices.

7.3.4 Equipment to monitor the patient. The basic monitoring includes non-invasive blood pressure (NIBP), pulse-oximeter, heart rate and electrocardiogram (ECG). The use of respiratory monitors such as capnography or chest wall impedance is highly recommended, especially when loss of response to verbal contact is expected. The monitor alarms should be enabled and set to appropriate audible value.

7.3.5 Equipment for airway management and ventilation.

7.3.6 Appropriate drugs for cardiopulmonary resuscitation and equipment for administration of drugs.

7.4 A written record of the time and dosages of the drugs used must be kept as part of the patient's records. This documentation must also include the monitored values of the patient's vital signs.

7.5 There should be a protocol on the handing over of care of the patient to the recovery room staff, and from the recovery room staff to the ward staff or discharge. This should include further instructions on monitoring and management of expected and unexpected complications.

7.6 Extra medical staff should be immediately available in case of an emergency.

7.7 The patient should be reviewed by the doctor before discharge from the recovery room.

7.8 For Monitored Sedation and MAC in the magnetic resonance imaging (MRI) suite, MRI-safe or MRI-conditional equipment must be used. These areas are considered as high-risk as there may be poor access to the alarms and patients.

SECTION 8: PRE-ANAESTHETIC CONSULTATION

The main aims of pre- anaesthetic consultation are to ensure patients are optimised before surgery/procedure, perform risk assessment of the patient, and obtain informed consent. The role of anaesthesiologist has evolved to the role of a perioperative physician.

8.1 The pre-anaesthetic consultation should preferably be performed by the anaesthesiologist who will manage the patient during surgery or procedure. If that is not possible, there must be means available for the findings of the consultation to be conveyed to the anaesthesiologist administering the anaesthetic.

8.2 The consultation should take place at an appropriate time before surgery and anaesthesia to allow for adequate assessment, reviewing investigations ordered and optimisation of medical conditions. This is especially important in patients with significant co morbidities, patients undergoing major surgery or where there are specific anaesthetic concerns. The pre-anaesthetic consultation may be performed in the Anaesthetic clinic, ward or at the operating theatre.

8.3 Early consultation may not be possible in some situations (e.g., emergency surgery, labour wards, and ICU), however a relevant assessment should not be omitted.

8.4 For daycare surgery or day of admission surgery, the pre-anaesthetic consultation should preferably be done prior to admission e.g., Anaesthetic Clinic. Otherwise, there should be allowance of adequate time for assessment prior to surgery.

8.5 Pre-anaesthesia consultation rooms/area must have sufficient equipment, hand washing/disinfection facilities, and enough space for a private consultation and clinical evaluation.

8.6 The pre-anaesthetic consultation should include the following:

8.6.1 Relevant present and past medical history.
8.6.2 Review of current and past medication including any herbal medication.
8.6.3 Allergies.

8.6.4 A clinical examination of the patient.

8.6.5 Review of laboratory, radiological and other investigations. If necessary, the anaesthesiologist may request for further investigations.

8.6.6 Therapeutic measures if necessary, should be ordered and carried out to optimise the patient.

8.6.7 Fasting time.

8.6.8 Discussion on the anaesthetic plan, technique, and pain management with the patient and / or guardian.

8.7 An informed consent should be taken which encompasses details of the anaesthetic technique, risk of anaesthesia and any other risk relevant to the patient's condition and type of surgery.

8.8 The information of medication management, the prescription, adjustment, and discontinuance of any drugs is considered necessary.

8.9 The information about patient's optimization plan should be relayed to primary team after completion of the pre-anaesthetic consultation.

8.10 There should be consultation with colleagues in other disciplines where appropriate.

8.11 A written summary of the pre-anaesthetic consultation should be available and becomes part of the patient's medical records.

8.12 The pre-anaesthetic consultation may include written or computer-generated questionnaires, screening exams, and telemedicine with anaesthesiologist.

8.13 At all-time patient privacy and confidentiality must be respected during our pre-anaesthetic consultation.

SECTION 9: RESUSCITATION FACILITIES

General

There should be adequate resuscitation facilities wherever anaesthesia, regional anaesthesia or monitored care are being provided. Adequate resuscitation facilities must also be available in the corresponding recovery areas and areas conducting clinic procedures under local anaesthesia.

These facilities should include a range of emergency drugs and resuscitation equipment. In general, there must be adequate resuscitation facilities to deal with events such as cardiac arrest, arrhythmias, local anaesthetic toxicity, hypovolaemia/bleeding, bronchospasm, anaphylaxis, shock states and malignant hyperthermia.

All resuscitation equipment must undergo scheduled checks and maintenance to ensure they're functioning well. Sizes appropriate to the whole range of patients cared for by that specific area, including all paediatric age groups must be available.

The storage system for drugs should be designed to avoid errors in administration. Examples include separating high alert medications and ensuring arrangements that minimise confusion due to look alike sound alike (LASA) medications.

9.1 Emergency Drugs:

1. Epinephrine (Adrenaline)
2. Amiodarone
3. Atropine
4. Calcium Chloride / Gluconate
5. Dextrose 50%
6. Norepinephrine (Noradrenaline)
7. Dopamine
8. Dobutamine
9. Ephedrine
10. Phenylephrine
11. Flumazenil
12. Frusemide
13. Hydrocortisone

14. Hydralazine
15. Intralipid 10% (for local anaesthetic toxicity)
16. IV Fluids: Isotonic crystalloids, other crystalloids, and colloids
17. Labetalol
18. Lignocaine
19. Magnesium Sulphate
20. Naloxone
21. Nitroglycerine
22. Salbutamol
23. Sodium Bicarbonate 8.4%

Additionally, there need to be easy access to these drugs although they may not be onsite:

1. Adenosine
2. Potassium chloride
3. Sugammadex
4. Albumin solution
5. Insulin
6. Propofol
7. Midazolam
8. Fentanyl
9. Morphine
10. Dantrolene Sodium (for malignant hyperthermia) *

* Dantrolene sodium should be readily available for immediate use when required. However, in smaller hospitals where it is impractical to keep the stock of dantrolene in the facility, the management must ensure that provisions have been made to obtain the dantrolene immediately from another facility.

9.2 Equipment (include various sizes where applicable):

1. Oropharyngeal airway
2. Nasopharyngeal airway
3. Laryngeal mask airway
4. Laryngoscope with laryngoscope blade
5. Endotracheal tube
6. Tracheostomy tube
7. Stylet
8. Bougie

9. Magill forceps: adult and paediatric size
10. Self-inflating bag
11. Face masks for mask ventilation
12. Suction device
13. Suction tubing
14. Hard suction tip e.g., Yankauer
15. Soft suction catheter
16. Front of neck airway (FONA) equipment in a pack: scalpel holder, number 10 blade scalpel and a size 6.0 mm cuffed tracheal tube (FONA set to be used with a bougie)
17. Oxygen supply with adequate back-up supply
18. Oxygen flow meter
19. Oxygen therapy devices: Nasal prongs, Simple face mask, Reservoir mask, Venturi mask of various oxygen concentration
20. Equipment to deliver nebulized drugs
21. Nasogastric tube
22. Chest tubes
23. Chest drainage sets
24. Stethoscope
25. Syringes
26. Needles
27. Intravenous cannula
28. Defibrillator
29. Gel for defibrillator
30. Glucometer with glucometer strips
31. Torch light for pupillary examination
32. Temperature measuring device
33. Monitoring equipment displaying ECG tracing, NIBP and pulse oximeter with plethysmography; with functioning alarms
34. Infusion pump with functioning alarm
35. Infusion tubing
36. Scissors
37. Tape
38. Sharps bin
39. Quantitative neuromuscular monitoring
40. Patient trolley that can be tilted into head down position

Additionally, there should be easy access to the following equipment although they may not be onsite in some facilities:

41. Videolaryngoscope
42. 12 lead ECG device
43. Warming devices
44. Waveform capnography
45. Oxygen analyzer
46. Gas analyzer
47. ETT cuff pressure measurement device
48. Ultrasound machine
49. Mechanical ventilator with functioning alarm
50. Arterial blood gas estimation
51. Haemoglobin estimation
52. Electrolytes estimation
53. Ketone estimation

SECTION 10: QUALITY ASSURANCE

10.1 A continual evaluation of anaesthesia practises should be initiated.

10.2 Regular discussion of appropriate topics and cases with multidisciplinary professional colleagues should take place.

10.3 Protocols and standard operating procedures should be developed to ensure that deficiencies in individual and collective practice are identified and rectified.

SECTION 11: SAFE SURGERY SAVES LIVES

World Health Organization introduced the 'Surgical Safety Checklist' in 2008 to help improve surgical safety from pre, intra and post-operative stages for a patient. In 2009, Malaysian Health Ministry pledged to improve surgical safety via two main strategies. Firstly, by improving inter-team communication and secondly, to use the "Surgical Safety Checklist" to improve the standards of care provided to patients. In 2013, Safe Surgery Saves Lives (SSSL) programme was included in Malaysian Patient Safety Goals with a main objective to improve surgical safety and reduce preventable harm during surgery.

The Ministry of Health Peri-Operative Checklist consists of: Pre-operative checklist, Operating team checklist, Swab and instrument count form and Pre-discharge check.

11.1 The Pre-operative checklist should be performed by 2 nurses (one from the ward and the other from the operating theatre). This is performed at the receiving bay of the operating theatre (OT). This checklist includes checking the patient's profile, a pretransfer check and an information on the surgeon, surgery, and time.

11.2 The Operating team checklist should be performed by the circulating nurse in the operating room (OR), and it involves the entire events from the start till end of surgery. This checklist includes the following:

11.2.1 SIGN- IN

- Is done by the anaesthesiologist and coordinator nurse.
- Done prior to induction of anaesthesia.
- All components in this list must be checked.

11.2.2 TIME- OUT

- Surgeon, anaesthesiologist, and scrub nurse must be present.
- Done prior to surgical incision.
- Each surgical team must perform their time out before starting their respective surgery.

- White board written up with complete details on the patient, diagnosis, procedure, teammates, antibiotics, tourniquet time, other special needs, and reminders.

11.2.3 SIGN- OUT

- Surgeon summarises the operative procedure and findings.
- Surgeon will verify specimens and tests to be done.
- Anaesthesiologist highlights post-operative anaesthetic plan.
- Doctors may want to update families from time to time.

11.3 The Swab and Instrument Count should be performed by the scrub nurse and circulating nurse. Both these nurses should not be interrupted during this procedure.

11.4 An Incident/Instrument malfunction form must be filled up if there were any untoward incidences during the surgery or procedure.

11.5 The Pre-discharge check should be done by the ward nurse and recovery room nurse just as the patient leaves the OT.

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