GUIDELINES FOR ANAESTHESIA SERVICES IN NEPAL

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SECTION 1 - INTRODUCTION

Anaesthetists are involved with an increasing proportion of patients along with the rise in the number of surgical patients and also with the advancement of minimally invasive and non invasive procedures throughout the world.

At the same time, the role of anaesthetists has been expanded in various others units and disciplines of medicine including the obstetric care units, intensive care unit, pain management clinic, radiology, radiation oncology suites and also in the endoscopic procedures as analgesia and comfort remains the prime concern for all patient.

The skills of anaesthetists in the recognition and treatment of cardiovascular, respiratory and central nervous system problems are added to their responsibility for the provision of providing analgesia and anesthesia services during any procedures or surgical intervention. Their presence allows early consultation on the management of life-threatening complications. Resuscitation of the patients, including the newborn is also important responsibility for the anaesthetist. Anaesthetists are also an integral part of obstetric care teams.

The provision of a safe anaesthesia service is the responsibility of the individual anaesthetist and the institution and should be devolved to the directorate of anaesthesia. A comprehensive service can only be provided if anaesthetists who are skilled and experienced in anaesthesia and analgesia are immediately available at all times for all elective & emergency surgeries and procedures.

The anaesthesia services that are required to provide by the anesthesiolgist includes all of the following (but are not limited to):

- the organisation and audit of anaesthesia care for surgical and non surgical procedures including the pre-anaesthesia assessment, pre-operative and postoperative care;
- the administration, supervision and audit of regional analgesia;
- the administration, supervision and audit of various invasive/non invasive procedures under analgesia and/or sedation (Monitored Anaesthesia Care, MAC)
- The management of anaesthesia during labour and caesarean section. Also of participation, if requested by the paediatric service, in resuscitation of the newborn. (However, the primary responsibility of the anaesthetist rests with the mother).
- Anaesthesia skills as part of the team managing severe illness in the intensive/critical care unit. This may also include the transfer of a critically ill patient from one unit to another unit or institution.
- Opportunities for appropriate continuing medical education for non-trainee grades contributing to the anaesthesia service;
- Education and training of nurses and paramedics in-service.
- Awareness programs and education of patients undergoing anaesthesia so that they can make informed choices about analgesia and anaesthesia.
- Information and updating co-workers from other surgical or medical disciplines regarding the scope and limitations of anaesthesia services
- And, an academic training programme for trainee anaesthetists in an academic institution.

In view of all these services being provided by anaesthetists in Nepal over the past few decades, there have not been any guidelines so as to guide the anaesthetists and various institutions to refer to regarding anaesthesia services. An urgent requirement has been felt of a Guideline that could set up at least a minimum level of care and standards that has to be met for all patients receiving any forms of anaesthesia. Thus the Society of Anaesthesiologist of Nepal (SAN) formed a taskforce working committee from among the executive committee members in May 2011 and formulated these guidelines. This guideline represents minimum standard of care and expresses the common consensus of SAN and is not an opinion of an individual.

All the Anaesthesiologists, health care professionals, professional institutions and health care providers in Nepal, when practising in Nepal are herby requested to abide by these Anaesthesia Service Guidelines issued by Society of Anaesthesiologist of Nepal (SAN). Failure to comply with this guideline will confer the responsibility of the consequences to that individual or institution, and may be pleaded guilty in the court of law.

SECTION 2 - DEFINITIONS AND TERMINOLOGIES

Anaesthesia:	'Anaesthesia' or 'Anaesthesia' involves the administration of a medication to produce a blunting or loss of pain perception (analgesia), voluntary and involuntary movements, autonomic function, and memory and/or consciousness; depending on where along the central neuraxial (brain and spinal cord) the medication is delivered.
Analgesia:	"Analgesia" involves the use of a medication to provide relief of pain through the blocking of pain receptors in the peripheral and/or central nervous system. The patient does not lose consciousness, but does not perceive pain to the extent that may otherwise prevail.
Anaesthesiology:	'Anaesthesiology' or Anaesthesiology' means the practice of medicine that specializes in the relief of pain during and after surgical procedures and childbirth, during certain chronic disease processes, and during resuscitation and in the management of critically ill patients in the operating room and intensive care environments.
Anaesthesiologist:	Anaesthesiologist / Anaesthetist / Anaesthetist A qualified medical practioner who after completing basic medical degree posses an academic qualification of Postgraduate Diploma (D.A) or Masters Degree (M.D) in Anaesthesiology recognized by Nepal Medical Council and registered as a specialist in Anaesthesiology in Nepal Medical Council for the purpose.
Trainee:	"Trainee" means a doctor who after completion of medical school is currently enrolled in an approved Post Graduate Residency program in Anaesthesiology.

Anaesthesia Assistant: An anaesthesia assistant is defined as a person who:

a. Works under the direction and supervision of an anaesthesiologist;

b. Has completed a medical school based Anaesthesiologist's Assistant education program that includes minimum two years of specialized basic science and clinical education in anaesthesia at a level that builds on a premedical undergraduate science background." And ,

c. Is registered with the Nepal Health Professional Council

SAN: Society of Anaesthesiologists of Nepal

NMC: Nepal Medical Council

General Anaesthesia: A drug-induced loss of consciousness during which patients are not arousable, even by painful stimulation. The ability to independently maintain ventilatory support is often impaired. Patients often require assistance in maintaining a patent airway, and positive pressure ventilation may be required because of depressed spontaneous ventilation or drug-induced depression of neuromuscular function. Cardiovascular function may be impaired. General anaesthesia is used for those procedures when loss of consciousness is required for the safe and effective delivery of surgical services or other procedures.

Regional Anaesthesia: The delivery of anaesthetic medication at a specific level of the spinal cord and/or to peripheral nerves, (including epidurals and spinals and other central neuraxial nerve blocks), is used when loss of consciousness is not desired but sufficient analgesia and loss of voluntary and involuntary movement is required. Given the potential for the conversion and extension of regional to general anaesthesia in certain procedures, it is necessary that the Administration of regional and general anesthesia be delivered or supervised by an anaesthesiologist.

The administration of medication via an epidural or spinal route for the purpose of analgesia, during labor and delivery, is not considered anaesthesia and therefore is NOT subject to the anaesthetist's supervision requirements.

MAC: Monitored Anaesthesia Care; Anaesthesia care that includes the monitoring of the patient by an anaesthetist. Indications for MAC depend on the nature of the procedure, the patient's clinical condition, and/or the potential need to convert to a general or regional anaesthetic. Deep sedation/analgesia is included in MAC.

Deep sedation/analgesia is a drug-induced depression of consciousness during which patients cannot be easily aroused but respond purposefully following repeated or painful stimulation. The ability to independently maintain ventilatory function may be impaired. Patients may require assistance in maintaining a patent airway, and spontaneous ventilation may be inadequate. Cardiovascular function is usually maintained. Because of the potential for the inadvertent progression to general anesthesia in certain procedures, it is necessary that the administration of MAC or deep sedation/analgesia be delivered or supervised by an anaesthetist.

SECTION 3 - RECOMMENDATIONS

- Patients requiring anaesthesia have a right to the same facilities and standards of peri-operative care as all medical and surgical patients.

- Patients and their relatives should be informed of the level of availability of all forms of anaesthesia and analgesia in each and every units of each and every hospital and healthcare center.

- All the patients undergoing a procedure under anaesthesia MUST have a preanesthetic consultation prior to the procedure by an anaesthetist.

- At least one consultant anaesthetist should be allocated for providing anaesthesia service to ONLY one patient. Extra anaesthetists will be required above this minimum, in units where frequent turnovers of inexperienced trainees, house officers, residents are working.

- The person performing the anaesthesia should have no other duties at that time.

- The person assisting the anaesthetist during the procedure should have no other duties at that time.

- All the criteria for preoperative preparations and immediate postoperative care (even though performed by resident trainee or staff nurses or anaesthesia assistant) should be strictly followed and MUST be supervised by anaesthesiologist.

- All the patients after completion of a procedure under anaesthesia shall have a post anaesthesia consultation/visit by the anaesthetist within 24 hours.

- Each and every minor details of the anaesthesia procedure, drugs, events, complications and management done, shall be documented so as to be produced when required. In the court of law, “whatever is not documented is not performed.”

SECTION 4 – STANDARDS OF MONITORING

Administration of any form of anaesthesia to a patient undergoing surgery is associated with inherent risks and complications. These risks may be due to anaesthetic drugs or techniques, or due to associated surgical disease and may be complicated by coexisting medical problems. Morbidity or even mortality due to anaesthesia may not be entirely predictable or preventable. Continuous monitoring of the patient, however, has shown that the risk of unfavourable outcome may be minimized. There is enough evidence and wide acceptance that adoption of good and proper monitoring standards in clinical anaesthesia practice has considerably improved the patient safety and outcome.

Monitors are now available for detection of Hypoxia (Pulse Oximeter, Oxygen Analyzers), Hypoventilation (Capnometers), monitoring the cardiac status (ECG, Non-invasive and invasive BP, Central venous pressures), temperature monitoring to detect hypothermia, neuromuscular monitors to facilitate use of muscle relaxants etc. Further specialized monitoring for cardiac hemodynamic (such as stroke volume, cardiac output and systemic resistance measurements, Trans-esophageal Echocardiography), cerebral hemodynamics (such as ICP Monitoring, Cerebral Doppler, cerebral micro dialysis), monitoring depth of anaesthesia (by Brain Function monitor, BIS) etc are also available. However, it is well recognized that all monitors may not improve patient outcome.

For a monitor to be useful, they should be reliable, improve patient safety and also lead to better clinical outcome. Further, they should also be cost-effective. It cannot be overemphasized that monitors may not prevent an adverse outcome of anaesthesia. They however reduce the risks by early warning of impending or deteriorating condition of the patient. Thus, it is the man behind the machine, appropriately trained Anaesthesiologists, who has the responsibility of properly interpreting the digits and graphs. The right information must be collected at the right time, interpreted correctly and acted upon appropriately.

Therefore, for a good outcome, monitors are essential. However, increasing the number of monitors is unlikely to improve the outcome of anaesthesia. A

set of minimum monitors which have proved their reliability and improve safety of anaesthetized patient is therefore essential for practice of anaesthesia.

In 1986, the American Society of Anaesthesiologists under the Stewardship of Dr. H. Ketcham Morrel took first initiative in recommending "Minimum Monitoring Standards" for anaesthesia. An International Task Force (ITF) was constituted by World Federation of Anesthesiologists in 1989 for

a. guidance and assistance to anaesthesia providers, professional societies, hospital administrators, and the governments in improving the quality and safety of anaesthesia
b. update and improvise minimum mandatory monitory standards as applicable to each country, depending on the medico-legal, cultural norms and customs, racial, endemic and environmental factors.

The recommendations of ITF were accepted by WFSA in 1992. Based on these guidelines, each country has formulated their guidelines or recommendations for minimum monitoring standards that need to be followed for safe conduct of anesthesia.

The Association of Anaesthetists of Great Britain and Ireland introduced their guidelines in 2000, revised in 2006 and again amended recommendations have been introduced in 2007 along with the development of newer monitoring equipments.

The ASA has reviewed and amended recommendations on "Standards of Basic Monitoring" in 2005.

The Indian Society of Anaesthesiologists took guidelines from Recommendations of WFSA for "Minimum Monitoring standards" in 1999 and adapted as National Standards since then and has been revised in December 2007.

In Nepal, Anaesthesia has been practised by qualified anaesthesiologist even before there were any qualified surgical professionals. But till date, there were no definite guidelines for minimum monitoring in anaesthesia.

Nepal is a country of vivid diversity and the medical practices in Nepal vary extensively. In towns and smaller cities, there are smaller hospitals with fewer anaesthetic equipments and anaesthesiologists are working alone without help being available. In contrast, the major cities have high tech corporate hospitals with state of the art equipments being available. In between these two groups, there are large number of Government hospitals, medical college (teaching) hospitals and other hospitals, which may not be equipped with extensive monitoring facilities, but adequate enough to meet the minimum monitoring standards.

The introduction of these national monitoring standards shall be made the hospital management realize the need for procurement of new monitors. The Consumers also shall make the hospital management follow these guidelines seriously, lest they may face medico-legal problems.

Considering these in view, new monitoring standards has been revised to allow safe practice of anaesthesia in all types of hospitals. Further the role and responsibilities of anaesthesiologists and hospital management is emphasized clearly. It is hoped that following the minimum monitoring standards guidelines would make practice of anaesthesia safe for the patient.

Monitors and Monitoring of the Patient

During anesthesia, it is mandatory for all patients to be monitored for Oxygenation, Ventilation, and Circulation both Clinically and with appropriate monitors.

4.1 Oxygenation

For every patient undergoing anaesthesia, it is MANDATORY to be monitored for Oxygenation.

4.1.1 Oxygenation of the patient should be monitored clinically by observation for absence of cyanosis and pink colour of the skin and mucous membrane and operating field and absence of cyanosis. There must be adequate, illumination of the patient for proper observation of colour.

4.1.2 It is **mandatory** for Oxygenation to be further monitored by Pulse Oximetry, which displays both the saturation and heart rate in bold form. The pulse oximetry should have variable pitch pulse tone and low oxygen alarm which is audible clearly. Display of pulse plethysmography by the pulse oximeter is strongly recommended.

4.1.3 It is **mandatory** for all patients to receive an assured Inspired Oxygen concentration of at least 25%. This may be ensured by appropriate Anesthetic machine, which has Oxygen or hypoxic guard set to minimum of 25% of Oxygen. These anesthetic machine should also be fitted with oxygen failure device and oxygen failure alarm.

4.1.4 When anesthetic machine, which do not have a hypoxic guard and oxygen failure device is to be used, the Inspired Oxygen Concentration should be monitored with an Oxygen Analyzer appropriately fitted in the inspiratory portion of Anesthetic Circuit. The Oxygen analyzer should also have audible alarms for low oxygen in the circuit.

4.2 Ventilation

For every patient under anesthesia, it is MANDATORY to monitor Ventilation, spontaneous or controlled.

4.2.1 Ventilation of the patient either spontaneous or controlled ventilation should be monitored clinically by observation of chest movement of the patient which should be synchronous thoraco-abdominal respiration, movement of the reservoir bag and auscultation of the breath sounds.

4.2.2 In addition to clinical observation, it is mandatory for ventilation to be monitored by analysis of expired carbon-dioxide level with Capnograph, and maintain the End-tidal Carbon-dioxide at appropriate level of ventilation desired. Display of Capnograph is **strongly recommended** in all patients under general anaesthesia.

4.2.3 It is also **strongly recommended** to monitor Expired Tidal or Minute Volume by appropriate volume measurement readings in all patients under general anesthesia whether under spontaneous or controlled ventilation.

4.2.4 It is **mandatory** that whenever Endotracheal tube or Laryngeal mask Airway is inserted, the correct positioning should be checked by Quantitative analysis of Carbon-dioxide by capnograph and End-tidal Carbon-dioxide reading. The monitoring should be continued till the endotracheal tube or laryngeal mask airway is removed.

4.2.5 When ever mechanical ventilation is instituted on a patient, it is **mandatory** that there should be an audible alarm system available to detect disconnection of patient from mechanical ventilatory system.

4.2.6 It is **mandatory** to measure airway pressure in all patients receiving general anaesthesia through LMA or endotracheal intubation.

4.2.7 All patients under regional or monitored anaesthesia should be monitored for respiration clinically. It is however **strongly recommended** that the respiration be monitored by expired carbon-dioxide monitoring.

4.3 Circulation

For every Patient under anesthesia, it is MANDATORY for Circulatory Functions to be monitored.

4.3.1 It is **mandatory** that every patient subjected to anaesthesia shall be monitored by continuous tracing of Electrocardiogram. The ECG monitoring should be continued into the recovery room or post anaesthesia care unit till he is discharged to the ward.

4.3.2 It is **mandatory** to have a defibrillator available in the operation theatre, kept charged and ready for use in case of cardiac arrest.

4.3.3 It is **mandatory** for every patient to be monitored clinically by palpation of pulse at appropriate places and at frequent intervals not more than five minutes. The pulse rate may be recorded from palpation or from ECG or pulse oximeter monitors.

4.3.4 It is **mandatory** for every patient undergoing anaesthesia to be monitored for blood pressure. It shall be mandatory for blood pressure to be monitored with a Non-invasive Blood Pressure monitor. They shall be recorded frequently not longer than five minutes.

4.3.5 It is **mandatory** for every patients at high risk for anesthesia (ASA Grade III and above), patients who are hemodynamically unstable, patients on inotropic support and who required ionotropic support during the procedure, and for surgeries/procedures with expected blood loss more than 30% of the blood volume, shall have blood pressure monitored by an Continuous intra-arterial pressure tracing.

4.3.5 For patients undergoing surgery in the above category (4.3.5), it is **strongly recommended** to monitor Central venous Pressure by any appropriate method.

4.4 Additional Monitoring Recommendations

4.4.1 Patients having prolonged surgery defined as more than 3 hours, High risk for anesthesia (ASA III or above), patients with extremes of age (<15 and /or > 65 years, i.e. Pediatric and Geriatric age group), and patient undergoing major surgery, with expected blood loss more than 30% of blood volume may be monitored with additional monitoring devices.

4.4.2 It is **strongly recommended** that the above group of patients (4.4.1) shall be monitored for core body temperature by nasopharyngeal or oesophageal or rectal probes.

4.4.3 It is **strongly recommended** that body warming devices should be used to maintain near normal temperature in the above category of patients (4.4.1)

4.4.4 It is **strongly recommended** that the above group of patients (4.4.1), AND patients with neuromuscular diseases, receiving neuromuscular blocking muscle relaxants, shall be monitored for degree of neuromuscular block by a neuromuscular stimulator.

4.5 Additional monitoring recommendations for Specialized procedures

4.5.1 It is **MANDATORY** that patients undergoing specialized surgery under any form of anaesthesia should have following monitors in addition to monitoring requirements stated above (4.1-4.4);

a. **Cardiac Surgeries:**

i. Anaesthetic Agent Concentration Monitor: Both Inspiratory & Expiratory (I&E)
ii. Cardiac Output Monitor (Example includes but are not limited to: PICCO, Flowtrac, Doppler, PA Catheter, TEE).
iii. Bi spectral Index (BIS) Monitor
iv. Capnograph (End Tidal Carbon Dioxide Measurement)

b. **Intracranial Surgeries:**

i. Anaesthetic Agent Concentration Monitor (I&E)
ii. Bi spectral Index (BIS) Monitor
iii. Capnograph (End Tidal Carbon Dioxide Measurement)

c. **Major Vascular Surgeries:**

i. Anaesthetic Agent Concentration Monitor (I&E)
ii. Capnograph (End Tidal Carbon Dioxide Measurement)

d. **Obstetric Surgeries:**

i. Foetal Heart Rate Monitoring System
ii. Capnograph (End Tidal Carbon Dioxide Measurement)

e. **Thoracic Surgeries**
   i. Anaesthetic Agent Concentration Monitor (I&E)
   ii. Capnograph
   (End Tidal Carbon Dioxide Measurement)

f. **Laparoscopic Surgeries**
   i. Capnograph
   (End Tidal Carbon Dioxide Measurement)

g. **Neonatal (<28 days) and Paediatric (< 15 years) Surgeries**
   i. Capnograph
   (End Tidal Carbon Dioxide Measurement)
   ii. Anaesthetic Agent Concentration Monitor (I&E)
   iii. Core body temperature
   iv. Precordial/Oesophageal Stethoscope (as required)
   v. Paediatric probes for SPO_2 Monitoring
   vi. Paediatric Cuffs for NIBP monitoring

h. **Geriatric (> 65 years) Surgeries**
   i. Capnograph
   ii. Anaesthetic Agent Concentration Monitor (I&E)

4.6 Monitoring Recommendations based on level of health care facility

During anesthesia, it is mandatory for all patients to be monitored for Oxygenation, Ventilation, and Circulation both clinically and with appropriate monitors. Even though lack of resources are of prime concern in a developing country like ours, it is again emphasized that the quality of care delivered to a patient cannot be compromised and thus the basic monitoring as stated in Section 4.1- 4.3 shall be provided to all patients by the health care providers.

Based on the level of health care facilities (Appendix I), the following requirements of monitoring are mandatory:

LEVEL I: No Anaesthesia Services. Monitoring requirements based on other needs.

LEVEL II: Basic Monitoring Standards as set in 4.1 – 4.3
ECG, BP, and SPO_2: A must for each and all patients.

LEVEL III: Basic Monitoring Standards as set in 4.1 – 4.3
ECG, BP, and SPO_2: A must for each and all patients.

LEVEL IV: Basic Monitoring Standards as set in 4.1 – 4.4
ECG, BP, SPO_2, $ETCO_2$ and additional as required.

LEVEL V: Monitoring Standards as set in 4.5.

4.6 Monitoring: The Equipment

4.6.1 The hospital management shall be responsible for procurement, maintenance, servicing, and calibration of monitoring and other anaesthetic equipments. They should procure the equipments in adequate numbers.

4.6.2 The concerned anaesthesiologists shall be familiar with the setup, proper use, and troubleshooting of the equipments. For more complex equipments, the anaesthesiologist should be appropriately trained regarding its usage before equipment or monitor is out to use.

4.6.3 Any new equipment to provide anaesthesia service (e.g. anaesthesia machine) shall be properly handed over to anaesthesiologist by the responsible person from the manufacturer. The new equipments shall be used in patients only after successful operation over at least 3 hours without the patient.

4.6.4 The anaesthesiologist should check all the anaesthetic equipments and monitors before connecting them on the patient. Alarm setting should be appropriately set for upper

and lower limits and ensured that they are working properly before commencing anesthesia.

4.6.5 In children and other uncooperative patients, who may not allow to place monitors to be placed before anesthesia, patients may be induced anesthesia and monitors connected as soon as possible. Till then, clinical monitoring of pulse and auscultation shall be carried out.

4.6.6 The anaesthesiologist must maintain a proper anaesthetic record of the monitors used for recording vital signs along with the record of drugs and procedures.

4.7 Monitoring during transportation to the Post-operative Recovery Area

4.7.1 All patients who have received anaesthesia shall be monitored continuously till they recovers from anesthesia and all reflexes are active.

4.7.2 Patients, while transferring to the post-operative recovery area shall be accompanied by the responsible anaesthesiologists, or his assistance with adequate knowledge and experience, till the patient is handed over to a responsible person in the recovery room, and a brief summary of case and proper instructions is explained to the person in charge.

4.7.3 Patient should be shifted only when his hemodynamic status is stable.

4.7.4 Patient should be continued to be monitored with ECG, Pulse Oximeter And NIBP or invasive arterial monitoring whenever needed.

4.7.5 If a patient requires mechanical ventilation during transport, they should also be monitored with a Capnograph for End-tidal CO_2 monitors, and disconnection alarm for ventilator such as airway pressure monitoring.

4.7.6 Should the patient require transfer to another part of the hospital or outside, the standard of monitoring should be same as detailed above applicable for transferring to the postoperative recovery area.

4.8 Monitoring in the Post-operative Recovery Area

4.8.1 All hospitals with operation theatre facilities shall have a provision for Post operative recovery area for immediate management of patients recovering from effects of anaesthesia.

4.8.2 Every patient shall be monitored in the Post-operative recovery area with continuous monitoring of ECG, Pulse Oximeter and NIBP or Invasive Arterial monitoring.

4.8.3 A post-operative recovery chart shall be maintained by recovery ward staff detailing level of consciousness, hemodynamic status, and respiration. They shall be charted at least every 15 minutes and earlier, if any changes are noted towards deteriorating condition of the patient.

4.8.4 Patient shall be transferred out of recovery or post-operative ward, only when the patient has completely recovered from the effect of all anaesthetic drugs and clinical condition of the patient is stable.

4.8.5 If the clinical condition of the patient is not stable, he should be transferred to appropriate Intensive Care Units or High dependency units for further management.

4.9 Monitoring during Regional Anaesthesia and MAC

4.9.1 All patient undergoing surgery under regional anesthesia or sedation shall be monitored as required under general anesthesia.

4.9.2 All patient undergoing surgery under regional anesthesia or sedation also MUST have anesthesia machine and accessories available in the same room should the need for intubation/general anesthesia arises.

4.9.3 In all cases a minimum monitoring with ECG, Pulse Oximeter and NIBP is mandatory.

4.9.4 All care and observations should be recorded at least every 5 minutes, if the vital signs are stable, and every 3 minutes or earlier, if vital signs are unstable.

SECTION 5 – ANAESTHESIA SERVICE GUIDELINES

5.1 The Anaesthesia Provider: The Anaesthesiologist

5.1.1 All anaesthetic procedure shall be provided by a trained & qualified anaesthetist, possessing an academic qualification of Postgraduate Diploma (D.A) or Degree (M.D or D.N.B) in Anaesthesiology recognized by Nepal Medical Council and registered as a Specialist in Anaesthesiology in Nepal Medical Council for the purpose.

5.1.2 It must be noted that providing anaesthesia has its own morbidity and mortality. In the interest of the patients and their outcome, it should be ensured that **only qualified anaesthetist**, who is well trained and qualified to provide anaesthesia, who is aware of problems and solutions concerning anaesthesia shall only provide anaesthesia to the patient. The practice of any non-anesthetist (by other clinicians, nurse, anesthesia assistants and technicians) giving anaesthesia is considered harmful and hence strongly discouraged.

5.1.3 Anaesthesiologists can provide anaesthesia service to ONLY ONE patient at a particular time. However, if another emergency procedure has to be performed at the same time and another anaesthetist is being available, the anaesthetist can provide anaesthesia services to the second patient, but ONLY when the first patient is stable and there is an assistant (medical officer, resident trainee in anaesthesia, or anaesthesia assistant) to monitor the first patient AND ONLY IF the two operating rooms are within a distance of 50 meters AND in the same floor.

5.1.4 One Anaesthesiologist MUST be attending calls or be responsible for 'On-Call' Anesthesiology Service at ONLY ONE hospital/institution on a particular day/date.

5.2 The Hospital Management

5.2.1 The hospital management shall be responsible for employing or providing a qualified anaesthetist for surgical procedures for providing anaesthetic care. The hospital management should ensure that only trained and qualified Anaesthetist provides anaesthesia in their hospital as stated in Section 5.1. Any anaesthetic mishaps occurring during anaesthesia provided by any other person will be legally the responsibility of the hospital management.

5.2.2 The hospital management shall provide an assistant to the anaesthesiologist, who may be a trainee anaesthesiologist or a nurse or an anaesthesia technician well versed in anaesthetic procedures.

5.2.3 Should any anaesthetic mishaps occur, the anaesthesiologists should have additional separate assistant available for help. In major hospital, a junior anaesthesiologists or a postgraduate trainee in anaesthesia may be available. If having junior anaesthesiologist is not feasible, a nurse or anaesthesia technician who is trained or has technical qualification in anaesthetic procedure should be available for help.

5.2.4 The **discharge summary** of each and every patient MUST clearly mention the full name of the anaesthesiologist, the procedure and anesthetic technique performed, and complications if any.

5.2.5 A lead anaesthetist should be part of the Operation Theatre Management Committee, aimed at facilitating optimal theatre efficiency.

5.2.6 Appropriate accommodation, facilities, secretarial and administrative support must be provided for staff working in departments of anaesthesia.

5.2.7 A comprehensive range of drugs and other agents required for safe practice of anaesthesia must be agreed, with their supply maintained at all times.

5.3 The Anaesthesia Service

5.3.1 **Pre Anaesthesia Evaluation / Consultation (PAC)**

A pre-anaesthesia evaluation must be performed by the concerned anaesthesiologist (or a trainee anaesthesiologists under supervision) designated to provide anaesthesia for each patient who receives general, regional or monitored anaesthesia. In accordance with current standards of anaesthesia care, the Pre-anaesthesia evaluation of the patient includes, at a minimum:

- Review of the medical history, including anaesthesia, drug and allergy history;
- Interview and examination of the patient;
- Notation of anesthesia risk according to established standards of practice
  (e.g. ASA classification of risk);
- Identification of potential anaesthesia problems, particularly those that may suggest potential complications or contraindications to the planned procedure (e.g., difficult airway, ongoing infection, limited intravascular access);
- Additional pre-anaesthesia evaluation, if applicable and as required in accordance with standard practice prior to administering anesthesia (e.g., echocardiography, stress tests, additional specialist consultation);
- Development of the plan for the patient's anaesthesia care, including the type of medications for induction, maintenance and

post-operative care and discussion with the patient (or patient's representative) of the risks and benefits of the delivery of anaesthesia.

5.3.2 The anaesthetist providing anaesthesia for a patient shall be present throughout the surgical procedure and shift the patient to the post-operative ward or Intensive care as necessary and be available till his condition is stable.

5.3.3 If anaesthesia is being provided from a hazardous environment such as radiation, there should be appropriate monitoring devices available so that patient condition can be monitored from remote location.

5.3.4 The anaesthesiologist should provide same care as required during General Anaesthesia, for Regional anaesthesia or for sedation and monitored anaesthesia care. Though utmost care is given while patient is given general anesthesia, often there is some laxity in care during regional or monitored anesthesia care. It should be noted that rapid changes may occur during these procedures as well. Hence patients under regional or monitored anaesthesia care should also be monitored as recommended for General anaesthesia.

5.3.5 The anaesthetist should maintain and record the monitored data in the anesthetic record system accurately and frequently.

5.3.6 It is recommended that the monitored data should be recorded at intervals not longer than three minutes in rapidly changing situations and not longer than 5 minutes in stable patients.

5.4 Standard delivery of Anaesthesia services:

Anesthesia services must be consistent with needs and resources. Delivery of anesthesia services and procedures must include the delineation of preanesthesia and postanesthesia responsibilities. The standard of anesthesia delivery service must ensure that the following are provided for each patient:

- Patient consent;
- Infection control measures;
- Safety practices in all anesthetizing areas;
- Protocol for supportive life functions, e.g., cardiac and respiratory emergencies;
- Proper measures during transfusion of blood and blood products;
- Reporting requirements;
- Documentation requirements;
- Equipment requirements, as well as the monitoring, inspection, testing, and maintenance of anaesthesia equipment;
- Delineation of pre- and post-anaesthesia staff responsibilities

5.5 An intraoperative anesthesia record.

There MUST be an intraoperative anesthesia record or report for each patient who receives general, regional or monitored anesthesia. While current practice dictates that the patient receiving moderate sedation be monitored and evaluated before, during, and after the procedure by trained practitioners, an intraoperative anesthesia report is not required because, as explained above , moderate sedation is not “anesthesia”. Current standard of care stipulates that an intraoperative anesthesia record, at a minimum, includes:

- Name and hospital identification number of the patient;
- Name(s) of anaesthesiologist(s) who administered anesthesia, and as applicable, the name and profession of the trainee anaesthesiologist, assistant, or operating practitioner;
- Name, dosage, route and time of administration of drugs and anesthesia agents;
- Techniques(s) used and patient position(s), including the insertion/use of any intravascular / airway / regional anesthesia / other devices;
- Name and amounts of IV fluids, including blood or blood products if applicable;
- Timed-based documentation of vital signs as well as oxygenation and ventilation parameters; and
- Any complications, adverse reactions, or problems occurring during anesthesia, including time and description of symptoms, vital signs, treatments rendered, and patient’s response to treatment.
- Condition and time during shift to recovery area or Post anesthesia care unit

5.6 A postanesthesia evaluation

A post anesthesia evaluation completed and documented by an individual qualified to administer anesthesia, as specified in Section 5.1, no later than 24 hours after surgery or a procedure requiring anesthesia services.

The evaluation is required any time general, regional, or monitored anesthesia has been administered to the patient. But the patient receiving moderate (conscious) sedation be monitored and evaluated before,

during, and after the procedure by anaesthesiologists, and thus a postanesthesia evaluation is not required.

Accepted standards of anesthesia care indicate that the evaluation may not begin until the patient is sufficiently recovered from the acute administration of the anesthesia so as to participate in the evaluation, e.g., answer questions appropriately, perform simple tasks, etc. The evaluation can occur in the OT/PACU/ICU or other designated recovery location. The elements of an adequate post-anesthesia evaluation should be clearly documented and conform to current standards of anesthesia care, including:

- Respiratory function, including respiratory rate, airway patency, and oxygen saturation;
- Cardiovascular function, including pulse rate and blood pressure;
- Mental status;
- Temperature;
- Pain;
- Nausea and vomiting; and
- Postoperative hydration.

But depending on the specific surgery or procedure performed, additional types of monitoring and assessment may be necessary.

5.7 The Anaesthesia Department

- The anaesthesia department (anaesthetic service) must be consultant led, with a clinical director (head of department) and lead clinicians (anaesthesiologists) who are responsible for each component of the service.

- Departments of anaesthesia must have an identified consultant who is responsible for ensuring that all lists are covered by suitably trained anaesthetists. Wherever possible consultant anaesthetists will be re-allocated to cover for colleagues' absences.

- Departments of anaesthesia should provide an acute pain service and either have or provide access to a non-acute ('chronic') pain service with nominated lead consultants.

- All staffs in anaesthesia department and operation theatre in clinical contact with patients must be appropriately trained in resuscitation skills.

- Departmental guidelines for anaesthetic practice should be in place, observed and reviewed in accordance with good medical practice and sources of national guidance.

KEY POINTS / SUMMARY:

- Guidelines are 'standards' appropriate to general and specific aspects of anaesthetic practice issued by the Society of Anaesthesiologists of Nepal (SAN) and should be referred to when considering the provision of any anaesthetic services.
- A lead anaesthetist should be part of the Operation Theatre Management Committee, aimed at facilitating optimal theatre efficiency.
- All patients must undergo appropriate pre-operative assessment and be seen by an anaesthetist before operation.
- Dedicated skilled anaesthetist MUST be available for each and every situation where anaesthesia and sedation are administered.
- Appropriately trained and competent staff is a MUST while providing care for all patients recovering from anaesthesia or sedation.
- A comprehensive range of drugs and other agents required for safe practice of anaesthesia must be agreed, with their supply maintained at all times.
- All patients MUST undergo appropriate post anaesthesia evaluation within 48 hours by an anaesthetist after the operation.
- The discharge summary of each and every patient MUST clearly mention the full name of the anaesthesiologist, the anaesthetic procedure performed, and complications if any.
- All equipment should be maintained according to manufacturers' specifications.
- Appropriately trained staff, dedicated equipment and satisfactory personal insurance arrangements must be available for inter-hospital transfers.
- A system must be in place for dealing effectively with complaints.
- There must be effective mechanisms for the 'hand-over' both of the care of individual patients, and of overall services providing continuity of care for 24hrs.
- A critical incident reporting system must be in place and regular audit, critical incident and managerial meetings should be held and appropriately recorded.

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APPENDIX I
HEALTH CARE FACILITIES

Level I Facility:

Primary Health Care Centers, Health posts / Sub Heath Posts.
No Provision of an Operating Room.

Level II Facility:

Provision of Operation theatre facilities for Emergency Surgeries (life/limb saving) mainly Obstetric and Surgical Emergencies.
Usually Complicated Cases are referred to higher facilities.

Level II Facility Includes:
a. District Hospitals in Very Rural (Aati Durgam) Districts (Appendix II)
b. Community Hospital in Very Rural Districts (Aati Durgam)
c. Temporary Operating Rooms made for the provision of Surgical Camps.

Level III Facility:

Provision of Operation theatre facilities for Emergency Surgeries (life/limb saving) mainly Obstetric and Surgical Emergencies.
Minor elective surgeries also performed.
Usually Complicated Cases are referred to higher facilities.

Level III Facility Includes:
a. District Hospital in Rural Districts (Durgam) Districts
b. Community Hospital in Rural (Durgam) Districts
c. Private Hospital In Very Rural (Aati Durgam) Districts

Level IV Facility:

Provision of Operation theatre facilities for Non specialized Elective and Emergency Surgeries.
Usually very complicated cases requiring highly specialized professionals are referred to higher specialized centers.

Level IV Facility Includes:
a. District Hospital in Urban Districts (Sugam) Districts
b. Community and Private Hospital in Urban (Sugam) Districts

Level V Facility:

Level V Facility Includes:
a. Tertiary Care Centers (BPKIHS, NAMS, TUTH)
Various different types of surgeries perfomed by various different specialists, E..g. General Surgery, Orthopedic Surgery, Obstetric Surgery, ENT, Ophthalmology, e.t.c.
Various surgeries are performed which requires highly specialized professionals (subspecialists or superspecialists).
b. Hospitals affiliated to Medial Colleges;
Examples includes following but are not limitied to:
Chitwan Medical College Teaching Hospital, Universal College of Medical Sciences, Janaki Medical College Teaching Hospital, Kathmandu Medical College Teaching Hospital (KMCTH), Kathmandu University Teaching Hospital (KUTH), KIST Medical College Teaching Hospital, Lumbini Medical College Teaching Hospital (LMCTH), Nepal Medical College Teaching Hospital (NMCTH), e.t.c.
c. Hospital / Centers for Specialized Patients / Surgeries:
Example includes following (but not limited to) hospitals:

Cardiac Center:	SGNHC, MCTVTC
Transplant Center:	MCTVTC
Neuro Centre:	NNSRS
Maternity Center:	Prasuti Griha
Paediatric Hospital:	Kanti Children Hospital
Orthopedic Center:	Nepal Ortho Hospital
Cancer Center:	BPKMCH,Bharatpur; BCH, NCH

APPENDIX II:

Under Developed:
Rural Districts (Durgam)

1. Baitadi
2. Dadeldhura
3. Maygdi
4. Okhaldhunga
5. Bhojpur
6. Ilam
7. Sindhuli
8. Panchthar
9. Sindhupalchok
10. Gulmi
11. Parbat
12. Dolkha
13. Ramechaap
14. Taplejung
15. Pyuthan
16. Kailali
17. Bardiya
18. Kanchanpur
19. Palpa
20. Lamjung
21. Gorkha
22. Arghakhachi
23. Dhankuta
24. Surkhet
25. Dang
26. Syangja
27. Tanahu
28. Udayapur
29. Nuwakot
30. Dhading
31. Kavre
32. Kapilvastu
33. Mohottari

Remote Under Developed:
Very Rural Districts
(Aati Durgam)

1. Bajura
2. Jajarkot
3. Dolpa
4. Humla
5. Jumla
6. Kalikot
7. Darchula
8. Achham
9. Bajhang
10. Mugu
11. Rukum
12. Salyan
13. Dailekh
14. Rolpa
15. Terathum
16. Doti
17. Khotang
18. Sankhuwasabha
19. Manang
20. Mustang
21. Solukhumbu

Sugam Districts:
Rest all Districts