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FOREWORD

Healthcare challenges are a matter of global concern involving all corners of the world, and countries in Asia, are no exception. For some countries, the issues are mostly about improving access to basic health services and tackling poverty related problems such as communicable diseases and infant mortality. For others, it could be battling rising chronic, lifestyle diseases or caring for the ageing population. Although the issues may vary, given differences in the national healthcare systems, population demography, socio-economic status, development and various other nuances, health care providers are nevertheless similarly faced with the task of improving healthcare delivery system against a backdrop of rising costs and demands.

In Malaysia, we are fortunate to have one of the region's more advanced healthcare systems with an accessible network of affordable, primary care services. It has been the Ministry of Health's (MOH) top priority to upgrade and expand the country's health services to cater for the needs of the population, from those residing in the interior and remote areas to those living in the urban. This is guided by MOH Vision for Health, which is that of a nation working together for better health; and Mission to lead and work in partnership to facilitate and support the people to attain fully their potential in health, appreciate health as a valuable asset and take individual responsibility and positive action for their health and to ensure a high quality health system that is customer centred, equitable, affordable, efficient, technologically appropriate, environmentally adaptable and innovative with emphasis on professionalism, caring and teamwork value, respect for human dignity and community participation).

Under 10 Malaysian Plan which began in 2011, the thrust no 4 is to improve the standard and sustainability of Quality of Life of the population by transforming healthcare to improve quality and provide universal access. And the focus is in 4 areas; firstly transforming delivery of the healthcare system, secondly increasing quality, capacity and coverage of the healthcare infrastructure, and thirdly shifting towards wellness and disease prevention, rather than treatment and fourthly increasing the quality of human resource for health.

As Anaesthesiology and Intensive Care Services are one of the main services provided by the MOH hospitals, it is imperative and vital to work together, to provide quality and evidence-based care to all Malaysians who are in need of it. Thus as guidance to development and implementation of the service, this first revision of the policy will become the catalyst of change towards excellence in the Anaesthesiology and Intensive Care services and hospital care.

I thank all involved for their commitment to achieving the MOH's vision and mission for the betterment of the country and her rakyat.

Datin Dr V.Sivasakthi,

MOH Head of Service for Anaesthesiology and Intensive Care Services

1. INTRODUCTION

1.1 Anaesthesiology and Intensive Care Services are among the major clinical specialty services provided by the Ministry of Health Malaysia (MOH) including pain management.

1.2 Advancement in surgery and rapid development of surgical subspecialties require the support of comprehensive and efficient anaesthetic services, while an ageing population, higher prevalence of chronic diseases and greater public expectation pose an increasing demand for intensive care services.

1.3 As the largest health care provider in the country, hospitals in the MOH play a leading role in the development and provision of anaesthesiology and intensive care services in the country

1.4 This policy document covers key areas of anaesthesiology and intensive care services such as organisation, human resource and asset requirements as well as patient management, ethics and clinical governance

1.5 It is intended to guide health care providers, hospital directors and policy makers on the development and implementation of anaesthesiology and intensive care services in MOH hospitals

1.6 The document outlines optimal achievable standards in accordance with best practices and guidelines. In hospitals where these standards are not fully met, necessary steps need to be taken to attain them.

1.7 The document shall be reviewed and updated every 5 years or when need arises.

2. OBJECTIVES OF SERVICE

2.1 To provide peri-operative anaesthetic care, pain management and intensive care efficiently in a safe and professional manner. The services shall be patient centred, holistic and in accordance to the current best practices

2.2 To uphold the value of teamwork by working closely with other clinical services to achieve the best possible outcome in patient care.

2.3 To provide continuous education, professional development and formal training for medical and allied health professionals.

2.4 To collaborate and conduct research in the fields of anaesthesiology, intensive care and pain management.

3. SCOPE OF SERVICE

3.1 Peri-operative anaesthetic care for patients undergoing surgery,diagnostic and therapeutic procedures.

3.2 Care for the critically ill patients, requiring intensive monitoring and intervention or advanced life support

3.3 Pain management services for obstetrics, acute and chronic pain patients

4. COMPONENTS

4.1 Peri-operative Anaesthesiology Service

4.1.1 Anaesthetic Clinic

4.1.2 Anaesthesia in the operating theatre

4.1.3 Anaesthesia outside the operating theatre

4.1.4 Day care anaesthesia

4.2 Intensive Care Services

4.3 Subspecialty Anaesthesiology Services

4.3.1 Cardiothoracic anaesthesiology and perfusion

4.3.2 Paediatric anaesthesia

4.3.3 Neuro-anaesthesia

4.3.4 Obstetric anaesthesia and analgesia

4.4 Pain management services

4.4.1 Acute pain management

4.4.2 Chronic pain management

4.5 The components of the service will vary between hospitals depending on the category of hospitals (refer to Table 1).

Table 1: Components of Service According to Category of Hospitals

Component of service	Category of Hospitals			
	State	Major with specialist	Minor without specialist	Non-specialist
Peri-operative anaesthesia service				
Anaesthethetic Clinic	Yes	Yes	Yes	No
Anaesthesia in OT	Yes	Yes	Yes	Identified hospitals
Anaesthesia outside OT	Yes	Yes	No	No
Day care	Yes	Yes	No	Identified hospitals
Intensive Care Service	Level 3	Level 3	Level 2	No
Subspecialty Anaesthesia Service				
Cardiothoracic anaesthesiology & perfusion	Identified hospitals	Identified hospitals	No	No
Pediatric anaesthesia	Yes	Identified hospitals	No	No
Neuro-anaesthesia	Identified hospitals	Identified hospitals	No	No
Obstetric anaesthesia & analgesia	Yes	Yes	Yes	Identified hospitals
Pain management service				
Acute pain management	Yes	Yes	Yes	Identified hospitals
Chronic pain management	Yes	Identified hospitals	No	No

Note: As per MOH Specialty and Subspecialty Blueprint, 2011

5. ORGANISATION

5.1 The department shall be headed by a consultant anaesthesiologist (refer to Appendix 1: Chart 1) who:

5.1.1 Is responsible for the management of all the components of the service

5.1.2 Collaborates with the MOH Head of Anaesthesiology and Intensive Care Services in formulating strategic plans for service development, policies and procedures

5.1.3 Works closely with the relevant stakeholders such as the hospital director, nursing managers and heads of other clinical services in areas pertaining to the development and implementation of the services

5.2 The MOH Head of Anaesthesiology and Intensive Care Services serves as the advisor to MOH on all matters pertaining to the services. The specific functions of the MOH Head of Anaesthesiology and Intensive Care Services are listed in Appendix 9.

5.3 The organization of the department is determined by the category of the hospital, level of patient care and scope of the services provided (refer to Table 1). All specialist-based hospitals shall provide at least two basic services i.e. anaesthesia services in the operating theatre (OT) and intensive care services.

5.4 Dedicated service units shall be established when there is sufficient workload, available expertise and human resource. Its establishment shall be recommended by the head of department with the approval of the hospital director and the MOH Head of Anaesthesiology and Intensive Care Services.

5.5 For non-specialist hospitals, the anaesthesiology service shall be under the responsibility of the hospital director. The head of department of anaesthesiology and intensive care services of the respective state hospitals shall advise on the following matters:

5.5.1 Postings of credentialed medical officers, training and their job descriptions which shall be done in tandem with the development of the services in that hospital

5.5.2 Clinical management

5.5.3 Procurement of equipment and consumables

5.5.4 Development of local clinical policies and guidelines

5.6 Organisation of subspecialty anaesthesia services:

5.6.1 The development and delivery of subspecialty anaesthesia services shall be coordinated and integrated within the Anaesthesiology and Intensive Care Services

5.6.2 Each subspecialty anaesthesia services shall be headed by its respective Head of Subspecialty at the national level. The respective Head of Subspecialty Service shall:

5.6.2.1 Report to the MOH Head of Anaesthesiology and Intensive Care Services

5.6.2.2 Coordinate and provide direction for the development of its subspecialty service, in consultation with the MOH Head of Anaesthesiology and Intensive Care Services

5.6.2.3 Develop, coordinate and facilitate the subspecialty training program

5.6.3 Each subspecialty service shall be guided by the general policies and procedures pertaining to the practice of anaesthesia as well as special requirements for its individual subspecialty service

5.6.4 The subspecialty anaesthesia service may function as a unit within the Department of Anaesthesiology and Intensive Care when the patient caseload within the unit is sufficiently high and shall be headed by a consultant trained in its relevant subspecialty. The head of subspecialty unit shall report to the head of department of the Department of Anaesthesiology and Intensive Care (refer to Appendix 1: Chart 2)

5.7 The department shall establish the following committees (refer to Appendix 2):

5.7.1 Management Committee

5.7.2 Quality Assurance Committee

5.7.3 Safety Committee

5.7.4 Continuing Professional Development Committee

5.7.5 Other committees may be established when the need arises e.g. Post-graduate Training Committee

5.7.6 In smaller department, the functions of the above committees can be held by individuals within a single management committee.

6. GENERAL STATEMENT

6.1 Anaesthesia shall be administered by adequately trained and credentialed doctors.

6.2 The hospital shall facilitate the department to provide adequate operating time determined by the hospital director and the OT Committee. This is to ensure that surgeries are done in a timely manner for optimal patient outcome.

6.3 Day care anaesthesia is an important core component of the anaesthesia service and is to be specifically emphasised in accordance with MOH policy (refer to *Director General of Health Circular No 32/2010; Policy on Day Care Services in MOH hospitals, MOH, 15 Nov 2010)*

6.4 In rural East Malaysia, every effort shall be made to ensure that doctor-based services are achieved within a predetermined time frame

6.5 Surgical patients who undergo major surgery shall be attended by an acute pain service team for post operative pain control.

6.6 All critically ill patients with reversible conditions and in whom reasonable functional status may be restored, shall be cared for in the intensive care unit. Managing patients on mechanical ventilators in general wards shall be discouraged.

6.7 Referrals of cases from non-specialist hospitals shall be made to the nearest specialist hospital with the appropriate level of care and facility.

6.8 All categories of staff shall be credentialed and privileged to perform specific tasks appropriate to their level of skills and competency.

6.9 Medical surveillance of staff shall be implemented according to the *Occupational and Safety Health Act (OSHA) 1994*, amended in *2006*, *Sharp Injury Surveillance,* MOH, 2007 and *A Guide to the Occupational Health and Safety Act,* Revised *Oct 18, 2012*.

6.10 Patient safety shall be of utmost importance and specific measures to ensure this shall be implemented according to the existing guidelines (refer to *Safe Surgery Saves Lives Initiative* (SSSL); Implementation Guidelines, MOH, *Nov 2009*) and *Guide on Patient Safety in the Department of Anaesthesiology and Intensive Care* in Appendix 3.

6.11 Management of medication shall be in accordance with the *Guide on Medication Safety in the Department of Anaesthesiology and Intensive Care* in Appendix 4.

6.11.1 Whenever possible, clinical pharmacists shall be posted to the department to implement policies and procedures related to safe and effective use of medications.

6.11.2 Dantrolene shall be available in all state hospitals and to be shared with other hospitals when necessary.

6.12 The department shall implement infection control measures in accordance to general hospital operational and service specific policies.

6.12.1 The department shall ensure a high level of awareness on infection control measures among all categories of staff. The importance of proper hand hygiene shall be emphasised. Standard precaution measures shall also be reinforced to minimise the risk of infection to patients and healthcare workers (refer to *Hand Hygiene Handbook*, *MOH, 2006*)

6.12.2 Strict adherence to infection control measures shall be undertaken to minimise the risk of infection from invasive catheterisation and mechanical ventilation.

6.12.3 Reuse of single use items shall be discouraged. All sterilisation processes shall comply the existing standards (refer to *Malaysian Standard of Sterilised Process*, *Second Edition, Malaysian Sterile Service Association (MSRA), 2011*).

6.12.4 The department shall establish an infection control team which includes an anaesthesiologist and link nurses who shall collaborate with the hospital's infection control unit. They shall be responsible for the implementation and monitoring of infection control measures.

6.12.5 For specific measures of infection control in Intensive Care Unit (ICU) and anaesthesia, the following guidelines shall be complied:

6.12.5.1 Critical Care Medicine Section of the Malaysian Society of Anaesthesiologists: *Consensus Statement on Infection Control Measures in the ICU, 2009*

6.12.5.2 Australia and New Zealand College of Anaesthesiologists,. PS28. *Guidelines on Infection Control in Anaesthesia, 2005*

6.12.5.3 *National Antibiotic Guidelines*, *MOH, 2008*

6.12.5.4 *Policy and Procedures on Infection and Antibiotic Control*, *Second Edition. MOH, 2010*

6.13 The department shall be equipped to ensure the delivery of safe anaesthesia and intensive care (refer to Appendix 5: *List of Recommended Equipment for Various Facilities*)

6.14 New technology and advances in anaesthesia, analgesia and monitoring shall be incorporated into daily practice where appropriate. Ultrasound guidance is to be utilised for peripheral nerve blocks and procedures such as central line placement when the appropriate equipment and expertise is available.

6.15 The department shall move towards increased utilization of information and communication technology (ICT). This includes the implementation of Critical Care Information System (CCIS) in ICU, Operation Theatre Management System (OTMS) in the OT and Hospital Information System (HIS) in identified hospitals.

6.16 There shall be an efficient inventory management system for stock-keeping of drugs, consumables and assets to effective stock monitoring. The Anaesthesia Asset Management System (AAMS) has been implemented to better manage the department assets (refer to www.treasury.gov.my)

6.17 Communication with the patient and family members is essential and there shall be full disclosure of any unexpected adverse outcome in accordance with the general hospital operational policy. The head of department or the most senior member of the anaesthetic team present at the time of the incident shall inform the patient or next of kin at the soonest possible time and document the discussion in detail (refer to Appendix 6 for *Guide on Effective Communication in the Department of Anaesthesia and Intensive Care*).

6.18 Communication among the medical professionals shall be enhanced. Intra and inter-departmental communication shall be open, honest and effective to ensure optimal patient care. Staff shall display respect and tolerance towards others to maintain harmonious interpersonal relationship.

6.19 A monthly on-call roster with all contact numbers shall be made available to other departments and on-call team shall be contactable at all times by telephone or pager.

6.20 There shall be appropriate space and facilities in the department for administrative and non-clinical functions. These include specialist offices, CME/Meeting rooms, call rooms and rest rooms.

6.21 The department shall support the national organ/tissue transplantation programme. Specifically, the department shall be involved in identification,

management of potential donor, certification of brain death in ICU and provision of peri-operative anaesthetic services for organ procurement and transplantation.

6.22 The department shall support the 'Full Paying Patient' programme and 'Saturday Elective List' and comply with the MOH's policy on the programmes.

6.23 All Anaesthesiology and Intensive Care departments shall comply with the standards set by the Malaysian Society for Quality in Health (MSQH) or Joint Commission International (JCI) and seek accreditation status as part of the hospital initiative.

7. PERI-OPERATIVE ANAESTHESIA SERVICE

7.1 Anaesthetic Clinic

7.1.1 The anaesthetic clinic is an outpatient clinic that carries out pre-operative assessment of patients scheduled for elective surgery, daycare surgery and day of surgery admission (DSA). It shall be established in all state hospitals and major hospitals. The establishment of an anaesthetic clinic is set with the following general and specific objectives:

7.1.2 General objectives

7.1.2.1 To provide a system whereby a patient recommended for surgery is optimised and prepared for surgery

7.1.2.2 To provide a system for pre-anaesthetic assessment of patients scheduled for elective surgery, daycare surgery and day of surgery admission.

7.1.3 Specific objectives

7.1.3.1 To ensure that the patients are in optimal state of health pre-operatively

7.1.3.2 To ensure anaesthesia management is planned appropriately

7.1.3.3 To make appropriate referrals to the relevant disciplines as and when necessary

7.1.3.4 To commence appropriate treatment according to guidelines

7.1.3.5 To educate patients regarding anaesthesia and other related procedures

7.1.3.6 To obtain informed consent for anaesthesia

7.1.3.7 To facilitate day of surgery admission and day care surgery

7.1.3.8 To establish audit tools to monitor aspects of care and outcomes

7.1.4 The clinic schedule shall be determined by the case load and human resource available.

7.1.5 The assessments of patients shall be guided by the current guidelines (refer to *Anaesthetic Clinic Protocols*, *MOH, Nov 2012*) which also includes functions, infrastructure requirements, processes, audit standards/tools as well as medical therapy guidelines.

7.2 General Anaesthesia Service in the OT

7.2.1 All patients shall be assessed pre-operatively by the anaesthetising doctor.

7.2.2 Pre-operative fasting practice shall be in accordance with the *Guidelines on Pre-operative Fasting*, *College of Anaesthesiologists, Academy of Medicine Malaysia, revised 2008.*

7.2.3 In OT, the correct identification of the patients are verified by the nurse and doctor by using SSSL checklist which also includes valid informed consent for surgery and anaesthesia (refer to *Consent for Treatment of Patients by Registered Medical* P*ractitioner: Malaysian Medical Council, 2013*).

7.2.4 Separation of children or intellectually challenged patients from parents or guardians prior to anaesthesia is to be discouraged.

7.2.5 The minimum standards for the safe conduct of anaesthesia in the OT shall be strictly adhered to (refer to *Recommendations on Minimum Facilities for Safe Anaesthesia Practice in Operating Suites and Other Anaesthetising Locations: Australia and New Zealand College of Anaesthesiologists. P255. 2012).*

7.2.6 A skilled assistant shall be available in every operating room to assist in the administration of anaesthesia.

7.2.7 Formal hand-over of patient information shall take place whenever there is a change of caregivers during anaesthesia even temporarily e.g. during relief for breaks or permanently.

7.2.8 The assistant medical officer (AMO) shall be responsible for the regular preventive maintenance of the equipment in the unit through the hospital's concession company.

7.2.9 All equipment of more than ten years shall be phased out in stages by requesting the hospital's concession company for evaluation of Beyond Economic Repair (BER) to ensure safety and uninterrupted service.

7.2.10 Monitoring of patients under anaesthesia shall comply with the recommended standards (refer to *Recommendations for Safety Standards and Monitoring during Anaesthesia and Recovery*: *College of Anaesthesiologists Malaysia, 2008*)

7.2.11 Anaesthetic breathing systems shall not be shared between patients unless protected with efficient bacterial and viral filter.

7.2.12 Image Intensifiers shall only be used in operating rooms with radiation protection. All staff within the operating rooms shall be protected with lead gowns.

7.2.13 All staff shall be provided with the appropriate protective eye wear during operations involving the use of laser.

7.2.14 All anaesthetic locations shall be equipped with anaesthetic gas scavenging system.

7.2.15 Needle free delivery system shall be used to prevent needle stick injury. Appropriate size sharp bins shall be available for sharp disposal.

7.2.16 Prioritisation of emergency cases undergoing surgery shall be made in accordance with the *Peri-operative Mortality Review (POMR) Guidelines, MOH, 1996* and *Sixth Report, 2007.*

7.2.17 Post-anaesthesia patients shall be monitored in the recovery room according to the level of care determined by the physiologic status of the patient.

7.2.18 Staffing requirements;

7.2.18.1 The current ratio of 1 anaesthesiologist to 5 surgeons is of concern. The minimum acceptable ratio of anaesthesiologist to surgeon shall be 1: 3

7.2.18.2 Intra-operative supervision of medical officers (MO) conducting anaesthesia for uncomplicated procedures shall be 1 specialist to 2 MOs.

7.2.18.3 Intra-operative supervision of medical officers (MO) conducting anaesthesia for complicated or complex procedures is 1 specialist to 1 MO.

7.2.18.4 Anaesthesia for highly complex subspecialty procedures shall be specialist-based.

7.2.18.5 In major hospitals with active emergency services, the anaesthesiologist specialist on-call provides resident/active on-call duties whenever possible.

7.2.18.6 The staffing requirement for MOs shall be 1.5 for every anaesthetic location.

7.2.18.7 In hospitals with busy emergency services, there shall be 2 MOs rostered for every emergency operating room. In these hospitals, a 12 hours shift system shall be considered.

7.2.18.8 For every recovery location with more than 10 beds, there shall be at least 1 MO rostered.

7.2.18.9 There shall be at least 1 MO rostered for every 4 ventilated beds at the Post-Anaesthetic Care Unit

7.2.18.10 The minimum period of training for a MO to function independently and administer anaesthesia for uncomplicated cases is 8-12 weeks. However, this shall be assessed on case to case basis and only a MO who is competent shall be allowed to do on-call duties.

7.2.18.11 The anaesthetic nurses shall undergo a post-basic peri-anaesthesia course/Advanced Diploma in Peri-anaesthesia.

7.2.18.12 A skilled anaesthetic assistant is essential for the conduct of anaesthesia. There shall be a dedicated pool of anaesthetic assistants in OT. The anaesthetic assistant shall be appropriately trained and dedicated in the duty of assisting anaesthesia or monitoring patients in recovery room. There shall be 1 assistant per anaesthetic location.

7.2.18.13 There shall be 1 trained nurse for every 2 patients in recovery room. For unconscious patients, the ratio shall be 1 nurse to 1 patient.

7.3 Anaesthesia Service outside the OT

7.3.1 Anaesthesia is increasingly required for procedures outside the OT e.g. radiology and imaging room, endoscope suites, dental clinic, neurophysiology laboratory, obstetric suite, electroconvulsive therapy room, interventional radiology and Invasive Cardiac Catheterisation Laboratory (ICL). The administration of anaesthesia in these locations presents challenges to the anaesthesiologist due to the unfamiliarity with the environment and the special safety concerns in some of the areas e.g. in magnetic resonance imaging (MRI) room.

7.3.2 The same standards of anaesthetic care and facility as in the OT shall be applied to these locations.

7.3.3 The need for pre-operative assessment, medications, patient fasting and anaesthetic consent shall be consistent with the standard anaesthetic care.

7.3.4 There shall be adequate trained staff to assist the anaesthesiologist

7.3.5 Monitoring of patients under anaesthesia shall comply with the standards (refer to *Recommendations for Safety Standards and Monitoring during Anaesthesia and Recovery: College of Anaesthesiologists Malaysia, 2008*).

7.3.6 Post-anaesthesia patient shall be cared for in a designated area with appropriate staff, monitoring and resuscitation equipment.

7.3.7 Post-anaesthesia patient transported from the anaesthetic location to the ward shall be monitored according to the level of care determined by the physiologic status of the patient.

7.3.8 In locations where there are specific health and safety issues e.g. MRI room, radiotherapy room, and safety of patients shall be ensured.

7.3.9 The department shall advise the hospital to implement the *Guidelines on Sedation by Non-Anaesthesiologists* by *College of Anaesthesiologists Malaysia, 2012*.

7.3.10 Referrals from a primary discipline for failed sedation shall be assessed by the anaesthetic team according to the physiologic status of the patient and rescheduled electively at later date.

8. INTENSIVE CARE SERVICE

8.1 The main objective of the Intensive Care Service is to provide the highest standard of care possible using evidence-based practice in all critically ill patients who require intensive monitoring or advanced life support in a safe and comfortable environment for the patients and their relatives.

8.2 The ICU shall provide the level of care appropriate to the size and overall function of the hospital. The level of care shall also be determined by the facilities and expertise available in the unit (refer to Appendix 8).

8.3 There shall be preferably only a single ICU that caters for all patients from all medical and surgical specialties in the hospital. However, in specialty based hospitals or institutes, dedicated ICU may be established.

8.4 For the continuum and high quality of care of the critically ill patients, high dependency patients shall be cared for in an integrated intensive care/high dependency unit (HDU). Similarly, patients requiring stepped down care following intensive care shall be cared for in this integrated unit.

8.5 The number of ICU beds shall be at least 3-5% of total acute hospitals beds in all hospitals. Additional 0.5%-1% beds shall be factored in for post-operative patients undergoing subspecialty surgery e.g. cardiothoracic, neurosurgery, vascular, hepatobiliary, spinal, reconstructive surgery and interventional radiology.

8.6 Care of the critically ill patients shall be provided by a dedicated intensive care team led by preferably an intensivist.

8.7 A separate Paediatric ICU shall be established when the paediatric case load exceeds 300 admission annually.

8.8 The unit shall adopt a culture of accountability that continuously evaluates and improves the services by conducting regular audits.

8.9 Organisation and management:

8.9.1 The head of department of Anaesthesiology and Intensive Care shall be responsible for the overall administrative management, while the appointed intensivist or anaesthesiologist shall be responsible for the day-to-day management of the unit.

8.9.2 The matron/nursing sister/nursing manager shall be responsible for coordinating the nursing services in the unit.

8.9.3 The assistant medical officer (AMO) shall be responsible for the maintenance of the equipment in the unit and work closely with the hospital's concession company.

8.9.4 The unit shall be managed by an intensivist or anaesthesiologist who spends dedicated time in the unit during office hours. During out-of-office hours, the intensivist or anaesthesiologist on-call shall be physically present in the unit when the need arises.

8.9.5 The unit shall have 24 hour cover by a resident MO who shall be responsible for providing first line call during out-of-office hours. The MO shall discuss all referrals and problems in the unit with the intensivist or anaesthesiologist on-call.

8.9.6 The MO to patient ratio of 1:4 shall be adhered to.

8.9.7 The ideal norm of nurse to patient ratio according to the level of ICU shall be adhered to during all shifts when there is full complement of nursing staff.

8.10 Policies and procedures:

8.10.1 Patients admitted to the unit shall be cared for by the MO/Anaesthesiologist/Intensivist from the Department of Anaesthesiology and Intensive Care in a professional, caring and courteous manner.

8.10.2 Consultation with relevant units shall be sought when the need arises.

8.10.3 The unit shall operate as a multi-disciplinary general ICU and shall not segregate patients.

8.10.4 The primary or referring unit shall discuss all referrals to the unit with the intensive care team. This shall include prior acceptance of any patient from another hospital if ICU admission is anticipated.

8.10.5 The attending anaesthesiologist shall inform and discuss in advance with the intensivist or anaesthesiologist in the ICU regarding elective surgical cases requiring post-anaesthesia intensive care. The anaesthesiologist who booked the case shall check on bed availability before starting the case.

8.10.6 All patients referred shall be reviewed by the intensive care team prior to admission. All admission shall be informed to the intensivist or the anaesthesiologist of the ICU.

8.10.7 Priority for admission shall be based on the urgency of patient's need for intensive care (refer to *Management Protocol in ICU; Admission, Triage and Discharge Criteria*,2012 and www.msic.org.my/download/managmentprotocolInICU.pdf).

8.10.8 The referring physician shall continue to provide care for the patient until the patient is admitted to the ICU.

8.10.9 The ICU doctor shall brief the immediate family of the patient's condition, management plan, possible complications and expected outcome on admission to the unit. The immediate relative shall also be updated regularly on the patient's

progress. Enquiry by other relatives or friends shall be directed to the identified immediate relative.

8.10.10 Critically ill patients in ICU shall have invasive procedures performed as part of their management. Consent for surgical procedures shall be obtained (refer to *Consent for Treatment of Patients by Registered Medical Practitioners: Malaysian Medical Council, 2013).*

8.10.11 All patients in the unit shall be identified with an admitting primary unit. Patients transferred in from another hospital shall be identified with the unit that agreed to accept the patient.

8.10.12 It is the responsibility of the admitting primary unit to seek another primary unit for the patient should the team decides to discharge the patient from its care while patient is still in ICU.

8.10.13 All clinical and nursing notes, management and treatment orders for the patient shall be documented legibly in the patient's case notes (either manual or electronic) with the staff's name and signature recorded. There shall only be one set of notes for each patient and this shall be in continuation with the patient's case notes from the ward and in chronological order documenting the progress and management of the patient.

8.10.14 Drugs prescribed to patients shall be in accordance with the MOH approved list of drugs.

8.10.15 Strict measures shall be taken to prevent medication errors in the unit (refer to Appendix 3 and 4)

8.10.16 All medication ordered shall be written in the prescription chart by doctors from the intensive care team. Orders by doctors from other units shall be discussed and agreed upon by the intensive care team prior to initiation.

8.10.17 The unit shall take measures to prevent patient falls

8.10.18 The unit shall comply with all hospital infection control policies. Infection control measures in the ICU shall be guided by the C*onsensus Statement on Infection Control Measures in the ICU*, Malaysian Society of Anaesthesiologists, 2009 and *MOH Policy and Procedures on Infection Control 2010.*

8.10.19 All staff shall observe strict hand hygiene and standard precaution measures during patient care.

8.10.20 Central venous catheter Care Bundle and measures to prevent catheter - related blood stream infection shall be applied to all patients with CVC (refer to *CVC Care Bundle Manual, 2008)*

8.10.21 Ventilator care bundle and measures to prevent ventilator-associated pneumonia shall be applied to all patients who are mechanically ventilated (refer to *Ventilator Care Bundle Manual, 2006* and *ICU Management Protocols 2013*)

8.10.22 Management of patients with severe sepsis or septic shock shall be in accordance to Surviving Sepsis Campaign Guidelines by *Dellinger RP et al. Surviving Sepsis Campaign; International Guidelines for the Management of Severe Sepsis and Septic Shock, 2012 ,Intensive Care Medicine, 2013 39:165 -228)*

8.10.23 All ICU patients shall receive early mobilisation therapy (refer to *Management Protocols in ICU 2012; Early Mobilisation for patients in ICU)*

8.10.24 The prescribing of antimicrobials shall be guided by the related guidelines (refer to *The Guide to Antimicrobial Therapy in Adult ICU 2012*, *Malaysian Society of Intensive Care) and National Antibiotic Guidelines, MOH, 2008*

8.10.25 Patients shall be screened for their nutritional status and fed according to the Protocol on Enteral and Parenteral Nutrition in ICU (refer to *Management Protocols in ICU 2012)*

8.10.26 The clinical management of patients in the ICU shall be guided by MOH guidelines (refer to *Management Protocols in ICU*, *MOH, 2012*).

8.10.27 Intra and inter-hospital transport of patients from ICU shall be the responsibility of the Intensive Care team. The primary unit shall be responsible for intra and inter- hospital transport of critically ill and ventilated patients managed in their ward. However, the intensive care team may assist depending on resource availability.

8.10.28 All discharges to the ward shall be informed to the primary unit doctor prior to transfer. A discharge summary documenting the diagnosis, progress and management of the patient in the unit and further management plan shall be attached to the case notes of the patient.

8.10.29 All staff shall care for the dying patients in the same compassionate and caring manner as they would care for patients who are expected to survive. Physical, emotional and spiritual needs shall be provided to the dying patients and their relatives to the best of one's ability.

8.10.30 When continuing intensive care is deemed medically futile; consideration shall be given to withholding or withdrawing of life-support. This decision shall be discussed with the patient, family and other team members as appropriate (refer to *Withholding and Withdrawing of Life Support Therapy in ICU*, *Management Protocols in ICU, 2012*)

8.10.31 Requests for ill patients to be discharged home shall be discussed with the primary unit prior to approval.

8.10.32 All deaths shall be informed to the primary unit and Cause of Death discussed when necessary.

8.10.33 Due to bed constraints, some patients may be ventilated in other critical care areas or general wards as a temporary measure, until a bed is available or the patient is referred to another hospital. Patients ventilated in the wards shall be reviewed by the intensive care team regularly. (refer to *Appendix 8;Guide for Management of Patients Who are Ventilated in the Ward and Policy on Mechanical Ventilation outside the ICU*; *Management Protocols in ICU 2012*)

8.10.33 The Intensive Care Service shall be prepared for any surge in demand such as during mass casualties or disease outbreaks, following the appropriate MOH/hospitals guidelines.

8.10.34 Intensivist visits to hospitals without intensivist shall be on a referral basis. Tele-consultation with intensivists shall be encouraged for difficult cases.

8.10.35 The number of primary team /visiting doctors shall be restricted as per department policy.

8.11 Facilities and equipment

8.11.1 The area for each bed shall be sufficient to allow easy access to the patient and to allow the deployment of equipment needed to manage the patient appropriately. It shall also take into account the risk of cross infection.

8.11.2 All ICUs shall be provided with isolation rooms with positive/negative pressure facilities for isolation of patients who are highly infectious.

8.11.3 Apart from patient care areas there shall be a designated room/area for counselling of relatives

8.11.4 Separate areas for cleaning and storage of equipment (refer to *Guidelines on ICU Design*. *American College of Critical Care Medicine & Society of Critical Care Medicine, 1995)*

8.11.5 Equipment in ICU shall be of appropriate type and quantity suitable for the function and workload of the unit. All emergency and life support equipment shall be readily accessible and functional (refer to *List of Recommended Equipment for Various Facilities,* Appendix 5*)*

8.11.6 All equipment shall be in good working condition and there shall be planned preventive maintenance schedules and regular safety tests on all equipment.

9. SUB-SPECIALTY ANAESTHESIA SERVICES

9.1 Cardiothoracic Anaesthesia and Perfusion Service (CAP)

9.1.1 The scope of the service includes;

9.1.1.1 Anaesthesia for adult and paediatric cardiac and thoracic surgeries

9.1.1.2 Anaesthesia for diagnostic or therapeutic cardiac and major vascular catheterisation procedures

9.1.1.3 Post-operative management of the cardiothoracic surgical patients in Cardiothoracic Intensive Care Unit (CICU)

9.1.1.4 Peri-operative transoesophageal echocardiography (TOE) examination

9.1.1.5 Perfusion support for extra-corporeal membrane oxygenation (ECMO)

9.1.2 The objective of the service is to provide safe and efficient peri-operative cardiothoracic anaesthesia, perfusion and cardiothoracic intensive care to all patients undergoing cardiothoracic surgery and invasive cardiology procedures.

9.1.3 The CAP service in the hospital shall be guided by the unit operational policies and relevant departmental and hospital policies

9.1.4 CAP is fully specialist based. The staffing ratio for cardiothoracic anaesthesiologist to cardiothoracic surgeon is 2:1

9.1.5 There shall be 2 trained cardiothoracic anaesthesiologists per patient location where cardiac surgery is performed. This is to ensure adequate staffing, the administration of anaesthesia, conduct and supervision of cardiopulmonary bypass and performance of TEE examination.

9.1.6 The unit shall have an elective cardiothoracic operating room schedule made in accordance with the number of cardiothoracic operating rooms, clinical and paramedic staffing levels and other resource factors.

9.1.7 Perfusion service is under the administrative management of the unit head of CAP who is appropriately trained in medical perfusion.

9.1.8 The Unit Head shall be assisted by a Chief Perfusionist who is a qualified assistant medical officer or of equivalent qualification appropriately trained in clinical perfusion.

9.1.9 There shall be 2 trained perfusionists per patient in every location where cardiopulmonary bypass is performed.

9.1.10 Perfusion Services shall be made available for all elective and emergency cases 24 hours including weekends and public holidays.

9.1.11 Perfusion support for ECMO shall be provided by a team specially trained for the service.

9.1.12 In line with the development of integrated intensive care services, post-operative care of cardiac surgical patients shall be integrated into such service.

9.1.13. Existing CICU shall be managed by the CAP unit in close liaison with the Intensive Care Service within the department until such time when the CICU can be integrated into the multi-disciplinary intensive care service.

9.1.14 Clinical management of the post-cardiac surgical patients shall be the joint care of the intensivists, cardiothoracic anaesthesiologist and the cardiothoracic surgeon.

9.1.15 Peri-operative TOE services;

9.1.15.1 Shall be provided where there are appropriately trained cardiothoracic anaesthesiologists in TOE

9.1.15.2 The service shall made available for diagnostic and monitoring purposes in OT (cardiac and general) and ICU (CICU and GICU)

9.1.15.3 The anaesthesiologist who performs the TOE shall work in consultation with the cardiology team for diagnostic interpretations of difficult cases that involve major surgical decisions.

9.2 Paediatric Anaesthesia Service

9.2.1 Anaesthesia for children demands special requirements usually unavailable in hospitals that are not dedicated to paediatric care. Children differ physiologically, anatomically, emotionally and socially. Wherever and whenever children undergo anaesthesia and surgery, their particular needs must be recognised and they must be managed in appropriate facilities and looked after by staff with relevant experience and training.

9.2.2 Children may require anaesthesia for a variety of surgical conditions; many will be elective and straight forward and are performed in non-specialist centers, usually in fit infants and children.

9.2.3 Children with significant acute or chronic medical problems, those undergoing complex major surgeries including cardiothoracic and neurosurgical, neonates and infants born less than 37 weeks of gestation and with a post-conceptual age of less than 52 weeks and small infants shall be referred to specialist units or tertiary paediatric centers.

9.2.4 Hospitals without paediatric anaesthesiologists or paediatric surgeons shall be able to manage and treat minor surgical elective procedures and surgical emergencies in children. In life-threatening emergency where transfer is not feasible, the most senior and appropriately experienced anaesthesiologists available shall undertake the anaesthesia.

9.2.5 Hospitals without paediatric anaesthesiologists or paediatric surgeons shall be able to resuscitate and stabilise seriously ill neonates, infants and children of all ages prior to transfer to a specialised children's unit for surgery or paediatric intensive care management.

9.2.6 There shall also be guidelines on which cases that shall be managed on site and which shall require transfer to a more specialised unit. Appropriate clinical pathways organized and commissioned within a surgical and anaesthesia network for children shall be established.

9.2.7 Neonatal and paediatric high dependency and intensive care services shall be available as appropriate for the type of planned surgery performed within a hospital.

9.2.8 Parents (or carers) shall be involved in all aspects of the decisions affecting the care of their children including the physical and psychological preparation for, and recovery from, anaesthesia and surgery.

9.2.10 All children scheduled for surgery shall be assessed before their operations. Parents shall be given full information about the proposed anaesthesia and surgical procedures and their written consent obtained.

9.2.11 There shall be a discussion with the child's parents about the conduct of anaesthesia and provision of post-operative pain relief.

9.2.12 Where special techniques such as regional anaesthesia, peripheral nerve blocks, invasive monitoring and blood transfusion are planned, they shall be discussed with the child and the parents. Children shall be given an explanation of these procedures appropriate to their age.

9.2.13 The ideal child-oriented peri-operative anaesthesia environment may not be able to be provided in all hospitals. However, wherever and whenever children undergo anaesthesia and surgery, their particular needs shall be recognized and managed in separate facilities from adults and looked after by staff with appropriate experience and training.

9.2.14 There shall be provision for parents to accompany children to the induction room and into recovery room. Parents shall be allowed into the OT in their 'street clothes'. They shall wear a gown over their clothes, with a change of footwear to theatre footwear, and a cap to cover their hair.

9.2.15 Pre-operative fasting practice shall be in accordance with the accepted guidelines (refer to *Guidelines on Pre-operative Fasting*, *College of Anaesthesiologists, Academy of Medicine Malaysia, revised 2008).*

9.2.16 Children of all ages who require anaesthesia shall be managed by anaesthesiologists who have received the necessary training in paediatric anaesthesia. They shall work within the limits of their professional competence.

9.2.17 MOs shall be appropriately supervised by a specialist when anaesthetising children. The level of supervision of a MO shall vary according to their ability and experience, the complexity and location of the procedure, the presence of any relevant co-morbidity and the age of the child.

9.2.18 A second anaesthesiologist is encouraged to be present, to act as a skilled assistant for the care of infants and children classified as ASA 3 or greater.

9.2.19 An anaesthesiologist shall be assisted by a skilled assistant and anaesthetic nurse who has specific paediatric skills and training where possible.

9.2.18 Specific requirements shall be:

9.2.18.1 Appropriate equipment for the needs of infants and children (age-adjusted).

9.2.18.2 Temperature control and patient warming devices shall be available to maintain body temperature throughout the peri-operative period.

9.2.18.3 Monitoring equipment shall comply to the *Recommendations for Safety Standards and Monitoring during Anaesthesia and Recovery: College of Anaesthesiologists Malaysia, 2008.*

9.2.18.4 Resuscitation drugs and equipment including a defibrillator, shall be routinely available at all sites where children are to be anaesthetised.

9.2.18.5 Anaesthetic machines shall incorporate ventilators with features to provide ventilation for the entire age range of paediatric patients.

9.2.18.6 There shall be adequate acute pain relief for children of all ages in accordance to *Pain Management Handbook*, MOH, 2013.

9.2.18.7 Recovery areas for children shall be separated or screened from those used by adults. It shall be equipped with paediatric airway and resuscitation equipment.

9.2.18.8 Infants and children undergoing procedures under sedation shall be accorded similar standard of care as those undergoing anaesthesia.

References:

Guidelines for the Provision of Anesthetic Services/Paediatric Anaesthesia, *Royal College of Anaesthetists, UK, 2013 by Wilkinson KA et al.* www.rcoa.ac.uk/gpas2013

Committee of Origin: Paediatric Anaesthesia, American Society of Anaesthesiologists, 9 Oct 2011

Statement on Anaesthesia Care of Children in Healthcare Facilities without dedicated Paediatric Facilities: Australian and New Zealand College of Anaesthetists. Review PS29, 2008

Valentin A, Ferdinande P, ESICM Working Group on Quality Improvement. Recommendations on basic requirements for intensive care units: structural and organizational aspects. Intensive Care Medicine, 2011

Rungta N, Govil D, Nainan S et al. Guidelines 2010 - ICU Planning and Designing in India

Ward NS, Levy MM. Rationing and critical care medicine. Crit Care Med 2007 Vol. 35, No. 2 (Suppl.)

Joynt GM, Gomersall CD. What do "triage" and "informed consent" really mean in practice? Anaesthesia Intensive Care 2011; 39: 541-544

Management Protocols in ICU,MOH,August 2012

9.3 Neuro-anaesthesia Service

9.3.1 The scope of service in neuro-anaesthesia will include anaesthesia for elective and emergency neurosurgical, spinal surgery as well as interventional neuro-radiological procedures

9.3.2 Hospitals designated as neurosurgical centers shall be staffed by anaesthesiologist trained in neuro-anaesthesia and credentialed to administer anaesthesia for advanced neurosurgical procedures.

9.3.3 In hospitals without resident neurosurgeons, anaesthesia is limited to emergency neurosurgical procedures such as uncomplicated neuro-trauma surgery or evacuation of intra or extra-cranial clots.

9.3.4 Administration of anaesthesia shall be carried out by a trained anaesthesiologist or by a doctor under direct supervision of a trained anaesthesiologist.

9.3.5 The anaesthesiologist shall be responsible for arranging an ICU bed for patients requiring ICU admission after surgery. For semi-urgent neurosurgical cases requiring ICU support, the anaesthesia team shall communicate with the neurosurgical team regarding decisions on when to call the case for surgery.

9.3.6 For urgent transfer of head injury cases from other hospitals to neuro-centers, the referring hospitals shall communicate with the neurosurgical team on the indication for transfer and need for further management. The neurosurgical team shall inform the anaesthetic team once the case has been accepted for surgery and post-operative ICU support.

In situations where ICU is full, the patient shall be ventilated temporarily in the ward until such time that the patient can be brought to the ICU. The neuro-surgical team shall ensure that trained nurses and monitoring facilities are provided for managing the patient.

9.3.8 In centers offering neuro-interventional services, the designated radiological suite shall have adequate facilities for providing safe anaesthesia (*Recommendations*

for safety standards and monitoring during anaesthesia and recovery, *Revised 2008. College of Anaesthesiologists, Academy of Medicine of Malaysia).*

9.4 Obstetric anaesthesia service

9.4.1 The objectives of the service are;

9.4.1.1 To manage obstetric patients needing anaesthesia and analgesia in a safe and efficient manner and based on current best available evidence

9.4.1.2 To maintain support of the vital functions in any obstetric emergency.

9.4.2 An OT shall be made available 24 hours for emergency lower segment caesarian section (LSCS) and other obstetric surgery.

9.4.3 In hospitals with high volume obstetric service, there shall be at least one other operating room for elective LSCS and other obstetric surgery.

9.4.4 Anaesthesia for uncomplicated obstetric surgeries shall be managed by appropriately trained MOs under the supervision of a specialist. Complicated or high risk cases shall be managed by specialists.

9.4.5 A trained anaesthetic assistant shall be present at all times during the procedures.

9.4.6 Equipment, facilities and support personnel similar to that provided in surgical operating suite shall be available. This include the availability of a properly equipped and staffed recovery room capable of receiving and caring for patients recovering from major regional or general anaesthesia.

9.4.7 High risk obstetric patients and all patients scheduled for LSCS shall be assessed at the anaesthetic clinic as early as possible or at least 1 month prior to the expected date of delivery. An anaesthetic management plan shall be clearly documented after consultation with the obstetrician and when necessary, with the physician or other consultants. The management plan shall mention the anaesthetic team involved in the care, choice of labour analgesia, intra-operative anaesthetic technique, immediate post-operative care including intensive care and post-operative pain control.

9.4.8 The department shall provide appropriate post-operative pain relief.

9.4.9 The department shall have clear documented lines of communication to ensure the availability of obstetric anaesthesia and analgesia services in any emergency situation. Alternative options for second OT/team shall be available if indicated.

9.4.10 The department is an essential member of the 'Red Alert' team and shall respond to requests to assist in the resuscitation and management of the critically ill patients e.g. eclampsia, severe post-partum haemorrhage.

9.4.11 Ultrasonography shall be used to assist in locating spinal / epidural space in difficult spine or obese patients

9.4.12 Oocyte retrieval shall be performed in day care OT /set up equipped with proper monitoring, resuscitation and recovery according to Minimum Safety Standards (refer to *Recommendations on Minimum Facilities for Safe Anaesthesia Practice in Operating Suites and Other Anaesthesising Locations:* Australia and *New Zealand College of Anaesthesiologists. P255. 2012).*

9. 4.13 Maternal mortality forms shall be filled within 24 hours upon receipt.

9.4.14 There must be representation from the department during hospital maternal mortality review

9.4.15 There shall be a dedicated specialist for coverage of maternity OT and labour room during office hours

9.5 Day care anaesthesia Service

(refer to *Day Care Anaesthesia Protocols*, *MOH, 2012)*

10. PAIN MANAGEMENT SERVICE

Organisation and management

The Pain management specialist shall be overall in charge of the pain management services which include acute, chronic and cancer pain as well as obstetric analgesia. In hospitals with an obstetric anaesthesiologist, the OAS will be under the care of the obstetric anaesthesiologist.

The APS is the responsibility of all specialists and not solely the responsibility of the Pain medicine specialist.

Acute Pain Service

10.1.1 Acute pain management service shall be provided to all patients in need.

10.1.2 Organisation and management

10.1.2.1 A specialist (not necessarily a pain specialist) shall be assigned to be overall in charge of the Acute Pain Service.

10.1.2.2 The day-to-day management of the service is under the responsibility of an assigned specialist anaesthesiologist and medical officer.

10.1.2.3 After office hours cover shall be provided by one of the medical officers on call, with specialist input where necessary.

10.1.2.4 The Acute Pain Service (APS) nurse is responsible for acute pain nursing care (setting up the patient controlled analgesia/ epidural/plexus infusions) and patient monitoring.

10.1.2.5 There shall be at least 2 trained and credentialed APS nurses. Depending on the workload, more nurses may be appointed to the APS.

10.1.2.6 It is recommended that the pharmacist be responsible for the preparation of syringes with pre-mixed drugs.

10.1.3 Policies and procedures;

10.1.3.1 Patients on PCA, epidural and plexus infusion techniques may only be managed in wards where nurses have been trained in acute pain management.

10.1.3.2 Management of all patients shall be provided as in standard protocols based on the Pain Management Handbook 2013.

10.1.3.3 All patients shall receive monitoring and observations as per protocol and all observations shall be charted in the APS form.

10.1.3.4 The APS team shall review all patients at least twice a day. A doctor shall be present at a minimum of one of these ward rounds. Additional visits by APS doctor or nurse shall be carried out when necessary.

10.1.3.5 Disposal of opioid-containing solutions shall be done in accordance to the MOH protocol (refer to *Pain Handbook Management*, MOH, 2013)

10.1.3.4 Traditional and complementary medicine including acupuncture shall be incorporated into acute pain management techniques, as a step towards “Pain Free Hospitals”.

10.1.4 Training, Audit and Research

10.1.4.1 The APS team shall conduct regular training for nurses on acute pain management.

10.1.4.2 In accordance with MOH policy, the APS team shall assist to train and implement Pain as the 5th Vital Sign (P5VS) for the whole hospital.

10.1.4.3 Regular audit of the APS shall be carried out to monitor the outcomes of APS i.e. quality of analgesia, side effects, complications and patient satisfaction.

10.1.4.4 Appropriate research projects on Acute pain management shall be carried out.

Obstetric Analgesia Service

10.2.1 The objective is to provide safe & effective analgesia to labouring mothers.

10.2.2 Organisation and management;

10.2.2.1 Twenty four hours Obstetric analgesic services (OAS) shall be available whenever possible, in all hospitals with specialists.

10.2.2.2 An anaesthesiologist & a medical officer shall be assigned daily to provide this service.

10.1.2.3 After office hours cover shall be provided by one of the medical officers on call, with specialist input where necessary.

10.2.2.4 During office hours, the OAS nurse shall be responsible for assisting the anaesthesiologist or medical officer and for initial monitoring of the labouring mother. After office hours, this will be the responsibility of a nurse from the labour room.

10.2.2.5 It is recommended that the pharmacist be responsible for the preparation of syringes with pre-mixed drugs.

10.2.3. Policies and procedures;

10.2.3.1 The labour room shall be equipped with adequate monitoring & emergency resuscitation facilities.

10.2.3.2 Consent shall be obtained from the patient prior to the performing the procedure.

10.2.3.3 Details of all labour analgesia performed shall be recorded on the Obstetric Analgesia Service (OAS) forms.

10.2.3.4 The initial maternal and foetal monitoring shall be done by the OAS nurse; subsequent monitoring shall be done according to the appropriate protocols. (Refer to *Pain Management Handbook,MOH, 2013*). Parameters monitored shall be recorded in the appropriate form.

10.2.3.5 Epidural catheters shall be removed by the OAS nurse or anaesthesiologist when the epidural is no longer required. The removal of such catheters shall be documented in the OAS form.

10.2.3.6 Post-operative obstetric patients shall be reviewed by the OAS team at least once a day and at other times if necessary.

10.2.4 Training, Audit and Research

10.2.4.1 The OAS team shall conduct regular training for nurses on obstetric analgesic techniques.

10.1.4.2 Traditional and complementary medicine including acupuncture, may be incorporated into the management of labour pain, as a step towards "Pain Free Hospitals".

10.1.4.3 Regular audits of the OAS shall be carried out to monitor the outcomes i.e. quality of analgesia, side effects, complications and patient satisfaction.

10.1.4.4 Appropriate research projects on Obstetric analgesia shall be carried out.

Chronic Pain Service

10.3.1 The objective is to provide pain management services to patients with chronic non-cancer and cancer pain.

10.3.2 Organisation and management;

10.3.2.1 Pain Management Clinics shall be established in all state hospitals and in other specified hospitals with specialists.

10.3.2.2 A Pain Medicine specialist shall be in charge of the Pain management clinic.

10.3.2.3 In addition to the doctors, the following supportive staff shall also be in attendance for patient assessment and management: physiotherapists, occupational therapists, clinical psychologists and/or psychiatrists, social workers and pharmacists. All staff should receive the appropriate training and experience in management of chronic and cancer pain.

10.3.2.4 The chronic pain management clinic shall have the appropriate space required to run a multidisciplinary clinic. As far as possible this should be part of the Specialist Clinic complex.

10.3.2.5 OT facilities for interventional procedures, preferably in the Ambulatory Care Center (ACC) shall be made available.

10.3.2.6 The service should have access to equipment for interventional procedures including fluoroscopy, ultrasound, radiofrequency and electro-acupuncture.

10.3.2.7 There shall be *at least* one medical officer, one specialist and one nurse in attendance at each clinic and interventional session.

10.3.3 Policies and procedures;

10.3.3.1 All patients shall be seen on a referral basis. Patients should be referred to the Pain Clinic by a specialist or general practitioner, following set referral criteria and appointments shall be given according to priority. Patients with cancer pain shall be seen as soon as possible.

10.3.3.2 All patients seen at the Pain Clinic shall be assessed and managed by a multidisciplinary team using a multimodal approach.

10.3.3.3 As far as possible, diagnostic and/or therapeutic procedures shall be done on a day care basis.

10.3.3.4 Chronic pain patients requiring admission to hospital for any reason (e.g. control of severe pain) shall be admitted under the appropriate primary unit.

10.3.3.5 Traditional and complementary medicine including acupuncture, shall be a standard chronic pain management technique, as a step towards "Pain Free Hospitals".

10.3.4 Training Audit and Research

10.3.4.1 In accordance with MOH policy, the pain team shall help to train and implement Pain as the 5th Vital Sign (P5VS) for the whole hospital.

10.3.4.2 Regular audits shall be carried out to monitor the outcomes of pain management modalities used for chronic and cancer pain.

10.3.4.3 Appropriate research projects on chronic pain management shall be carried out.

11. TRAINING AND EDUCATION

11.1 The department shall define the level of knowledge, skills and training requirements for all its personnel.

11.2 A written orientation programme shall be used to introduce new staff to the relevant aspects of the facilities and prepare them for their roles and responsibilities.

11.3 The staff shall have access to appropriate educational programmes to maintain and augment their professional competency. Participation in these educational or training activities shall be documented in *myCPD*.

11.4 The department shall facilitate staff to attend relevant educational programmes conducted by professional bodies, societies and educational institutes.

12. QUALITY AND RESEARCH

12.1 Quality Improvement

12.1.1 There shall be a continuous process of clinical data collection and analysis to establish the changing pattern in clinical practice, morbidity and mortality.

12.1.2 Whenever possible, data shall be collected using a standard procedure or format for the purpose of comparison and analysis.

12.1.3 There shall be a mechanism for audit findings to be used effectively for continuous improvement of patient care.

12.1.4 To achieve the above objectives, the department shall participate in the following existing MOH quality initiatives:

12.1.4.1 Incident reporting

12.1.4.2 NIA and KPI (refer to Appendix 11)

12.1.4.3 Pain as 5th vital sign and Pain free hospitals

12.1.4.3 POMR and SSSL

12.1.4.4 Malaysian Registry in Adult ICU (MRIC) and its related activities e.g. Compliance to Ventilator Care Bundle and CVC Care Bundle

12.1.4.5 In addition to the above, the department shall also conduct hospital or department specific quality improvement studies and participate in clinical audits initiated at national level by MOH.

12.1.4.6 Patient Safety Goals (refer to *Director General of Health Circular No 2/2013*, *dated 2 May 2013* and *Malaysian Patient Safety Goals-Implementation and Surveillance, effective 1 June 2013*)

12.2 Research

12.2.1 The department shall work closely with the hospital Clinical Research Center and other relevant bodies e.g. universities to advance research activities.

12.2.2 The department shall support research activities by providing funding, facilities, and protected time for the staff

12.2.3 The department shall participate in international multi-centered clinical trials

13. GENERAL HOSPITAL OPERATIONAL POLICY (GHOP)

13.1 The department of Anaesthesiology and Intensive Care shall abide with the GHOP in the following areas:

13.1.1 Hospital admission and discharge policy

13.1.2 Hospital Visitors Board, Visitor and visiting hours

13.1.3 Policy on porter service

13.1.4 Infection control policy

13.1.5 Central Sterilisation service

13.1.6 Management of hospital waste

13.1.7 Policy on supply of pharmaceuticals and consumables

13.1.8 Policy of procurement of assets and medical equipments

13.1.9 Catering services

13.1.10 Laundry and Linen supply

13.1.11 Cleaning and Cleansing services

13.1.12 Engineering services including planned preventive maintenance services

13.1.13 Security Services

13.1.14 Fire precaution and Disaster Plan for Mass Casualties

13.1.15 Medical Record Management

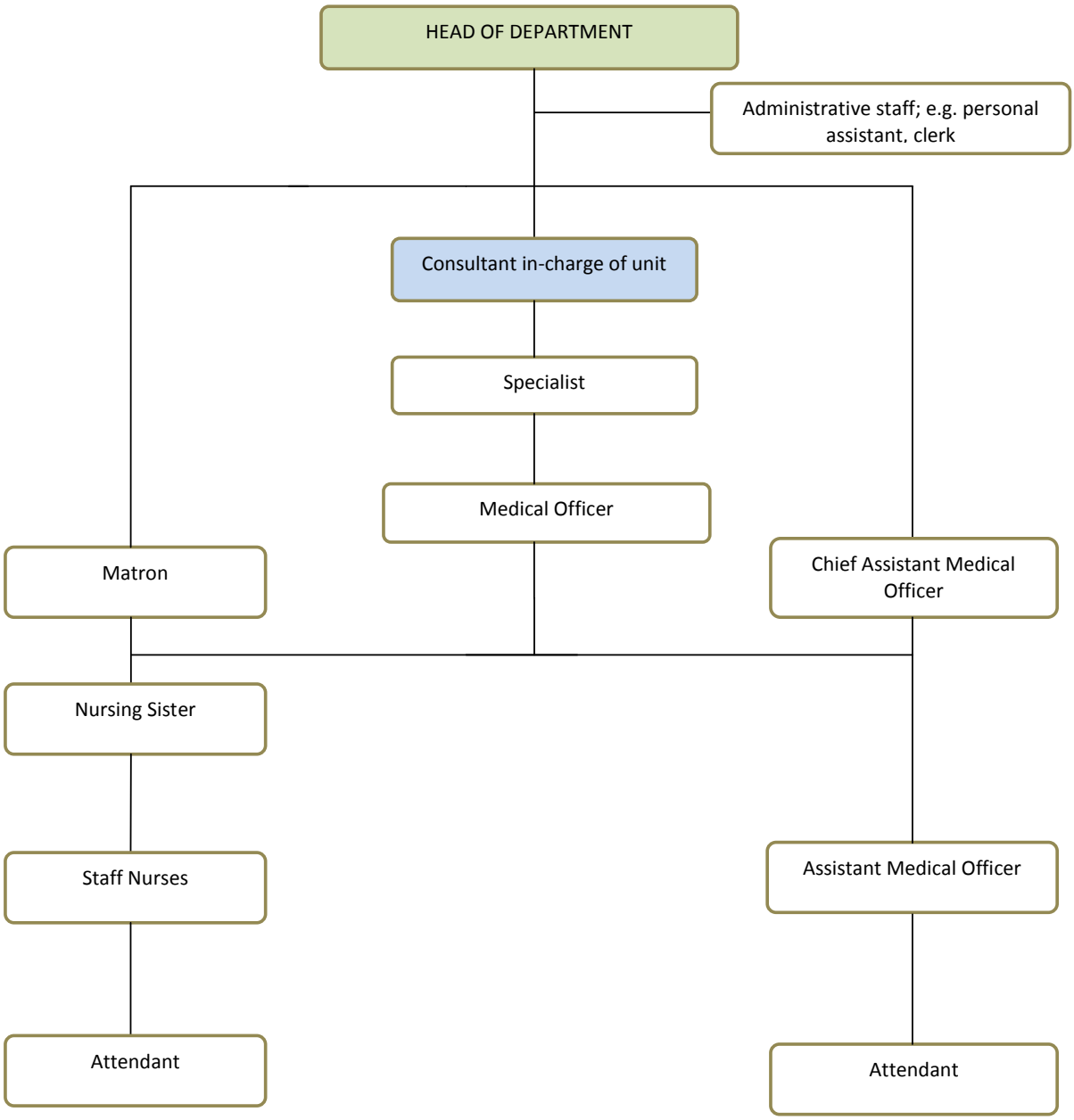
13.1.16 Information and Communication (ICT) Technology system

13.1.17 Policy of Quality Assurance

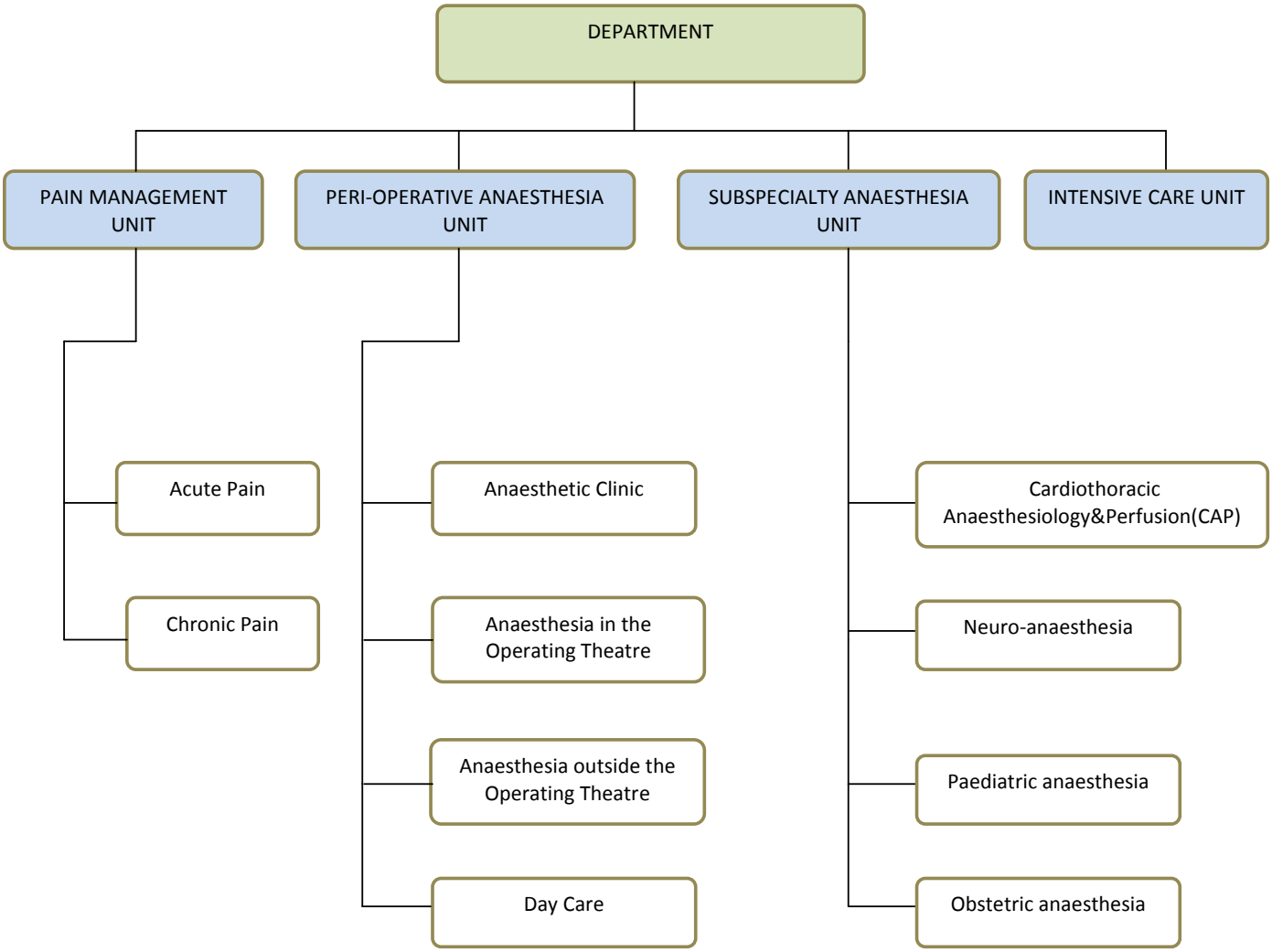
13.1.18 OSHA, Sharp Management and Needle Stick Injury Policy and Guidelines

13.1.19 Policy regarding public relations, release of information and confidentiality

APPENDICES



Appendix 1 Chart 1; Organisation Chart (by Position) of the Department of Anaesthesiology and Intensive Care



Appendix 1 Chart 2;Organisation Chart (by Function) of the Department of Anaesthesiology and Intensive Care

Appendix 2

TERMS OF REFERENCE FOR DEPARTMENT COMMITTEES

A. Management Committee

1. This committee is the highest decision making committee in the department
2. The committee shall assist the head of department in the day-to-day running of the department
3. The committee shall be chaired by the head of department. The composition of members shall depend on the size of the department; generally it shall consist of senior consultants, doctors, nurses and assistant medical officers who are in-charge of the various components of the service.
4. The committee shall meet monthly or whenever necessary to discuss management issues e.g. departmental policies, strategic development of the department, procurement of consumables and equipments, stock keeping, staff issues etc.

B. Quality Assurance Committee

1. The function of the committee is to promote, organise and monitor the quality improvement activities including Key Performance Indicators, clinical audits and research
2. The committee is responsible for the successful implementation of all quality initiatives under the MOH Quality Assurance Program
3. The committee shall be chaired by senior consultant who may or may not be the quality assurance coordinator. Its member shall include officers in-charge of the various quality activities e.g. National Indicator Approach (NIA), incidence reporting, Peri-operative Mortality Review (POMR), National Audit on Adult Intensive Care (NAICU) etc.
4. The committee shall meet at least 3 times a year and prepare reports and feedbacks as required

C. Continuing Professional Development (CPD) Committee

1. The function of the committee is to plan, promote, organize and monitor CPD activities in the department.
2. The committee shall maintain the CPD records of its staff members and verify their attendance

3. The committee shall be chaired by a specialist. Its membership shall comprise of officers in-charge of the various CPD activities for all categories of staff including doctors, anaesthetic nurses, ICU nurses and assistant medical officers.
4. The committee shall meet at least three times a year.

D. Safety and Health Committee

1. The function of the committee is to ensure a safe working environment against falls, electrical, chemical and sharp injuries, fire and gas explosions, crimes etc for its staff. The committee shall also provide training related to safety for its staff.
2. The committee shall liaise closely with the hospital Safety and Health Committee for the implementation of the hospital wide safety and health measures.
3. The committee shall be chaired by a specialist or the appointed department safety and health officer.
4. Its membership shall include area members i.e. matron/sister and assistant medical officers of various locations e.g. OT, ICU
5. The committee shall meet 3 times a year

Appendix 3

GUIDE ON PATIENT SAFETY IN THE DEPARTMENT OF ANAESTHESIOLOGY AND INTENSIVE CARE

(Also refer to SAFE SURGERY SAVES LIVES INITIATIVE: Implementation Guideline "Safer Surgery through Better Communication", MOH, Nov 2009)

1. As part of the department's initiative to enhance patient safety, attention shall be paid to team-work, communication, education and training.
2. Correct identification of patient prior to surgery shall be done by 2 staffs using 2 patient identifiers; in order of priority:
   2.1 Ask the patient his/her name, date of birth, identification card number and/or address and verify it against the information in the patient's case notes
   2.2 If the patient is unable to tell his/her name, refer to the identification bracelet and if possible verify the information by asking family or relatives
   2.3 By asking the patient's relative to identify the patient by name, date of birth and /or address
   2.4 By the hospital registration identification number
3. Patients shall be identified correctly prior to administration of blood and blood products, medications, procedures, interpretation of data, investigations and imaging.
4. Two staffs shall counter-check the correct drug, dose, dilution and route prior to administration of high alert medications (digoxin, heparin, potassium chloride, insulin, magnesium sulphate and epidural/regional block infusions). Therapeutic levels shall be monitored where applicable.
5. Administration of blood and blood products shall adhere to the existing protocols.
6. Management of patients undergoing sedation shall be in accordance to the existing guidelines.
7. The department shall undertake measures to prevent patient harm resulting from falls. Patients in the OT shall not be left unattended. Adequate assistance shall be provided for positioning of the patient for any procedure. Transport trolleys shall be fitted with side rails.

Appendix 4

GUIDE ON MEDICATION SAFETY IN THE DEPARTMENT OF ANAESTHESIOLOGY AND INTENSIVE CARE

1. The department shall abide by the rules and regulations of the MOH and hospital policy on medication use
2. All medication prescribed shall be in accordance with the approved list of drugs in the MOH. The use of medication not in the MOH drugs formulary shall require prior approval from the Director General of Health Malaysia
3. All anaesthetic, resuscitative, psychotropic and other identified medication shall be stocked in adequate quantities and be readily available in the OT and ICU.
4. Dedicated staff shall be responsible for the ordering and receiving of drugs to ensure adequate supply in the OT and ICU (refer to Appendix 9). All medication shall be properly and safely stored.
5. Controlled substances shall be accurately accounted and recorded according to applicable law and regulation of MOH
6. All medications to be administered to the patients shall be accurately labeled in colour with the name of medication and its concentration.
7. All medication and storage areas shall be periodically inspected according to hospital policy to prevent abuse, theft or loss. The process shall ensure that medication is stored properly and replaced when used, damaged or expired.
8. Inventory of medication shall preferably be kept in each storage area (refer to Appendix 7)
9. All multi-dose vials and ampoules shall be swabbed with alcohol wipes prior to drawing out the contents.
10. All medications administered to the patients shall be clearly written into the patient's record with regards to name, dosage, route and time.
11. All compound medication (e.g. epidural cocktails) shall be prepared under aseptic technique.
12. Patients shall be monitored for drug effectiveness and adverse effects. All adverse effects shall be documented into the patient's records, informed to the patient (or relative) and reported to the pharmacy via the adverse drug reaction (ADR) format.
13. All medication errors and near misses shall be reported using MOH standardised forms for education and prevention as part of the patient safety program.

Appendix 5

LIST OF RECOMMENDED EQUIPMENT FOR VARIOUS FACILITIES

A. Anaesthesia

No	ITEM
1	Anaesthesia workstation with anaesthesia machine, ventilator, physiologic monitor & computer/printer (charting)
2	Fibreoptic laryngoscope with video camera system
3	Emergency trolley
4	Difficult intubation trolley; video assisted laryngoscope, intubating LMA, fibreoptic bronchoscope, bougies, Mc Coy laryngoscope, supraglottic devices, cricothyroidotomy set
5	Suction pump
6	Rapid infuser
7	Cardiac Pacing and Defibrillation Device.
8	Infusion syringe pump
9	Infusion volumetric pump
10	Target controlled infusion pump (TCI)
11	Portable ultrasound machine
12	Peripherals nerve stimulator
13	Bispectral index (BIS) monitor
14	Warming blanket
15	Warming mattress
16	Overhead warming device/ceiling warmer
17	Pneumatic compression devices.
18	Patient transport trolley
19	Patient transfer device
20	Blood warming device
21	Blood refrigerator
22	Drugs refrigerator
23	Fluid/blanket warming cabinet
24	Disinfectant washer
25	Equipment drying cabinet
26	Video laryngoscope
27	Anaesthesia cart

B. Recovery Room

No	ITEM
1	Recovery room monitor-6 channel
2	Transport monitor with end tidal CO2 monitoring
3	Transport ventilator
4	Suction pump
5	Electrocardiography (ECG)
6	Patient recovery trolley
7	Infusion syringe pump

C. Intensive Care Unit

No	ITEM
1	Critical care bed
2	ICU ventilator
3	Non invasive ventilator
4	Transport ventilator
5	Physiologic monitor System/Equipment
6	Transport monitor
7	Electrocardiography (ECG)
8	Cardiac Pacing and Defibrillation Device
9	Emergency trolley
10	Infusion syringe pump
11	Infusion volumetric pump
12	Enteral feeding pump
13	Suction pumps
14	Arterial blood gas/serum electrolyte analyser
15	Warming blanket
16	Heating or Cooling Unit for medical mattress
17	Pneumatic compression device
18	Blood refrigerator
19	Drug refrigerator
20	Washer disinfectant
21	Equipment drying cabinet
22	Patient rehabilitation chair
23	Patient Hoist Systems

Additional for Level 2 & 3 ICUs

No	ITEM
1	Continuous renal replacement therapy (CRRT) machine
2	Flexible fibreoptic bronchoscope with video camera system
3	Non invasive cardiac output monitor
4	Ultrasound machine
5	Bispectral index (BIS) monitor

Additional Level 3 ICUs

No	ITEM
1	Rapid fluid infusion system
2	Fluid management system
3	Trans-esophageal echocardiography (TEE)
4	Intracranial pressure monitor
5	Near Infrared Spectrometry

D. PAIN MANAGEMENT

No	ITEM
1	Patient control analgesia pump
2	Syringe pump
3	Radiofrequency machine
4	Transcutaneous electrical nerve stimulation (TENS) machine
5	Nerve Stimulator
6	Ultrasound
7	Electro-acupuncture

Appendix 6

GUIDE ON EFFECTIVE COMMUNICATION IN THE DEPARTMENT OF ANAESTHESIOLOGY AND INTENSIVE CARE

1. All categories of staff shall maintain effective interpersonal relationships with other staff members, patients and relatives.

2. The patients and /or family shall be given a full explanation of the anaesthetic or procedure including its risks and benefits and other available alternatives. A written informed consent shall be obtained after the discussion.

3. The OT counter/reception nurse shall provide information about the patient in the OT to the family when required.

4. Intra and inter-department communication shall be open, honest and effective to ensure optimal patient care. Staff shall display respect and tolerance towards others to maintain harmonious interpersonal relationships.

5. All inter-departmental referrals shall be made after consultation with the specialist.

6. MOs shall inform the specialist of anticipated or unanticipated problems (e.g. difficult intubation, massive haemorrhage, paediatric patients).

7. Formal hand-over of patient information shall take place whenever there is a change of responsibility of care e.g. temporary relief in OT, from Operating Room to recovery room, from OT to ICU, during Acute Pain Service and Intensive Care rounds and from ICU to ward.

8. The head of department shall be consulted in the occurrence of any unexpected untoward event. The most senior anaesthesiologist in the team shall inform the patient/family of the incident in a caring, truthful and honest manner as soon as possible after discussion with other healthcare providers. The head of department shall also inform the hospital director.

Appendix 7

LIST OF MEDICATION

No	Locality	Preparation	Name of the drug
1	Anaesthetic cart (0T)	Injection	Adrenaline Atropine Calcium gluconate Dextrose 50% Distilled water Ephedrine Heparinised saline Hydrocortisone Noradrenaline Neostigmine Sodium bicarbonate
		Lubricant	K-Y jelly
		Injection/Local anaesthetic	Lignocaine
		Inhalation	Albuterol and ipratropium (Combivent) solution Salbutamol - metered dose inhaler
2	Central Storage area (OT)	Injection	Adenosine Adrenaline Atropine Aminophylline Amiodarone Ca Chloride Calcium gluconate Chlorpheniramine Dantrolene Dexamethasone Digoxin Distilled water Dobutamine Dopamine Ephedrine Esmolol Etomidate Flumazenil Frusemide Glyceryltrinitrate Granisetron/Ondasetron Heparinised saline

			Hydralazine Hydrocortisone Labetalol Magnesium sulphate Metochlorpramide Naloxone Neostigmine Noradrenaline Phenylephrine Phenytoin Parecoxib Paracetamol Propofol Ranitidine Sodium bicarbonate Sodium glycopyrollate Sugammadex Terbutaline / Salbutamol Verapramil
		Local anaesthetic	Isobaric bupivacaine Hyperbaric bupivacaine Isobaric bupivacaine with adrenaline Levobupivacaine Ropivacaine
		Suppositories	Diclonefac Sodium Paracetamol
		Lubricant	K-Y jelly
		Injection/Local anaesthetic	Lignocaine
		Volatile agents	Sevoflurane Desflurane
		Inhalation	Albuterol and ipratropium (Combivent) solution Salbutamol - metered dose inhaler
3	Drug refrigerator (OT)	Injection	Atracurium Insulin Intralipid 20% Pitocin Rocuronium Suxamethonium

4	Dangerous Drug Act (DDA) cupboard (OT)	Injection	Diazepam Fentanyl Ketamine Midazolam Morphine Oxycodone Pethidine Remifentanil Thiopentone
5	Emergency Trolley (ICU)	Injection Inhalation	Adenosine Adrenaline Atropine Calcium gluconate / Chloride Dextrose 50% Distilled water Frusemide Heparin Heparinised saline Hydrocortisone Magnesium sulphate Noradrenaline Sodium bicarbonate Albuterol and ipratropium (Combivent) solution
6	Central Storage Area (ICU)	Injection	Adenosine Adrenaline Aminophylline Amiodarone Atropine Calcium gluconate Chlorpheniramine Dexamethasone Dextrose 50% Digoxin Dobutamine Dopamine Distilled water Frusemide Glyceryltrinitrate Heparin Heparinised saline Hydrocortisone Labetalol Magnesium sulphate

			Noradrenaline Phenytoin Potassium chloride Potassium dihyrogen phosphate Propofol Sodium bicarbonate Terbutaline/Salbutamol Vasopressin
		Injection/Local anaesthetic Lubricant	Lignocaine 2% K-Y jelly
7	Drugs Refrigerator (ICU)	Injection	Atracurium Cisatracurium Insulin Rocuronium Suxamethonium
8	DDA cupboard (ICU)	Injection	Diazepam Fentanyl Ketamine Midazolam Morphine Pethidine Thiopentone
9	Emergency trolley (Anaesthetic clinic)	Injection	Adrenaline Atropine Dextrose 50% Distilled water Heparin Heparinised saline Hydrocortisone
10	Emergency trolley (Pain Clinic)	Injection	Adrenaline Atropine Dextrose 50% Distilled water Heparin Heparinised saline Hydrocortisone Intralipid 20%

Please note that the above list of medications serves as a guide. The list may differ depending on the category of the hospital and its various specialties (e.g. Protamine Sulphate in OT)

Appendix 8

ESTABLISHMENT OF INTEGRATED INTENSIVE CARE/HIGH DEPENDENCY UNITS IN MOH HOSPITALS

ICUs are specialised areas where critically ill patients requiring advanced life support are managed by a team of specially trained doctors and nurses. The ICU is an integral part of an acute care hospital providing care for patients with medical diseases or following trauma or surgery. Intensive care service in MOH hospitals is provided by the Department of Anaesthesiology and Intensive Care.

Hospitals have become larger and more specialised, expectation of patients has increased and society is more aware of their rights. The demand for intensive care beds far exceeded its supply and this has resulted in severe shortage of ICU beds in MOH hospitals. Based on a survey in 2010 by Clinical Research Center, HKL, the number of ICU beds in MOH was 557 or 53% of the total number of ICU beds in Malaysia. However, the number of ICU beds per 100,000 populations of 3.7 is low as compared to 8.0 per population in Australia and 8.2 per 100,000 populations in Spain.

Each year, more than 5000 patients in MOH state hospitals are denied ICU admissions due to the unavailability of beds in the ICU. This figure far exceeded the acceptable refusal rate of intensive care admission, which is about 5% (refer to Intensive Care Working Group of the Clinical Resource Efficiency Support Team (CREST) UK 1993).

Recent development in the organisation of ICUs and the role of High Dependency Unit (HDU)

Historically, HDU beds were introduced to provide a step between intensive care and ward care, in an effort to overcome the shortage of intensive care beds. This concept led to the establishment of HDUs which are areas providing monitoring and support to patients at risk of developing organ system failure but not for managing patients with multi-organ failure. It is also an area where patients are managed post-discharge from ICU before returning to the wards. It operates as an independent unit physically separated from the ICU and may be headed by a separate medical/nursing team.

One of the recommendations in the *Comprehensive Critical Care*, Department of Health, UK 2000, is that the existing division into high dependency and intensive care based on beds be replaced by a classification that focuses on the level of care that individual patients need. In line with this recommendation, the Critical Care Unit is an integrated ICU/HDU. Integrated ICU/HDUs are common in Australia and the trend is for increased integration and flexibility in a way that beds are used. Under this concept, patients who are weaned from mechanical

ventilation remain in the same bed in the ICU but with a 'stepped-down' in nursing ratio and other interventions. This effectively reduces the cost of hospital care without having to move the patient from one unit to another thus minimizing the risk of transportation. More importantly, the patient remains under the care of the same intensive care team, reduces the stress of patients and relatives from another transfer and thus results in better patient outcome.

Parallel to this development is the trend towards establishing big multi-disciplinary ICUs catering for all disciplines including specialized surgical disciplines e.g. cardiothoracic and neurosurgery. The Alfred Hospital, Australia in its upgrading exercise in 2000 amalgamated its three specialists ICU; cardiothoracic, trauma and general ICUs into a 35 bedded ICU which incorporates both intensive care and high dependency patients. Similarly, the UCL Hospital in London has a new complex with has a 35 critical care beds. A single big ICU with provision for stepped-down beds allows sharing of staff and equipment and has better patient and relatives' satisfaction.

What is the ideal number of ICU beds?

The number of beds needed, will depend on a variety of factors; among which are expected length of stay, occupancy levels, and the demand for intensive care expected from the population.

The recommended bed occupancy rate (BOR) for an ICU is 70%. This should ensure that units could respond to emergencies and that patients would less likely to be refused admission.

Estimation of intensive care beds:

$$\text{Basic no of beds (X)} = \frac{\text{annual hospital admissions x rate of demand x average length of stay}}{365 \times \text{ideal occupancy}}$$

Assuming a Poisson distribution, the number of beds required to accept 95% of referrals at all times:

$$=X + (1.64 \times \sqrt{X})$$

E.g. a hospital with 50,000 admission a year, unit admission of 2% of total hospital admission, ideal ICU BOR at 70% and average length of unit stay is 6 days,

$$\text{Basic no of beds (X)} = \frac{50{,}000 \times 0.02 \times 6}{365 \times 0.7}$$

$$= 23.5$$

Assuming a Poisson distribution, the number of beds required to accept 95% of referrals at all times:

$= 23.5 + (1.64 \times \sqrt{23.5}) = 31.5$

The ratio of intensive care to high dependency beds will be based on the ratio of intensive care beds days to high dependency days. In the example above, if the ratio is 3:2, therefore, the anticipated bed requirements will be 20 intensive care beds and 12 high dependency beds.

When should a Paediatric ICU be established?

Currently in MOH hospitals, paediatric patients are managed in the General ICUs except in hospitals where there are dedicated Paediatric ICUs e.g. HKL and Hospital Raja Permaisuri Bainun, Ipoh. Paediatric patients comprised about 10% of the cases admitted to the General ICUs. In addition, a number of critically ill children were also managed in the Neonatal ICU or acute bays in paediatric wards.

The Joint Faculty of Intensive Care Medicine, Australia and New Zealand in its Policy Document Review 2003 on Minimum Standards for Intensive Care recommended that a Paediatric ICU should have a minimum of 300 admissions per year to ensure sufficient clinical workload to maintain clinical expertise.

Based on the Australian model, we recommend that Paediatric ICUs be established in MOH's state hospitals where the case load exceeds 300 admissions per year. Paediatric ICUs in the state hospitals shall be managed by the Paediatric Departments.

LEVELS OF ICU IN THE MOH HOSPITALS

ICU are categorised into 3 levels:

Level 1:

This is equivalent to the HDU or acute care ward and shall be made available in all hospitals without anaesthesiologist. The unit shall have 4-6 beds and shall be capable of providing

intensive monitoring and basic intensive care e.g. oxygen therapy and inotropic support but not mechanical ventilation. Nurse to patient ration shall be 1:2-3 patients.

Level 2:

This shall be located in hospitals with anaesthesiologists (minor specialist hospitals) capable of providing intensive care. The number of beds shall be 6-12 and the unit shall be capable of providing mechanical ventilation. Nurse to patient ratio shall be 1:2 for non-ventilated patients and 1:1 for ventilated patients.

Level 3:

All state and major specialist hospitals shall have Level 3 ICUs with facilities for multiple organ support e.g. mechanical ventilation and renal replacement. Nurse to patient ratio shall be 1:1 or more in complex cases. The unit shall operate as a 'closed unit' directed by an intensivist or an anaesthesiologist with special interest in intensive care. The number of beds shall range from 16-35, or approximately 3-5% of total number of beds in the hospitals depending on the services provided by the hospital. The unit shall cater for both medical and surgical cases.

Guide for management of patients who are ventilated in the ward

There are 4 categories of patients who are ventilated in the ward

i. Category 1 – Patients who have a reasonable prospect of meaningful recovery but not admitted due to unavailability of ICU bed.

ii. Category 2 - Patients whose initial prospect of meaningful recovery is uncertain and not admitted due to unavailability of ICU bed. **Refer sub-appendix below for criteria to include patients in Category 2.**

iii. Category 3 – Patients with minimal or no prospect of meaningful recovery
In these patients, efforts should be made to institute End-of-Life care

Examples of category 3 patients:

a) Irreversible brain damage

b) End stage cardiac, respiratory and liver disease with no options for transplant

c) Metastatic cancer unresponsive to chemotherapy and /or radiotherapy

d) Patients with non-traumatic coma leading to a persistent vegetative state

e) Severe disability with poor quality of life

f) Patients with poor response to treatment to date e.g. recurrent bowel leaks with multiple laparotomies, recurrent soft tissue and musculoskeletal infections requiring multiple surgical interventions, chronic medical conditions which fail to respond to treatment such as SLE, HIV

iv. Category 4 – Patients for chronic ventilation or "home ventilation" i.e. patients who are ventilator dependent for the rest of their life e.g. traumatic tetraplegic patients, Gullain Barre Syndrome, motor neuron disease

i. Management of patients in Category 1

- Every effort should be made to admit them to ICU. If ICU beds are not available, then they should be admitted to other critical care areas in the same hospital while waiting for ICU bed availability. If beds are still not available, then efforts should be made to transfer them to another hospital with ICU beds.

- Priority of ICU admission should be given to Category 1 patient over elective surgical patient

ii. Management of patients in Category 2

- Prior discussion between ICU/Anaesthesiologist and Primary Unit Specialist should be made prior to intubation of a patient whose meaningful recovery is uncertain. Clear decision should be made and written in the BHT and family members should be informed of decision i.e. not for ventilation or for ventilation with possibility of the limitation of care at 24 to 48 hours if no improvement or if patient deteriorates.

a) If the joint decision is not to intubate/ventilate the patient, the management of the patient shall be continued in the ward (without ventilation)

b) If the joint decision is to intubate/ventilate the patient, then the patient will be intubated and effort made to bring patient to ICU. If ICU bed remains unavailable, assessment should be made to see the progress of the patient. If the patient still remains in Category 2 and ICU bed is still unavailable, reassessment is needed after another 24 hours. At the end of 48 hours, decision must be made to categorize the patient to either Category 1 or 3. If there is a difference in opinion in categorization of the patient, a second person in both disciplines should be sought to resolve the difference. No patient in Category 2 will be ventilated more than 48 hours in the ward.

- Patients who are already intubated before any discussion between Primary Unit Specialist and ICU/Anaesthesiologist, decision should be made in the next 24 hours to categorize the patient into either Category 1 or 3 by the two teams. At the end of 48 hours, decision must be made to categorize the patient to either Category 1 or 3. If there is a difference in opinion in categorization of the patient, a second person in both disciplines should be sought to resolve the difference. No patient in Category 2 will be ventilated more than 48 hours in the ward.

iii. Management of patients in Category 3

- Effort should be made to institute End of Life care. In the event that the patient is intubated, effort should be made to withdraw therapy and to provide comfort and tender loving care. No inotropes nor vasopressors should be started and patient should be extubated and not ventilated.

iv. Management of patients in Category 4

- Patients in this group should not be in any acute deterioration of physiological parameters and arrangement may be made to discharge home on ventilator
- If the patient deteriorates, he or she needs to be re-assessed and re-categorised to either Category 1, 2 or 3 and subsequent management follows accordingly the Category that he or she is assigned.

Sub-appendix: Criteria to include patients in Category 2

(Adapted from Dr. P. Mc Daid - A Quick Guide to Identifying Patients for Supportive and Palliative Care 2011)

A. General decline. Symptomatic with low level activity.
Formal measures of poor or deteriorating performance status include:

a. Limited self-care; in bed or chair over 50% of the day
b. MRC Breathlessness Scale 4/5
c. NYHA Grade 3/4
d. WHO Performance Grade 3/4

B. Chronic illnesses based on organ systems involvement.
Have to fulfill any two of the underlying conditions

I. Heart Disease
   a. NYHA Class III/IV heart failure, severe valve disease or extensive coronary artery disease
   b. Persistent symptoms despite optimal tolerated therapy

II. Respiratory disease
   a. Severe airways obstruction (FEV1<30%) or restrictive deficit (vital capacity < 60%, transfer factor < 40%)
   b. Meets criteria for long term oxygen therapy (PaO_2 < 7.3 kPa)
   c. Breathless at rest or on minimal exertion between exacerbations
   d. Persistent severe symptoms despite optimal tolerated therapy

III. Cancer
   a. Performance status deteriorating due to metastatic cancer and/or co-morbidities
   b. Persistent symptoms despite optimal palliative oncology treatment or too frail for oncology treatment

IV. Neurological disease
   a. Progressive deterioration in physical and/or cognitive function despite optimal therapy
   b. Recurrent aspiration pneumonia; breathless or respiratory failure

V. Kidney disease
   a. Conservative kidney management due to multimorbidity
   b. Deteriorating on renal replacement therapy; persistent symptoms and/or increasing dependency

VI. Liver disease
   a. Advanced cirrhosis (Childs C) with one or more complications:
      i. Intractable ascites
      ii. Hepatic encephalopathy
      iii. Hepatorenal syndrome
      iv. Bacterial peritonitis
      v. Recurrent variceal bleeds
      vi. No options for liver transplantation
   b. Serum albumin < 25g/l and prothrombin time raised or INR prolonged > 2.5

VII. Dementia
   a. Unable to dress, walk or eat without assistance; unable to communicate meaningfully
   b. Urinary or fecal incontinence

C. Recurrent ICU admissions (more than 2) during a single hospital admission

D. Two or more unplanned admission to hospital within the last 6 months

Appendix 9

STAFF –ROLES AND FUNCTIONS

A. MOH Head of Service for Anaesthesiology and Intensive Care Services

The main function of the Head of Service is to advise the MOH in matters pertaining to Anaesthesia, Intensive Care and Pain Management with regards to human resource, training, equipment, budget and development. The head of service coordinates with the states head of service and heads of department in the implementation of policies to achieve the MOH's vision and missions.

Specific functions are to:

1. Advise on postings of specialists and trainees
2. Advise on equipment requirements and allocation of budgets
3. Data collection and census for planning and development
4. Advise and organize CPD programme
5. Advise and implement quality initiative activities
6. Advise and formulate protocols, guidelines and policies
7. As a representative within the national committee i.e. Conjoint Board, Master's Training Committee, Subspecialty Training Committee and Drug Committee

B. Head of Department

Administrative

1. To advise the hospital director on matters pertaining to anaesthesia, intensive care and pain management to ensure that high medical standards in patient care are maintained.
2. To participate in task forces and committees as advised by the hospital director
3. To participate, implement, monitor, evaluate and take remedial measures if and when necessary in the hospital's quality assurance activities
4. To plan, implement and monitor the department's activities according to the policies and procedures of the department, hospital and MOH. Heads of department of state hospital shall also be responsible for the planning, implementation and monitoring of the anaesthesiology and intensive care services in their respective state.
5. To prepare the budget for the department and be responsible for the effective use of the resources
6. To conduct regular meetings with all department personnels
7. To organise continuous medical education activities for the department

8. To audit the department's activities and performance and prepare its annual report for submission to the hospital director and Head of Service.
9. To conduct yearly assessments of all medical staff in the department

Clinical

1. To conduct pre-anaesthetic assessment for the patients in the anaestheticclinic,ward and OT
2. To provide effective, efficient and professional anaesthetic management for elective and emergency cases undergoing surgery
3. To provide effective, efficient and professional intensive care management for patients in the ICU
4. To provide adequate pain relief for post-operative patients and laboring mothers
5. To provide professional,clinical leadership and supervision to specialists,MOs and HOs
6. To provide and assist in the resuscitation of patients
7. To organise and undertake teaching of Masters trainees, MO, HO, nurses and assistant medical officers
8. To undertake on-call duties as per roster
9. To be up-to-date with trends and developments in anaesthesiology, intensive care and pain management by keeping abreast of relevant literature, conferences and courses

C. Specialist
Administrative

1. To assist the head of department in carrying out administrative duties
2. To orientate new MO to the department on their roles and responsibilities
3. To carry out non-clinical duties as directed by the head of department or hospital director
4. To organise continuous medical education (CME) for personnel of the department (Masters trainees, MO,HO, nurses and assistant medical officer)
5. To attend talks, seminars, courses and conferences to improve and update knowledge
6. To participate and implement department's CME activities, morbidity and mortality meetings, QA activities, research, patient satisfaction studies, innovation and KPI
7. To assist in the organisation of the department's courses e.g. Acute Pain Service

8. To assist the head of department in preparing the department for ISO 2000 and accreditation by relevant bodies
9. To prepare OT schedule and on-call rosters

Clinical

1. To conduct pre-anaesthetic assessment patients in the anaesthetic clinic, wards and OT
2. To provide anaesthesia for elective and emergency cases undergoing surgery
3. To care for patients in the ICU
4. To provide adequate pain relief for post-operative patients and labouring mothers
5. To supervise junior specialists, MOs and HOs in the provision of anaesthesia
6. To provide and assist in the resuscitation of patients
7. To undertake on-call duties as per roster

D. Medical Officer

1. To provide anaesthesia for patients undergoing elective and emergency surgery under specialist supervision
2. To perform on-call duties as per roster
3. To perform invasive procedures under supervision
4. To attend the anaesthetic clinic under specialist supervision
5. To be actively involved in patient resuscitation when necessary
6. To provide basic intensive care for patients in the ICU
7. To participate in the educational and audit programmes within the department

E. Intensive Care Nurse

1. To provide nursing care for critically ill patients
2. To ensure patients' general well- being
3. To hand over details of patients condition, progress, management and plans to the next attending nurse
4. To recognize signs of deterioration in patients' condition and institute remedial measures
5. To assist doctors in procedures
6. To monitor and record patients' vital signs
7. To trace laboratory investigations, previous hospitalization case notes and radiological investigations

8. To adhere to infection control policies
9. To communicate and maintain rapport with family members.
10. To perform cardiopulmonary resuscitation
11. To document care provided in the patients' case notes
12. To comply with ICU protocols and related guidelines
13. To comply with the protocols on care bundles
14. To attend continuous nursing education (CNE) activities

F. Anaesthetic Clinic Nurse

1. To receive referrals and register patients
2. To screen patients with questionnaire
3. To assist doctor during consultation
4. To facilitate patients for lab investigations, X-rays and ECG
5. To trace investigation results and previous records
6. To despatch reply of referral letters
7. To document, record and perform data entry
8. To ensure patients understand their preoperative instructions
9. To contact patients when necessary

G. Acute Pain Service (APS) Nurse

Clinical

1. To see cases referred by the wards and the OT
2. To carry out post-operative pain management
3. To prepare drugs and equipment required
4. To monitor every patient
5. To conduct APS rounds at least twice a day
6. To recognize complications of APS
7. To maintain patient records
8. To assist doctors in performing procedures (e.g. obstetric epidurals)
9. To monitor the implementation of pain as 5th vital sign

Administrative

1. To enter patient data for statistical purposes
2. To conduct audit activities
3. To be involved in training activities

4. To perform other duties as requested by specialist
5. To attend relevant courses to update and improve knowledge
6. To assist in training of nurses in pain as 5th vital sign

H. Chronic Pain Service Nurse

Clinical

1. To receive referrals, give appointments and register patients in Pain Management Clinic
2. To screen patients using questionnaires
3. To contact patients when necessary
4. To assist doctor during consultation and procedures
5. To prepare patients for OT
6. To monitor patients post procedure
7. To maintain patient records
8. To educate patients on non-pharmacological methods of pain management

Administrative

1. To enter patient data for statistical purposes
2. To conduct audit activities
3. To be involved in training activities
4. To perform other duties as requested by specialist
5. To attend relevant courses to update and improve knowledge

I. Assistant Medical Officer

1. To assist doctors in the management of patients and during performance of procedures
2. To check and calibrate equipment in OT and ICU on a regular basis, ensuring that they are in good working condition
3. To assist in the transport of critically ill patients
4. To ensure that cleaning and sterilization of equipment is done according to schedule
5. To maintain inventory of equipment and consumables (AAMS)
6. To manage storage of equipment
7. To assist in procurement of assets and consumables
8. To assist in all the department activities e.g. courses, workshop, census and quality initiatives

9. To assist in budgeting and monitoring of the allocation
10. To assist in collecting the department's data statistic for workload analysis and audit

Appendix 10

RECOMMENDED BASIC TRAINING REQUIREMENT FOR VARIOUS CATEGORY OF PERSONNEL

A. Specialist
   1. Clinical governance/Management
   2. Research methodology and biostatistics
   3. Quality assurance
   4. Professional conferences
   5. Good clinical practice (GCP)
   6. End of life care
   7. Pain as 5th vital sign
   8. Ultrasonography
   9. Grief Response Organ Donation Awareness (GRODA)

B. MO
   1. Basic Life support
   2. Advanced Life Support
   3. Basic Assessment and Support in Intensive Care (BASIC)
   4. Simulation in anaesthesia
   5. Acute Pain Service
   6. Pain as 5th vital sign
   7. GRODA
   8. Paediatric Advance Life Support (PALS)
   9. Professional conferences

C. Intensive Care Nurses/Assistant Medical Officer
   1. Basic Life Support
   2. Advanced Life Support
   3. Post Basic in Intensive Care Nursing
   4. Professional conferences

D. Anaesthetic Assistant
   1. Basic Life Support
   2. Post basic peri-anaesthesia care

E. Additional Courses for Specialty Personnel
   1. Perfusionist course
   2. Acute pain service
   3. Paediatric Advanced Life Support

Appendix 11

NATIONAL INDICATOR APPROACH (NIA) AND KEY PERFORMANCE INDICATORS (KPI) FOR ANAESTHESIOLOGY AND INTENSIVE CARE SERVICES

TYPE		NO	PERFORMANCE INDICATOR (PI)	OPTIMAL TARGET / STANDARD
PI	KPI	1	Percentage of elective and emergency surgery patients who received acute pain service	≥ 10%
PI	KPI	2	Ventilator Care Bundle (VCB) compliance rate	≥ 85%
PI	KPI	3	Number of mortality/morbidity audits/ meetings conducted in the department (in 6 months)	≥ 6
PI	NIA	4	Percentage of patients awaiting emergency surgery for more than 24 hours due to lack of operation theatre time	≤ 1%
PI	NIA	5	Incidence of intubation in the recovery room	≤ 0.3%
PI	NIA	6	Percentage of post-operative patients leaving the recovery room with pain score of ≥ 4	< 10%
PI	PI	7	Percentage of patients undergoing elective surgery who were assessed in the anaesthetic clinic	≥ 30%
PI	PI	8	Percentage of patients having a pain score of ≤ 4 within the first 24 hours after elective and emergency surgery	≥ 75%
PI	PI	9	Percentage of elective surgical cancellations after pre operative assessment in the AnaestheticClinic	≤ 10%

Appendix 12

DRAFTING COMMITTEE

Chairperson:

Datin Dr V.Sivasakthi, Head of Service, HKL

Members:

1. Dr Mary S.Cardosa, Hospital Selayang
2. Dato' Dr Jahizah Hj Hassan, Hospital Pulau Pinang
3. Dr Kavitha M.Bhojwani, Hospital Raja Permaisuri Bainun,Ipoh
4. Dr Lim Wee Leong, Hospital Sg Buloh
5. Dr S.Sushila, Hospital Selayang
6. Dr Aisai Abdul Rahman, Hospital Sultanah Nur Zahirah,Kuala Terengganu
7. Dr Tai Li Ling, Hospital Kuala Lumpur
8. Dr Jenny Tong May Geok, Hospital Tuanku Jaafar,Seremban
9. Dr Mohd Rohisham Zainal Abidin,Hospital Tengku Ampuan Rahimah, Klang
10. Dr Melor Mohd Mansor, Hospital Ampang
11. Dr Seet Sok Noi, Hospital Sg. Buloh
12. Dr Patimah Amin, Medical Development Division,MOH

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