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Semua Pengarah Kesihatan Negeri
Semua Timbalan Pengarah Kesihatan Negeri (Perubatan)

YBhg Dato'/Datin/Tuan/Puan,

OPERATIONAL POLICY; ANAESTHESIA AND INTENSIVE CARE SERVICE

Dengan segala hormatnya saya merujuk kepada perkara di atas.

Untuk makluman YBhg Dato'/Datin/Tuan/Puan, beberapa langkah sedang dan akan diambil oleh Program Perubatan di dalam mempertingkatkan mutu perkhidmatan perubatan yang disediakan oleh hospital-hospital Kementerian Kesihatan. Selain mempertingkatkan usaha pembangunan infrastruktur dan sumber manusia, adalah penting agar sistem yang digunapakai bagi operasi perkhidmatan perubatan diselaraskan dan diperbaiki dari semasa ke semasa. Penggunaan sistem serta proses kerja yang lebih sistematik dapat memastikan agar sumber yang sedia ada digunakan secara optimum dan lebih berkesan.

Oleh itu, bagi memastikan langkah ini dilaksanakan, Program Perubatan sedang berusaha untuk mendokumentasi polisi operasi perkhidmatan-perkhidmatan perubatan. Bersama-sama ini disertakan naskah dokumen polisi – *Anaesthesia and Intensive Care Service; Operational Policy*, yang telah berjaya dirangka oleh Bahagian Perkembangan Perubatan dengan kerjasama pakar-pakar anaesthesia dan rawatan rapi. Dokumen tersebut merangkumi aspek-aspek penting di dalam operasi perkhidmatan termasuk pengurusan sumber manusia, pembangunan infrastruktur, struktur organisasi, kualiti, pengurusan pesakit, etika dan lain-lain berkaitan urustadbir klinikal. Dokumen tersebut adalah relevan untuk dipraktikkan di semua kategori hospital iaitu di hospital negeri, hospital pakar dan hospital tanpa pakar.

Diharap pihak YBhg Dato' / Datin / Tuan / Puan dapat memastikan segala perkara yang diperuntukkan di dalam dokumen polisi tersebut dilaksanakan di peringkat negeri / hospital masing-masing. Naskah buku tersebut juga hendaklah diedarkan kepada semua pengarah hospital, ketua-ketua jabatan yang berkenaan dan diletakkan di kawasan-kawasan tertentu seperti dewan bedah dan unit rawatan rapi sebagai rujukan anggota perubatan. Semua anggota perubatan di dalam Jabatan Anaesthesia dan Rawatan Rapi termasuk anggota yang baru juga diminta untuk meneliti dan melaksanakan dokumen tersebut.

Kerjasama pihak YBhg Dato' / Datin / Tuan / Puan amat dihargai di dalam mempertingkatkan mutu perkhidmatan perubatan yang disediakan oleh Kementerian Kesihatan.

Sekian terima kasih.

BERKHIDMAT UNTUK NEGARA

Saya menurut perintah,

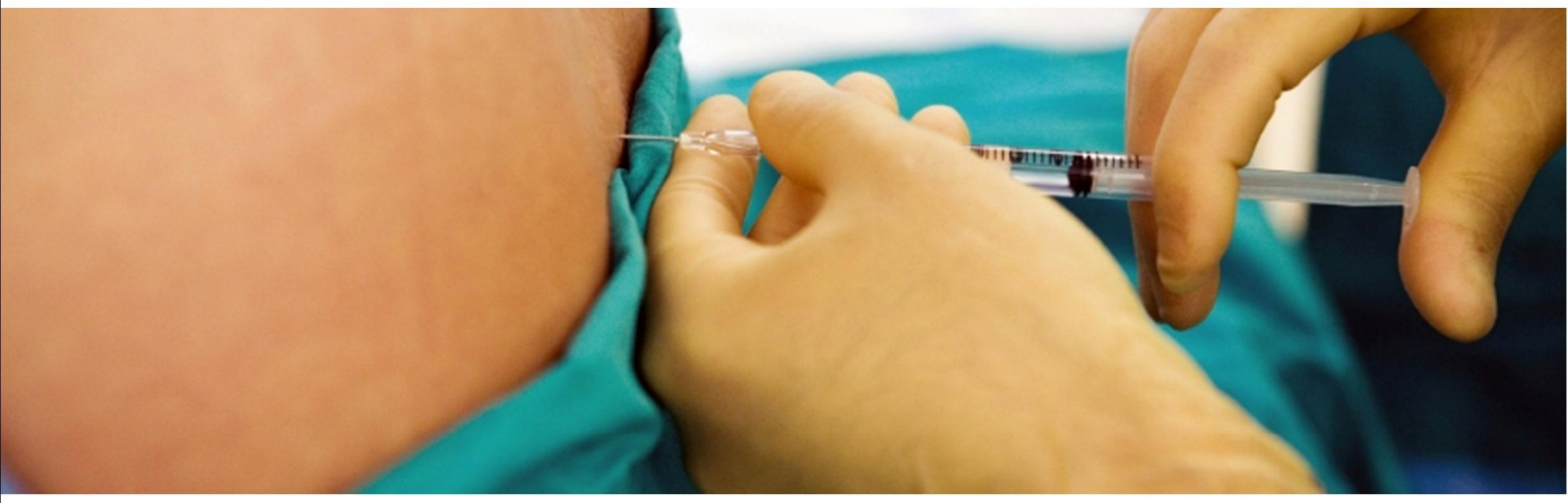
(DATUK DR NOOR HISHAM ABDULLAH)
Timbalan Ketua Pengarah Kesihatan (Perubatan)

S.k

- Ketua Pengarah Kesihatan Malaysia
- Pengarah Perkembangan Perubatan
- Penasihat Kebangsaan Perkhidmatan Anaesthesia dan Rawatan Rapi

MOH/P/PAK/142.07(BP), FEBRUARY 2008

ANAESTHESIA & INTENSIVE CARE SERVICE



Operational Policy

MINISTRY *of* HEALTH MALAYSIA

MEDICAL DEVELOPMENT DIVISION,
MINISTRY OF HEALTH MALAYSIA

ANAESTHESIA AND INTENSIVE CARE SERVICE

OPERATIONAL POLICY

This policy was developed by the Surgical and Emergency Services Unit, Medical Services Development Section of Medical Development Division and the Drafting Committee of Operational Policy of Anaesthesia and Intensive Care Service.

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More about anaesthesia and intensive care in Malaysia;
National Audit of Intensive Care Unit – www.icu.org.my
Malaysian Society of Anaesthesiologist – www.msa.net.my
College of Anaesthesiologists, Academy of Medicine Malaysia - www.acadmed.org.my

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Medical Development Division would like to acknowledge the contributions of the following groups and individuals towards the development of this document;

Dato' Dr Noorimi Hj Morad, the former Deputy Director General of Health (Medical Services) for her leadership and guidance. Her commitment, dedication and thoughtfulness is strongly admired.

Dr Ng Siew Hian and the Drafting Committee on Operational Policy of Anaesthesia and Intensive Care Service for the continuing support and dedication. Their vast experience and professionalism have facilitated the Division in developing this document.

Special gratitude to the National Advisors of Surgery, Orthopaedic, Medicine, Paediatric, Obstetrics and Gynaecology Services and other relevant parties for the constructive comments on the draft policy.

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FOREWORD

DIRECTOR GENERAL OF HEALTH MALAYSIA

As the biggest healthcare provider in the country, the Ministry of Health faces great challenges as the population grows and the disease burden increases. Rising healthcare costs, in particular, are of great concern not only to developing countries like ours but also to the developed ones. Under these circumstances, the task of formulating national healthcare policies that are appropriate and acceptable to both patients and healthcare providers has become a rather difficult and complex one. Despite these challenges, the Ministry of Health continues to envision a healthcare service that is of high quality, safe, equitable, accessible and affordable to all.

Despite the many achievements of our healthcare delivery system in the past and present, an increasingly educated public continues to expect even better services from our hospitals. Clearly, there is still much room for improvement. Better methods and processes for the delivery of hospital-based services have to be formulated and implemented, and we should have the determination and courage to put planned strategies into action. We also need to ensure that proper systems are put in place in our hospitals that are acceptable, evidence-based, outcome-oriented, quality driven, practical, and above all suit the needs and interests of our patients. Having a well-documented Operational Policy for a clinical discipline like this will help to ensure that services are executed efficiently, utilising existing resources. Having documents like this shall be among our strategies to improve the medical services, apart from measures like infrastructural and human capital development.

I would like to congratulate the Medical Programme, in particular the Medical Development Division, for leading this effort. I would also like to commend the anaesthetic and intensive care fraternity for taking the lead to be the first clinical discipline to develop and publish such a comprehensive document. Thank you.

Tan Sri Datuk Dr Hj Mohd Ismail Merican

DEPUTY DIRECTOR GENERAL OF HEALTH (MEDICAL)

Anaesthesia and intensive care service is one of the main medical services provided by our Ministry of Health hospitals by virtue of its capacity to support other clinical disciplines and to provide adequate and appropriate care for critically ill patients. Advancement of surgery, increasing workload and higher public expectations are among the factors that have made the provision of anaesthesia one of the major challenges in developing hospital services in the country. Furthermore, lack of intensive care beds in public hospitals and manpower constraints have posed a major problem that need to be addressed prudently in order to ensure better, more accessible and higher quality medical care in the future.

Despite these constraints and challenges, it is essential that efforts continue to be undertaken to ensure the good deliverance of service. The availability of this Operational Policy will provide guidance to all relevant parties on the development of a system that is more coordinated and efficient in providing care to our patients. This policy will also benefit healthcare managers in formulating local hospital policies and procedures, coordinating inter-departmental collaboration, and planning for facilities and service development, thereby ensuring that available resources are utilised optimally.

I would like to congratulate the Medical Development Division for initiating and coordinating this effort. I must also commend the drafting committee led by Dr Ng Siew Hian for their continuing dedication and commitment in assisting the Ministry to develop and provide better medical care to the community. I hope that the quality of our medical services will continue to improve in tandem with the Ministry's mission to provide the country with a healthcare system that is of international standing.

Datuk Dr Noor Hisham Abdullah

NATIONAL ADVISOR OF ANAESTHESIA AND INTENSIVE CARE SERVICE

The Anaesthetic and Intensive Care Service is arguably one of the biggest services in the hospitals. With increasing demands from the public and clinicians, the anaesthetic departments face many challenges in meeting these expectations. Clearly, there is a need for this critical service to be delivered in an efficient, structured and coordinated manner consistent with the vision and missions of the Ministry of Health. I believe it is with this in mind that the idea of developing the Department Operational Policy was mooted.

This document provides essential guide for the management of the anaesthetic department and the provision of its services. By outlining policies and procedures based on current best practices, this document sets standards for the anaesthetic practice in the Ministry of Health hospitals. We have also taken the opportunity to introduce new policies that reflect a shift towards patient centred practice with greater emphasis on patient safety and communication. I believe both health care managers and providers involved in anaesthesia and intensive care will find this document useful.

The Medical Development Division, Ministry of Health has provided enormous support in the preparation of this document and I am grateful to Dr. Teng Seng Chong and Dr. Hirman Ismail for their guidance and assistance. I also wish to thank my colleagues in the Drafting Committee who developed this document and all those who have helped in one way or another. Last but not least, a word of thanks to Dr. Shanti R. Deva for proof reading the document.

Dr. Ng Siew Hian

THE POLICY

1. INTRODUCTION

1.1. Anaesthesia and Intensive Care service are among the major clinical specialty services provided by the Ministry of Health hospitals.

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

1.3. As the biggest health care provider in the county, hospitals in the Ministry of Health play a leading role in the development and provision of anaesthetic and intensive care service in the country.

1.4. This policy document covers key areas of anaesthetic and intensive care service 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 managers and policy makers on the requirement, operation and development of anaesthetic and intensive care service in the Ministry of Health 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 meet these standards.

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

2. OBJECTIVES OF SERVICE

2.1. To provide peri-operative anaesthetic care and intensive care efficiently in a safe and professional manner.

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

3. SCOPE OF SERVICE

3.1. The department provides peri-operative anaesthetic care and pain management for patients undergoing surgery or diagnostic procedures.

3.2. The department also provides care for the critically ill surgical or medical patients, requiring intensive monitoring and intervention or advanced life support.

4. COMPONENTS OF SERVICE

4.1. Peri-operative Anaesthesia Service

4.1.1. Anaesthetic clinic

4.1.2. Anaesthesia in the operating theatre

4.1.3. Anaesthesia outside the operating theatre

4.2. Subspecialty Anaesthesia Service

4.2.1. Cardiothoracic anaesthesia and perfusion

4.2.2. Paediatric anaesthesia

4.2.3. Neuro-anaesthesia

4.2.4. Obstetric anaesthesia and analgesia

4.2.5. Day care anaesthesia

4.3. Intensive care service

4.4. Pain management service

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[1].

[1] Refer to Table 1; Components of Services According to Category of Hospitals, page 11

COMPONENTS OF SERVICE	CATEGORY OF HOSPITALS			
	STATE	MAJOR SPECIALIST	MINOR SPECIALIST	WITHOUT SPECIALIST
PERI-OPERATIVE ANAESTHESIA SERVICE				
Anaesthetic clinic	√	√	-	-
Anaesthesia in the operating theatre	√	√	√	Identified hospitals
Anaesthesia outside the operating theatre	√	√	-	-
SUBSPECIALTY ANAESTHESIA SERVICE				
Cardiothoracic anaesthesia and perfusion	Identified hospitals	Identified hospitals	-	-
Paediatric anaesthesia	Identified hospitals	Identified hospitals	-	-
Neuro-anaesthesia	Identified hospitals	Identified hospitals	-	-
Obstetric anaesthesia and analgesia	Identified hospitals	Identified hospitals	-	-
Day care anaesthesia	Identified hospitals	Identified hospitals	-	-
INTENSIVE CARE SERVICE[2]	Level 3	Level 3	Level 2	-
PAIN MANAGEMENT SERVICE				
Acute pain management	√	√	√	-
Chronic pain management	Identified hospitals	Identified hospitals	-	-

Table 1; Components of Services According to Category of Hospitals

[2] Refer to appendix viii; Level Of Intensive Care Units In Ministry Of Health's Hospitals, page 82

5. ORGANISATION

5.1. The department shall be headed by a consultant anaesthetist who:

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

5.1.2. Collaborates with the National Advisor of Anaesthesia and Intensive Care Service in formulating strategic plan of 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 development, operation and other technical matters.

5.2. The Head of Anaesthesia and Intensive Care Service serves as the National Advisor to the Ministry of Health on all matters pertaining to the service. The specific functions of the National Advisor of Anaesthesia and Intensive Care Service are listed in appendix ix.

5.3. The organisation of the department is determined by the category of the hospital, level of patient care and the scope of the services provided. All specialist-based hospitals shall provide at least two basic services i.e. anaesthesia service in the operating theatre and intensive care service.

5.4. Dedicated service units shall be established when there is sufficient workload, available expertise and manpower. Its establishment shall be recommended by the head of department with the approval of the hospital director and the National Advisor of Anaesthesia and Intensive Care Service.

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

5.5.1. Postings of medical officers and their job descriptions

5.5.2. Clinical management

5.5.3. Procurement of equipments 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 Anaesthesia and Intensive Care Service.

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

5.6.2.1. Report to the National Advisor of Anaesthesia and Intensive Care Service.

5.6.2.2. Coordinate and provide direction for the development of its subspecialty service, in consultation with the National Advisor of Anaesthesia and Intensive Care Service.

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 Anaesthesia and Intensive Care when the patient caseload within the unit is sufficiently high.

5.7. The subspecialty anaesthesia unit shall be headed by a consultant trained in its relevant subspecialty. The head of the subspecialty unit shall report to the head of the Department of Anaesthesia and Intensive Care.

5.8. The department shall establish the following committees[3];

5.8.1. Management committee

5.8.2. Quality Assurance Committee

5.8.3. Safety Committee

5.8.4. Continuing Professional Development Committee

5.8.5. Other committee may be established when the need arises e.g. Post-graduation Training Committee.

5.8.6. In smaller departments, the functions of the above committees can be held by individuals within a single Management Committee.

[3] Refer to appendix i; Terms of Reference for Department Committees page 64

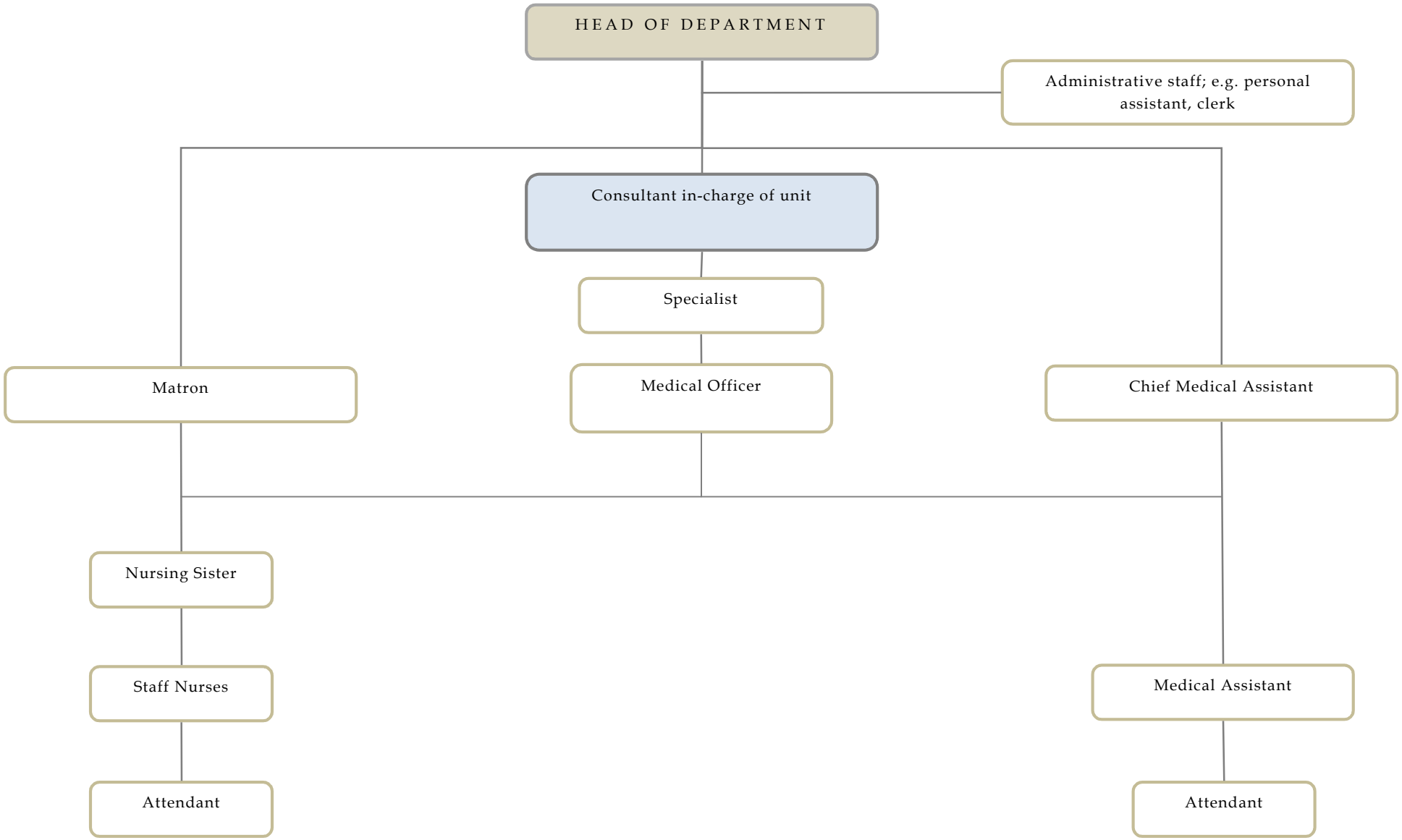

Chart 1; Organisation Chart (by Position) of the Department of Anaesthesia and Intensive Care

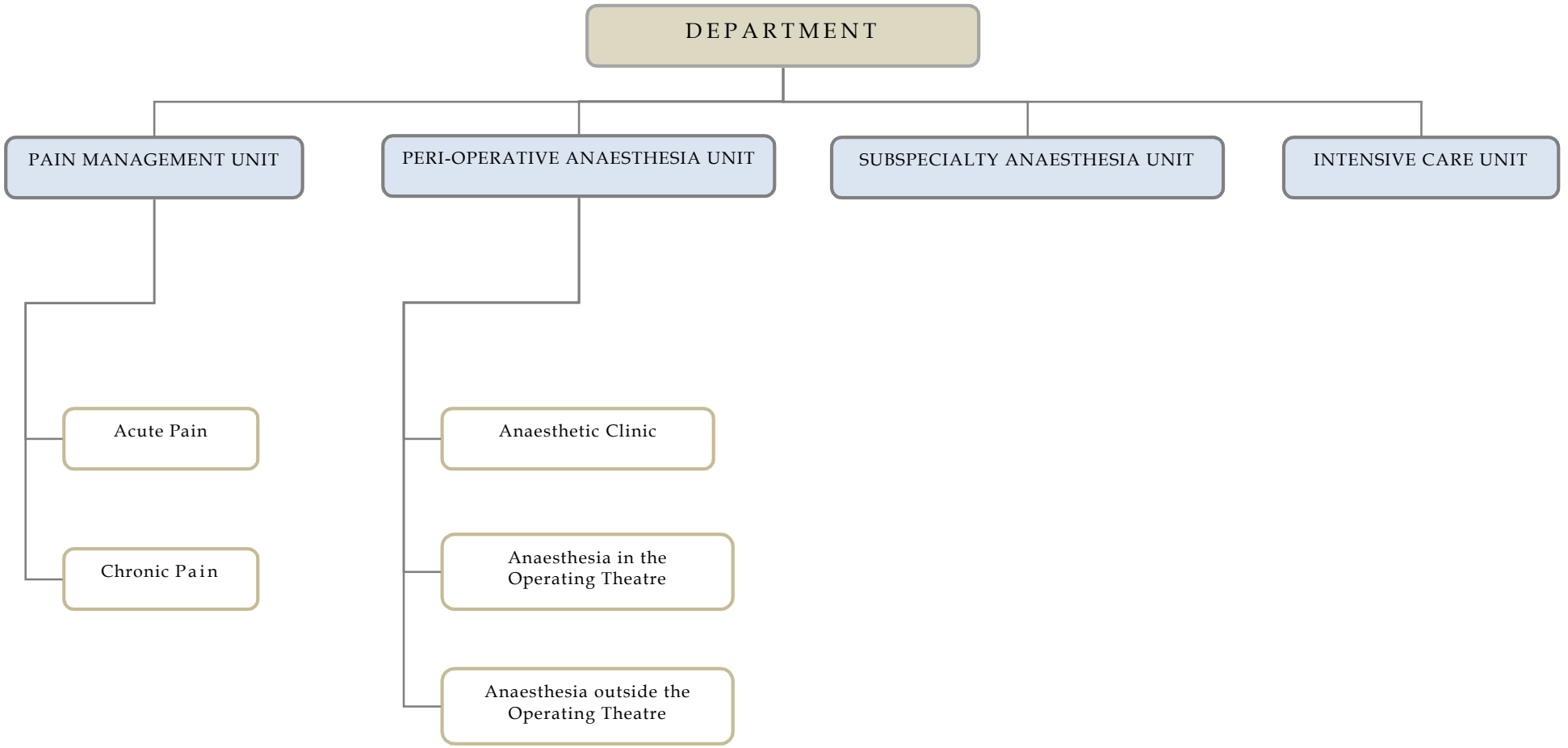

Chart 2; Organisation Chart (by Function) of the Department of Anaesthesia and Intensive Care

6. GENERAL STATEMENT

6.1. Anaesthesia shall only 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 Operating Theatre (OT) Committee. This is to ensure that surgeries are done in a timely manner for optimal patient outcome.

6.3. In rural East Malaysia, every effort shall be made to ensure that a doctor based service is achieved within a predetermined time frame.

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

6.5. 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 the general ward shall be discouraged.

6.6. Referral of cases from non specialist hospitals shall be made to the nearest specialist hospital with the appropriate level of care.

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

6.8. Medical surveillance of staff members shall be implemented according to the Occupational and Safety Health Assurance (OSHA) guidelines[4].

6.9. Patient safety shall be of utmost importance and specific measures to ensure this shall be implemented according to the existing guidelines [5].

6.10. Management of medication shall be in accordance with the Guide on Medication Safety in the Department of Anaesthesia and Intensive Care [6].

6.11. The department shall implement infection control measures in accordance with whole hospital and service specific policies.

6.11.1. 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

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

[4] Department of Occupational Safety and Health, Ministry of Human Resource Malaysia 2001. Guidelines on Medical Surveillance Under the Occupational Safety and Health Regulations 2000

[5] Refer to appendix ii; Guide On Patient Safety In The Department Of Anaesthesia And Intensive Care, page 66

[6] Refer to appendix iii; Guide on Medication Safety in the Department of Anaesthesia and Intensive Care, page 68

6.11.3. It is preferable that single use items are not reused. However, if such items are reused, the existing guidelines shall be adhered to.

6.11.4. The department shall establish an infection control team which includes an anaesthetist 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.

6.11.5. For specific measures of infection control in ICU and anaesthesia, the following guidelines shall be complied:

6.11.5.1. Critical Care Medicine Section of the Malaysian Society of Anaesthesiologists 2004. *CCMS Statement on Infection Control Measures in the Intensive Care Unit*;

6.11.5.2. Australia and New Zealand College of Anaesthesiologists, 1998. P28. *Policy on Infection Control*.

6.12. The department shall be adequately equipped to ensure the delivery of safe anaesthesia and adequate intensive care[7].

6.13. There shall be an efficient inventory management system for stock-keeping of drugs, consumables and assets to ensure effective stock monitoring. The Anaesthesia Asset Management System (AAMS) shall be implemented to better manage the department assets. Relevant national guidelines on asset management shall be adhered to.

6.14. Communication with the patient and the family members is essential and there shall be full disclosure of any unexpected

[7] Refer to appendix iv; List of Recommended Equipments for Various Facilities, page 70

adverse outcome in accordance with the hospital wide 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 his /her next of kin at the soonest possible time and document the discussion in detail.

6.15. Communication among the medical professionals shall be enhanced [8]. 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.

6.16. 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.

6.17. 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.

6.18. The department shall support the national organ / tissue transplantation programme in accordance with the National Organ, Tissue and Cell Transplantation Policy (Ministry of Health Malaysia 2007). Specifically, the department shall be involved in the certification of brain death, management of potential donor in the intensive care unit and provision of peri-operative anaesthetic services for organ procurement and transplantation.

6.19. The department shall support the 'Full Paying Patient' programme and comply with the Ministry's policy on the

[8] Refer to appendix v; Guide On Effective Communication In The Department Of Anaesthesia And Intensive Care, page 73

programme. The department shall determine and assign appropriate specialists to provide anaesthetic care for these patients.

6.20. All anaesthetic 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 wide initiative. Departments in major hospitals are encouraged to work towards accreditation by the Australian and New Zealand College of Anaesthetists (ANZCA).

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. It shall be established in all state and major hospitals.

7.1.2. Objectives of the Anaesthetic Clinic are;

7.1.2.1. To ensure that the patients are in optimal state of health preoperatively

7.1.2.2. To ensure anaesthesia management is planned appropriately.

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

7.1.2.4. To educate patients regarding anaesthesia and other related procedures

7.1.2.5. To obtain informed consent for anaesthesia

7.1.2.6. To facilitate day of surgery admission and day care surgery

7.1.3. The Clinic schedule shall be determined by the case load and the manpower available.

7.1.4. The assessments of patients shall be guided by the Recommendations on Pre-Anaesthetic Assessment (College of Anaesthesiologists, Academy of Medicine Malaysia,1998)

7.1.5. The Clinic shall be attended by dedicated medical and nursing staff;

7.1.5.1. A specialist shall be available for consultation at all times

7.1.5.2. Patients with physical status of ASA III and above shall be assessed by a specialist

7.1.5.3. In major hospitals with high patient caseload, the clinic shall be attended by at least 2 medical officers and 2 nurses. The number of doctors and nurses required shall increase with increasing patient caseload.

7.2. General Anaesthesia Service in the Operating Theatre

7.2.1. All patients shall be assessed pre-operatively by an anaesthetist. There shall be a second pre-anaesthetic assessment prior to the induction of anaesthesia.

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, 1998)

7.2.3. On arrival to the operating theatre, the reception nurse shall identify the patient using a checklist. The anaesthetist shall also verify the identity of the patient, the planned surgical procedure and the site of surgery before the administration of anaesthesia.

7.2.4. All patients shall have a valid informed consent for surgery.

7.2.5. All patients shall have a valid informed consent for anaesthesia.

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

7.2.7. The minimum standards for the safe conduct of anaesthesia in the operating theatre shall be strictly adhered to. (Australia and New Zealand College of Anaesthesiologists. T12000. *Recommendations on Minimum Facilities for Safe Anaesthesia Practice in Operating Suites*)

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

7.2.9. 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 meal breaks or permanently

7.2.10. All anaesthetic equipment shall be maintained in good working conditions with regular planned preventive maintenance.

7.2.11. All equipment of more than ten years shall be phased out in stages to ensure safety and uninterrupted service.

7.2.12. Monitoring of patients under anaesthesia shall comply with the standards in Recommendations for Safety Standards and Monitoring during Anaesthesia and Recovery (Malaysian College of Anaesthesiologists, 2003).

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

7.2.14. Image intensifiers shall only be used in operating rooms with radiation protection. All staff within the operating room shall also be protected with lead gowns.

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

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

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

7.2.18. Prioritisation of emergency cases undergoing surgery shall be made in accordance with the Peri-operative Mortality Review (POMR) Guidelines on Prioritisation of Emergency Cases (Ministry of Health).

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

7.2.20. Staffing requirements;

7.2.20.1. The current ratio of 1 anaesthetist to 5 surgeons is of concern. The minimum acceptable ratio of staffing of anaesthetist to surgeon shall be 1: 3.

7.2.20.2. Intra-operative supervision of medical officers conducting anaesthesia for uncomplicated procedures shall be 1 specialist to 2 medical officers.

7.2.20.3. Intra-operative supervision of medical officers conducting anaesthesia for complicated or complex procedures is 1 specialist to 1 medical officer.

7.2.20.4. Anaesthesia for highly complex subspecialty procedures shall be specialist based.

7.2.20.5. In major hospitals with active emergency services, the anaesthetic specialist on-call shall provide resident on-call duties whenever possible.

7.2.20.6. The staffing requirement for medical officers shall be 1.5 for every anaesthetic location

7.2.20.7. In hospitals with busy emergency services, there shall be 2 medical officers rostered for every emergency

operating room. In these hospitals, a 12 hours shift system shall be also be considered.

7.2.20.8. There shall be at least 1 medical officer rostered for each recovery location with more than 10 beds.

7.2.20.9. There shall be at least 1 medical officer rostered for every 4 beds in the Post- Anaesthetic Care Unit

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

7.2.20.11. The anaesthetic nurses shall undergo a post-basic peri-anaesthesia course.

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

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

7.3. Anaesthesia Service Outside the Operation Theatre

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

7.3.2. The same standards of anaesthetic care and facility as in the operating theatre 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 anaesthetist.

7.3.5. Monitoring during anaesthesia shall comply with the minimum standards outlined in the guideline by the Malaysian College of Anaesthesiologists and Malaysian Society of Anaesthesiologists (1998).

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

7.3.7. Post-anaesthesia patient shall be transported from the anaesthetic location to the ward on an anaesthetic recovery trolleys and 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, safety of patients and staff shall be ensured. Appropriate precautions shall be strictly adhered to, in accordance with the local department policies and protocols.

7.3.9. The department shall advise the hospital in the development and implementation of a local hospital wide policy on the practice of intermediate and deep sedation. Guidelines on sedation by professional bodies shall be adhered to.

8. SUBSPECIALTY ANAESTHESIA SERVICE

8.1. Cardiothoracic Anaesthesia and Perfusion Service

8.1.1. The scope of the service includes;

8.1.1.1. Anaesthesia for adult and paediatric cardiac and thoracic surgeries

8.1.1.2. Anaesthesia for diagnostic or therapeutic cardiac and major vascular catheterisation procedures

8.1.1.3. Post-operative management of the cardiothoracic surgical patients in the intensive care unit.

8.1.2. 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.

8.1.3. The Cardiothoracic Anaesthesia and Perfusion Service in the hospital shall be guided by the Unit Operational Policy and relevant departmental and hospital policies. (References)

8.1.4. Cardiothoracic Anaesthesia Service is fully specialist based. The staffing ratio for cardiac anaesthetist to cardiac surgeon is 2:1

8.1.5. There shall be 2 trained cardiothoracic anaesthetists per patient location where cardiac surgery is performed. This is to ensure adequate staffing for the administration of anaesthesia, conduct and supervision of cardiopulmonary

bypass and performance of transoesophageal echocardiography examination.

8.1.6. 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 resources factors.

8.1.7. Perfusion service is under the administrative management of the Unit Head of Cardiothoracic Anaesthesia and Perfusion who is appropriately trained in medical perfusion.

8.1.8. The Unit Head shall be assisted by a chief perfusionist who is a qualified medical assistant or of equivalent qualification appropriately trained in clinical perfusion.

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

8.1.10. Perfusion Services shall be made available for all elective and emergency cases 24 hour, including weekends and public holidays.

8.1.11. In line with the development of an integrated intensive care service[9], post-operative care of cardiac surgical patients shall be integrated into such service.

8.1.12. Existing Cardiothoracic Intensive Care Unit (CICU) shall be managed by the Cardiothoracic Anaesthesia 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] Refer to clause 9.3 and 9.4, Intensive Care Service page 42

8.1.13. Clinical management of the post-cardiac surgical patients shall be the joint care of the Intensivists, Cardiothoracic Anaesthesiologist and the Cardiothoracic Surgeon.

8.1.14. Peri-operative transoesophageal echocardiography services;

8.1.14.1. Shall be provided where there are appropriately trained cardiothoracic anaesthesiologists in transoesophageal echocardiography

8.1.14.2. The service shall be made available for diagnostic and monitoring purposes in operation theatre (cardiac and general) and intensive care units (cardiac and general)

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

8.2. Paediatric Anaesthesia Service

8.2.1. Anaesthesia for children demands special requirements usually unavailable in hospitals which are not dedicated to paediatric care. As such, the department shall develop a policy which details criteria for the management of anaesthesia, surgery and nursing for children. This policy shall be developed and documented jointly by representatives of the anaesthesia, surgical and nursing staff and should be reviewed at intervals of not more than five years.

8.2.2. Parents (or carers) should 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.

8.2.3. The ideal child-orientated perioperative anaesthesia environment may not be able to be provided in all hospitals. However, wherever and whenever children undergo anaesthesia and surgery, their particular needs should be recognised and they should be managed in separate facilities from adults with staff who have appropriate experience and training.

8.2.4. There shall be provision for parents to accompany children to the anaesthetic room and recovery room. Parents shall be allowed into the operating theatre 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.

8.2.5. Children undergoing anaesthesia and surgery as day care or as in-patients shall benefit from the input of play

therapists, who can help in the preparation of the child for surgery.

8.2.6. Pre - operative fasting practice shall be in accordance with the Guidelines on Pre- operative Fasting (College of Anaesthesiologists, Academy of Medicine Malaysia, 2007).

8.2.7. Children of all ages, who require anaesthesia, must be managed by anaesthetists who have received the necessary training in paediatric anaesthesia and resuscitation. Specialist anaesthetists are expected to have training in the care of infants and children.

8.2.8. Medical officers, in anaesthesia, must be appropriately supervised by a specialist when anaesthetising children. The level of supervision of a medical officer 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.

8.2.9. All anaesthetists whether they are specialist paediatric anaesthetists or those with an interest in paediatric anaesthesia must recognise and work within the limits of their professional competence.

8.2.10. It will be beneficial for a second anaesthetist to be present, to act as a skilled assistant for the care of infants and children classified as ASA3 or greater.

8.2.11. Specific requirements will include:

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

8.2.11.2. Climate control, temperature control and patient warming devices shall be available so that body temperature is maintained throughout the peri-operative period.

8.2.11.3. Monitoring equipment shall comply with the Malaysian College of Anaesthesiologists, 2003 *Recommendation for Safety Standards and Monitoring during Anaesthesia and Recovery* and suitable for use with infants and children.

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

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

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

8.2.11.7. Children shall be separated from and not managed directly alongside adults, whether this be in the operating theatre, the post-anaesthesia care unit (recovery), intensive care, in-patient wards or the day care unit.

8.2.12. There should be regular audit and morbidity meetings relating to paediatric anaesthesia. This should involve all staff participating in the care of children and ideally should include the views of the children, when appropriate, and their parents.

8.3. Neuro-anaesthesia Service

8.3.1. The scope of services in neuro-anesthesia will include the following ;

8.3.1.1. Anaesthesia for elective neurosurgical procedures

8.3.1.2. Anaesthesia for emergency neurosurgical procedures, including neuro-trauma and medical neurological problems requiring neurosurgical interventions

8.3.1.3. Anaesthesia for radiological neuro-interventional procedures. (These services shall be provided as an integrated set-up using the existing operation theatres with appropriate intensive care and diagnostic radiological services support.)

8.3.2. Hospitals designated as neuro-surgical centres should be staffed by anaesthetic specialists trained in neuro-anaesthesia and credentialed to administer anaesthesia for advanced neurosurgical procedures by appropriately trained neurosurgeons. The hospital should also be accredited as a neurosurgical centre based on operation theatres, radiological support services, blood bank support services and ICU support staffing norms.

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

8.3.4. The process of pre-operative assessment, consent taking and pre-operative instructions for the neurosurgical patient shall be the same as for any other elective surgical procedures.

8.3.5. Administration of anaesthesia shall be carried out by a trained anaesthetist or by a doctor under the direct supervision of a trained anaesthetist.

8.3.6. The anaesthetist shall be responsible for arranging an ICU bed for patients requiring ICU admission after the surgery.

8.3.7. In neuro-centres offering neuro-interventional services, the designated radiological suite shall have adequate facilities for providing safe anaesthesia including anaesthetic and monitoring equipment, patient recovery area and transport devices. Cases scheduled for neuro-interventional procedures shall be assessed pre-operatively and the management of anaesthesia shall be according to standard practises in the OT.

8.3.8. All anaesthetic, recovery and ICU admission processes shall be documented accordingly.

8.4. Obstetric anaesthesia Service

8.4.1. The objectives of the service are;

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

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

8.4.2. An operating theatre shall be made available 24 hours for emergency lower segment caesarean section (LSCS) and other obstetric emergency surgery.

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

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

8.4.5. A trained anaesthetic assistant must be present at all times during procedures.

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

8.4.7. High risk obstetric patients shall be assessed at the anaesthetic clinic as early as possible or at least one 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.

8.4.8. The department shall provide appropriate postoperative pain relief.

8.4.9. 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 a second operating theatre/team should be available if the on-call medical officer or specialist is busy.

8.4.10. The department is an essential member of the 'Red Alert' team and will respond to requests to assist in the resuscitation and management of the critically ill patients e.g. eclampsia, severe postpartum haemorrhage.

8.5. Day-care anaesthesia Service

8.5.1. Day-care anaesthesia service shall be provided in an integrated set-up using the existing OT or a dedicated ambulatory care facility.

8.5.2. In day-care anaesthesia patients shall be admitted, operated and discharged on the same day. The standard of care shall be the same as for inpatients. The discharge criteria shall be strictly adhered. The safety of the patient upon discharge is of utmost concern, in which he/ she should be free from surgical and anaesthetic complication (such as inadequate recovery)

8.5.3. Day-care anaesthesia shall be provided from 8 am to 3 pm on weekdays.

8.5.4. Patient and procedure selection criteria shall be strictly adhered to.

8.5.5. The patient shall be assessed pre-operatively and given clear verbal and written pre-operative instructions. Anaesthetic consent shall be obtained.

8.5.6. The patient will be assessed by the anaesthetist before discharge using the appropriate discharge criteria. Clear verbal and written post-operative instruction shall be given to the patient prior to discharge.

8.5.7. Patients unfit for discharge shall be admitted to the wards.

8.5.8. Anaesthetic and recovery processes shall be documented.

9. INTENSIVE CARE SERVICE

9.1. 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.

9.2. The Intensive Care Unit 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[10].

9.3. There shall preferably be only a single Intensive Care Unit that caters for all patients from all medical and surgical specialties in the hospital. However, in speciality based institutes, dedicated intensive care units catering for such services may be established.

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

9.5. The number of Intensive Care Unit beds shall be at least 3 - 5% of the total acute hospital beds in major hospitals[11]. Additional beds shall be factored in for post-operative patients undergoing subspecialty surgery e.g. cardiothoracic, neurosurgical, vascular,

[10] Refer to appendix viii; Levels of Intensive Care Units in Ministry of Health hospitals, page 82

[11] Refer to appendix vii; Establishment of Intensive Care/ High Dependency Unit in Ministry of Health Hospital, page 78

hepatobiliary, spinal, reconstructive surgery and interventional radiology.

9.6. Care of the critically ill patients shall be provided by a dedicated intensive care team led by an intensivist whenever possible.

9.7. A separate Paediatric Intensive Care Unit shall be established when the paediatric case load exceeds 300 admissions annually.

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

9.9. Organisation and management:

9.9.1. The Head of Department of Anaesthesia and Intensive Care shall be responsible for the overall administrative management, while the appointed intensivist or anaesthetist shall be responsible for the day-to-day management of the unit.

9.9.2. The nursing sister shall be responsible for coordinating the nursing services in the unit.

9.9.3. The medical assistant in-charge shall be responsible for the cleaning and maintenance of the equipment in unit.

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

9.9.5. The unit shall have 24 hour cover by a resident medical officer who shall be responsible for providing first line call during out-of-office hours. He shall discuss all referrals and

problems in the unit with the intensivist or anaesthetist on-call.

9.9.6. The medical officer to patient ratio of 1:4 shall be practiced.

9.9.7. The ideal norm of nurse to patient ratio according to the level of ICU shall be adhered to during all shifts when there is a full complement of the nursing staff[9].

9.10. Policies and procedures:

9.10.1. Patients admitted to the unit shall be cared for by the intensive care team from the Department of Anaesthesia and Intensive Care in a professional, caring and courteous manner.

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

9.10.3. The unit shall operate as a multi-disciplinary general intensive care unit and shall not segregate patients by class or gender.

9.10.4. 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 Intensive Care Unit admission is anticipated.

9.10.5. The attending anaesthetist shall inform and discuss in advance with the intensivist or anaesthetist in the Intensive Care Unit regarding elective surgical cases requiring post-operative intensive care. The anaesthetist who booked the case shall check on bed availability before starting the case.

9.10.6. All patients referred shall be reviewed by a member of the Intensive Care team prior to admission. All admissions

shall be informed to the specialist or consultant of the Intensive Care Unit.

9.10.7. Priority for admission shall be based on the urgency of patient's need for intensive care[12]. Unscheduled, emergency admissions shall take precedence over scheduled elective surgical admissions. Triaging of admissions to the unit shall be done by the intensivist or anaesthetist whenever necessary.

9.10.8. The referring physician shall be responsible for the care of the patient until the patient is physically admitted to the Intensive Care Unit.

9.10.9. The Intensive Care Unit 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. Enquires by other relatives or friends shall be directed to the identified immediate relative.

9.10.10. Consent for invasive procedures performed in the ICU shall be obtained and guided by the policy on informed consent in ICU.

9.10.11. 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.

[12] Refer to Management Protocol in Intensive Care Unit. Admission, Discharge Criteria and Triage, Management Protocol in Intensive Care Unit. Medical Development Division (2006)

9.10.12. 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 the patient is still in the Intensive Care Unit.

9.10.13. All clinical and nursing notes, management and treatment orders for the patient shall be documented legibly in the patient's case notes 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. The case notes shall be in chronological order documenting the progress or management of the patient as recorded by the doctors from the various units.

9.10.14. Drugs prescribed to patients shall be in accordance with the Ministry of Health approved list of drugs.

9.10.15. Strict measures shall be taken to prevent medication errors in the unit[13].

9.10.16. 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.

9.10.17. The unit shall take measures to prevent patient injury caused by falls[14].

[13] Refer to appendix iii; Guide On Medication In The Department Of Anaesthesia And Intensive Care, page 68

[14] Refer to appendix ii; Guide On Patient Safety In The Department Of Anaesthesia And Intensive Care, page 66

9.10.18. The unit shall comply with all hospital infection control policies. Infection control measures in the Intensive Care Unit shall be guided by the CCMS Statement on Infection Control Measures in the Intensive Care Unit (Malaysian Society of Anaesthesiologists 2004).

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

9.10.20. The care of central venous catheters shall be in accordance with the protocol on central venous catheter care.

9.10.21. Ventilator care bundle and measures to prevent ventilator-associated pneumonia shall be applied to all patients who are mechanically ventilated.

9.10.22. Sepsis bundles shall be applied to all patients with severe sepsis as per International Surviving Sepsis guidelines[15].

9.10.23. The prescribing of antimicrobials shall be guided by The Guide to Antimicrobial Therapy in Adult Intensive Care Unit (Malaysian Society of Anaesthesiologists 2006).

9.10.24. Patients shall be screened for their nutritional status and fed according to the Protocol on Feeding the Critically Ill.

9.10.25. The clinical management of patients in the Intensive Care Unit shall be guided by the Management Protocols in Intensive Care Unit (Ministry of Health 2006).

9.10.26. Intra-hospital transport of patients (e.g. from Intensive Care Unit to radio imaging room, operation theatre) shall be the responsibility of the Intensive Care team in accordance with

[15] Refer to Dellinger RP, Cartlet IM, Masur H, et al. Guidelines for the management of severe sepsis and septic shock. Intensive Care Medicine (2004) 30:536-555

the standards defined by the Society of Critical Care Medicine, United States guidelines. Whenever possible, inter-hospital transport of patients shall also be the responsibility of the Intensive Care team[16].

9.10.27. 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.

9.10.28. 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.

9.10.29. When continuing intensive care is deemed medically futile, consideration shall be given to withholding or withdrawal of life-support therapy. This decision shall be discussed with the patient, family and with other team members as appropriate.

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

9.10.31. All deaths shall be informed to the primary unit.

9.10.32. Due to bed constraints, some patients may be ventilated in other critical care areas e.g. Cardiac Care Unit or general wards as a temporary measure until a bed is available or referred to another hospital. Patients ventilated in the

[16] Refer To Warren J, Fromm RE, Orr RA, Et Al. Guidelines for the Inter-Hospital and Intra-Hospital Transport of Critically Ill Patients. Critical Care Medicine (2004); 32:256-262

wards shall be reviewed by the Intensive Care team regularly.

9.10.33. The Intensive Care Service shall be prepared for any surge in demand such as during mass casualties or disease outbreaks e.g. pandemic avian influenza. For mass casualties, local hospital disaster plans shall be adhered to. In the case of pandemic avian influenza outbreak, the management shall be guided by the Intensive Care Preparedness for Avian Influenza Pandemic (Ministry of Health Malaysia 2006).

9.10.34. There shall be networking among Intensive Care Units in a geographical region to optimise intensive care resources. Intensive Care Unit in a local network shall be able to track the availability of beds in the network by using the "ICU Bed Watcher", a web-based ICU networking and database system. The transfer of patients shall be in accordance with the protocol on inter-hospital transfer.

9.10.35. Intensivist visit to hospital without intensivists shall be on a referral basis. Tele-consultation with intensivists shall be encouraged for difficult cases.

9.10.36. The number of visiting doctors shall be restricted to reduce traffic in Intensive Care Unit.

9.10.37. The unit shall ensure visitors adhere to the visiting protocol and visiting hours.

9.11. Facilities and equipment

9.11.1. There shall be appropriate areas available for patient, relatives and staff and separate areas for cleaning and storage of equipment[17].

9.11.2. 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.

9.11.3. All Intensive Care Units shall be provided with isolation rooms with positive/negative pressure facilities for isolation of patients who are highly infectious.

9.11.4. Equipment in the unit shall be of appropriate type and quantity suitable for the function and workload of the unit. All emergency or life support equipment shall be readily accessible and functional[18].

9.11.5. All equipment shall be in good working conditions and there shall be preventive maintenance plan and regular safety testing on all equipment.

[17] Refer to Guidelines on Intensive Care Unit Design 1995. Guidelines/Practice Parameters Committee of the American College of Critical Care Medicine & Society of Critical Care Medicine

[18] Refer to appendix iv; List Of Recommended Equipment For Various Facilities, page 70

10. PAIN MANAGEMENT SERVICE

10.1. Acute Pain Service

10.1.1. The acute pain service shall be provided to all patients in need.

10.1.2. Organisation and management;

10.1.2.1. The day-to-day management of the service is under the responsibility of an assigned anaesthetist and medical officer.

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

10.1.2.3. The pharmacists shall be responsible for the preparation of syringes with pre-mixed drugs.

10.1.2.4. All staff shall render services in a professional and caring manner.

10.1.2.5. Depending on the patient load, 2–4 nurses shall be assigned to APS; the nurse shall undergo the appropriate training before being credentialed as APS nurse.

10.1.2.6. A specialist is assigned overall in charge of the service.

10.1.2.7. At least 1 medical officer is scheduled for duties every day.

10.1.3. Policies and procedures;

10.1.3.1. Management of all patients shall be provided as in standard protocols which will be drawn up by each department based on the Pain Management Handbook (Malaysian Society of Anaesthesiologists, Malaysian Association for the Study of Pain 2004).

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

10.1.3.3. The APS team shall review all patients at least twice a day.

10.2. Obstetric Analgesia Service

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

10.2.2. Organisation and management;

10.2.2.1. 24hrs Obstetric analgesic services shall be available in all State hospitals and when indicated in all district hospitals.

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

10.2.2.3. Details of all obstetric epidurals performed shall be recorded on the Obstetric Analgesia Service (OAS) forms.

10.2.2.4. The pharmacist shall be responsible for all syringes with pre-mixed drugs.

10.2.2.5. The obstetric analgesic nurse shall be responsible for assisting the anaesthetist or medical officer and for monitoring of the patient.

10.2.2.6. The labour suites shall be equipped with adequate monitoring & emergency resuscitation facilities.

10.2.3. Policies and procedures;

10.2.3.1. Consent shall be obtained from the patient prior to the procedure being done.

10.2.3.2. Maternal and foetal monitoring shall be done by the OAS nurse. Parameters monitored shall be recorded in the OAS/General Anaesthesia form.

10.2.3.3. Post-operative obstetric patients shall be reviewed by the OAS team at least once a day.

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

10.3. Chronic Pain Service

10.3.1. The objective of chronic pain service is to provide service to 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.

10.3.2.2. A specialist trained in pain management shall be in charge of the unit.

10.3.2.3. In addition to the doctors, the following supportive staff shall also be in attendance for patient assessment and pain management: a physiotherapist, a clinical psychologist or psychiatrist trained in pain management.

10.3.2.4. There shall be at least one medical officer or trainee specialist, and one nurse in attendance at each clinic session.

10.3.2.5. The chronic pain management clinic shall have all the appropriate facilities and equipment for a full assessment of chronic pain patients.

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 given according to priority.

10.3.3.2. Patients with chronic non cancer pain shall be seen within a month of referral.

10.3.3.3. Patients with cancer pain shall be seen as soon as possible (next clinic day).

10.3.3.4. As far as possible, all patients seen by the pain specialist at the Pain Clinic shall also be assessed and managed by a physiotherapist and clinical psychologist or psychiatrist trained in pain management.

10.3.3.5. Management of all patients shall be done in a multidisciplinary approach by a pain team (comprising doctor, nurse, physiotherapist and clinical psychologist/ psychiatrist).

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

10.3.3.7. Patients may be admitted to hospital for the 2-week intensive cognitive-behaviour therapy pain management programme. All other patients shall be treated as outpatients as far as possible.

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 programme to maintain and augment their professional competency. Participation in theses educational or training activities shall be documented.

11.4. All staff is required to participate in the Ministry's e-CPD programme.

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

12. QUALITY AND RESEARCH

12.1. Quality Improvement

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

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

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

12.1.4. The achieve the above objectives, the department shall participate in the following existing Ministry of Health quality initiatives:

12.1.4.1. Incident reporting

12.1.4.2. National Indicators (for Anaesthesia and Intensive Care)

12.1.4.3. Peri-operative mortality review (POMR)

12.1.4.4. National Audit in Adult Intensive Care Units (NAICU) and its related activities e.g. compliance to ventilator care bundle

12.1.4.5. Key Performance Indicators (KPI)[19]

[19] Refer to appendix xi; Key Performance Indicator for the Department of Anaesthesia and Intensive Care, page 91

12.1.4.6. 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.

12.2. Research

12.2.1. The department shall work closely with the hospital Clinical Research Centre 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-centre clinical trials

13. WHOLE HOSPITAL POLICY

13.1. The Department of Anaesthesia and Intensive Care shall comply with the Whole Hospital Policy in the following areas:

13.1.1. Hospital admission and discharge policy.

13.1.2. Visitors and visiting hours.

13.1.3. Policy on transportation service.

13.1.4. Infection control policy.

13.1.5. Sterilization service.

13.1.6. Management of waste products.

13.1.7. Policy on supply of pharmaceuticals and consumables.

13.1.8. Policy on acquisition of assets and equipments.

13.1.9. Catering service.

13.1.10. Laundry and linen supply.

13.1.11. Cleaning service.

13.1.12. Engineering services including preventive and maintenance services.

13.1.13. Security service.

13.1.14. Fire precaution.

13.1.15. Medical record management.

13.1.16. Communication system.

13.1.17. Policy on quality assurance.

13.1.18. Occupational and Safety Health Assurance (OSHA).

13.1.19. Policy regarding public relation, release of information and confidentiality.

13.2. Specific infection control measures (Occupational Health Unit, Ministry of Health 2002);

13.2.1. All staff shall observe proper hand hygiene at all times. There shall be adequate facilities to support this practice.

13.2.2. Standard precaution measures shall be observed by all staff during patient care.

13.2.3. Use of needle free devices shall be encouraged to prevent needle stick injury. Needle stick injuries shall be reported and managed according to Ministry of Health guidelines.

13.2.4. Patient with infectious disease shall be managed in accordance with the national infection control policy.

13.2.5. Staff shall observe policies and procedures when managing patients with infectious disease undergoing surgery in OT.

13.2.6. Patients with infectious disease shall be managed in proper isolation rooms. There shall be adequate supply of personal protective equipments and consumables in managing these cases.

13.2.7. The Intensive Care Unit shall have individualised cubicles in preparation for the emergence of highly infectious diseases e.g. pandemic avian influenza.

13.3. Disposal of clinical waste shall be in accordance with Ministry's policy and procedure on management of waste product. Sharps shall be disposed of in special impermeable yellow bins.

13.4. Management of mass casualties requiring anaesthetic or intensive care services shall be in accordance with the local hospital policy.

APPENDIX

Appendix i;

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, nurses and medical assistants 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, selection 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 in the department.
2. The committee is responsible for the successful implementation of all quality initiatives under the Ministry of Health Quality Assurance Program
3. The committee shall be chaired by a senior consultant who may or may not be the quality assurance coordinator. Its members shall include officers in-charge of the various quality activities e.g. National Indicator Approach (NIA), incident reporting, Peri-Operative Mortality Review (POMR), National Audit on Adult Intensive Care (NAICU) etc.

4. The committee shall meet at least three times a year.

C. Continuing Professional Development Committee

1. The function of the committee is to plan, promote, organise 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, intensive care unit nurses and medical assistants.
4. The committee shall meet at least three times a year.

D. Safety Committee

1. The function of the committee is to ensure a safe working environment against falls, electrical injuries, fire, 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 committee and the Occupational Safety and Health Assurance (OSHA) Committee in the implementation of hospital wide safety measures.
3. The committee shall be chaired by a specialist or the department safety officer.
4. Its membership shall include area managers i.e. sister and medical assistants of various locations e.g. operation theatre, intensive care units.
5. The committee shall meet three times a year.

Appendix ii;

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

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 two staff using 2 patient identifiers.
    a. There are 4 steps to identify patients in order of priority:
        i. Ask the patient his name, date of birth, identification card number and/or address and verify it against the information in the patient's case notes
        ii. If the patient is unable to tell his name, refer to the ID bracelet and if possible verify the information by asking family, relatives.
        iii. By asking the patient's relative to identify the patient by name, date of birth and/or address
        iv. 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 staff 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 protocol.

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 operating theatre shall not be left unattended. Adequate assistance shall be provided for positioning of patient for any procedure. Transport trolleys shall be fitted with side rails.

Appendix iii;

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

1. The department shall abide by the rules and regulations of the Ministry of Health and hospital policy on medication use
2. All medication prescribed shall be in accordance with the approved list of drugs in the Ministry of Health. The use of medication not in the Ministry of Health 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 operating theatre and intensive care unit.
4. Dedicated staff shall be responsible for the ordering and receiving of drugs to ensure adequate supply in the operating theatre and intensive care unit
5. All medication shall be properly and safely stored (Refer appendix vi).
6. Controlled substances shall be accurately accounted and recorded according to applicable law and regulation of the Ministry of Health
7. All medications to be administered to the patients shall be accurately labelled with the name of medication and its concentration
8. 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.

9. Inventory of medication shall preferably be kept in each storage area. (Refer to list of medication attached.)

10. All multi-dose vials and ampoules shall be swabbed with alcohol wipes prior to drawing out the contents

11. All medication administered to the patients shall be clearly written into the patients' records with regards to name (preferably generic), dosage, route and time

12. All compounded medication (e.g. epidural cocktails) shall be prepared under aseptic techniques.

13. Patient shall be monitored for drug effectiveness and adverse effects. All adverse effects shall be documented into the patients' records, informed later to the patient (or relatives) and reported to the pharmacy via the adverse drug reaction (ADR) format.

14. All medication errors and near misses shall be reported using the Ministry of Health standardized form (Critical Incident Form) for education and prevention as part of the patient safety program.

Appendix iv;

LIST OF RECOMMENDED EQUIPMENT FOR VARIOUS FACILITIES

A. Anaesthesia

- Integrated anaesthesia workstation complete with ;
  - General anaesthetic machine
  - Ventilator
  - Physiologic monitor
  - Computer and printer
- Intubation laryngoscope and video camera
- Drugs and emergency trolley
- Difficult intubation trolley
- Suction machine
- Rapid infusion system
- Defibrillator
- Syringe pump
- Infusion pump
- Target-controlled infusion (TCI) pump
- Ultrasound machine
- Peripherals nerve stimulator
- Bispectral index (BIS) monitor
- Warming blanket
- Warming mattress
- Overhead warming device
- Pneumatic pump
- Transport trolley
- Sliding mattress
- Blood warmer device
- Blood refrigerator
- Drugs refrigerator
- Fluid warming device/cabinet
- Disinfectant washer
- Drying and warming cabinet

B. Recovery Room

- Recovery room monitor
- Transport monitor
- Transport ventilator

- Suction device
- Electrocardiography (ECG) machine
- Syringe pump

C. Intensive Care Unit

- Critical care bed
- ICU ventilator
- Non invasive ventilator
- Transport ventilator
- ICU monitors
- Transport monitor
- ECG machine
- Defibrillator
- Drugs and emergency trolley
- Volumetric pump
- Syringe pump
- Enteral feeding pump
- Transport suction device
- ABG and electrolyte analyser
- Warming device
- Pneumatic compression system
- Blood fridge
- Drug fridge
- Washer disinfectant
- Drying cabinet
- Patient chair
- Hoist
- Computer with internet , fax and printer

Additional for Level 2 and 3 ICUs

- Non invasive cardiac output monitor
- Continuous renal replacement machine
- Cooling device
- Flexible bronchoscope and video display unit
- Ultrasound machine
- Bispectral index (BIS) monitor

Additional for Level 3 ICUs

- Rapid fluid infusion system
- Fluid management system
- Trans-esophageal echocardiography (TEE) machine
- Intracranial pressure monitor

D. Pain Management

- Patient control analgesia pump
- Syringe pump
- Radiofrequency machine
- Transcutaneous electrical nerve stimulation (TENS) machine
- Nerve stimulator

E. Subspecialty Services

- Auditory evoke potential monitor
- Incubator
- Extracorporeal membrane oxygenator (ECMO)
- Trans-esophageal echocardiography (TEE) machine
- Magnetic resonance imaging (MRI) compatible device
- Anaesthetic machine
- Invasive ventilator
- Physiologic monitor
- Suction device
- Syringe pump

Appendix v;

GUIDE ON EFFECTIVE COMMUNICATION IN THE DEPARTMENT OF ANAESTHESIA 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 operating theatre counter/reception nurse shall provide information on the patient in the operating theatre 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. Medical officers shall inform the specialist of anticipated or unexpected 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 operating theatre (OT), from OT 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 anaesthetist in the team shall inform the patient/ family of the incident in a caring, truthful and honest

manner as soon as possible after a discussion with other healthcare providers. The head of department shall also inform the hospital director.

Appendix vi;

LIST OF MEDICATION

List of drugs in Anaesthetic Cart (Operating Theatre)

1. Injection Adrenaline
2. Injection Atropine
3. Injection Hydrocortisone
4. Injection Lignocaine
5. Injection Heparinised saline
6. Injection Dopamine
7. Injection Ephedrine
8. Injection Dexamethasone
9. Injection Sodium bicarbonate
10. Injection Neostigmine
11. Injection Propofol
12. Injection Thiopentone
13. Injection Ketamine
14. Injection Etomidate
15. Injection Suxamethonium
16. Injection Atracurium
17. Injection Rocuronium
18. Injection Distilled water

List of drugs in the Central Storage Area (Operating theatre)

1. Injection Digoxin
2. Injection Phenylephrine
3. Injection Sodium glycopyrollate
4. Injection Ondansetron / Granisetron
5. Injection Hyoscine butylbromide

6. Injection Amiodarone
7. Injection Phenytoin
8. Injection Aminophylline
9. Injection Terbutaline/Salbutamol
10. Injection Magnesium sulphate
11. Injection Adenosine
12. Injection Ranitidine
13. Injection Dobutamine
14. Injection Chlorpheniramine
15. Injection Frusemide
16. Injection Metochlorpramide
17. Injection Glyceryl trinitrate
18. Injection Esmolol
19. Injection Hydralazine
20. Injection Noradrenaline
21. Injection Labetalol
22. Injection Parecoxib
23. Local anaesthetic isobaric Bupivacaine
24. Local anaesthetic hyperbaric Bupivacaine
25. Local anaesthetic Ropivacaine
26. local anaesthetic levobupivacaine

List of drugs in Emergency Trolley (Intensive Care Unit)

1. Injection Adrenaline
2. Injection Atropine
3. Injection Adenosine
4. Injection 50% Dextrose
5. Injection Naloxone
6. Injection Flumezenil
7. Injection Calcium gluconate

8. Injection Dopamine
9. Injection Sodium bicarbonate
10. Injection Magnesium sulphate
11. Injection distilled water
12. Injection heparinised saline
13. Injection Frusemide

List of drugs in the Central Storage Area (Intensive Care Unit)

1. Injection Amiodarone
2. Injection Phenytoin
3. Injection Aminophylline
4. Injection Terbutaline/Salbutamol
5. Injection Magnesium sulphate
6. Injection Potassium Chloride
7. Injection Calcium Chloride
8. Injection Potassium dihydrogen phosphate
9. Injection Dobutamine

List of drugs in the Refrigerator (Intensive Care Unit)

1. Injection Propofol
2. Injection Etomidate
3. Injection Suxamethonium
4. Injection Atracurium
5. Injection Rocuronium
6. Injection Esmolol
7. Local anaesthetic isobaric Bupivacaine
8. Local anaesthetic hyperbaric Bupivacaine
9. Local anaesthetic Ropivacaine
10. Injection Noradrenaline

Appendix vii;

ESTABLISHMENT OF INTEGRATED INTENSIVE CARE/ HIGH DEPENDENCY UNITS IN MINISTRY OF HEALTH HOSPITALS

Intensive care units (ICU) are specialized 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 the Ministry of Health hospitals is provided by the Department of Anaesthesia and Intensive Care.

Hospitals have become larger and more specialized, expectation of patients has increased and society is more aware of their rights. In the last ten years, the demand for intensive care beds far exceeded its supply and this has resulted in severe shortage of ICU beds in the Ministry of Health (MOH) hospitals. Based on a survey in 2003 (National Audit on Adult Intensive Care Units), the number of ICU beds in MOH hospitals was 222 or 43% of the total number of ICU beds in Malaysia. At a total of 509 beds in the whole country, Malaysia has 2 ICU beds per 100,000 populations as compared to 24 per 100,000 in US, 7 per 100,000 in Australia and Singapore. ICU beds in MOH state hospitals comprise 1% of the total hospital beds. This is still below the figure of around 2.6% in the United Kingdom, 4.1% in Denmark and 10% in the United States.

Each year, more than five thousand 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% (Intensive Care Working Group of the Clinical Resource Efficiency Support Team (CREST) UK 1993).

Recent developments in the organization of ICUs and the role of high dependency unit

Historically, high dependency 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 High Dependency Units (HDU) 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 important recommendations in "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 Intensive Care (ICU)/High Dependency (HDU). Integrated Intensive Care/High Dependency Units are common in Australia and the trend is for increased integration and flexibility in the 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 recent upgrading exercise in 2000 amalgamated its three specialist Intensive Care Units; cardiothoracic, trauma and general intensive care units into a 35 bedded ICU which incorporates both intensive care and high dependency patients. Similarly, the UCL Hospital in London will soon be moving into a new hospital complex which has an ICU with provision for up to 35 critical care beds, making it the largest unit of its kind in London. 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 be less likely to be refused admission.

Estimation of intensive care beds:

Basic Number of Beds (X)

$$= \frac{\text{Annual hospital admissions x rate of demand x Average length of stay}}{365 \text{ x ideal occupancy}}$$

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 admissions a year, unit admission of 2% of total hospital admission, ideal ICU BOR at 70% and average length of unit stay is 6 days

$$\text{Basic Number of Beds (X)} = \frac{50{,}000 \times 0.02 \times 6}{365 \times 0.7}$$

$$= 23.5$$

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 the ratio of intensive care 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 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 the 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 Ministry of Health'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.

Appendix viii;

LEVEL OF INTENSIVE CARE UNITS IN THE MINISTRY OF HEALTH HOSPITALS

Intensive Care Units are categorised into 3 levels:

Level 1 -

This is equivalent to the 'high dependency unit' or 'acute care ward' and shall be made available in all district hospitals without anaesthetist. 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 ratio shall be 1: 2 - 3 patients.

Level 2 -

This shall be located in district hospitals with anaesthetists capable of providing intensive care. The number of beds shall be 6 - 10 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 Intensive Care Units 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 anaesthetist with special interest in intensive care. The number of beds shall range from 16 to 35, or approximately 3% - 5% of acute hospital beds depending on the services provided by the hospital. The unit shall be a mixed medical and surgical unit

Appendix ix;

STAFF - ROLES AND FUNCTIONS

A. National Advisor of Anaesthesia and Intensive Care Service

The main function of the National Advisor of Anaesthesia and Intensive Care is to advise the Ministry of Health in matters pertaining to Anaesthesia, Intensive Care and Pain management on manpower, training, equipment, budget and development. The National Advisor coordinates with the heads of department in the implementation of government policies to achieve the Ministry of Health's vision and missions.

Specific functions:

1. Advise on posting of specialists and trainees
2. Advise on equipment needs and allocation of budgets
3. Collate data and census for planning and development purposes
4. Advise and organise CPD programme
5. Advise and implement quality initiative activities
6. Advice and formulate protocols, guidelines and policies
7. Represent the service in national committees i.e. Conjoint Board, Master's Training Committee, Subspecialty Training Committee, 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 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 Ministry of Health. Heads of departments of state hospitals shall also be responsible for the planning, implementation and monitoring of the anaesthetic and intensive care services in their respective state
5. To prepare budget for the department and be responsible for effective use of the resources
6. To implement and monitor quality assurance activities and ensure that remedial measures are taken if necessary
7. To conduct regular meetings with all department personnel
8. To organise continuous medical education activities for the department
9. To audit the department's activities and performance and prepare its annual report for submission to the hospital director and National Advisor of Anaesthesia and Intensive Care Service.
10. To conduct yearly assessments of all medical staff within the department

Clinical

1. To conduct pre anaesthetic assessment for patients in the anaesthetic clinic, ward and operating theatre.
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 intensive care unit.
4. To provide adequate pain relief for post-operative patients and labouring mothers

5. To provide professional, clinical leadership and supervision to specialists and medical officers
6. To provide and assist in the resuscitation of patients
7. To organise and undertake teaching of Masters trainees, medical officers, nurses, medical assistants
8. To undertake on-call duties as per roster
9. To be up-to-date with trends and developments in anaesthesia, 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 medical officers 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 for personnel of the department (Masters trainees, medical officer, nurses, medical assistants)
5. To attend talks, seminars, courses and conferences to improve and update knowledge
6. To participate in and implement department's CME activities, morbidity and mortality meetings, QA activities, research, patient satisfaction studies, innovation and Key performance indicators.
7. To assist in the organization of 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 schedules and on call rosters

Clinical

1. To conduct pre anaesthetic assessment for patients in the anaesthetic clinic, wards and operating theatre.
2. To provide anaesthesia for elective and emergency cases undergoing surgery
3. To care for patients in the intensive care unit.
4. To provide adequate pain relief for post-operative patients and labouring mothers
5. To supervise junior specialists and medical officers in the provision of anaesthesia
6. To provide and assist in the resuscitation of patients
7. To undertake on-call duties as per the 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
4. To conduct pre-operative assessment
5. To attend the anaesthetic clinic under specialist supervision
6. To be actively involved in patient resuscitation when necessary
7. To provide basic intensive care for patients in the ICU
8. To participate on a regular basis in the educational and audit programme within the department

E. Intensive Care Nurse

1. To provide nursing care for critically ill patients
2. To ensure patient well being by providing nutrition, hygiene, medication, ventilation and other supports
3. To recognize complications ,take remedial measures and inform doctor
4. To assist doctors in doing procedures
5. To monitor and record patients' vital signs
6. To trace laboratory investigations, previous hospitalisation case notes and radiological investigations
7. To adhere to infection control policies
8. To communicate and update family members regarding the patients' condition
9. To perform cardiopulmonary resuscitation
10. To document nursing report in the patients' case notes
11. To pass over report to the next shift
12. To attend CNE activities
13. To comply with ICU protocols and related guidelines
14. To comply with the care bundles' protocols.

F. Anaesthetic Clinic Nurse

1. To receive referral and register patients
2. To screen patients with questionnaire
3. To facilitate patients for laboratory investigations, X-Rays and electrocardiogram
4. To trace investigation results and previous records
5. To assist doctor during consultation
6. To dispatch reply letters
7. To document, record and perform data entry for statistical purposes
8. To contact patients when necessary

E. Acute Pain Service Nurse

Administrative

1. To enter patient data for statistical purpose
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

Clinical

1. To see cases referred by the wards and the operating theatre
2. To carry out post operative pain management
3. To prepare drugs and equipment required
4. To monitor every patient
5. To conduct APS round 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)

Appendix x;

RECOMMENDED BASIC TRAINING REQUIREMENT FOR VARIOUS CATEGORY OF PERSONNEL

A. Specialist

- Management
- Research methodology and biostatistics
- Quality assurance
- Professional conferences

B. Medical Officer

- Basic Life Support
- Advanced Life Support
- Safe practice in Anaesthesia (SPA)
- Basic Assessment and Support in Intensive Care (BASIC)
- Simulation in anaesthesia
- Acute Pain Service
- Professional conferences

C. Intensive Care Nurses/Medical Assistant

- Basic Life Support
- Advanced Life Support
- Post Basic in Intensive Care Nursing
- Professional conferences

D. Anaesthetic Assistant

- Basic Life Support
- Post basic Peri-anaesthetic Care

E. Additional Courses for Specialty Personnel

- Perfusionist course
- Acute Pain Service
- Paediatric Advanced Life Support

Appendix xi;

KEY PERFORMANCE INDICATORS FOR ANAESTHESIA AND INTENSIVE CARE SERVICES

Aspect Of Performance : QUALITY & SAFETY		
Key Performance Indicators		Optimal Target/ Standard
Dimension; Clinical Effectiveness & Risk Management		
No. 1	Incidence of Intubation in the Recovery Room	< 0.3%
No. 2	Ventilator Care Bundle (VCB) compliance	> 80%
No. 3	Department Mortality / Morbidity meeting	At least once a month
Dimension; Patient-focused Care		
No. 4	Percentage of patients awaiting emergency surgery for more than 24 hours	< 1%
No. 5	Percentage of patients on Acute Pain Service for elective and emergency surgery	> 10%
No. 6	Percentage of patients assessed in anaesthetic clinic for elective surgery	> 50%

Table 2; Key Performance Indicators for Quality and Safety Aspects

Aspect Of Performance : PRODUCTIVITY		
Key Performance Indicators		Optimal Target/ Standard
Dimension; Workload		
No. 7	Total elective operating time per specialist	Observe trend
No. 8	Total elective operating time per medical officer	Observe trend
No. 9	Total number of patient visits by the Acute Pain Service per APS nurse	400 visits/nurse/month

Table 3; Key Performance Indicators for Productivity Aspects

Appendix xii;

DRAFTING COMMITTEE FOR OPERATIONAL POLICY; ANAESTHESIA AND INTENSIVE CARE SERVICES

Advisors

Datuk Dr Noor Hisham Abdullah, Deputy Director General of Health (Medical Services)

Dato' Dr Noorimi Hj Morad, former Deputy Director General of Health (Medical Services)

Dato' Dr Azmi Shapie, Director of Medical Development Division

Dr Teng Seng Chong, Senior Deputy Director of Medical Development Division

Chairperson

Dr. Ng Siew Hian, National Advisor of Anaesthesia and Intensive Care Service, Head of Department of Anaesthesia and Intensive Care, Hospital Kuala Lumpur

Coordinator/Secretariat

Dr Hirman Ismail, Assistant Director, Medical Development Division

Members

Datin Dr. V. Sivasakthi, Head of Department of Anaesthesia and Intensive Care, Hospital Melaka (Main document)

Dato' Dr. Jahizah Hassan, Head of Department of Anaesthesia and Intensive Care, Hospital Pulau Pinang (Main document and Cardiothoracic and Perfusion service)

Dr. Aisai b. Abdul Rahman, Head of Department of Anaesthesia and Intensive Care, Hospital Kuala Trengganu (Main document)

Dr. Jenny Tong May Geok, Head of Department of Anaesthesia and Intensive Care, Hospital Seremban (Main document)

Dr. Tai Li Ling Consultant Intensivist, Hospital Kuala Lumpur, (Main document and Intensive Care service)

Dr. Kavita M. Bhojwani, Head of Department of Anaesthesia and Intensive Care, Hospital Ipoh (Main document and Pain service)

Dr. Fauziah Yusoff, Head of Department of Anaesthesia and Intensive Care, Hospital Putrajaya (Main document)

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MEDICAL DEVELOPMENT DIVISION
MINISTRY of HEALTH MALAYSIA

ANAESTHESIA AND INTENSIVE CARE SERVICE; OPERATIONAL POLICY

This policy document covers key areas of the anaesthesia and intensive care service such as the organisational structure, human resource and asset requirements, patient management, ethics and clinical governance.

It is intended as a guide for health care providers, hospital managers and policy makers on the requirement, operation and development of the anaesthesia and intensive care service in the Ministry of Health hospitals.

The document outlines optimal achievable standards in accordance with best practices and guidelines.

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