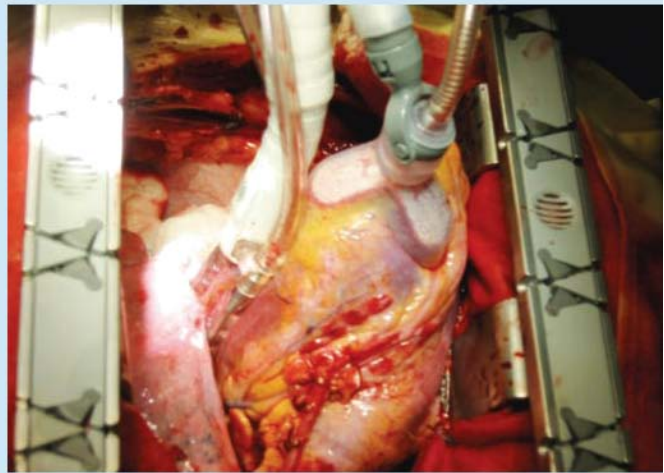




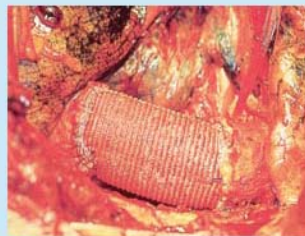
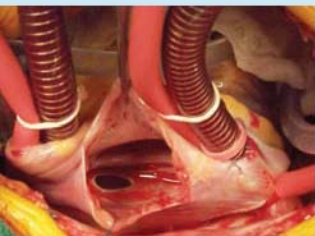
MINISTRY OF HEALTH MALAYSIA

MOH/P/PAK/131.07 (BP)



CARDIOTHORACIC SURGERY SERVICES OPERATIONAL POLICY

JANUARY 2011



**SURGICAL AND EMERGENCY MEDICAL SERVICES UNIT
MEDICAL SERVICES DEVELOPMENT SECTION
MEDICAL DEVELOPMENT DIVISION**



**MEDICAL DEVELOPMENT DIVISION
MINISTRY OF HEALTH MALAYSIA**

**CARDIOTHORACIC SURGERY SERVICES
OPERATIONAL POLICY**

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FOREWORD BY

THE DIRECTOR GENERAL OF HEALTH MALAYSIA

Malaysia, through the Ministry of Health, has made significant inroads in nation building, economic development and enhancement of the health status and quality of life of its people. The Ministry of Health is the biggest healthcare provider in the country and will face even greater challenges in the health sector, in tandem with the country's population growth and epidemiological transition of diseases.

Through successive Malaysia Development Plans, the medical and health care services have gradually expanded and enhanced with new programmes being introduced at the primary, secondary and tertiary levels. Accessibility to cardiology, cardiothoracic and cardiac rehabilitation services in the Ministry of Health hospitals, for example, have been strengthened so that more people can now benefit from the services provided.

To continually improve our hospital-based services, better tools and processes for effective delivery will be formulated and implemented. A comprehensive system, which is evidence-based and outcome-oriented, and which fulfills the criteria of acceptability, quality, practicality and patient-centeredness has to be established. The availability of an Operational Policy for the Cardiothoracic Surgery Services will help to guide our

health care providers provide efficient and effective services, despite resource constraints. It is hoped that this document will serve as a useful guide and tool for the improvement of cardiothoracic surgery services in Malaysia.

I would like to congratulate the Medical Development Division and the cardiothoracic surgeons from the Ministry of Health for their hard work in developing this document and for their contribution towards the progress of secondary and tertiary medical care in this country.

Thank you.

Tan Sri Dato' Seri Dr Hj Mohd Ismail Merican
Director General of Health Malaysia

FOREWORD BY

THE DEPUTY DIRECTOR GENERAL OF HEALTH (MEDICAL)

The history of the cardiothoracic surgery services in Malaysia dated back to the 60's when the first service was provided by the Lady Templer Hospital in Kuala Lumpur. The hospital carried out close-heart operations which do not require cardiopulmonary bypass (mainly ligation of PDA and Closed Mitral Valvotomy for Rheumatic Mitral Stenosis). Thoracic operations such as lung resection for tumour and TB were also performed. The first open heart surgery in Malaysia was carried out at the University Hospital, Kuala Lumpur in 1975, then by Kuala Lumpur Hospital in 1982. The National Heart Institute (or better known as IJN, Institut Jantung Negara) was established in 1992, followed by centres in Pulau Pinang Hospital (1994), Sultanah Aminah Hospital, Johore Bahru (1996), the Sarawak General Hospital (2001) and the latest, Serdang Hospital in 2006.

To ensure a high standard of cardiothoracic services in these centres, and in promoting professional accountability and responsibility, the Ministry of Health (MOH) regularly monitors clinical outcomes and Key Performance Indicators (KPI) in these centres. In addition, the Peri-operative Mortality Review Program (POMR), a repository of outcome data, is being maintained, akin to many professional bodies in the world. Data gathered so far indicated that the performances of our

centres are on par with international standards of competency and skills. The operative outcomes remain low in terms of mortality (less than 3%) and morbidity.

The availability of this Operational Policy will provide guidance to all the relevant key players in the hospitals providing cardiothoracic services. It will also benefit health care managers in the formulation of local hospital policies and procedures, establishment of interdepartmental collaboration, planning of facilities, service development and ensuring that available resources are utilized efficiently.

I would like to congratulate the Medical Development Division for initiating and coordinating the preparation of this important document. I must also commend the main author of this policy Cardiothoracic Surgery Services, Datuk Dr Abdul Rahman Ismail for his vision, never ending dedication and commitment in assisting the Ministry of Health develop and provide better cardiothoracic surgery care to the citizens of Malaysia. I sincerely hope that the high quality of our medical services will continue to improve in line with the Ministry's mission to provide the country with a healthcare system on par with international standards.

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

**FOREWARD BY MAIN AUTHOR OF CARDIOTHORACIC
SURGERY SERVICES OPERATIONAL POLICY
(FORMER NATIONAL ADVISOR OF CARDIOTHORACIC
SURGERY SERVICES)**

The objective of the Cardiothoracic Surgery Service is to provide safe and efficient Cardiothoracic Surgery Service, inclusive of pre-operative cardiothoracic assessment and preparation of patients going for surgery, performance of cardiothoracic surgery, post-operative cardiothoracic intensive care to all patients undergoing cardiothoracic surgery, out-patient follow-up care and cardiac rehabilitation programme. With increasing demands from the public, high volume workload, stressful environment and challenging battlefield in the operating theatres, the department faces many challenges. All the staff that provide this service, shall be adequately trained and instilled with the teamwork concept of one Malaysia. We will perform at our best and we will continue to improve our service in tandem with the Ministry's mission to provide this country with an excellent healthcare system.

The objective of this Operational Policy is to provide an essential guide for every personnel involved directly or indirectly in the provision of Cardiothoracic Surgery Service in Ministry of Health hospitals. I believe all of them will find this document useful for their references.

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, Dr. Patimah Amin and Dr. Zahirah Mohd Juraimi for their assistance. I would also like to thank my seniors and colleagues from the cardiothoracic surgery fraternity who have given me invaluable advices and ideas in the preparation of this policy.

Datuk Mr. (Dr.) Hj. Abdul Rahman Ismail
Head of Cardiothoracic Surgery Service
Sultanah Aminah Hospital, JB

ACKNOWLEDGMENTS

Ministry of Health would like to express appreciation to the main author of this policy, Datuk Mr (Dr) Hj Abdul Rahman Ismail. We would also like to express our appreciation to the ex-Head of department of cardiothoracic surgery: Y. Bhg. Datuk Dr. Zainuddin Wazir and Dr. Wong Poo Sing as well as Dato' Dr. Mohd Hamzah Kamarulzaman who have also contributed their ideas (directly or indirectly) in the development of this operational policy.

LIST OF ABBREVIATIONS

ALS	Advanced life support
AMO	Assistant Medical Officer
BLS	Basic life support
CC	Cardiology clinic
CCU	Coronary care unit
CICU	Cardiothoracic intensive care unit
COT	Cardiothoracic operating theatre
CPD	Continuing professional development
CRP	Cardiac rehabilitation programme
CRW	Cardiology rehabilitation ward
CTC	Cardiothoracic clinic
CTS	Cardiothoracic surgery
CTSPA	Cardiothoracic surgery personal assistant
CTW	Cardiothoracic ward
ECG	Electrocardiography
ECHO	Echocardiography
eGL	Electronic Guarantee Letter
HOD	Head of Department
CHDU	Cardiothoracic high dependency unit
CHDW	Cardiothoracic high dependency ward
IABP	Intra-aortic balloon counterpulsation pump
ICL	Invasive cardiac laboratory
IJNSB	Institut Jantung Negara Sdn Bhd

MO	Medical Officer
MOH	Ministry of Health
NH	Narayana Hrudayalaya Hospital
PCI	Percutaneous Coronary Intervention

1. INTRODUCTION

- 1.1 Cardiothoracic Services (activity 3.24) are among the major clinical specialty services provided by the Ministry of Health hospitals.
- 1.2 Increasing prevalence of heart diseases and greater public expectations are posing an increasing demand for comprehensive and efficient services that will give optimum care to the patient.
- 1.3 As the biggest health care provider, hospitals in the Ministry of Health play an important leading role in the development and provision of cardiothoracic services in Malaysia.
- 1.4 These services (activity 3.24) are provided by the Cardiothoracic Surgery Department (activity 3.24.1), Cardiology Department (activity 3.24.2) and Cardiothoracic Anaesthesia and Perfusion Unit (activity 3.24.3) of the relevant hospitals.
- 1.5 At the moment, there are five functional cardiothoracic centers in the Ministry of Health, located in the following hospitals:

- 1.5.1 Penang Hospital (Northern zone).
 - 1.5.2 Sultanah Aminah Hospital
(Southern zone).
 - 1.5.3 Sarawak General Hospital
(Sarawak zone).
 - 1.5.4 Serdang Hospital (Central zone).
 - 1.5.5 Queen Elizabeth II Hospital
(Sabah Zone).
- 1.6 This policy document covers key areas of Cardiothoracic Surgery Service such as organization, human resources, infrastructures, asset requirements, clinical governance, and ethics.
- 1.7 This policy is intended to guide the health care providers, hospital managers and policy makers on the requirements, operations and development of Cardiothoracic Surgery Service (activity 3.24.1) in the Ministry of Health hospitals.
- 1.8 This document shall be reviewed and updated every five years or when the need arises.

2. OBJECTIVES OF CARDIOTHORACIC SERVICES (ACTIVITY 3.24)

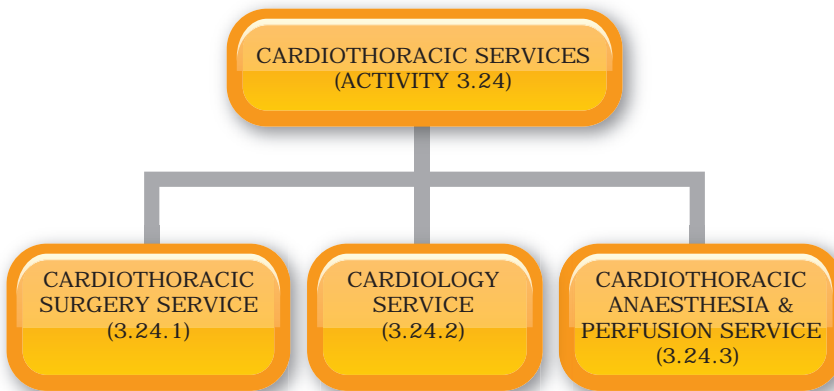
- 2.1 To provide high quality, comprehensive and efficient cardiothoracic services which include Cardiothoracic Surgery Service, Cardiology Service and Cardiothoracic Anaesthesia and Perfusion Service.

- 2.2 To become a center of excellence at each of the respective zone.

- 2.3 To provide training for the Ministry of Health professionals and staff.

3. ORGANIZATION OF CARDIOTHORACIC SERVICES

3.1 The provision of a comprehensive cardiothoracic services are provided by provider from three different clinical disciplines (please refer to section 1.4 and the table below):



4. SCOPES OF CARDIOTHORACIC SERVICES

- 4.1 Cardiothoracic Surgery Service consists of:
 - 4.1.1 Adult cardiac surgery service.
 - 4.1.2 Paediatric cardiac surgery service.
 - 4.1.3 Adult and paediatric thoracic surgery service.

- 4.2 Cardiology Service consists of:
 - 4.2.1 Adult cardiology service.
 - 4.2.2 Paediatric cardiology service.

- 4.3 Cardiothoracic Anaesthesia And Perfusion Service consist of:
 - 4.3.1 Cardiothoracic anaesthesia service.
 - 4.3.2 Perfusion services during cardiac surgical cases.
 - 4.3.3 Ventilatory support peri-operatively.

**5. CARDIOTHORACIC SURGERY SERVICE
(ACTIVITY 3.24.1) AND CARDIOTHORACIC
SURGERY DEPARTMENT**

5.1 Cardiothoracic Surgery Service:

5.1.1 The objective of the Cardiothoracic Surgery Service is to provide safe and efficient cardiothoracic surgery, inclusive of pre-operative cardiothoracic assessment and preparation of patients going for surgery, performance of cardiothoracic surgery, and provision of post-operative cardiothoracic intensive care to all patients undergoing cardiothoracic surgery, provision of follow-up care and rehabilitation.

5.1.2 The Cardiothoracic Surgery Service in the hospital shall be guided by this Operational Policy and the relevant departmental and hospital policies.

5.1.3 The Cardiothoracic Surgery Service shall at all times be administratively managed by the Head of Department of Cardiothoracic Surgery who is a gazetted cardiothoracic surgeon

(according to the MOH gazettment criteria). The national advisor of Cardiothoracic Surgery Service shall be consulted for any exemption to this requirement.

5.1.4 The Cardiothoracic Surgery Service shall provide service for elective, urgent and emergency cases everyday, including weekends and public holidays. (Please refer to section 5.2.1).

5.1.5 There are five components under the Cardiothoracic Surgery Service. All these five components must be available to ensure the service can be delivered in a continuous and efficient manner.

- (1) Cardiothoracic Clinic (CTC).
- (2) Cardiothoracic Ward (CTW).
- (3) Cardiothoracic Operating Theatre (COT).
- (4) Cardiothoracic Intensive Care Unit (CICU).
- (5) Cardiothoracic High Dependency Unit (CHDU).

5.1.6 All of the five components are under the administrative management of the Head. He will be responsible for the overall management of all the components. Questions and matters pertinent to each component, pertaining to the organization, staff, asset, training, budget, development and expansion, must be referred to the head.

5.1.7 Cardiothoracic Surgery Service (activities and programme) carried out by the department shall be under the scrutiny of the Head. He shall be assisted by cardiothoracic surgical OT sister, CICU sister, CTW sister and cardiothoracic clinic sister. These sisters shall be responsible for assisting the Head in coordinating the nursing service, activities and programme in the department.

5.1.8 Scope of Cardiothoracic Surgery Service is as shown below:

- (1) Out-patient Cardiothoracic Surgery Service.

- (2) In-patient Cardiothoracic Surgery Service.
- (3) Cardiac Surgical Service (open and close heart surgery).
- (4) Thoracic Surgical Service (thoracic surgery).
- (5) Cardiothoracic (post-surgical) Intensive Care Service.
- (6) In-patient & out-patient Cardiac Rehabilitation Programme.
- (7) 24-hours emergency service (emergency referral). (This service includes the surgical coverage for PCI at ICL).
- (8) Heart and Heart Valves Procurement Service. (National organ, tissue and cell transplantation programme).
- (9) MyCARE registry.

5.2 Cardiothoracic Surgery Department:

5.2.1 The Cardiothoracic Surgery Department shall implement infection control measures in accordance with national infection control policies. The department shall ensure a high level of awareness among all categories of staff. The importance of proper hand hygiene and standard precaution measures shall be reinforced.

5.2.2 The department shall support the national organ and tissue transplantation program in accordance with the National Organ, Tissue and Cell transplantation Policy (Ministry of Health Malaysia, 2007). Specifically, the department shall be involved in heart and heart valve procurement service.

5.2.3 The Ministry of Health's intention is to develop eight regional centers for Cardiothoracic Surgery Service for the country. Four of these centers are already operational, while the other four are being developed.

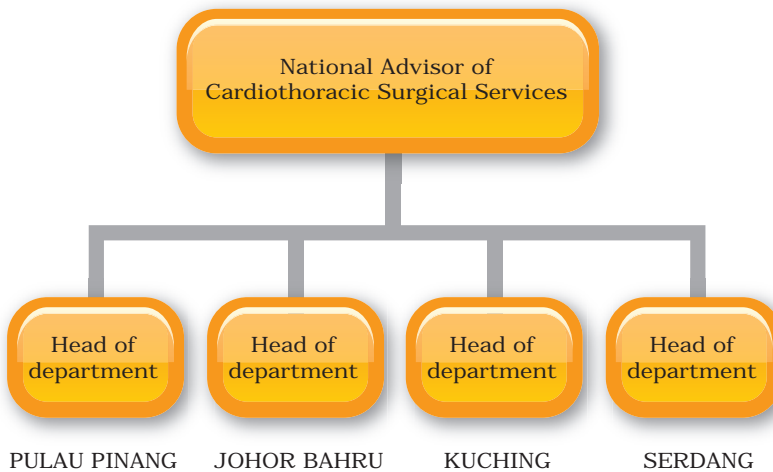
	Hospitals with the Cardiothoracic Surgery Service	Location	Service	Region
1	Penang Hospital	Georgetown	1995	North
2	Sultanah Aminah Hospital	Johor Bahru	1996	South
3	Sarawak General Hospital	Kuching	2001	Sarawak
4	Serdang Hospital	Serdang	2006	Central
5	Raja Perempuan Zainab II Hospital	Kota Bharu	2009	East Coast
6	Queen Elizabeth II Hospital	Kota Kinabalu	2010	Sabah
7	Tengku Ampuan Afzan Hospital	Kuantan	*10 th mp	East Coast
8	Sultanah Bahiyah Hospital	Alor Star	*10 th mp	North

*10th mp: Tenth Malaysia Plan

5.2.4 Components and facilities available at the existing centers:

	Hospitals with the Cardiothoracic Surgery Service	CT Clinic	CTW beds	CHDU beds	COT beds	CICU beds
1	Penang Hospital	+	18	4	2	7
2	Sultanah Aminah Hospital	-	16	4	2	6
3	Sarawak General Hospital	+	18	4	1	6
4	Serdang Hospital	+	28	6	2	10

5.2.5 Organization chart of Cardiothoracic Surgery Service:



- 5.2.6 The Head of regional cardiothoracic centre (or the Head of department) shall ensure that this policy is being carried out to ensure smooth delivery of Cardiothoracic Surgery Service.
- 5.2.7 Number of trained cardiothoracic surgeons must be based on the number of designated cardiac operating theatre. The required ratio of fully trained surgeons per theatre is 2:1. This figure is to ensure adequate staff required for cardiothoracic surgical operations, pre-operative and post-operative specialist care, consultation at specialist clinic, administration and for staff training.
- 5.2.8 There must be a minimum of two cardiothoracic medical officers per location (i.e. clinic, CTW, COT, CICU and CHDW). This figure is to ensure adequate number of MO required for cardiothoracic surgical operations, pre-operative and post-operative care and for the cardiothoracic clinic.
- 5.2.9 There must be a minimum of one sister per location (i.e. clinic, CTW, COT, CICU and CHDW). This figure is to ensure adequate number of

sisters required for smooth running of the service.

5.2.10 Number of nursing staff shall also be adequate and in the accepted ratio for the service:

- (1) Clinic - 3 nurses per consultation room.
- (2) CTW - 2 nurses per bed.
- (3) CICU - 5 nurses per bed.
- (4) CHDU - 3 nurses per bed.
- (5) COT - 4 nurses per theatre per shift.

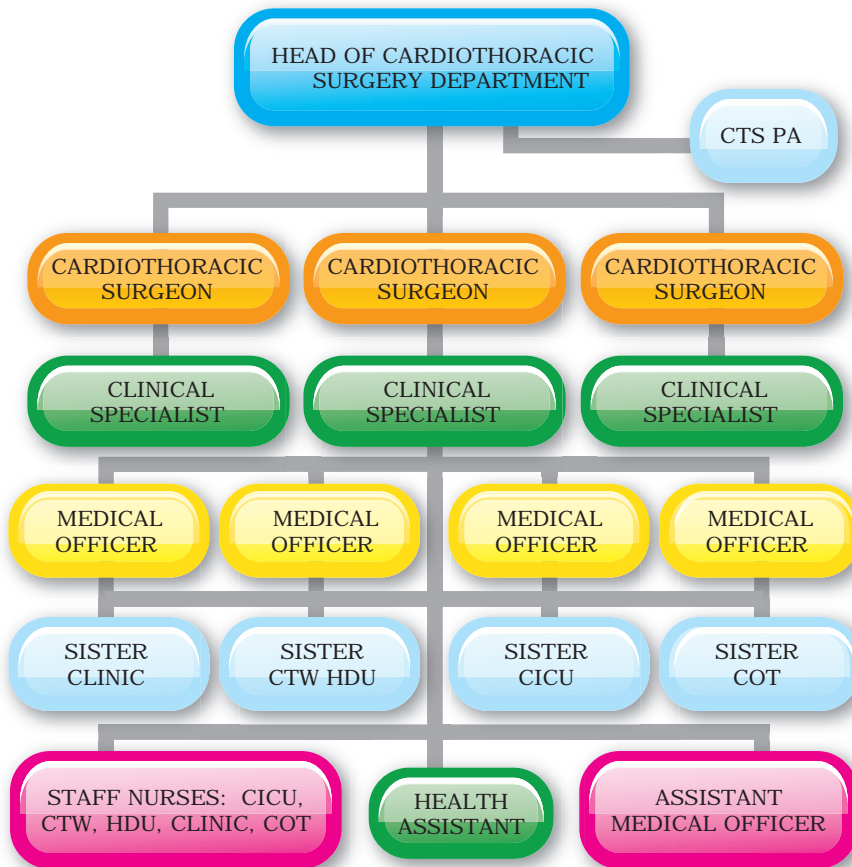
This figure is to ensure adequate number of nurses required for the smooth running of service.

5.2.11 There must be a minimum of one assistant medical officer (AMO) per location (i.e. clinic, CTW, COT, CICU and CHDW). This figure is to ensure adequate number of AMO required for cardiothoracic surgical operations, pre operative and post-operative echo-cardiography and for registry management (MyCARE).

5.2.12 Each Cardiothoracic Surgery Department shall have own contingency plan. This plan must be available on board, in order to address the issue of unexpected crisis.

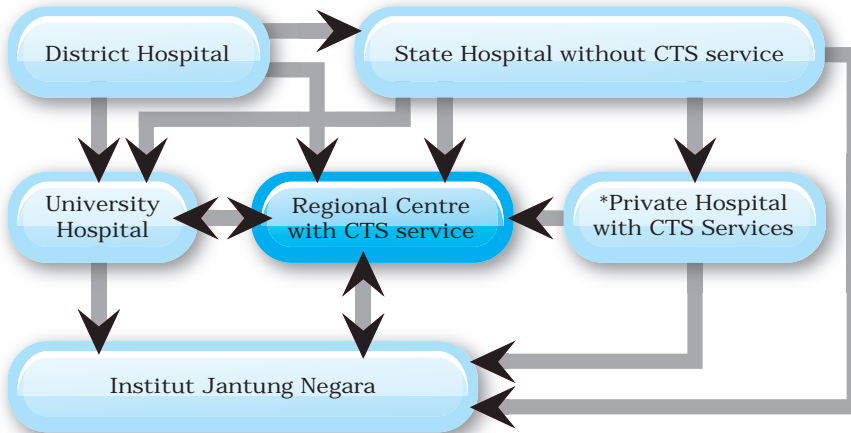
5.2.13 If there is any unexpected crisis, the head must immediately inform the Hospital Director and the National Advisor of Cardiothoracic Surgery Service.

5.2.14 Organization chart of Cardiothoracic Surgery Department:
(at each regional centre)



5.3 Referral System

5.3.1 The guide line for the referral system in the Ministry of Health's Cardiothoracic Surgery Service shall be as follow:



*for standby during PCI

5.3.2 Guidelines for referral to IJN, please refer to section 11.1.

5.3.3 Guidelines for referral to NH, please refer to section 11.2.

6. OPERATIONAL POLICIES FOR CARDIOTHORACIC SURGERY SERVICE (ACTIVITY 3.24.1)

6.1 CARDIOTHORACIC CLINIC:

6.1.1 The Cardiothoracic Clinic shall be under the overall charge of the Head of the Cardiothoracic Surgery Department. It is a specialist clinic and all patients (new and old cases) shall be seen by appointments only. Patients without any appointments shall be advised to go to the general outpatient department or to the emergency department in urgent cases. Exceptions can only be made by a consultant cardiothoracic surgeon.

6.1.2 The cardiothoracic clinic shall provide the following service; specialist referral clinic, follow-up clinic, and anticoagulation clinic.

6.1.3 All cardiothoracic patients to the specialist clinic are to be referred by cardiologists, respiratory physicians, physicians or surgeons from other

disciplines/hospitals. Referrals from private cardiologists will need to be reviewed by MOH cardiologist. During the visit at cardiothoracic clinic, the patients shall have clinical examination by medical officers and reviewed by cardiothoracic surgeon.

- 6.1.4 All patients who are urgently referred by a cardiologist from outside the regional centre must be admitted to the cardiology ward and be reviewed by the regional cardiologist on-call prior to surgeon's review.
- 6.1.5 All thoracic patients who are referred by a physician from within or outside the regional centre must be completely investigated prior to surgeon's review.
- 6.1.6 The cardiothoracic surgeons will formulate a care plan for the patient in terms of further investigations and date of admission for surgery / procedure. He shall also explain and discuss the management plan with the

patient and relatives regarding the benefits, effects and risks of the planned surgical procedure.

6.1.7 All patients who have undergone surgery shall be seen six weeks after surgery in the follow-up clinic. However some patients may require earlier appointments for review. All health care providers must alert the cardiothoracic MO urgently when there is a patient with potential post-operative complications.

6.1.8 All patients on anticoagulation medications will have their INR checked at regular intervals at the clinic, to ensure that the level of anticoagulation is safe and adequate.

6.2 CARDIOTHORACIC WARD (CTW):

6.2.1 The Cardiothoracic Ward shall be under the overall charge of the Head of the Cardiothoracic Surgery Department. The staff of this ward shall provide the pre-operative preparatory care to

patients who will undergo cardiothoracic surgery, and the post-operative cardiothoracic care to all the patients who have undergone cardiothoracic surgery.

CTW admission policy:

6.2.2 All preoperative patients who are admitted for surgery are categorized as follows:

- (1) Elective admission for those without or have well-controlled medical illnesses.
- (2) Elective admission for those with known medical illnesses that require further stabilization before operation.
- (3) Urgent admission for those patients who require urgent surgery as a consequence of deterioration of their conditions.
- (4) Postoperative patients with serious complications that might require surgical intervention, close monitoring, intravenous antibiotics,

frequent dressings or an unsatisfactory level of anticoagulation.

- (5) Postoperative patients transferred from CICU and deemed to be haemodynamically stable. These patients shall be monitored in the designated CHDU before being transferred to the general area.

6.2.3 All patients admitted to CTW must have prior approval by the cardiothoracic surgeon before admission.

6.2.4 All patients admitted shall be seen and clerked by a medical officer as soon as possible, and subsequently reviewed by a specialist on the day of admission.

CTW discharge policy:

6.2.5 Postoperative patients shall be discharged between the fifth and seventh postoperative day when; they are haemodynamically stable, Haemoglobin + total white cell count + electrolytes are satisfactory, chest X-ray

and echocardiography findings are acceptable, their wounds are clean and healthy, and the INR level is at a satisfactory level.

6.2.6 The decision to discharge a patient shall only be made by the cardiothoracic surgeon. Patients will be given discharge packs, which include a discharge summary, drug prescription, appointments for follow-up, and appointments for out-patient rehabilitation programme.

6.2.7 Patients are expected to vacate their bed by 1.00 pm.

CTW visiting policy:

6.2.8 The visiting hours for the CTW shall be based on existing hospital policy.

6.2.9 Each patient shall only be allowed two visitors at a time.

6.2.10 Outside of visiting hours, visiting shall only be allowed by the cardiothoracic

surgeon or ward sister, and for immediate relatives only.

6.2.11 An immediate relative may accompany the patient overnight while they are in the high dependency area (CHDU). Permission shall only be granted by the Head of Department or ward sister.

CTW ward round policy:

6.2.12 Ward rounds will be conducted three times a day on normal working days and twice daily on weekends and public holidays.

6.2.13 Ward rounds shall be led by a cardiothoracic surgeon or a clinical specialist. Night rounds shall be led by the specialist or surgeon on-call (active call).

6.2.14 All patients shall be informed of their progress, planned management including surgery, and plan for subsequent discharge and follow-up.

6.2.15 All clinical data shall be updated and documented in the patient's folder and shall also be entered into the electronic clinical information system (if the latter is available).

6.2.16 Consent for surgery from the patient shall be obtained in the presence of patient's close family members and counter-signed by the consultant cardiothoracic surgeon.

6.3 CARDIOTHORACIC INTENSIVE CARE UNIT

(CICU):

6.3.1 The cardiothoracic intensive care unit shall be under the overall charge of the Head of the Cardiothoracic Surgery Service, with the surgeons having primary responsibility for the patients. It is a unit, which will provide intensive care and life support to patients who have undergone cardiothoracic surgery.

CICU admission policy:

6.3.2 The following group of patients shall be admitted to the CICU.

- (1) Post adult open heart surgery

- (2) Post paediatric cardiac surgery.
- (3) Post thoracic surgery (admitted for close observations).
- (4) Under certain circumstances, paediatric patients shall be admitted to paediatric CICU for post-operative management if this facility is available and the patients shall be jointly managed with the paediatric cardiologist.

6.3.3 Patients shall be admitted via the cardiothoracic operating theatre. During the transfer from the theatre, patients shall be accompanied by a cardiothoracic surgeon or clinical specialist, anaesthetist, staff nurse and perfusionist. Patients will be continuously monitored using a portable monitor.

6.3.4 Patients may be admitted from CTW or other areas/units, if indicated clinically, as determined by the consultant cardiothoracic surgeon.

6.3.5 All patients shall be closely monitored and nursed on a one to one ratio. All patients are closely monitored, with every bed equipped with a bedside monitor, and all the monitors are centrally controlled.

6.3.6 The CICU shall provide:

- (1) Facilities for Monitoring of vital signs and vital organs.
- (2) Life support procedure & emergency resuscitation.
- (3) Life Saving Emergency bedside surgery facilities should be available at all times and be under the jurisdictions, of the Head of Cardiothoracic Surgery Department.
- (4) General nursing care.
- (5) Definitive treatment.
- (6) Early in-patient cardiac rehabilitation programme.

6.3.7 All CICU nursing staff shall be appropriately trained in CICU nursing and possess a post basic CICU nursing certificate. They shall be proficient in administering BLS and ALS.

6.3.8 All clinical data of each patient shall be entered directly into the charting system or into the electronic clinical information system. Their daily clinical progress and care plan shall be entered into the clinical notes. All entries into the patient's note should be signed and names of prescribing persons clearly written.

6.3.9 All clinical procedures including monitoring, medications, invasive procedures and cardiopulmonary resuscitation are done at the bedside. Strict aseptic techniques shall be maintained throughout all procedures.

6.3.10 Resuscitation carts which will include drugs for resuscitation and intubation shall be available in CICU.

6.3.11 All equipment and facilities for "functional portable COT" including chest reopen set, portable operating theatre light, diathermy machine, suction device and internal defibrillator, should be available at all time in the

CICU. It should be regularly checked and maintained and this is the responsibility of the sister in charge of the CICU and COT.

CICU ward round policy:

6.3.12 Ward rounds will be conducted three times a day on normal working days and twice daily on weekends and public holiday.

6.3.13 The ward round is to be led by a consultant cardiothoracic surgeon or a clinical specialist.

6.3.14 All clinical data will be updated and documented in the patient's folder and the data will also need to be entered into the CICU electronic clinical information system, if available. Each entry has to be signed and the name of the practitioner clearly written.

CICU visiting policy:

6.3.15 Only immediate relatives are allowed to visit patients in CICU.

- 6.3.16 Children below 12 years shall be advised not to visit, unless accompanied by an adult. Only two visitors shall be allowed at a time.
- 6.3.17 Visiting hours shall be from 12 noon to 2 pm and 4.30 pm to 7.00 pm daily.
- 6.3.18 However for ill patients, the next of kin shall be allowed to visit without restriction until 10 pm, except otherwise indicated by the CICU staff.
- 6.3.19 For terminally ill patients, the next of kin shall be allowed to stay by the bedside. For paediatric patients, there shall be no restriction to the visiting rights of their parents.
- 6.3.20 Patient's next of kin shall be informed of the patient's condition upon return to CICU by the operating consultant surgeon.

6.3.21 No visitors or relatives shall be allowed to enter during CICU ward rounds, cardiopulmonary resuscitation, chest reopen, patients return from OT or during radiological procedures.

CICU discharge policy:

6.3.22 All cardiac patients shall be transferred out from CICU to the HDU once they are clinically stable, and extubated.

6.3.23 Decision to transfer the patients shall only be made by the consultant cardiothoracic surgeon.

6.3.24 During transfer out from CICU, the patient shall be transported on a wheelchair and accompanied by a staff nurse. The patient shall be connected to telemetry system.

CICU on-call policy:

6.3.25 The CICU shall be functioning throughout the 24 hour period. It shall be staffed by on call team from cardiothoracic surgery department. The surgical on-call team shall comprise of:

- a. Consultant cardiothoracic surgeon.
- b. Clinical specialist cardiothoracic surgery.
- c. Medical officer of cardiothoracic surgery department.

6.3.26 In the case of life threatening emergency, the resuscitation and chest reopen procedure shall be performed immediately. The primary surgical on-call team (refer to section 6.3.27) shall be summoned by the cardiothoracic surgeon.

6.3.27 Additional team members shall be called in, if emergency surgery is required (either in theatre or in CICU):

- a. Cardiac anaesthetist.
- b. Perfusionist.
- c. Senior cardiothoracic operating scrub nurse.

- d. Circulating nurse.
- e. Assistant medical officer.
- f. Perfusionist.
- g. Perfusionist (respiratory lab).

6.4 CARDIOTHORACIC HIGH DEPENDENCY UNIT (CHDU):

6.4.1 The Cardiothoracic High Dependency Unit (CHDU) shall be dedicated as a step-down unit for post-operative cardiothoracic patients following their discharge from the CICU.

CHDU operational policy:

6.4.2 The CHDU shall be available throughout the 24 hours period.

6.4.3 The CHDU shall admit the following category of patients:

- Post open heart surgery patients.
- Post closed heart surgery patients.
- Post thoracotomy patients.

6.4.4 The CHDU shall have a nursing staff ratio of 1:2 (1 nurse: 2 patients).

6.4.5 The nurses in the CHDU shall be trained and proficient in BLS and ALS.

6.4.6 The CHDU shall have facilities for monitoring invasive blood pressure, non invasive blood pressure, ECG, and oxygen saturation equipment.

6.4.7 A fully equipped resuscitation cart shall be made available and regularly checked.

6.4.8 The discontinuation of monitoring and transfer of patient to the general postoperative ward shall be made on instruction by the consultant.

6.4.9 Removal of precautionary pacing wires shall be made by the medical officers and removal of chest tubes shall be made by the trained nursing staff.

6.5 CARDIOTHORACIC OPERATING THEATRE (COT):

6.5.1 The Cardiothoracic Operating Theatre shall be under the overall charge of the Head of the Cardiothoracic Surgery Department. This theatre is

a dedicated theatre, exclusively meant for cardiothoracic surgery only, Exceptions can only be made by the Head of Cardiothoracic Surgery Department.

COT operational policy:

6.5.2 The COT shall be available throughout the 24-hour period.

6.5.3 An operation list shall be made available and indicated for elective, urgent or emergency operations. The list shall include the details of the patients, operations planned and the facilities that shall be required. The head shall decide the types and arrangement of the cases and which theatre the cases need to be performed. The head must be informed for all elective cases and all non-elective cases taken to COT for surgical procedures.

6.5.4 Indications and timing of all surgical procedures (including insertion of IABP) is entirely the prerogative of the cardiothoracic surgeon.

- 6.5.5 Patients' relatives may accompany patient up to the airlock. A parent of a paediatric patient may accompany the child into the theatre until the induction of anaesthesia.
- 6.5.6 Patients shall be called to COT at 7.30 am. The first operation shall start at 8.00 am.
- 6.5.7 In the COT induction room, patients shall be closely monitored by non invasive methods including ECG, noninvasive blood pressure and oxygen saturation until the arrival of the cardiothoracic anaesthetist.
- 6.5.8 Any patients who become unstable prior to surgery shall be brought to the attention of the primary cardiothoracic surgeon.
- 6.5.9 Critically ill patients shall be accompanied by the cardiothoracic anaesthetist and cardiothoracic surgeon. For patients on IABP,

perfusionist will also need to be in attendance.

6.5.10 Upon completion of the operation, the CICU staff shall be informed of the patient's condition, life support requirements including ventilator, inotropes, mechanical assist devices and other invasive monitor. The CICU staff shall identify the CICU bed and ensure that all life support equipments are switched on and ready.

6.5.11 Patients shall be transferred onto the CICU bed from OT table.

6.5.12 During the process of transfer, patients shall be monitored using a portable monitor. Cardiothoracic surgeon, cardiothoracic anaesthetist, perfusionist, assistant medical officer and COT nurse shall accompany the patients. Drugs for resuscitation shall be made available.

6.5.13 Upon arrival/return to CICU, patients shall be connected to the ventilator and the COT staff shall pass over the relevant clinical data with regards to the patients to the CICU staff in charge of the patients.

6.5.14 Arterial blood gas, relevant blood investigations shall be sent to the laboratory as ordered.

Patients and staff flow:

6.5.15 Patient shall enter COT via the patient entrance through the COT air-lock.

6.5.16 Following surgery, the patient shall be transferred to CICU.

6.5.17 The primary cardiothoracic surgeon shall explain to the next of kin and family members about the outcome of surgery.

7. COMPREHENSIVE IN-SERVICE TRAINING FOR CARDIOTHORACIC SURGERY STAFF.

- 7.1 The in-service training of Cardiothoracic Surgery Department staff shall be under the responsibility of the Head of the Cardiothoracic Surgery Department, assisted by all the cardiothoracic surgeons, trainees, sisters, nurses and senior assistant medical officers. This Department will provide in-service training to all the staff.
- 7.2 As CICU and HDU are extensions of COT in the Cardiothoracic Services provided, each and every nursing staff and other supporting staff in the department shall be trained to acquire the theatre skills at least in the basic set up of open heart surgery. This is to anticipate the need to have an emergency surgery in CICU and HDU to save patient's life. Other skills will be taught as deemed necessary.
- 7.3 In order to achieve their optimum potential, staff in CTW, CICU and CHDU shall be rotated every year for a period between 4 - 6 weeks to COT to maintain their awareness, skills and competencies to ensure that they will be able

to assist the cardiothoracic surgeon in the CICU in the event of emergency life saving chest reopen procedure. Ultimately the staff will be able to work in different environment without diminishing their skills and competencies.

7.4 For this in-service training and implementation to be effective, its administration needs to be streamlined and be run under the Cardiothoracic Surgical Department at all times. This is to ensure safe delivery of Cardiothoracic Surgery Service, and to maintain staff professional development.

7.5 This type of training will foster greater understanding of the service and the concept of teamwork among the staff from different areas. This is a very important aspect of the service and it is unique to Cardiothoracic Surgery, where a continuum of quality service is provided for each patient from the day the patient is seen in the clinic until the day of discharge from the ward.

7.6 The ability of each staff to work in different environment, will place more awareness amongst

them and will remove any comfort zones that will hinder their personal development and at the same time ensure a safe delivery of service at all times, as everyone is aware of each others role.

7.7 Staff in the clinic and the ward shall have shorter rotation in the other areas as well, and this is to expose them to all the working environment and mechanisms in those areas.

7.8 The progress, competency and knowledge of the staff will be monitored by the Cardiothoracic Surgery Department at periodic intervals. Relevant courses shall be run by the department for the staff in order to provide the best care at all times. The staff will be sent for relevant courses if the need arises.

8. SPACE REQUIREMENTS AND FUNCTION OF SPACE

8.1 CARDIOTHORACIC CLINIC:

8.1.1. **Examination and Consultation Rooms:**

This room must be spacious for conducive consultation and to ensure privacy for the patients during examination.

8.1.2. **Waiting space:** Is located near the entrance of the clinic complex with provision of vending machine and public telephone. The space shall be adequate for 30 people to wait on easy chairs at a time. It requires good ventilation and lighting as patient's relatives may wait for couple of hours.

8.1.3 **Treatment Room:** This room is mainly to carry out injections, simple procedures, and for medical examination and assessment in privacy. The area must be sufficient for patient to undress with or without assistance within the curtain cubicle. Recording of patient data will be done outside the cubicle

to allow privacy and to allow patient to dress up after the examination.

8.1.4 Echocardiography room.

8.1.5 ECG room.

8.1.6 Reception with Filing Area: Shelves are required for keeping patient's folders.

8.1.7 Store Room: This is an area to store clinic items.

8.1.8 Pantry: Shelves are required for keeping small amounts of milk powder, sugar biscuits, etc. Worktops and sinks are necessary. Provision for washing-up, preparation of snacks and beverages are required. Microwaves oven and refrigerator are to be provided.

8.1.6 Staff toilet: For staff use.

8.1.7 Staff Room: For resting place.

8.1.8 Public toilet: Hidden but easily accessible from the waiting space.

8.1.9 Meeting room/ seminar room.

8.2 CARDIOTHORACIC WARD.

8.2.1 Central corridor: A central corridor with a minimum width of 10 feet will serve as the main thoroughfare in the ward.

8.2.3 Nursing station and Nurse Base: This is used for receiving patients, writing reports, communication with other departments, observations, etc. The nursing station faces the patient area.

8.2.4 Six-bedded bays: This area will be open bays with 6 beds each. Each bay shall have its own clinical wash hand basin, bath/toilet (2 bathrooms and 2 toilets). The bay space shall have sufficient area to accommodate trolleys, defibrillators, BP machines and ECHO machines during emergencies.

8.2.5 Two isolation rooms (air-conditioned): These are single rooms with their own baths/toilets. Each room will have a reversible pressure system, a small shoe

rack, hooks for hanging gowns and a wash hand basin. There shall be a bedside locker, wardrobe and chair for each bed.

8.2.6 Treatment room: This room is used mainly to carry out injections, for simple dressings, and for medical examination and assessment. The area must be sufficient for a patient to undress with or without assistance within the curtain cubicle. Recording of patient data will be done outside the cubicle to allow privacy and to allow patients to dress up after examination.

8.2.7 Procedure room: One procedure room is required for minor surgical procedures. It will have facilities similar to the treatment room but it will have a mounted examination light with an examination table.

8.2.8 Disposal room: Disposal room shall be located at the exit of the ward to ensure movement of disposed items through the

ward is minimized and avoid intrusion. General and clinical waste will be kept here in separate bags prior to collection.

8.2.9 Dirty Utility room: Urinals and bedpans will be washed, disinfected and held here for later use. A flusher disinfectant will be provided.

8.2.9 Clean utility room: Drugs, treatment trolley and intravenous infusion packs will be held here.

8.2.10 Pantry: Food pre-plated in the kitchen will be distributed to patients. Shelves are required for keeping small amounts of milk powder, sugar biscuits, etc. Worktops and sinks are necessary. Provision for washing-up, preparation of snacks and beverages are required. Microwave oven and refrigerator are to be provided.

8.2.11 Cleaner's Room: Housekeeping equipment will be cleaned here and kept for use. Space will be provided for storage of cleaning equipment.

8.2.12 Linen Bay: For storing clean linen. Shelves are required for keeping the linen.

8.2.13 Trolley/Wheelchair Park.

8.2.14 General Store: For storing general item and bulky items, like transfer trolley.

8.2.15 Sister's Office: For the used of COT sister for administrative work.

8.2.16 Nurses Change Room: These are single room with its own bath/toilet where the staff change from street clothes to clean clothes. A shoe rack, hooks for hanging gowns, lockers and cubicles for changing and wash hand basin should be provided.

8.2.17 Doctor's On-call Room: With toilet and shower facilities.

8.2.18 Staff Toilet: For staff use.

8.2.19 Bath for non-ambulant cases.

8.2.20 Disposal Corridor: To be used to transport soiled instruments and linen out from the theatre.

8.2.21 Washing & Drying.

8.2.22 Prayer Rooms: For staff and COT personnel.

8.3 CARDIOTHORACIC INTENSIVE CARE UNIT.

Guidelines for CICU facilities:

Ideally CICU should be linked to cardiac operating theatre.

Number of CICU beds : Five CICU beds for every cardiac theatre.

Space for each CICU bed : Must be spacious - 10 by 16 ft.

Monitors for CICU : The monitoring system must have central monitor.

Other essential CICU facilities:

8.3.1 Entrance/Air lock: It is an area for passage of patients.

- 8.3.2 **Reception/ Nurses Station:** A nurse will be sitting here and overseeing the movement of patients and visitors, as well as to watch over the post-operative cases.
- 8.3.3 **Central Corridor:** A 10 foot corridor should be provided as the main thoroughfare.
- 8.3.4 **Sister's Room:** For sister to perform administrative work.
- 8.3.5 **Patient area:** An open area with beds and curtain railings separating each bed area.
- 8.3.6 **An Isolation Room (air-conditioned):** This is a single room with its own bath/toilet. The room will have a reversible pressure system. A small shoe rack, hooks for hanging gowns and wash hand basin. There shall be bedside lockers, wardrobes and a chair. Ideally should be one room per theatre.

8.3.7 Doctor's Duty Room (air-conditioned):

This is a single room with two single beds and own bath/toilet. A small shoe rack, hooks for hanging gowns and wash hand basin. There shall be a bedside locker, wardrobe, table and chair for each bed.

8.3.8 Nurses Change Room:

These are single room with its own bath/toilet where the staff changes from street clothes to clean clothes. A shoe rack, hooks for hanging gowns, lockers and cubicles for changing and wash hand basin should be provided.

8.3.9 Store Areas:

This is an area to store CICU items like ventilators, infusion pump, etc.

8.3.10 Treatment area:

An area for preparation of injection and sets for procedures.

8.3.11 Pantry:

This is a necessary area for handling food trays for the patient. Shelves are required for keeping small amounts of milk powder, sugar biscuits,

etc. Worktops and sinks are necessary. Provision for washing-up, preparation of snacks and beverages are required. Microwaves oven and refrigerator are to be provided.

8.3.12 Haemodynamic laboratory: This laboratory is for keeping blood gas machine for arterial blood gas, serum electrolyte, haematocrit and various other analyses. It also functions as a leaning and drying room for ventilator tubing masks etc.

8.3.13 Cleaners' stores: For storing cleaning items.

8.3.14 Visitor's waiting area: This is an area for relatives for about 15 to 20 people, and with toilet facilities.

8.3.15 Seminar Room: for case conference, teaching session and meeting.

8.4 CARDIOTHORACIC HIGH DEPENDENCY UNIT.

8.4.1 Four-bedded bays: This will be open bays with 4 beds each. Each bay shall have its own clinical wash hand basin, bath/toilet. The bay space has sufficient space to accommodate trolleys, defibrillators, BP machines and ECHO machines during emergencies.

8.5 CARDIOTHORACIC OPERATING THEATRE.

Guidelines for COT:

Ideally cardiac operating theatre should be linked to CICU.

Number of COT : One COT for one million population of the region.

Space for each COT: Must be spacious – at least 800 sq feet for each theatre.

Monitors for COT : Monitoring system in OT must be connected to CICU.

COT must have a high degree of pathogen-free environment. The air-conditioning system must be safe, reliable and up to the standard.

Other essential COT facilities:

8.5.1 Entrance/Exit Lobby: It is a recess area, away from the main circulation area to Operating Theatre suite.

8.5.2 Air-Lock/Stretcher change Area: For transfer of patient from ward stretcher to O.T. stretcher across the red line. Provision of shelves to hold pillows and blanket from the ward, is required.

8.5.3 Reception/ Nurses Station: In this area, a nurse will watch for arrival of patient from the ward, as well as to watch over cases awaiting surgery.

8.5.4 Patient Holding: To accommodate 2 trolleys for pre-op patients.

8.5.5 OT Module:

8.5.5.1 Induction Room.

8.5.5.2 Scrub-up and Gowning-up area: The operating team members shall scrub-up here before entering the OT for

gowning up. There shall be provision for three staff to scrub at a time.

8.5.5.3 Operating theatre: Two operating theatre are required, each of which should be at least 800 square feet in area. An operating theatre table, ceiling-mounted operating theatre light, anaesthetic gas machine, anaesthetic gas pendant, wall-mounted X-ray illuminators socket outlets and clocks are required. The cardiothoracic surgeon must be consulted regarding the selection of operating theatre table and the ceiling-mounted operating light. Surgeon also must be consulted during the planning of new OT complex for opinion on design, size and OT layout.

8.5.5.4 Pump Room: To prepare and dismantle the heart lung bypass circuit with

accessories, to be washed, packed and sent for sterilization. The space shall be adequate to store a minimum of 2 heart-lung perfusion pumps and other equipments like general anaesthetic machine, drugs, intubation equipments, sterile supplies of pump sets and ice-making machine.

8.5.5.5 Perfusion and anaesthetic store.

8.5.5.6 OT store: For storage of equipments and consumable items.

8.5.5.7 Theatre sterile store: Sterile packs and linen are kept on stainless steel shelves. The linen and instruments required for an operation are laid out on trolleys ready

for use. Flash sterilization for dropped instruments will be done here.

8.5.5.8 **Linen store:** For storing clean linen.

8.5.5.9 **General store:** For storing general items and bulky items, like transfer trolley.

8.5.5.10 **Wash-up area:** This is an area where the soiled equipments are cleaned grossly before being sent to the C.S.S.D. Soiled linen is also dispatched to this room.

8.5.5.11 **Disposal room:** Materials for disposal are removed via a dirty corridor.

8.5.5.12 **Endoscopic equipment room:** For keeping endoscopic equipments. Cleaning process will be done in C.S.S.D.

8.5.5.13 Head of Cardiothoracic Surgical Department room:

For use by the Head of the Department for administrative work.

8.5.13 Doctor's room: For the use of surgeon to rest in-between cases and prepare patients write-ups or reports.

8.5.5.14 COT sister's office: For the use of COT sister for administrative work.

8.5.5.15 Staff Rest: For the staff to have their breaks and refreshment.

8.5.5.16 Clean Utility: It is located near the staff base. The space must be able to hold two fridges: one for the drugs and one for the blood packs. Fittings are similar to standard clean utility room described in previous chapters.

8.5.5.17 Disposal rooms: This room is to hold clinical waste and some domestic waste before collection and disposal. It needs to have pass-through cabinet system, i.e. the staff shall put the waste through an internal cabinet door. Over a hatch into the room and the services staff will collect them on the other side of the cabinet through an external door.

8.5.5.18 Cleaners Room: Two cleaners room are required; one for the OT proper and the theatre suite.

8.5.5.19 Relatives' Waiting Area: It is located near the OT entrance with provision of vending machine and public telephone. The space shall be adequate for 10 people to wait on easy chairs at a time. It requires good ventilation

and lighting as patient's relatives may wait for couple of hours.

8.5.5.20 Prayer Rooms: For staff in COT complex.

8.5.5.21 Pantry: For staff and COT personnel and this may be incorporated into the staff rest area.

9. STERILITY AND AIR QUALITY OF CARDIAC OPERATING THEATRE, AND THE STANDARD REQUIREMENT.

Cardiac theatre air conditioning system needs to be regularly monitored, and maintained by skill personnel. Intra-operative contamination secondary to faulty and poorly maintained A/C system is an important contributing factor to a significant portion of death. In 1982, Whyte et al stated that bacterial contamination of the surgical wound in the operating theatre is 98% caused by bacteria in the air of the operating room [7]. Therefore it is very important to have a sterile cardiac operating theatre with low bacterial count.

Every cardiac operating theatre must have a standard parameters and guidelines with regards to operating theatre A/C system. Head of department of cardiothoracic surgery and the theatre sister in-charge must ensure that the standard parameters and guidelines are strictly adhered.

At HSAJB, they have their own standard parameters exclusively meant for local use, to guide them in managing the theatre (to help them to decide whether their theatre is safe or not for use), to guide the

personnel who are in-charge of maintaining and servicing air conditioning system, and to gauge adequacy of the maintenance and servicing of the system [6].

Below are the recommended standard parameters:

Standard Parameters	For cardiothoracic operating theatres
1. Theatre temperature	15.0 - 17.0 Celsius
2. Air sampling count	Colony count < 10 CFU/m ³ (CFU: colony forming units)
3. Air humidity	50 - 55%
4. Air change rates	25 - 30 air changes per hour

10. DRESS CODE FOR CARDIAC OPERATING THEATRE

10.1 THE CLOTHING TO BE WORN BY ALL STAFF WORKING IN THE OPERATING THEATRE:

10.1.1 Approved theatre **suit**.

10.1.2 **Disposable hat or hood** to completely enclose the hair.

10.1.3 The wearing of **jewellery** is a hazard in cardiac theatres. Wrist watches and jewellery of any kind must not be worn.

10.1.4 The scrubbed personnel should wear **surgical masks** to completely obscure the mouth and nose. The mask should be removed and discarded in the COT at the end of a case.

10.1.5 Full face **visors or protective goggles** will be available and should be worn for all operative procedures.

10.1.6 Sterile **scrub gowns** will be of a non-woven water repellent material. Surgically acceptable quality disposable

gowns, is to be used during surgery unless not indicated. Plastic aprons may be worn under these gowns if additional protection is required.

10.1.7 Dedicated personalized **footwear** is available for all regular staff. Boots should be available and worn.

10.1.8 OT staff who have to leave the theatres when there is crash calls in CICU or when supervising transfer of ill patients to CICU, they should change their **theatre suit** on return.

10.1.9 If the case is known to be colonized with multiple resistant bacteria, and is not at the end of the operating list, theatre dress should be completely changed by all members of the operating team and anaesthetists and hands shall be properly cleansed before proceeding to the next operation.

11. REFERRALS

11.1 GUIDELINES FOR REFERRAL TO IJNSB

Referrals to IJNSB shall follow existing MOH guidelines. An outline of the current guidelines, pending any review, is as follows:

11.1.1 Securing a referral:

(i) Referral from a physician from public hospitals

Any patients who require treatment in IJNSB shall be examined and referred by a physician from a public hospital.

(ii) Referral from a physician of private clinics or hospitals

Any patients including Federal Government officers and Federal Government pensioners and their eligible dependents who require treatment in IJNSB can be examined and referred by a physician or cardiologist of private clinics or hospitals.

Federal Government Officers and Federal Government Pensioners who receive pension with eligible dependents shall be given free treatment at IJNSB.

- (a) In a case of emergency, IJNSB shall accept and render treatment to any patients who seek treatment without any referrals. Patients or relatives shall submit a valid guarantee letter within 24 hours either manually or electronically (eGL). Failing which, IJNSB shall impose charges as private patients.

- (b) For those patients without any referral or not in emergency situations shall not be given free treatment even though they have valid guarantee letter. IJNSB shall impose on them charges as private patients.

11.1.2 Validity of Guarantee letters:

- (a) Government Patients - 3 months (for outpatients); new GL for each admission.

- (b) Statutory Bodies and Local Authorities – 1 visit only unless otherwise stated.

- (c) Pensioners or eligible dependents seeking treatment at IJNSB shall have to bring their Pensioners Card for every encounter. If treatment is required by others not stated in the Pensioners Cards, a letter from Public Service Department (Pension Division) shall be acquired before seeking treatment at IJNSB.

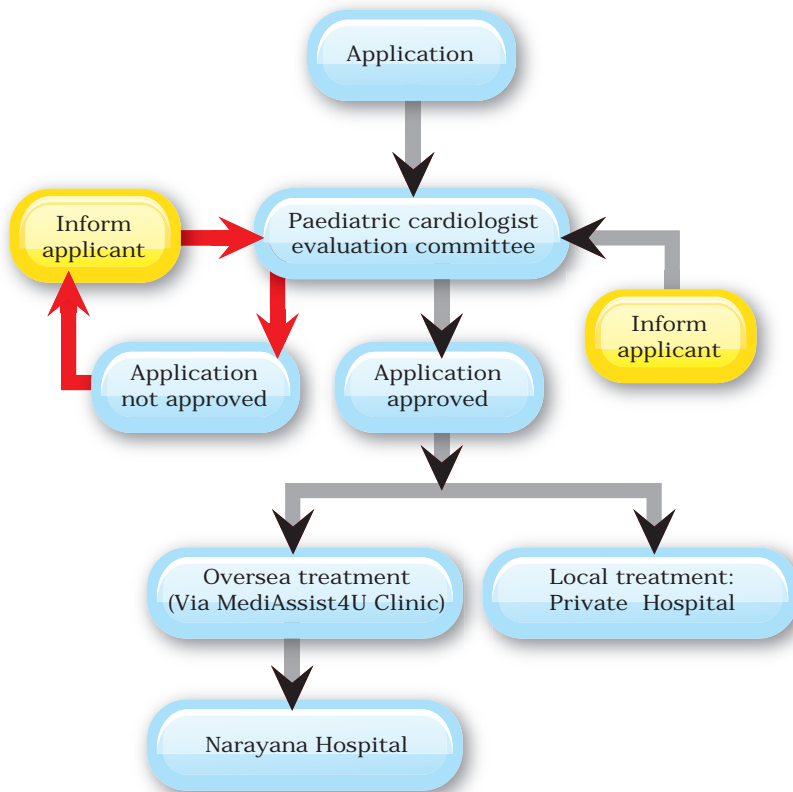
- (d) For army pensioners (optional or compulsory) with at least 10 years of service shall be required to produce a Certificate of Service (Sijil Pengakuan Perkhidmatan) for every encounter when seeking treatment at IJNSB.

- (e) It is IJNSB's prerogative to impose charges as private patients unto those referrals without Pensioners Card or Certificate of Service.

- (f) Private Patients – 1 visit only unless otherwise stated.

- (g) IJNSB accepts GL from Companies which are not registered under the Group Medical Credit Facility depending on case by case basis.

**11.2 GUIDELINES FOR REFERRALS OF
PAEDIATRIC CARDIOTHORACIC CASES
TO NARAYANA HOSPITAL AND
OUTSOURCING OF CARDIOTHORACIC
SURGERY.**



11.3 SELECTION CRITERIA OF PAEDIATRIC PATIENTS FOR CARDIAC SURGERY.

A. TYPES OF LESIONS THAT CAN BE CONSIDERED TO BE REFERRED TO PRIVATE HOSPITALS FOR SURGERY.

1. Duct dependant lesions:

- Acyanotic: Severe Coarctation of aorta,
Interrupted Aortic Arch or Hypoplastic Arch.
- Cyanotic : Pulmonary Atresia with or without VSD.

2. Significant Left to right shunt:

- Large VSD in failure.
- Complete AVSD.
- Severe Valvular Heart Lesions feasible for repair.

3. Cyanotic Heart Disease:

- Total Anomalous Pulmonary Venous Drainage.
- Ebstein Anomaly.
- Truncus Arteriosus.

- Double Outlet Right Ventricle (DORV).
- Tetralogy of Fallot (TOF).
- Pulmonary Atresia with VSD.
- Tricuspid Atresia with or without Pulmonary Atresia.
- Transposition of Great Arteries either with VSD or without VSD.

B. TYPES OF LESIONS TO BE DISCUSSED WITH IJN PRIOR TO REFERRING TO PRIVATE HOSPITALS OR NH.

- Hypoplastic Left Heart Syndrome.
- Single Ventricle Physiology with undetermined or RV pathology.
- Right or Left isomerism.
- Major Aorto-pulmonary Collateral Arteries with Severely Hypoplastic Main Pulmonary Arteries or No Native Pulmonary Arteries.

**C. TYPES OF LESION TO BE REFERRED
TO MOH HOSPITALS WITH
CARDIOTHORACIC SERVICES WITHIN
REASONABLE WAITING TIME.**

- All types of Atrial Septal Defects.
- Patent Ductus Arteriosus.
- Large PDA in failure.
- Large ASD.

12. TRAINING AND EDUCATION

All cardiothoracic surgeons and cardiothoracic surgery staff shall be involved in:

- Continuing Medical Education programme for doctors.
- Continuing Nursing Education programme for nurses and assistant medical officer.
- Post-basic ICU intensive training programme.
- Post-basic Cardiothoracic training programme (new project).
- COT training programme for nurses and assistant medical officer (short courses).
- Undergraduate bedside teaching programme for medical students.
- Postgraduate (Master in General Surgery) training programme.
- Fellowship training programme (Cardiothoracic Surgery).
- Pump talk session (Information and education for public).

13. QUALITY IMPROVEMENT & RESEARCH

All cardiothoracic surgeons shall be involved in:

- Incident Reporting.
- National Indicators.
- Perioperative mortality review.
- Perioperative morbidity review.
- National Audit for adult open heart surgery (MyCARE registry) [8] and CUSUM for all operating physicians.
- Key performance indicators (KPI).
- National clinical audit.
- Quality improvement studies.
- Operation waiting time survey.
- Customer satisfaction survey.
- Clinical research activities & clinical trials.

14. REFERENCES:

1. Panduan Mengenai Kemudahan di IJN bagi Pelbagai Golongan Pesakit di Bawah Tanggungan Kerajaan Persekutuan; 22 September 1997 dan Pekeliling Perkhidmatan Bil 4/2001.
2. Surat Pekeliling Ketua Pengarah Kesihatan Bil 12/2002 – Garispanduan Rawatan Susulan di Institut Jantung Negara bagi Pesakit Tanggungan Kerajaan, 7 Oktober 2002.
3. National Heart Institute Charges Guide Government 2003.
4. Garispanduan Bekalan Alat-alat Implan di Institut Jantung Negara (IJN) bagi Pesakit-pesakit Tanggungan Kerajaan Persekutuan 2003.
5. Surat Pekeliling Perkhidmatan Bil 13/2007 – Pindaan Peraturan Pelaksanaan Kemudahan Perubatan Di Insitut Jantung Negara Sdn Bhd.
6. Peri-operative mortality review – 6th report (2003-2004), Ministry of Health Malaysia 2007.

7. Whyte et al. Intra-operative contamination. *J Hosp Infect* 1982; 3:123 - 135.

8. MyCARE website: www.aacrm.org.my.

Appendix 1

1. ROLES OF NATIONAL ADVISOR FOR CARDIOTHORACIC SURGERY

The main function of the National Advisor of Cardiothoracic Surgery is to advise the MOH in matters pertaining to cardiothoracic surgery service on:

1. Manpower requirements.
2. Infrastructures & facilities.
3. Budget & allocations.
4. Drugs/consumables/reagents.
5. Equipments.
6. Planning and development of new centres.
7. Training & career development of staff.

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 organize CPD programme.
5. Advise and implement quality initiative activities.

6. Advise and formulate protocols, guidelines and policies.
7. Represent the service in national committees.
8. Advise and coordinate with the HOD of regional centres.
9. Advise registry and research activities.
10. Screening of new surgeons.
11. Advise and oversee credentialling of surgeons.
12. Supervise and monitor performance of trainees.

2. GUIDE ON PATIENT SAFETY IN THE WARD

- 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.
- 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. Therapeutic levels shall be monitored where applicable.
- 5) Administration of blood and blood products shall adhere to the existing protocol.
- 6) The department shall undertake measures to prevent patient harm resulting from falls.

- 7) Patients in the operating theatre shall not be left unattended.
- 8) Adequate assistance shall be provided for positioning of the patient for any procedure.
- 9) Transport trolleys shall be fitted with side rails.

3. GUIDE ON MEDICATION SAFETY

- 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.
- 3) All resuscitative, anaesthetic, psychotropic and other identified medications shall be stocked in adequate quantities and be readily available in the operating theatre and cardiothoracic intensive care unit.
- 4) Dedicated staff shall be responsible for the ordering and receiving of drugs to ensure adequate supply.
- 5) All medication shall be properly and safely stored.
- 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 labeled with the name of the medication and its concentration.
- 8) All medications and storage areas shall be periodically inspected according to the 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 medications shall preferably be kept in each storage area.
- 10) All multi-dose vials and ampoules shall be swabbed with alcohol wipes prior to drawing out the contents.
- 11) All medications administered to the patients shall be clearly written into the patients' records with regards to name (preferably generic), dosage, route and time.
- 12) 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.

- 13) 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 4

4. GUIDE ON EFFECTIVE COMMUNICATION IN THE DEPARTMENT

- 1) All categories of staff shall maintain effective interpersonal relationships with other staff members, patients and relatives.
- 2) The patient and/or family shall be given a full explanation of the 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 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 patients shall inform the specialist of anticipated or unexpected problems.
- 7) Formal hand-over of patient information shall take place whenever it is necessary (e.g. patients in maternity HDW, critically ill patient transferring to another unit, critically ill patients in ICU).
- 8) The head of department shall be consulted in the occurrence of any unexpected untoward event. The most senior category of staff on 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.

5. LIST OF RECOMMENDED EQUIPMENTS FOR CICU

1. Critical care bed
2. CICU ventilator
3. CICU transport ventilator
4. CICU cardiac monitoring system
5. ECG machine
6. CICU echocardiography machine
7. Defibrillator
8. Drugs and emergency trolley
9. Volumetric pump
10. Syringe pump
11. Entral feeding pump
12. Transport suction device
13. ABG and electrolyte analyzer
14. Warming device
15. Blood fridge
16. Drug fridge
17. Washer disinfectant
18. Drying cabinet
19. Staff chair
20. Patient chair
21. Fax machine
22. Printer

23. Scanner
24. Photostat machine
25. Portable light
26. Emergency chest reopen set
27. Pulse oximeter
28. Pacemaker: single and dual chamber

**6. LIST OF RECOMMENDED EQUIPMENTS FOR
CARDIAC OT**

1. Cardiothoracic operating table
2. Main operating theatre light
3. Portable operating light
4. COT ventilator
5. COT transport ventilator
6. COT monitoring system
7. Portable transport monitoring
8. COT echocardiography machine
9. Heart Lung machine
10. Cell saver machine
11. Surgeon's headlight
12. Defibrillator
13. Drugs and emergency trolley
14. Volumetric pump
15. Transport suction device
16. Pacemaker: single+dual chamber
17. ABG machine
18. Diathermy machine
19. Graft flow machine
20. Harmonic scapel machine
21. Sternal saw - vertical
22. Sternal saw - oscillating

23. Sternal saw - paediatric
24. Telescope for vein harvesting
25. Video camera system cart
26. Bronchoscopy set - adult
27. Bronchoscopy set – paediatric
28. Suture cabinet
29. Transport trolley
30. Pulse oximeter
31. Mayo trolley
32. Instruments trolley
33. IABP machine
34. Storage trolley
35. Flush autoclave
36. Low temperature sterilizer
37. Oxygen regulator
38. CO2 regulator
39. Low vacuum regulator
40. CO2 insufflator with cylinder
41. Adult pump set
42. Paediatric pump set
43. Adult thoracotomy set
44. Paediatric thoracotomy set
45. Adult thorocotomy extra
46. CABG extra set
47. CABG micro set
48. Chest reopen set
49. Valve extra set

50. Computer with internet
51. Fax machine
52. Printer
53. Scanner
54. Photostat machine
55. Warming device
56. Blood fridge
57. Drug fridge
58. Washer disinfectant
59. Drying cabinet
60. Staff chair

7. LIST OF MEDICATIONS (FOR CICU)

1. Injection Adenosine
2. Injection Adrenaline
3. Injection Atropine
4. Injection Amiodarone
5. Injection Calcium Gluconate
6. Injection 50% Dextrose
7. Injection Dexamethasone
8. Injection Digoxin
9. Injection Dobutamine
10. Injection Dopamine
11. Injection Ephedrine
12. Injection Frusemide
13. Injection Glycerly trinitrate
14. Injection Haloperidol
15. Injection Heparinised Saline
16. Injection Hydrocortisone
17. Injection Lignocaine
18. Injection Magnesium Sulphate
19. Injection Noradrenaline
20. Injection Potassium Chloride
21. Injection Ranitidine
22. Injection Sodium Bicarbonate
23. Injection Sodium Nitroprusside

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