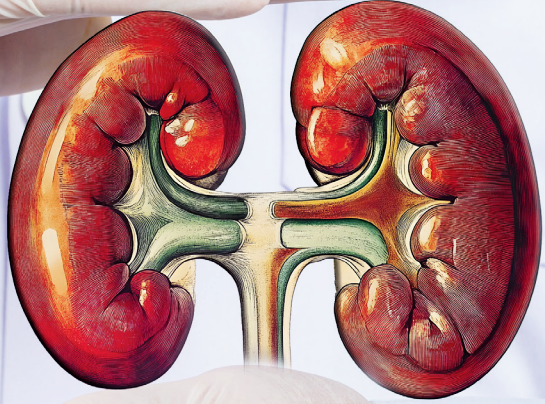
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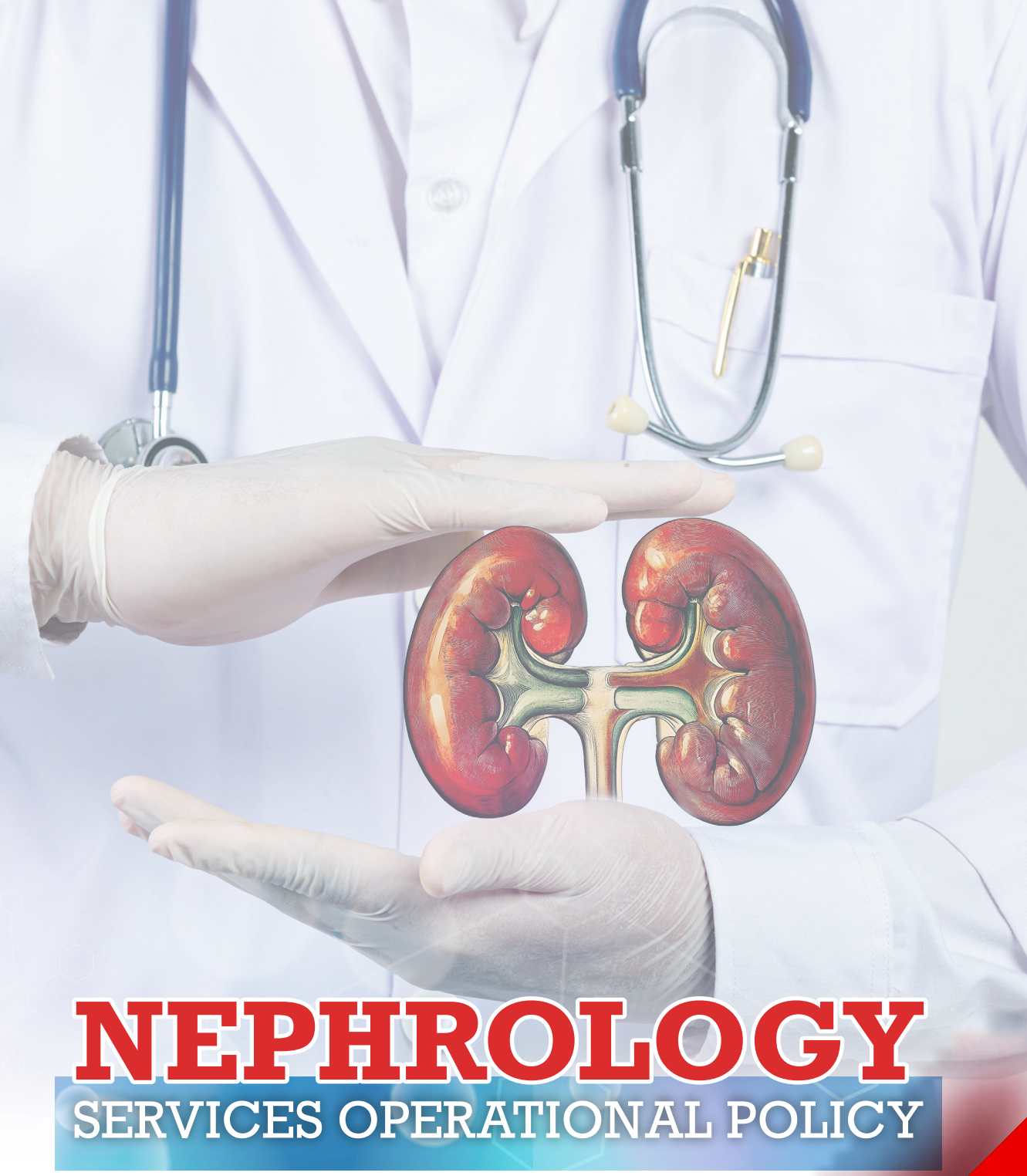
MINISTRY OF HEALTH MALAYSIA



NEPHROLOGY
SERVICES OPERATIONAL POLICY

3rd EDITION

IVISION



NEPHROLOGY

SERVICES OPERATIONAL POLICY

3rd EDITION

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MEDICAL DEVELOPMENT DIVISION
MINISTRY OF HEALTH MALAYSIA

NEPHROLOGY SERVICES OPERATIONAL POLICY

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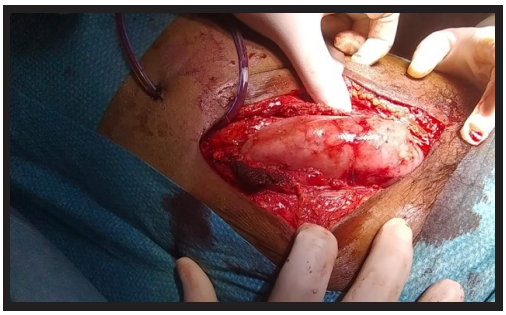
The Medical Development Division would like to acknowledge the contributions of Dr. Sunita Bavanandan, Head of Subspeciality for Nephrology Services from 2022 to 2024 and the Drafting Committee for the Nephrology Services Operational Policy for their support and tireless efforts in making the development of this document possible.

The Medical Development Division would also like to recognise the contributions of all those who were directly or indirectly involved in the formulation and preparation of this policy.


SEDARAN
ANSPLAN
(BULANAN)
Time: 7.30am














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MESSAGE FROM DIRECTOR GENERAL OF HEALTH MALAYSIA



There is an increasing burden of patients with Chronic Kidney Disease and kidney failure requiring kidney replacement therapy in Malaysia that is related to the increasing prevalence of Non-Communicable Diseases (NCDs) and an ageing population. In line with this, the Nephrology Service in the Ministry of Health Malaysia has expanded over the years to increase access to safe and efficient hemodialysis service at minimal cost to patients in all of the MOH hospitals, as well as satellite hemodialysis units in health clinics. Other nephrology services have also been expanded, in particular, Peritoneal Dialysis (PD) with the adoption of a "PD First" policy in MOH facilities and Kidney Transplantation which has seen increased activity in the last 6 years. There have also been advances in Critical Care Nephrology and Diagnostic & Interventional Nephrology, while Kidney Supportive Care is a new service that has been initiated since the second edition of the Nephrology Services Operational Policy was published in 2017. Hence this 3rd edition is most timely, and will no doubt aid the planning and implementation of Nephrology service delivery in the coming years by serving as a reference for clinicians and administrators.

I would like to congratulate the Medical Development Division and the team of consultant nephrologists for their commitment in developing this revised edition, which sets the standard for Nephrology Services in the Ministry of Health with the objectives of providing high-quality and safe patient-centered care.



Datuk Dr Mahathar bin Abd Wahab
Director General of Health Malaysia.

MESSAGE FROM DIRECTOR MEDICAL DEVELOPMENT DIVISION



The provision of high-quality nephrology services requires a well-structured and efficient workflow to ensure optimal patient outcomes. This Nephrology Services Operational Policy 3rd Edition document serves as a comprehensive guide for healthcare professionals involved in nephrology care, outlining the standardized processes that govern our daily operations.

Nephrology is a specialized field that demands precision, coordination, and adherence to best practices to manage patients with acute and chronic kidney conditions effectively. To achieve excellence, it is essential that all staff members, including nephrologists, nurses, dialysis technicians, and administrative personnel, follow a clear and cohesive workflow. This SOP ensures that delivery of care is conducted with efficiency, consistency, and patient safety at the forefront.

By implementing this SOP, we aim to enhance patient safety, reduce variability in care delivery, and promote operational efficiency within our nephrology services. Your commitment to following these guidelines will contribute to better patient outcomes, improved workflow processes, and the overall success of our nephrology services.

We extend our gratitude to all healthcare professionals dedicated to advancing kidney care and ensuring the highest standards in nephrology services.

Dato' Dr. Mohd Azman bin Yacob
Director Medical Development Division
Ministry of Health Malaysia

MESSAGE FROM HEAD OF SUBSPECIALITY FOR NEPHROLOGY SERVICES

The Nephrology Service in the Ministry of Health Malaysia (MOH) is part of the secondary and tertiary clinical services provided by MOH at various hospitals in the country. Apart from direct services delivered by its units, the Nephrology Services also plays an important role in supporting other services including Medical and Surgical services, Intensive Care units, Coronary Care and Cardiothoracic units, Oncology and Obstetrics & Gynecology. With recent advances in the field of nephrology and expansions of service, we have revised the previous document and added in new sections pertaining to Critical Care Nephrology, Diagnostic & Interventional Nephrology as well as Kidney Supportive Care. We wish to thank the Medical Development Division of MOH for their unfailing support, as well as all of our nephrology colleagues who were involved in the preparation of this document, in particular Dato' Dr Anita B. Manocha.

We hope that this updated document will continue to serve as a planning tool for the further development of a structured and well-coordinated service to ensure the delivery of the best standards of nephrology care to patients in this country.

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LIST OF ABBREVIATIONS

ADPKD	Adult Polycystic Kidney Disease
AIDS	Acquired Immune Deficiency Syndrome
ALT	Alanine Transaminase
AKI	Acute Kidney Injury
AMO	Assistant Medical Officer
Anti-HBS	Anti-Hepatitis B Surface
Anti-HBS Ab	Anti-Hepatitis B Surface Antibody
Anti-HCV	Anti-Hepatitis C Virus
Anti-HIV	Anti-Human Immunodeficiency Virus
CAPD	Continuous Ambulatory Peritoneal Dialysis
CCN	Critical Care Nephrology
CCU	Coronary Care Unit
CDC	Centre for Disease Control
CKAPS	Cawangan Kawalan Amalan Perubatan Swasta
CKD	Chronic Kidney Disease
CME	Continuous Medical Education
COPD	Chronic Obstructive Pulmonary Disease
CPD	Continuing Professional Development
CPG	Clinical Practice Guidelines
CKRT	Continuous Kidney Replacement Therapy
DBD	Donation after Brain Death
DCD	Donation after Circulatory Death
DIN	Diagnostic and Interventional Nephrology
DM	Diabetes Mellitus
ECG	Electrocardiograph

EMEA	European Medicines Evaluation Agency
ESA(s)	Erythropoietin Stimulating Agent(s)
ESKD	End Stage Kidney Disease
FDA	Food and Drug Administration
FMS	Family Medicine Specialist
GDP	Glucose Degradation Products
HBsAg	Hepatitis B Surface Antigen
HCV	Hepatitis C Virus
HCVcAg	Hepatitis C Virus C Antigen
HCV Ab	Hepatitis C Virus Antibody
HCV	Hepatitis C Virus
RNA PCR	RNA Polymerase Chain Reaction (Viral Load)
HD	Haemodialysis
HDF	Haemodiafiltration
HDU(s)	Haemodialysis Unit(s)
HDW	High Dependency Ward
HIV	Human Immunodeficiency Virus
HIV Ag-Ab	Human Immunodeficiency Virus Antigen-Antibody
HOD	Head of Department
HOS	Head of Speciality
ICU	Intensive Care Unit
IHD	Intermittent Haemodialysis
IP	Intra-Peritoneal
IPD	Intermittent Peritoneal Dialysis
KKM	Kementerian Kesihatan Malaysia
KPI(s)	Key Performance Indicator(s)
KRT	Kidney Replacement Therapy

KSC	Kidney Supportive Care
KT	Kidney Transplantation
KTU	Kidney Transplant Unit
Kuf	Ultrafiltration Coefficient
Med	Medical
MMWR	Morbidity And Mortality Weekly Report
MO(s)	Medical Officer(s)
MOH	Ministry of Health
MW	Molecular weight
MyKAS	Malaysian Kidney Allocation System
NKTC	National Kidney Transplant Centre
NGO(s)	Non-governmental Organisation(s)
NIBP	Non-Invasive Blood Pressure Monitoring
NIP-CKD	Nephrology Integrated Plan - Chronic Kidney Disease
PD	Peritoneal Dialysis
PDEP	Pre-dialysis education programme
PET	Peritoneal Equilibration Test
PKD	Paired Kidney Donation
QA	Quality Assurance
RO	Reverse Osmosis
SIG	Special Interest Group
SCUF	Slow Continuous Ultrafiltration
SLEDD	Slow Extended Daily Dialysis
SVR	Sustained Viral Response
UF	Ultrafiltration
UK	United Kingdom
UTAC	Unrelated Transplant Approval Committee

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EXECUTIVE SUMMARY

The document is the 3rd edition of the Nephrology Services Operational Policy for the Ministry of Health Malaysia, published in 2025. It outlines key areas of nephrology services including organization, human resources, asset requirements, patient management, ethics, and clinical governance.

The policy aims to guide healthcare providers, hospital managers, and policymakers on the requirements, operation, and development of nephrology services in MOH hospitals, setting optimal standards in accordance with best practices.

The document covers comprehensive nephrology services such as general nephrology, kidney replacement therapy (dialysis and transplantation), critical care nephrology, diagnostic and interventional nephrology, and kidney supportive care.

It details tiers of service, components of service, organizational structures, and operational policies for various nephrology services, including hemodialysis and peritoneal dialysis.

The policy also addresses training, education, credentialing, clinical governance, and general hospital policies related to nephrology. It will be reviewed and updated every 5 years or earlier as needed.



1. INTRODUCTION

The Nephrology service is one of the major clinical subspeciality services provided in Malaysia. The increasing prevalence of chronic kidney disease (CKD) and end stage kidney disease (ESKD) requires the support of a comprehensive service which includes general nephrology, dialysis and kidney transplantation (KT). MOH being the largest health care provider in the country, plays a leading role in the development and provision of these services. Over the years, nephrology services in MOH have expanded to include areas like critical care nephrology (CCN), diagnostic and interventional nephrology (DIN) and kidney supportive care (KSC) which are included in this third edition.

This policy document covers key areas of nephrology services such as organisation, human resource and asset requirements as well as patient management, ethics and clinical governance. It is intended to guide healthcare providers, hospital managers and policy-makers on the requirement, operation and development of nephrology services in MOH hospitals. The document outlines the 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.

The document shall be reviewed and updated every 5 years or earlier as the need arises.



2. VISION, MISSION AND OBJECTIVES OF THE NEPHROLOGY SERVICE

2.1 Vision

All Malaysians will have equitable access to patient-centred optimal kidney care that is of high quality and is sustainable within a universal healthcare system.

2.2 Mission

To prevent and manage acute kidney injury (AKI) and Chronic Kidney Disease (CKD) and its progression to ESKD to reduce the health and socio-economic burden related to kidney diseases.

2.3 Objective

2.3.1 Nephrology Clinical Service Objectives

- To provide comprehensive general nephrology services including AKI and CKD care, dialysis, KT, CCN, DIN and KSC in MOH.
- To promote the prevention, early detection and treatment of kidney disease through close collaboration with primary healthcare providers and other relevant organisations.
- To provide leadership in all aspects of the development of comprehensive nephrology services in the country.
- To provide training to junior doctors, specialists and nephrologists as well as healthcare providers.
- To collaborate and network with all parties in MOH, academic institutions, non-governmental organisations (NGOs) and private-public partnership (PPP) to enhance the practice and development of Nephrology in the country.
- To collaborate with international organisations and overseas centres of excellence in the field of Nephrology to further enhance the specialty in the country.

2.3.2 Nephrology Quality Service Objectives

The nephrology service will endeavour to keep within the overall standards by meeting the set targets of key performance indicators (KPIs) for services provided. These include:

- The waiting time at the general nephrology clinic
- Kt/V – for assessing the adequacy of haemodialysis provided to patients
- Peritonitis rate – for assessing the complication rate of patients on peritoneal dialysis
- Kidney transplantation advocacy

3. SCOPE OF SERVICES

The scope of Nephrology services shall include:

3.1 General Nephrology
3.2 Kidney Replacement Therapy (KRT) i.e., Dialysis and Transplantation
3.3 Critical Care Nephrology (CCN)
3.4 Diagnostic and Interventional Nephrology (DIN)
3.5 Kidney Supportive Care (KSC)

4. TIERS OF SERVICE

Nephrology Services shall be delivered in accordance with tiers of service as illustrated below.

Table 1: Tiers of Service

Tiers	Description
1	National referral hospital
2	Regional referral hospital
3	Hospital with state level services
4	Hospital with a minimum of one resident nephrologist
5	Hospital with visiting nephrologist

Table 2: Specific Requirements for the development of Nephrology Services including human resource, medical equipment, facilities and special budget

Resources/ Recruitment	Tier 1 (National Referral Hospital)	Tier 2 (Regional Referral Hospital)	Tier 3 (State Level Hospital)	Tier 4 (Resident Nephrologist)	Tier 5 (Visiting)
Human Resources	As per Tier 3	As per Tier 3	As per Tier 4 Renal Dietitian Renal Pharmacist +/-Physiotherapist +/-Occupational therapist	As per Tier 5 Plus Nephrologist(s) +/- Nephrology trainee(s) Social welfare officer	MO Specialist (physician) Nurse AMO HD/PD Manager Med. Attendant Dietitian Pharmacist Social welfare officer
Medical equipment	To establish a basic General Nephrology service, HD and PD units – as per Starter pack				
Space areas/ facilities	As per latest National HD and PD standards				
Special budget	Refer to Nephrology Integrated Plan (NIP-CKD) and list of medications – as per Starter pack				

Table 3: Comprehensive nephrology services include day-care, ward and outpatient services

Facilities	Tier 1 (National Referral Hospital)	Tier 2 (Regional Referral Hospital)	Tier 3 (State Level Hospital)	Tier 4 (Resident Nephrologist)	Tier 5 (Visiting)
In-patient services (Ward)	As per Tier 3 Transplant ward Nephrology ICU/HDW ward	As per Tier 3	1-2 Nephrology wards or a minimum 28 beds each for male and female +/-Nephrology ICU/HDW ward	Medical based integrated/ Nephrology ward (minimum 28 beds)	Medical based ward
Day-care	Dialysis treatment (HD and PD) Outpatient Nephrology Procedure(s) (core and specialised) and medications National Kidney Transplant Centre (NKTC)	Dialysis treatment (HD and PD) Outpatient Nephrology Procedure(s) (core and specialised) and medications +/- Kidney Transplant Unit (KTU)	Dialysis treatment (HD and PD) Integrated Outpatient Nephrology Procedure(s) (core and specialised) and medications	Dialysis treatment (HD and PD) Integrated Outpatient Nephrology Procedure(s) (core and specialised) and medications	Dialysis treatment (HD, +/- PD) +/- Outpatient Nephrology Procedure(s) (privileged core procedure) and medications
Outpatient	Outpatient Nephrology and specialist interest Nephrology Clinic Transplant Clinic with tertiary services	Outpatient Nephrology and specialist interest Nephrology Clinic Transplant Clinic with tertiary services	Outpatient Nephrology and specialist interest Nephrology Clinic Transplant work-up and follow-up Clinic	Outpatient Nephrology-Integrated Medical Clinic Transplant work-up Clinic	Outpatient Medical Clinic

Table 4: Special Initiatives/ Programs

Special initiatives/ programs	Tier 1 (National Referral Hospital)	Tier 2 (Regional Referral Hospital)	Tier 3 (State Level Hospital)	Tier 2 (Resident Nephrologist)	Tier 5 (Visiting)
Palliative care integration	Yes	Yes	Yes	Yes	Yes
CKD outreach clinic	Yes	Yes	Yes	Yes	Yes
Home/Community HD	Yes	Yes	Yes	Yes	Yes
DIN Suite	Yes	Yes	Yes	No	No
PD Special Interest Group (SIG)	No	No	No	No	Yes
Community healthcare provided assisted PD	Yes	Yes	Yes	Yes	No

5. COMPONENTS OF SERVICE

The range of services provided by nephrology units in MOH include:

5.1 Outpatient / Ambulatory Care Services

5.1.1 Clinics

- General Nephrology – Acute and Chronic Kidney Disease – e.g., diabetic kidney disease
- Kidney Transplantation (KT)
- Peritoneal Dialysis (PD)
- Haemodialysis (HD)
- Specialised (e.g., CKD outreach clinic, vascular access, kidney supportive care and research)

5.1.2. Ambulatory Care Services

- Dialysis - Haemodialysis, Peritoneal Dialysis
- General Nephrology procedures and treatment
- Diagnostic and Interventional Nephrology

5.2 In-patient Services

- Care of patients with kidney diseases
- Care of kidney transplant recipients and donors
- Acute kidney replacement therapy
- Insertion of HD and PD catheters
- Critical Care Nephrology e.g., continuous kidney replacement therapy
- Therapeutic Plasma Exchange (TPE)/Apheresis
- Diagnostic and Interventional Nephrology - kidney biopsy, insertion of PD and HD catheters, endovascular intervention

5.3 Rehabilitation and support services for the well-being of patients with kidney disease.

6. ORGANISATION

6.1 The Head of Subspecialty (HOS) Nephrology Services is appointed by the Ministry of Health. The HOS shall represent the views of all the nephrologists in MOH, on all aspects of the practice and development of nephrology services and will be the principal liaison officer between them and MOH.

6.2 The HOS shall convene at least biannual meetings of all nephrologists in MOH. The meeting shall discuss amongst others:

- Proposed development of the service for the ensuing year
- Allocations of funds
- Purchase of equipment and disposables
- Posting and mobilisation of nephrologists
- Training and CPD programs

- Audit of outcomes of care
- Other related matters – e.g., medico-legal issues

The decisions of the meetings shall be implemented by the various committees. The HOS shall call for a meeting of nephrologists at any time if the need arises.

6.3 The appointed State Nephrologist shall be responsible for the following:

- The overall management of the comprehensive nephrology services in the state
- Supervising the dialysis unit managers to ensure they meet the objectives and targets of the service
- Working closely with the relevant stakeholders such as the state health director, nursing managers and heads of clinical services in areas pertaining to development, operation and other technical matters
- Collaborating with the HOS in formulating strategic plans of service development, policies and procedures for their respective states
- Identification of equipment, drugs and consumables for procurement
- Audit of dialysis and outcome of treatment

6.4 The department/unit of Nephrology shall be headed by a nephrologist who:

- Is responsible for the overall management of the comprehensive nephrology services in the department/unit
- Collaborates with the appointed state nephrologist and HOS in formulating strategic plans of service development, policies and procedures
- 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

- Builds a team of dedicated staff comprising nephrologists, trainees, medical officers, haemodialysis and peritoneal dialysis paramedics assisted by the pharmacists, dietitians, social workers, physiotherapist and occupational therapist as available
- Shall play an advisory role to the Hospital Director and the Medical Advisory Board of the hospital on all matters relating to nephrology services

6.5 The organisation of the department is determined by the category of the hospital, level of patient care and the scope of services provided:

- For hospitals with resident nephrologist, the nephrology service shall be under the responsibility of the nephrologist
- For hospitals with a resident physician but without a nephrologist, haemodialysis units shall be under the administrative responsibility of the Head of Medical Department/Unit. The state nephrologist (or the nephrologist designated by the national advisor in the states without nephrologists) shall be responsible for issues as listed in 6.3.
- For hospitals without a resident nephrologist or a physician, haemodialysis units shall be under the administrative responsibility of the Hospital Director. The state nephrologist (or the nephrologist designated by the national advisor in states without nephrologists) shall be responsible for issues as listed in 6.3.
- Satellite haemodialysis units in Health Clinics shall be under the administrative responsibility of the Family Medicine Specialist or the senior Medical Officer in charge of the health clinic. The state nephrologist (or the nephrologist designated by the national advisor in states without nephrologists) shall be responsible for issues as listed in 6.3.
- For hospitals without resident nephrologists and health clinics with affiliated satellite haemodialysis units, the general medical care of the nephrology and dialysis patients shall be supervised by the Physician/Family Medicine Specialist/

Medical Officer of the hospital/clinic, and he/she shall liaise with the senior nephrologist in the state on any matter relating to the clinical care of kidney patients. The state nephrologist (or the national advisor in states without nephrologists) shall arrange for a nephrologist to periodically visit the district hospitals and health clinics without nephrologists to review patients. Hospital Directors/Family Medicine Specialists shall appoint a medical officer to be responsible for the day-to-day care of dialysis patients, including the provision of emergency coverage.

6.6 Organisation Chart

6.6.1 **Haemodialysis unit** at hospital with ***resident nephrologist*** (*Appendix 1*)

6.6.2 **Haemodialysis unit** at specialist hospital ***without resident nephrologist*** (*Appendix 2*)

6.6.3 **Haemodialysis unit** at ***non-specialist hospital*** (*Appendix 3*)

6.6.4 **Satellite Haemodialysis** unit ***at the Health Clinics*** (*Appendix 4*)

6.6.5 **Nephrology Ward/Clinic** at hospital ***with resident nephrologist*** (*Appendix 5*)

6.7 Nephrology Sub-committees

6.7.1 At the national level, the Nephrology service shall establish the following management committees **(NEPHROLOGY MANAGEMENT COMMITTEE)**:

- Planning and Development Committee
- Technical Specifications Committee

- Technical Evaluation Committee
- Human Resource Committee
- Nephrology Training Committee
- Ethics & Clinical Governance committee

Refer to Appendix 6 for terms of reference of the committees

6.7.2 The Nephrology service shall establish working clinical committees (**NEPHROLOGY WORKING CLINICAL COMMITTEES**) led by appointed nephrologist by HOS:

- Haemodialysis Program Committee
- Peritoneal Dialysis Program Committee
- Kidney Transplantation Program Committee
- Chronic Kidney Disease Committee
- Critical Care Nephrology Committee
- Diagnostic and Interventional Nephrology Committee
- Kidney Supportive Care Committee
- Research & Audit Committee

Appendix 6 - 7

6.7.3 At the state level, the functions of the above committees may be performed by individuals within a single management committee

6.7.4 The role of each staff member of the Nephrology Department/Unit has been illustrated in Appendix 8

7. OPERATIONAL POLICIES SERVICES

All MOH hospitals with a resident nephrologist(s) shall establish a nephrology department/unit which provides comprehensive nephrology services for both acute kidney injury (AKI), CKD and ESKD patients. Kidney replacement therapy (KRT) for ESKD shall be an integrated program consisting of Kidney Transplantation (KT), Peritoneal Dialysis (PD), Haemodialysis (HD) and Kidney Supportive Care (KSC). Patients can and shall be transferred from one KRT treatment modality to another as and when necessary. This will ensure the care of ESKD patients shall be a seamless continuum. CKD stage IV-V patients shall be given a pre-dialysis education programme (PDEP) by nephrologists or trained healthcare providers to enable him/ her to make an informed decision. As a policy for ESKD patients, transplantation is advocated as the best option for KRT where suitable, followed by **'PD first'** policy in line with KKM endorsement.

7.1 Haemodialysis Services

All MOH hospitals (with the exception of special medical institution) shall establish a haemodialysis unit (HDU). The unit shall provide outpatient and inpatient haemodialysis treatment.

7.1.1 Requirements for HDU

7.1.1.1 Location

The unit shall be located within the hospital or within its grounds. In the latter situation, the HDU shall be in an area which is easily accessible to the patients who receive treatment on a regular ambulatory basis. At the same time, the unit may dialyse patients from the wards. As such the unit shall be connected to the main hospital by covered corridors to enable safe and easy transport of patients. Other considerations in locating a HD unit shall include:

a) easy access to vehicles transporting patients and delivering machines/consumables/disposables
b) availability of adequate water pressure for HD, Reverse Osmosis (RO) and reprocessing machines
c) Security for patients, staff and equipment
d) Satellite HDUs were set up in Health Clinics that have a considerable number of patients on KRT but no nearby government HDUs
e) Satellite HDUs were affiliated to the nearest hospitals with resident nephrologist(s) to which patients were sent to in the event of acute emergencies

7.1.1.2 Water System

a) Adequate uninterrupted water supply is a prerequisite for effective haemodialysis treatment
b) Every haemodialysis treatment shall use water treated by a RO system to ensure purity of the water. When possible, ultrapure water treatment system should be considered
c) The water for dialysis shall undergo periodic chemical and microbiological testing to achieve the requirements as recommended by the current National Haemodialysis Quality and Standards
d) Details of water treatment system – refer to Section 2.4, Chapter 2, 5th edition of Handbook KRT

7.1.1.3 Equipment (refer to starter pack: Appendix 9A) and consumables

a) Haemodialysis Machines

The MOH Nephrology service shall provide HD machines which are current, cost effective

and with monitoring and other features that will ensure efficient and safe haemodialysis. Only machines approved by local (Medical Device Authority) and international regulatory authorities e.g., Food and Drug Administration of United States of America (FDA), European Medicines Evaluation Agency (EMEA) and Japan Ministry of Health shall be purchased. All HD machines shall be serviced regularly according to the manufacturer's recommendations.

The recommended number of HD stations depends on the category of hospitals:

- State Hospitals - 30 to 50 haemodialysis stations
- Hospitals with specialists - 20 to 40 haemodialysis stations
- Hospitals without specialists - 5 to 20 haemodialysis stations

b) Reprocessor Machines

Automated reprocessors with pressure check and fibre bundle volume measurement shall be used. However, in the future where transition to single-use dialysers is advocated, the requirement for reprocessing would become obsolete.

7.1.1.4 Consumables

a) Dialysers

- Dialysers have varying characteristics depending upon:
  i. Membrane material
  ii. Ultrafiltration coefficient (Kuf)

Table 5: Dialyser characteristics according to Kuf and β_2m clearance

	Kuf (ml/mmHg/hr)	β_2m clearance (ml/min)	β_2m sieving coefficient
Low flux	< 10	< 10	-
Middle flux	10 - 20	10 - 20	-
High flux	> 20	> 20	> 0.6

iii. Surface area and priming volume
iv. Clearance of urea, creatinine, uric acid, phosphate and vitamin B12
v. Sterilisation method

- Single use dialysers are currently recommended. However, if dialysers need to be reused, safe reprocessing techniques which comply with the standard recommendations is advocated.

b) Bloodlines and needles
- Universal bloodlines are preferred as they can be used in most HD machines
- All lines should be equipped with clamps which are luer-lock in type
- The priming volume of the bloodline in adults is between 100 - 150ml
- Artery and venous fistula needles range from 15G - 17G. The commonly used size for adults is 15G
- Blunt needle is mandatory for buttonhole cannulation

c) Dialysate
- Dialysate solution is required for haemodialysis
- Composition of dialysate is as follows:

Table 6: Composition of dialysate fluid

Component	Range (mmol/l)	Typical (mmol/l)
Sodium	135 - 145	140
Potassium	2.0 - 3.0	2
Calcium	1.0 - 1.75	1.25
Magnesium	0.5 - 1.0	0.75
Chloride	87 - 124	100
Glucose*	0 - 11	5.5
Acetate	2 - 4	3
Bicarbonate	20 - 40	35

* Dialysate solutions used locally do not contain any glucose

7.1.1.5 List of medications
(refer to Starter Pack: Appendix 9B)

7.1.1.6 Power supply

- Continuous power supply is required for uninterrupted haemodialysis treatment
- Battery back-up is a necessity in the event of electrical power supply failure

7.1.1.7 Standard of care

- Haemodialysis shall be performed three times weekly for at least 4 hours; where appropriate, patients may require a change in their dialysis prescription
- Dialysis adequacy shall be measured 3-monthly, and the dialysis dose shall be adjusted to achieve a delivered Kt/V of at least 1.2 or a Urea Reduction Ratio of at least 65%

- Hepatitis seroconversion is a sentinel event, and every case shall be notified and the infection control practice in the unit shall be thoroughly reviewed
- Death while on HD treatment or soon after shall be notified and an investigation carried out to determine its cause

7.1.1.8 Operational hours

- Where feasible a haemodialysis unit shall run at least three shifts of haemodialysis daily, 6 days a week to optimise the use of resources

7.1.1.9 Fees

- Patients shall be charged according to the Fees (Medical) Act 1982
- The fees shall be collected by authorised personnel according to established financial procedures

7.1.1.10 Screening

- All patients for haemodialysis shall be screened for viral infections:
  a) Prior to being accepted for treatment patients shall be screened for HBsAg, anti-HBs Ab, anti- HCV and anti-HIV
  b) For high-risk patients, refer to Section 2.11.2.5, Chapter 2, 5th edition, Handbook of KRT
  c) HBsAg, anti-HBs Ab titre, anti-HCV and anti-HIV shall be performed at least every 6 months
  d) Patients who are HBsAg negative and have anti-HBs Ab titre less than 10 IU/L shall be vaccinated

e) Hepatitis B
   - In the newly infected HBV patients, monitor HbsAg at least 3 monthly for up to 6 months
   - Patients with confirmed chronic HBV infection require at least annual HBsAg testing to detect those who have seroconverted

f) Hepatitis C
   - Confirmed positive anti-HCV patients may not require repeated serology tests
   - Patients who are anti-HCV positive should be tested for HCVcAg or HCV RNA PCR if intended for treatment

g) Human Immune deficiency virus (HIV)
   - Confirmed HIV infection does not require repeated serologic tests

Table 7: Recommendations for routine biochemical and virology testing in dialysis patients

Types of patients	ALT	HBsAg	Anti-HBs	Anti-HCV	HIV Ag-Ab Combo	Others
New patient	Monthly for 3 months If ALT is elevated, HBsAg and anti-HCV should be repeated	Upon admission	Upon admission	Upon admission	Upon admission	
Chronic patient whereby previous virology tests were negative	3 monthly If ALT is elevated, HBsAg and anti-HCV should be repeated	At least 6 monthly	At least annually	At least 6 monthly	At least 6 monthly	
Patient returning from other centre/ receiving blood transfusion	Monthly for 3 months If ALT is elevated, HBsAg and anti-HCV should be repeated	3 months post transfusion	At least annually	3 months post transfusion	3 months post transfusion	
Anti-HCV positive	-	At least 6 monthly	At least annually	-	At least 6 monthly	Send for HCVcAg or HCV RNA PCR if intended for treatment

7.1.1.11 Infection Control

- All haemodialysis centres must practise strict infection control:
  a) The HDU shall follow the policies and practices as recommended in the current National Haemodialysis Quality and Standards
  b) An infection control team shall be identified to activate, regulate, monitor and report infection control activities including staff training, case detection, documentation and audit activities
  c) Strict adherence to the guidelines for universal precautions by the staff shall always be practised (refer to Appendix 10)

7.1.1.12 Isolation Practices – refer to Section 2.11.2.6, Chapter 2, 5th edition, Handbook of KRT

a) Hepatitis B
   - Patients with Hepatitis B shall be dialysed with a single use dialyser in a separate room with dedicated machines

b) Hepatitis C
   - Patients with untreated Hepatitis C shall be dialysed with a single use dialyser in a separate room with dedicated machines
   - Patients with treated Hepatitis C, HCV Ab positive patients with negative HCV PCR or achieved sustained viral response (SVR) should continue dialysis at first shift HCV machine or last shift negative side or dedicated SVR machine, with single use dialysers

c) HIV

- Patient with HIV shall be isolated and dialysed using separate machines, equipment, instruments and single use items. It is mandatory not to reuse dialyzers
- The disposal of bloodlines and dialysers shall follow:
  Guidelines on Handling and Management of Clinical Wastes in Malaysia (www.doe.gov.my/maklumat-buangan-terjadual/).

7.1.2 Patient Selection for Centre Haemodialysis

Selection of patients for long term HD in the HDU shall be under the purview of a selection committee. This committee shall consist of minimum of one nephrologist and senior paramedics from the dialysis unit. A consultant nephrologist may chair this selection committee. The selection process and selection criteria are as follows:

7.1.2.1 Waiting time

The duration on the waiting list is the major criteria for acceptance

7.1.2.2 Priority group

The following will be given priority to be accepted into the MOH dialysis program once vacancy is available:

a) Patients with failed allograft who had undergone either a living related or deceased kidney transplantation at an MOH hospital
b) Peritoneal dialysis patients in MOH hospitals who require a change in dialysis modality upon nephrologist's judgement
c) Patients transferred from other MOH dialysis units
d) Children (<18 years)

7.1.2.3 Other factors to be taken into consideration include:

a) Government employment (and their dependents)
b) Socio-economic status
c) Multiple co-morbidities

The above selection criteria cannot be enforced strictly as selection of patients for KRT involves other human and clinical factors including patient's choice. Hence these criteria remain as a guide and other clinical criteria may be considered at the discretion of the selection committee.

Haemodialysis is not recommended in the following groups of patients and prior consultation with a consultant nephrologist is required before offering HD treatment:

a) Patients with terminal illnesses e.g., terminal cancers, terminal end organ failure (liver, heart, lungs)
b) Patients with active psychosis
c) Patients with persistent hypotension
d) Patients with very poor quality of life e.g., bed-ridden, dementia
e) Patients with extensive coronary artery disease and not suitable for any form of coronary intervention
f) Patients with severe vascular disease where creation of any form of vascular access is unlikely to be successful; the patient and immediate family members shall be informed of the reasons for the decision and the patient may be offered alternative treatment if indicated

7.1.2.4 For temporary lodgement of patient into government haemodialysis centre -refer to policy in Appendix 11

7.1.3 Manpower

7.1.3.1 The HD team shall consist of a multi-disciplinary team: refer to Table 8

7.1.3.2 The responsibilities of the haemodialysis paramedics are as listed in Appendix 8.

Table 8: Human Resource for HDs in Hospital and Health Clinics (Klinik Kesihatan)

Human Resources	Tier 1 (National Referral Hospital) HD stations >30-50	Tier 2 (Regional Referral Hospital) HD stations 30-50	Tier 3 (State Level Hospital) HD stations 30-50	Tier 4 (Resident Nephrologist) HD stations 20-40	Tier 5 (Visiting) HD stations 5-20
Person-in-charge	Designated Nephrologist	Designated Nephrologist	Designated Nephrologist	Designated Nephrologist	Director of Hospital/ HOD Medical/ FMS
Medical Officer	3-4 Rotation	3-4 Rotation	3-4 Rotation	2-3 Rotation	1 Designated
Specialist	2-3	2-3	1-2	1	1 (Med/FMS)
Dialysis Manager	1-2	1-2	1	1	1
Nurses and AMO	1:4	1:4	1:4	1:4	1:4-6
Medical Attendant	1 per shift (depending upon the number of patients)				
Dietitian	1 Renal trained	1 Renal trained	1 Renal trained	1 Integrated	1 Integrated
Pharmacist	1-2 Renal trained	1-2 Renal trained	1 Renal trained	1 Integrated	1 (General) Integrated
Social welfare officer	1	1	1	1	1

7.1.4 Haemodialysis Clinic

7.1.4.1 The HD clinic is dedicated for the follow up of patients that are on chronic haemodialysis in MOH units and home units

7.1.4.2 The objective of the clinic is to review HD patients every 3 months to ensure that the patients receive optimal care

7.1.4.3 During each clinic visit:

a) Physical examination including examination of the vascular access should be done
b) The patients' dialysis charts, medications and laboratory tests shall be reviewed including an assessment of dialysis adequacy
c) Complications of ESKD and haemodialysis such as mineral bone disease, anaemia, malnutrition and cardiovascular disease shall be assessed when required
d) The patients shall receive dietary advice and be referred to a dietitian when necessary

7.1.4.4 Other services: specialised clinics (for example vascular access and CKD-MBD clinics) shall be established whenever feasible

7.2 Peritoneal Dialysis Services

All MOH hospitals with a resident nephrologist shall establish a PD unit.

7.2.1 Requirements for PD units

7.2.1.1 Location

A PD unit shall be located close to the Nephrology/ Medical Ward

7.2.1.2 Storage

Every PD unit shall have an adequate storage area to ensure proper storage of dialysate, consumables and equipment

7.2.1.3 Equipment (refer to Starter Pack: Appendix 12A), consumables medications

a) Automated peritoneal dialysis machines
   Each PD unit shall be equipped with a minimum of one automated peritoneal dialysis machine
b) Consumables and peritoneal dialysis solution
   Each patient is regularly supplied with consumables and PD solution. Consumables that are required shall include a PD catheter which is introduced into the peritoneal cavity and transfer set which is used for exchanges. Peritoneal dialysis solution can be divided into conventional and biocompatible solutions
c) List of medications (refer to Starter Pack: Appendix 12B)

7.2.1.4 Screening

All patients for PD must be screened for viral infections:

b) HBsAg, anti-HBS titre, anti-HCV and anti-HIV shall be performed before being accepted for treatment and 6 monthly
c) Patients who are HBsAg negative and have anti HBs antibody titre less than 10 IU/l shall be vaccinated
d) For HBV, HCV and HIV positive patients - refer Section 7.1.1.10.

7.2.1.5 Infection Control

All PD centres must practice strict infection control:

a) PD units shall follow the policies and practices as determined by the National Peritoneal Dialysis Quality Standards 2020

b) An infection control team shall be identified to activate, regulate, monitor and report infection control activities including staff training, case detection, documentation and audit activities

c) Strict adherence to the guidelines for universal precautions by the staff shall always be practised

d) Other guidelines for the PD unit include:
   - A clean area shall be clearly designated for preparation of patient for an exchange; this area shall be disinfected in between patients
   - Education on care of the exit site and catheter shall be emphasised to patient, family and staff
   - Education on universal precautions shall be emphasised to patient, family and staff

7.2.2 Patient Selection for PD – refer to Section 3.1.2 & 3.1.3, Chapter 3, 5th Edition, Handbook of KRT

a) General factors:
   - PD is best suited to patients who are independent, disciplined, and motivated to care for themselves
   - They should be physically and mentally capable to perform the procedure
   - When these characteristics are not met e.g., in the very young children, patients with stroke, and the elderly, assisted PD can be performed by a fully committed and reliable trained assistant

- Home environment assessment is required prior to the initiation of PD training to ascertain home suitability (such as electrical and water supply, sink for hand washing, dedicated clean area to perform PD exchanges and adequate storage space). This may include home visits by the PD nurses

b) Psychosocial factors:
   - Patient preference and motivation
   - Concern with body image
   - Occupation
   - Economic consideration
   - Home and workplace environment
   - Family support and availability of an assistant
   - Distance from the nearest HD centre

c) Medical factors:
   - Age
   - Cerebrovascular and cardiovascular disease
   - DM: in those with proliferative retinopathy, the risk of intra-ocular bleed is less with PD
   - Impaired vision
   - Peripheral vascular disease
   - Severe pulmonary disease
   - Lumbar disc problems
   - Inflammatory bowel disease
   - Previous extensive abdominal surgery
   - Extensive adhesions/endometriosis
   - Body size/weight

d) Absolute contraindications
   - Extensive peritoneal fibrosis and adhesions arising from previous surgery, intra-abdominal infection or inflammatory bowel disease

- Surgically irreparable abdominal defects that may render PD ineffective or unsafe (e.g., prune belly syndrome)
- Lack of a committed and suitable assistant for patients who are mentally or physically incapable of performing PD

e) Relative contraindications
- Abdominal hernias - hernias may be repaired before or simultaneously during PD catheter insertion
- Colostomy, ileostomy, nephrostomy, and ileal conduits: may lead to contamination of the catheter exit site
- Poor vision, neurological or rheumatological disorders resulting in physical disability including poor dexterity
- Psychological problems – psychotic, belligerent or uncooperative patients cannot be expected to perform PD even with assistance
- Chronic obstructive pulmonary disease (COPD) - may not be tolerated due to increased intra-abdominal pressure
- Severe diverticular disease of the colon increases risk for peritonitis
- Chronic backache from lumbar disc disease - worsening of lordosis can occur with long-standing increased intra-abdominal pressure and poor muscle tone, giving rise to severe discomfort in some patients
- Severe chronic skin conditions unresponsive to therapy involving the abdomen and hands increases risk for peritonitis
- Body size limitations – in patients with morbid obesity, there may be issues related to catheter placement, wound healing, further weight gain from caloric absorption and dialysis adequacy

- Other intra-abdominal pathology such as endometriosis, polycystic kidneys, abdominal aortic aneurysm, and abdominal mass

7.2.3 Manpower

7.2.3.1 The PD team shall consist of: refer to Table 9

7.2.3.2 The responsibilities of the PD nurse are as listed in Appendix 8

Table 9: Human Resource for Peritoneal Dialysis units in Hospitals

Human Resources	Tier 1 (National Referral Hospital)	Tier 2 (Regional Referral Hospital)	Tier 3 (State Level Hospital)	Tier 4 (Resident Nephrologist)	Tier 5 (Visiting)
Person-in-charge	Designated Nephrologist	Designated Nephrologist	Designated Nephrologist	Designated Nephrologist	HOD Medical
Medical Officer	3-4 Rotation	3-4 Rotation	3-4 Rotation	2-3 Rotation	1 Designated
Specialist	1-2	1-2	1-2	1	1 (Med)
Dialysis Manager	1-2	1-2	1	1	1
Nurses	01:25	01:25	01:25	01:25	01:25
Medical Attendant	1 per shift (however, depends upon number of patients)				
Dietitian	1 Renal trained	1 Renal trained	1 Renal trained	1 Integrated/ Renal trained	1 Integrated
Pharmacist	1-2 Renal trained	1-2 Renal trained	1 Renal trained	1 Integrated	1 (General) Integrated
Social welfare officer	1	1	1	1	0-1

7.2.4 Peritoneal Dialysis Clinic

- The PD clinic is dedicated for the follow up of patients on peritoneal dialysis
- The objective of the clinic is to review PD patients every 3 months (or earlier if required) to ensure that the patients receive optimal care
- During each visit:
  a) The patients shall receive a physical examination which shall include an examination of the exit site and the tunnel tract
  b) The patients' dialysis charts, medications and laboratory tests shall be reviewed including assessment of dialysis adequacy (Kt/V, PET)
  c) The patients shall receive education in the following aspects:
     - hand hygiene
     - exit-site care
     - recording of weight, blood pressure, volume of ultrafiltrate, PD solution strengths
     - PD exchanges
     - to recognise the potential complications like exit site infection, peritonitis, and ultrafiltration failure
     - administration of Erythropoietin Stimulating Agents (ESAs)
     - diet

7.3 General Nephrology Services

General Nephrology services shall provide both inpatient and outpatient care

7.3.1 Outpatient Nephrology Services

7.3.1.1 The nephrology clinic will provide promotive, preventive, diagnostic and therapeutic as well as counselling services on kidney health, acute and chronic kidney disease (CKD)

7.3.1.2 The objectives of this clinic are:

a) To identify and treat underlying disease
b) To delay the progression of kidney disease including optimising blood pressure control and proteinuria reduction
c) To counsel patients (and/relatives) on care of their disease
d) To provide nutritional support and counselling
e) To prevent long term complications of CKD
f) To prepare patients for KRT
g) To provide psychosocial support and referral for financial assistance

7.3.1.3 Appointments for all referral cases shall be in accordance with existing guidelines as stated in the 'Garis Panduan Rujukan' in accordance with the hospital policy

7.3.1.4 Specialised clinics dedicated for specific groups of patients may be established if necessary. These may include:

a) CKD clinic
b) Diabetic kidney disease clinic
c) Glomerulonephritis clinic
d) Hypertension clinic
e) Cardio-Kidney Metabolic clinic
f) Pre-dialysis clinic
   The clinic sessions shall be organised to counsel patients on the various modalities of kidney replacement therapy; requires a multi-disciplinary team
g) Vascular access clinic to assess patients for vascular access e.g., Doppler ultrasound of fistulas or venous mapping of limbs
h) Research clinic

7.3.1.5 Equipment required for starting a Nephrology Clinic – (refer to Starter Pack: Appendix 13)

7.3.2 Day-care Nephrology Services

The following services can be provided as a day-care procedure; if the facilities for day care are not available, these services can be performed as an inpatient:

- Haemodialysis
- Insertion of cuffed and non-cuffed haemodialysis catheters
- Assessment or creation of vascular access
- Insertion of peritoneal dialysis access/other PD-related procedures e.g., shaving of external cuff
- Treatment of stable patients with PD peritonitis and IPD
- Kidney biopsy
- Administration of parenteral drugs e.g., immunosuppressive agents, iron sucrose, antibiotic
- Endovascular procedures – e.g., venoplasty

7.3.3 In-patient Nephrology Services

7.3.3.1 The services provided include:

a) Care of patients with common kidney disorders such as glomerular diseases e.g., nephrotic syndrome, nephritic syndrome
b) Management of chronic haemodialysis patients e.g., those with complications requiring admission, vascular access surgery, parathyroidectomy surgery
c) Management of peritoneal dialysis patients e.g., those with complications requiring admission, PD training, PD cycler
d) Management of kidney transplant patients e.g., those with complications requiring admission, graft biopsy

e) Management of acute kidney injury (AKI) patients with intermittent HD, slow extended daily dialysis (SLEDD), continuous kidney replacement therapy (CKRT) with hemofiltration, hemodiafiltration, slow continuous ultrafiltration (SCUF) or acute PD
f) Management of acute poisoning using extra-corporeal techniques such as hemoperfusion
g) Management of patients requiring extracorporeal procedures such as plasmapheresis or hemadsorption
h) Consultation services to other clinical services/ departments
i) Procedures:
   - Kidney biopsy
   - Insertion and removal of catheters e.g., insertion of cuffed and non-cuffed HD catheters, PD catheters
   - Endovascular procedures: Fistulogram, Fistuloplasty and stenting
   - Vascular access surgery
   - Parathyroidectomy surgery (performed by surgical team)

7.3.3.2 Admission to the ward

a) Elective admission - as per hospital policy
b) Emergency admission - as per hospital policy

7.3.3.3 The in-patient team consist of multi-disciplinary personnel based upon a 28-bedded ward: refer to Table 10

Table 10: Human Resource for General Nephrology Ward in Hospitals

Human Resources	Tier 1 (National Referral Hospital)	Tier 2 (Regional Referral Hospital)	Tier 3 (State Level Hospital)	Tier 4 (Resident Nephrologist)	Tier 5 (Visiting)
Consultant/ Specialist	1:2 Designated Nephrologist	1-2 Designated Nephrologist	1-2 Designated Nephrologist	Designated Nephrologist	Visiting Nephrologist
Medical Officer	1:8	1:8	1:8	01:10	01:10
Specialist	01:14	01:14	01:14	01:28	01:28
Nurses • Standard • Acute • Iso room • HDW	 1:4 1:2 1:1 1:2	 1:4 1:2 1:1 1:2	 1:4 1:2 1:1 1:2	 1:4 1:2 1:1 1:2	 1:4 1:2
Medical Attendant	01:14	01:14	01:14	01:14	01:14
Dietitian	1 (renal trained)	1 (renal trained)	1 (renal trained)	1 (integrated)	1 (integrated)
Pharmacist	1:20 (renal trained*)	1:20 (renal trained)	1:20 (renal trained)	1:20 (integrated)	1:20 (integrated)
Social welfare officer	1	1	1	1	0-1

* Preferably trained in transplant pharmacy as well

Their responsibilities are to:

a) Conduct daily ward rounds and call duties
b) Perform in-patient medical procedures (including counselling and treatment)
c) Arrange for special procedures and investigations
d) Provide nephrology care for patients referred from other disciplines and refer patients to other departments if necessary:
    - Refer to Appendix 14 for the policy on referral of patients to Nephrology either inpatient or outpatient and policy of patients under shared management
    - All referrals shall be in accordance with the existing guidelines as stated in the "Garis Panduan Rujukan" in accordance with hospital policy

e) Provide discharge summary and plan on follow up treatment
f) Infection control:
- A team shall be designated for infection control activities in the ward
- This team shall activate, regulate, monitor and report infection control activities
- This shall be in accordance with the hospital infection control guidelines

g) Pain management

7.4 Kidney Transplantation Services

Kidney transplantation shall be the preferred KRT for suitable patients with ESKD. In providing such a service MOH shall ensure that it abides by the Declaration of Istanbul and all guidelines provided by international organisations like the World Health Organisation and the Transplantation Society especially on issues of ethics. Kidney transplantation surgery and the immediate post-transplant care shall be performed only in designated centres. However, the subsequent management of the kidney transplant patients can be done in any MOH hospitals with a resident nephrologist

7.4.1. Requirements for kidney transplantation:

7.4.1.1 Transplant team

The members of the transplant team consist of:

a) Nephrologist(s)
b) Transplant surgeon(s) (in centres performing transplant surgery)
c) Clinical specialist(s)
d) Medical officer(s)
e) Transplant coordinator(s) (for role & function: refer to Appendix 8)
f) Transplant nurse(s)
g) Pharmacist(s)
h) Other supportive staff – dietitian, social welfare officer

7.4.1.2 Transplant clinic. (refer to Starter Pack: Appendix 15A)

a) The transplant clinic is dedicated for the follow up of kidney transplant recipients and kidney donors; a team including kidney transplant nurses shall be present in this clinic to assist doctor

b) Arrangements may be made to review transplant recipients who develop acute medical problems on non-clinic days

7.4.1.3 Transplant isolation and intensive care facilities

7.4.1.4 Pathology & Laboratory services

Transplant centres and transplant clinics shall have access to specific laboratory services such as immunology, mycology, virology, bacteriology, therapeutic drug monitoring and renal histopathology services

7.4.1.5 Radiological services

Transplant centres and transplant clinics shall have access to specific services such as ultrasound and Doppler, nuclear scan and interventional radiology services

7.4.1.6 Immunosuppressive drugs

a) Transplant centres and transplant clinics shall have access to specific immunosuppressive drugs (Appendix 15B)

b) Current policies on the supply of immunosuppressive drugs to kidney transplant patients apply

7.4.2 Responsibilities of the transplant team members:

- Work up of potential kidney donors and recipients
- Maintain and update the potential cadaveric kidney deceased transplant waiting list
- Provide comprehensive inpatient and outpatient services
- Follow up of kidney transplant recipients and donors
- Provide graft biopsy services
- In transplant centres, the team shall provide peri-operative care of kidney transplant recipients and living donors
- Provide information and data to the National Renal Registry

7.4.3 Centres designated to perform kidney transplantation surgery shall have a donor advocate service or facilitate the potential donor to get counselling from a donor advocate; this is to ensure that the potential donor will get objective advice on the risks and benefits of organ donation from an independent person

7.4.4 Types of kidney donors

Potential kidney donors shall be assessed thoroughly to ensure suitability for transplantation according to current recommendations

a) Living kidney transplantation

Selection criteria:

I. Relationship

Table 11: Types of live kidney donors

Type of donor	Description
Live related donor	A genetically related first-and second-degree family Other members need assessment by the Unrelated Transplant Approval Committee (UTAC) in MOH
Live emotionally related	A legally registered spouse of the recipient
Live unrelated donor	Generally, not be accepted In exceptional cases, needs assessment by the Unrelated Transplant Approval Committee (UTAC) in MOH

II. Age
- Exclude those who are less than 18 years
- Older donors require more vigorous assessment and discussion concerning
- risk of donation (> 65 years of age)
- Biological age is more important than chronological age

III. Immunological compatibility
- ABO and HLA compatible donor-recipient pair is preferable
- Options for transplant candidates with high immunological risk are:
  - Explore different living donors
  - Paired kidney donation (PKD)
  - Desensitisation procedures
  - Wait for a compatible deceased donor organ

IV. Contraindications – (refer to Chapter 5, 5th edition, Handbook KRT
- Proteinuria
- Impaired kidney function
- DM is generally contraindicated

  - However, such donors can be considered in certain circumstances
- Hypertension with evidence of target organ damage
- Morbid obesity (BMI > 35 kg/m2)
- Psychiatric illness e.g., psychotic disorders
- Coagulopathy
- Systemic illness with potential to develop kidney disease
- Active drug abuse e.g., amphetamines, heroin, and cocaine
- Severe cardiac, pulmonary and liver disease
- Pregnancy
- Active malignancy
- Nephrolithiasis
  - Bilateral kidney stones
  - History of a previous infection-related (struvite) or cystine renal stone
  - Significant and non-correctable metabolic abnormality
- Autosomal dominant polycystic kidney disease (ADPKD)
  - Donor candidate with ADPKD should not donate
  - Donor candidate with a family history of ADPKD in a first-degree relative may be acceptable for donation if they meet age-specific imaging or genetic testing criteria that reliably exclude ADPKD

b) Deceased Donor Kidney Transplantation
   - There are two types of deceased donation
     - Heart-beating or donation after brain-death (DBD)
     - Non-heart beating or donation after circulatory death (DCD)

- All suitable potential recipients shall be placed on the national deceased donor waiting list
- Patients are selected based on the criteria established by the Malaysian Kidney Allocation System (MyKAS 3.0)

7.5 Critical Care Nephrology (CCN)

Setting up a CCN unit in a hospital involves several key steps, including planning, staffing, acquiring equipment, and establishing protocols. All Tier 2-5 hospitals with ICU and resident nephrologist shall provide CCN service for patients presenting with Acute/ Chronic Kidney injury requiring CCN attention.

7.5.1 Requirement for CCN Unit:

7.5.1.1 Location

Whenever possible, an intensive care unit is preferred. It could be an ICU / CCU managed by an Intensivist/Anaesthetist and Physicians, or an ICU or high dependency wards within the Nephrology or Medical Department

7.5.1.2 Equipment (refer to Starter Pack: Appendix 16) and Technology

a) Dialysis machines (quantity depending on local needs)
   - Continuous Kidney Replacement Therapy (CKRT) machine
   - Haemodialysis machine which can perform Slow Low Efficiency Dialysis (SLED) and Intermittent haemodialysis (IHD)
   - Reverse Osmosis (RO) systems – in-built/ portable
   - Peritoneal Dialysis Cycler in centres with resident PD patients

b) Monitoring system
- Patient monitoring system – for continuous vital sign monitoring
- Glucometer

c) Supportive Equipment
- Infusion pumps for medications (diuretics, vasopressors)
- Ventilators
- ECG machine
- Defibrillator
- Suction apparatus
- Nebuliser

d) Imaging Equipment
- Ultrasound machine (linear, phased array and curvilinear probes) for catheter placement, point of care for assessing fluid and haemodynamic status and to exclude obstructive uropathy

7.5.2 Procedures

7.5.2.1 General Procedures

a) Intermittent dialysis (acute)
- Patient information sheet for acute dialysis
- Prescribing form for acute dialysis
- Monitoring form for acute dialysis

b) Slow low efficiency dialysis/ Prolonged intermittent kidney replacement therapy

c) Kidney ultrasound

7.5.2.2 Advanced procedures

a) Continuous Kidney Replacement Therapy

b) Therapeutic plasma exchange/apheresis

c) Point of care Echocardiography, IVC scan, Venous Access Ultrasound and Lung scan

d) Body Impedance Analysis (optional)

7.5.3 Patient selection

7.5.3.1 Renal conditions

a) AKI – haemodynamically unstable AKI
b) AKI on CKD
c) ESKD

7.5.3.2 Complications requiring Specialized Nephrology Care

a) Electrolyte Imbalances: Severe hyperkalaemia, hyponatremia, hypernatremia, hypocalcaemia, or hypercalcemia that are life-threatening or refractory to treatment
b) Acid-Base Disorders: Severe metabolic acidosis or alkalosis not manageable with standard treatments
c) Volume Overload: Fluid overload unresponsive to diuretics, requiring dialysis or other advanced interventions

7.5.3.3 Comorbid conditions and Multisystem failure

a) Sepsis and Multiorgan Dysfunction: Patients with sepsis or multi-organ dysfunction syndrome (MODS) who develop AKI or require nephrology expertise
b) Syndrome: Patients with heart failure/disease and concomitant kidney dysfunction needing integrated cardio-kidney care
c) Hepatorenal Syndrome: Patients with liver failure requiring combined hepatology and nephrology management

7.5.3.4 Post-Operative and Trauma patients

a) Post-Operative Complications: Patients who develop AKI or other kidney complications following major surgery, particularly cardiac, vascular, or abdominal surgery

b) Trauma Patients: Trauma patients with kidney injuries or those developing AKI due to rhabdomyolysis, shock, or other trauma-related factors

7.5.3.5 Haematologic and Oncologic Conditions:

a) Tumour Lysis Syndrome: Patients undergoing chemotherapy or other cancer treatments who develop AKI
b) Hematopoietic Stem Cell Transplantation: Patients undergoing stem cell transplantation who develop complications

7.5.3.6 Autoimmune and Systemic Disease

a) Glomerulonephritis: Severe or rapidly progressive glomerulonephritis causing AKI that may require oxygen support, haemodialysis and or plasma-exchange
b) Vasculitis: Systemic vasculitis with kidney involvement requiring intensive immunosuppressive therapy and KRT support

7.5.3.7 High-Risk Pregnancy

a) Pre-Eclampsia and Eclampsia: Pregnant women with severe pre-eclampsia or eclampsia causing kidney dysfunction
b) HELLP Syndrome: Patients with HELLP syndrome requiring intensive monitoring and nephrology intervention

7.5.3.8 Drug intoxication

a) Patient with drug intoxication requiring intervention for drug removal
b) Patient with drug intoxication who develop AKI requiring KRT

7.5.4 Staffing

7.5.4.1 Medical staff

Depending on capacity, at least one nephrologist and three medical officers

7.5.4.2 Nursing staff

Nurses trained or privileged in nephrology and dialysis procedures – IHD, CKRT

7.5.4.3 Supporting staff

a) Dietitians – renal trained
b) Pharmacists
c) Medical attendants
d) Physiotherapists
e) Social welfare officers

7.5.5 Outpatient service

A dedicated clinic or integrated renal clinic to follow-up post- AKI discharge

7.6 Diagnostic and Interventional Nephrology.

All MOH hospitals with a resident nephrologist shall establish Diagnostic and Interventional Nephrology (DIN) service depending on their training (General or Advanced)

7.6.1 Requirement for DIN (general or advanced), depending on the nephrologist training

7.6.1.1 Location

There should be a dedicated unit within the Nephrology Care set-up to facilitate training and management

7.6.2 Procedures performed under DIN: refer to table 12

Table 12: Procedures performed under DIN

GENERAL PROCEDURES	ADVANCED PROCEDURES
Point of Care Ultrasound (POCUS) for kidney and fluid assessment	Ultrasound surveillance of AVF and AVG
Biopsy of native and graft kidneys	Ultrasound mapping for pre-AVF creation
US guided temporary & cuffed HD catheter insertion	Laparoscopic Tenckhoff catheter insertion
Peritoneoscope Tenckhoff catheter insertion	Percutaneous transluminal angiogram for AVF/AVG (diagnostic and treatment)
Seldinger Tenckhoff catheter insertion +/- ultrasound guided	AVF/AVG creation
Ultrasound assessment of newly created AVF/AVG	Advanced POCUS for haemodynamics
Ultrasound guided cannulation of AVF/AVG using a. localization/mapping of AVF/AVG b. real-time c. combination of above	

7.6.3 Patient selection for Diagnostic and Interventional Nephrology

7.6.3.1 Patient selection for DIN

a) Indicated for native kidney biopsy
b) Graft kidney biopsy
c) Pre-initiation of dialysis (CKD stage 5) - planning for access creation
d) Patients with vascular access issues

7.6.3.2 The DIN team shall consist of: refer to table 13

Table 13: Human Resource for Diagnostic Interventional Nephrology

Human Resources	Tier 1 (National Referral Hospital)	Tier 2 (Regional Referral Hospital)	Tier 3 (State Level Hospital)	Tier 4 (Resident Nephrologist)	Tier 5 (Visiting)
Person-in-charge	Designated Nephrologist (certified)	Designated Nephrologist	Designated Nephrologist	NA	NA
Medical Officer	Rotation	Rotation	Rotation	NA	NA
Specialist	Rotation	Rotation	Rotation	NA	NA
Nurses/ AMO	U32: 1 U29: 3-4	U32: 1 U29: 3-4	U32: 1 U29: 3-4	NA	NA
Medical Attendant	1	1	1	NA	NA
Juru Xray diagnostic	1-2	1-2	1	NA	NA
Social welfare officer	1	1	1	NA	NA

7.6.3.3 Scope of service of Trained nurses/AMO (DIN) for:

i: General

- Handling fluoroscopy machine for related procedures
- Performing real-time ultrasound guided needling for AVF/AVG

ii: Advanced setting

- Performing ultrasound for AVF/AVG surveillance

7.6.4 Diagnostic and Interventional Nephrology Clinic (Advanced)

The clinic is integrated for the follow up of the patients under DIN. The follow up will depend on the individual needs e.g., pre and post AVF creation

7.6.5 Equipment (refer to Starter Pack: Appendix 17) required for DIN Service

7.7 Kidney Supportive Care

Kidney Supportive Care (KSC) is the application of palliative care principles and practices integrated into management of patients with chronic kidney disease. The goal is alleviation of suffering through treatment of symptoms, empathic communication, support for psychosocial, emotional and spiritual distress. All MOH hospitals with nephrology facilities may establish KSC services.

7.7.1 Requirements for Kidney Supportive Care

7.7.1.1 Location

There should be an integrated clinic within Nephrology/Medical/Palliative care set-up or wards to facilitate training and management

7.7.2 Patient Selection for KSC

7.7.2.1 Kidney supportive care should be considered throughout CKD care. Patient selection for enhanced palliative care delivery services may be considered in:

a) Advanced age
b) Elderly patients with multiple comorbidities
c) Patients with advanced disease, e.g., severe liver/ heart/lung failure, advanced malignancy, multi-organ failure

7.7.2.2 The KSC team may consist of:

a) Nephrologist
b) Palliative care physician
c) Specialist and/or medical officer
d) Trained nurses (in nephrology and/or palliative care)

e) Allied health staff who are trained (in nephrology and/or palliative care)
f) Assistant Medical Officer
g) Medical social worker, dietitian, renal pharmacist
h) Psychologist, physiotherapist, occupational therapist
i) Staff from any other related services that may be needed for clinical assessment

7.7.2.3 KSC Clinic

a) The clinic is for the follow up of patients on KSC. Patients may be followed up in the community/home. This will depend on individual needs
b) If patients are managed in community, services shall be a collaboration with primary care physician and/or hospice
c) During each visit:
   The patients shall have full history taking, receive a physical examination and the holistic aspect of supportive care will be focussed on:
   - physical symptoms
   - psychosocial symptoms
   - social and emotional symptoms
   - spiritual symptoms
d) Advance Care Planning shall be performed on an annual basis or when there is clinical deterioration. This should be documented in a standardised manner using the form in Appendix 18

8. TRAINING AND EDUCATION

Training would include:

- House officers/ Medical officers / Specialist/ Trainee nephrologists
- Nursing personnel
- Allied health personnel
- Patients and family
- Medical students

8.1 Training of Trainee Nephrologists

- There is a formal training programme for the trainee nephrologist where the doctors with specialist qualifications (MRCP or Masters) undergo a period of structured training for a minimum period of 36 months
- The programme is designed to develop competency in knowledge, skills and attitudes necessary for the practise of renal medicine
- Nephrology examinations are conducted every year and is conducted by the Nephrology Speciality Training and Examination committee (NSTEC)
- A trainee is eligible to sit for the nephrology examination after completion of 3 years of the training where they must complete a minimum of 8 core modules and fulfil their 36-month training by doing any additional core or elective module(s)

Table 14: Nephrology Speciality Training Modules

	Modules	Duration	Months
CORE MODULES	General Nephrology	GN1	4 months
		GN2	4 months
	Haemodialysis	HD1	4 months
		HD2	4 months
	Peritoneal dialysis	PD1	4 months
	Transplant	Transplant 1	4 months
		Transplant 2	4 months
	Critical Care Nephrology	CCN	4 months
ELECTIVE MODULES	Others	Advanced PD	2-4 months
		Diagnostic Interventional Nephrology	2-4 months
		Renal Histopathology	2-4 months
		Paediatric Nephrology	2-4 months
		Transplant immunology	2-4 months
		Advanced research or biostatistics	2-4 months

*Source: Handbook on Specialist Training in Nephrology 2021

8.2 Training of Physicians or Medical Practitioners

- MOH accredited centres are involved in the training programme of 200-hours certification course to train physicians to become the person-in-charge for private haemodialysis services in Malaysia under the Private Healthcare Facilities and Services Act 1998 (PHSA Act).

  Source: msn.org.my; Training: 200 hours training programme

- Training of physicians or medical officers during the medical rotation, in the MOH is in accordance with the logbook based upon the MMED and MRCP programme in individual hospitals.

8.3 Training of Allied Health Professionals

- Paramedics undergo training either in HD or PD
- Those who are working in specialised nephrology areas like HD and PD need to undergo privileging for a list of procedures according to the MOH guidelines – refer to "Credentialling and Privileging Guidelines for Staff-nurses, Assistant Medical Officers and Allied Health Professionals", 2018
- Paramedics can apply for post-basic training in Nephrology offered by MOH. Once completed and fulfil other criteria they can apply for credentialing

8.4 Training of Patient and Family

- Training of patient and family is an essential component particularly for home dialysis therapies:
  a) Home Haemodialysis
  b) Peritoneal Dialysis – CAPD or APD

9. CREDENTIALING AND PRIVILEGING

The process of credentialing and privileging is guided by Credentialing & Privileging Guidelines for Nurses, Assistant Medical Officers and Allied Health Professionals in the MOH, second edition (2018) and Guidelines for Credentialing and Privileging in the MOH, first edition (December 2001).

9.1 Definitions

Credentialing: The two-pronged process that involves establishing requirements and evaluating individual qualifications for entry into a particular status/ specialty based on pre- determined professional training requirements and experience. Credentialing first involves considering and establishing the professional training and experience. The second aspect of credentialing involves obtaining and evaluating evidence of the qualifications of individual applicants.

Privileging: The right of a health care provider to provide specific care that is consistent with his/ her training, experience and competency.

9.2 Credentialing Process

National Credentialing Committee specific for nephrology services for nurses, assistant medical officers are appointed by MOH with representatives throughout the nation. Criteria for credentialing is in Appendix 19

9.3 Criteria for Privileging

Criteria for privileging for central venous catheter insertion (core procedure) shall include Nephrologist, Trainee Nephrologist, Internal Medicine Physician and Medical officer.

a) Observed and/or assisted hemodialysis CVC insertion (IJV and femoral vein 3 each)
b) Completed 5 each of IJV and femoral vein catheter insertion under the supervision of Nephrologist consultant or specialist
c) Completed logbook signed by Consultant Nephrologist

10. CLINICAL GOVERNANCE

It is necessary for a framework to ensure high-quality, safe and effective care in patients with kidney diseases whilst improving quality and integrity of service via fostering continuous improvement and innovation. Some of the areas include:

10.1 Quality Assurance and Audit

The Nephrology service will endeavour to keep within the overall standards by meeting the target of hospital wide indicators. It shall also identify other discipline specific indicators of the services provided covering outpatient, inpatient, general nephrology, PD, HD and renal transplant related activities:

a) Key performance indicators for Nephrology
b) Regular review of clinical practice guidelines and standards

10.2 Patient Safety

a) It is important to ensure that a detailed consent process is strictly followed when delivering patients' care plan particularly when patient undergoes interventional procedures

b) Incident reporting and risk management is another area of concern and needs attention.

c) There are some suggested standard operating procedures, check-lists and consent forms as guidance – refer to Appendix 20-34

10.3 Research and Innovation

The nephrology services recognise the need for active research in areas of interest such as General Nephrology, Dialysis, Kidney Transplantation, CCN, DIN and KSC to ensure there is good evidence to support local nephrology practices. The scope of research will include clinical epidemiology, health economics and the use of medical devices.

11. GENERAL HOSPITAL POLICIES

The Nephrology services shall comply with the whole hospital

- Policy in the following areas:
- Hospital admission and discharge
- Transportation service
- Infection control
- Sterilisation service
- Management of waste products
- Supply of pharmaceuticals and consumables
- Acquisition of assets and equipment
- Catering service
- Laundry and linen supply
- Cleaning service
- Engineering service including preventive and maintenance services
- Security service
- Fire precaution

- Medical record management
- Communication system
- Quality assurance
- Occupational and Safety Health Act (OSHA)
- Public relations, release of information and confidentiality

12. CLINICAL PRACTICE GUIDELINES.

The practice of Nephrology shall be guided by the clinical practice guidelines prepared by the MOH. In the absence of any clear guideline on any issue or subject, the internationally recognised best practice shall be adopted. Some of the examples are as listed:

12.1 Local Guidelines:

- Management of Hypertension, 5th edition,2018
- Management of Chronic Kidney Disease, 2nd edition, 2018
- Malaysian CKD MBD and Parathyroidectomy Guidelines and SOP, 2018
- Management of Type 2 Diabetes Mellitus, 6th edition, 2020
- Management of Systemic Lupus Erythematosus, 2023
- Management of Heart failure, 5th edition, 2023

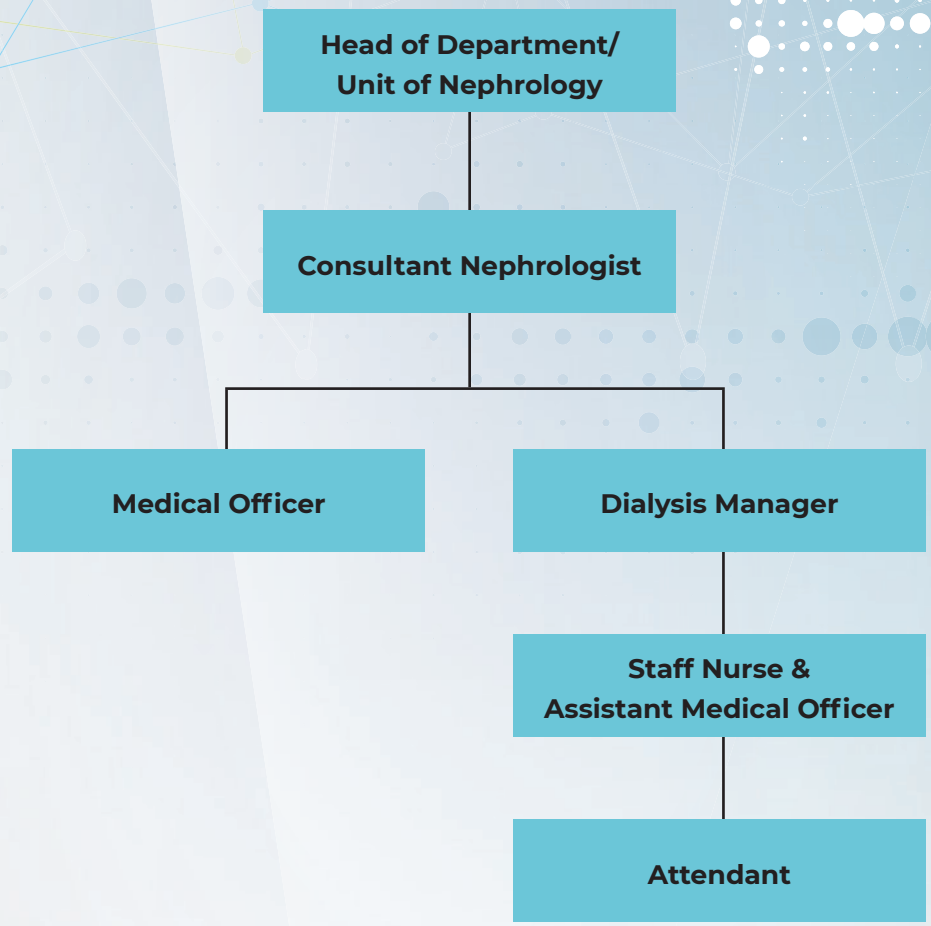
12.2 International Guidelines:

- KDIGO: Clinical Practice Guideline for the Management of Glomerular Disease, 2021
- KDIGO: Clinical Practice Guideline for the management of Blood pressure in CKD, 2021
- KDIGO: Clinical Practice Guideline for the management of Diabetes in CKD, 2022
- KDIGO: Clinical Practice Guideline for the Acute Kidney Injury (AKI) and Acute Kidney Disease (AKD), 2023
- KDIGO: CKD Guideline on Evaluation, Prognostication and Management of Kidney Disease, 2023
- KDIGO: Clinical Practice Guideline for the Evaluation and Management of CKD, 2024

- KDIGO: Clinical Practice Guideline for the management of ANCA- associated vasculitis, 2024
- KDIGO: Clinical Practice Guideline for the management of Lupus Nephritis, 2024

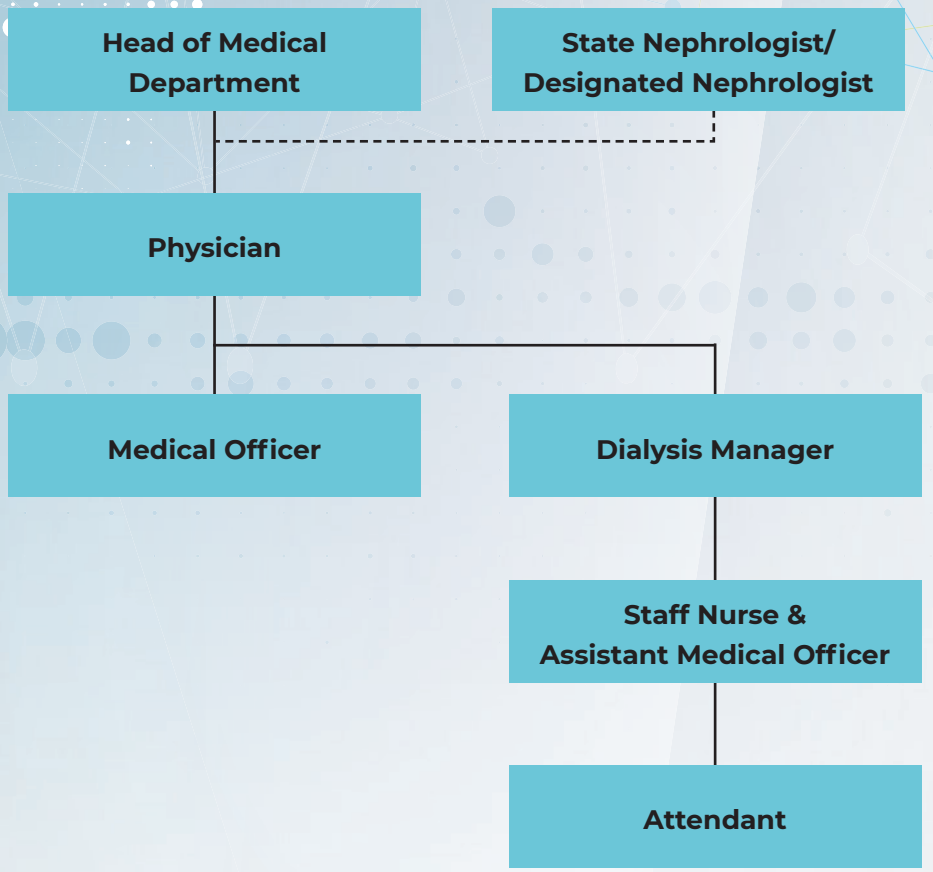
APPENDIX 1

HAEMODIALYSIS UNIT ORGANISATIONAL CHART AT HOSPITAL WITH RESIDENT NEPHROLOGIST



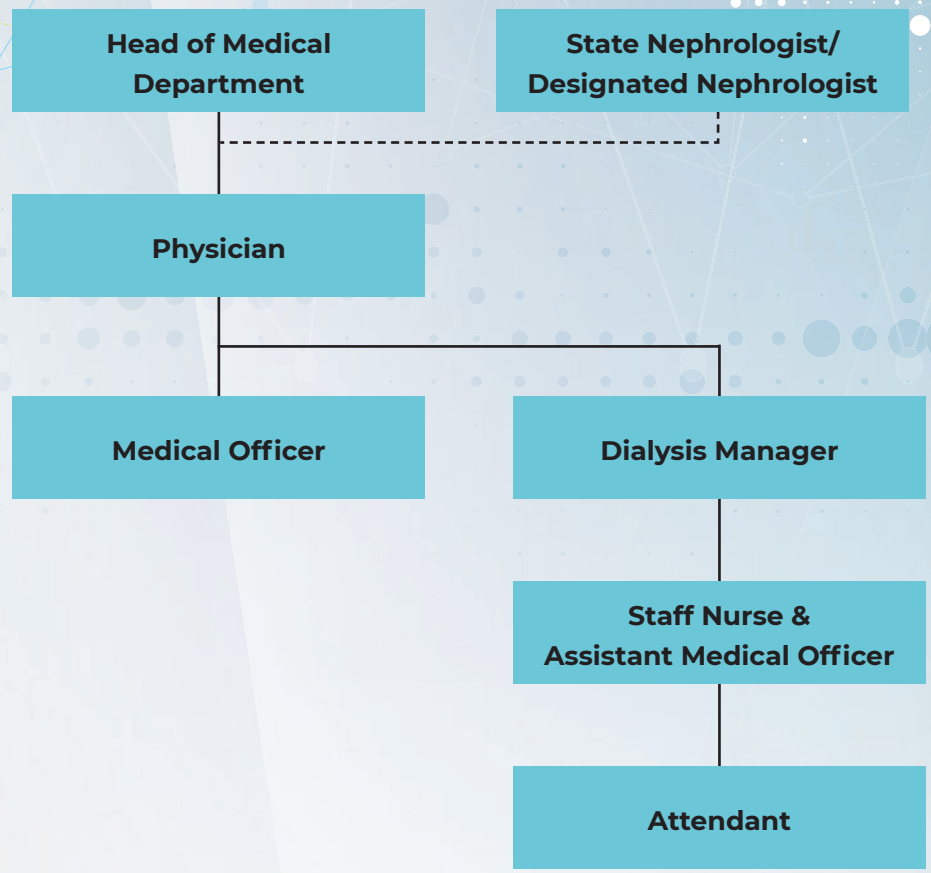
APPENDIX 2

HAEMODIALYSIS ORGANISATIONAL CHART AT SPECIALIST HOSPITAL WITHOUT RESIDENT NEPHROLOGIST



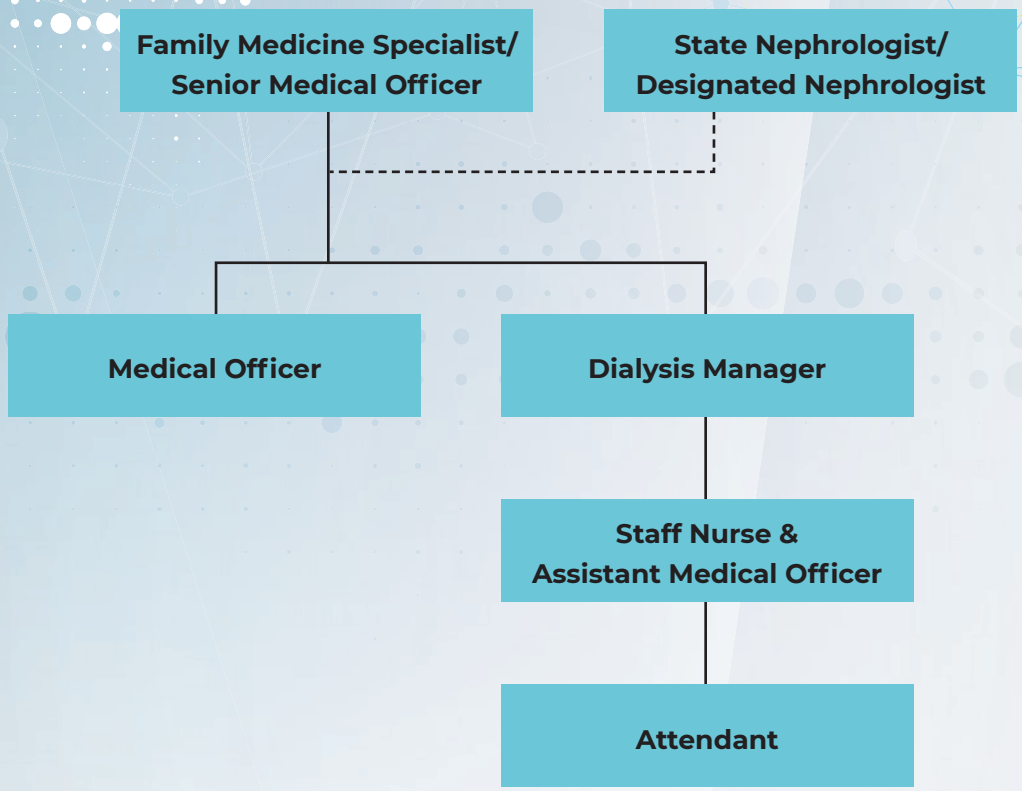
APPENDIX 3

HAEMODIALYSIS ORGANISATIONAL CHART AT HOSPITAL WITHOUT SPECIALIST



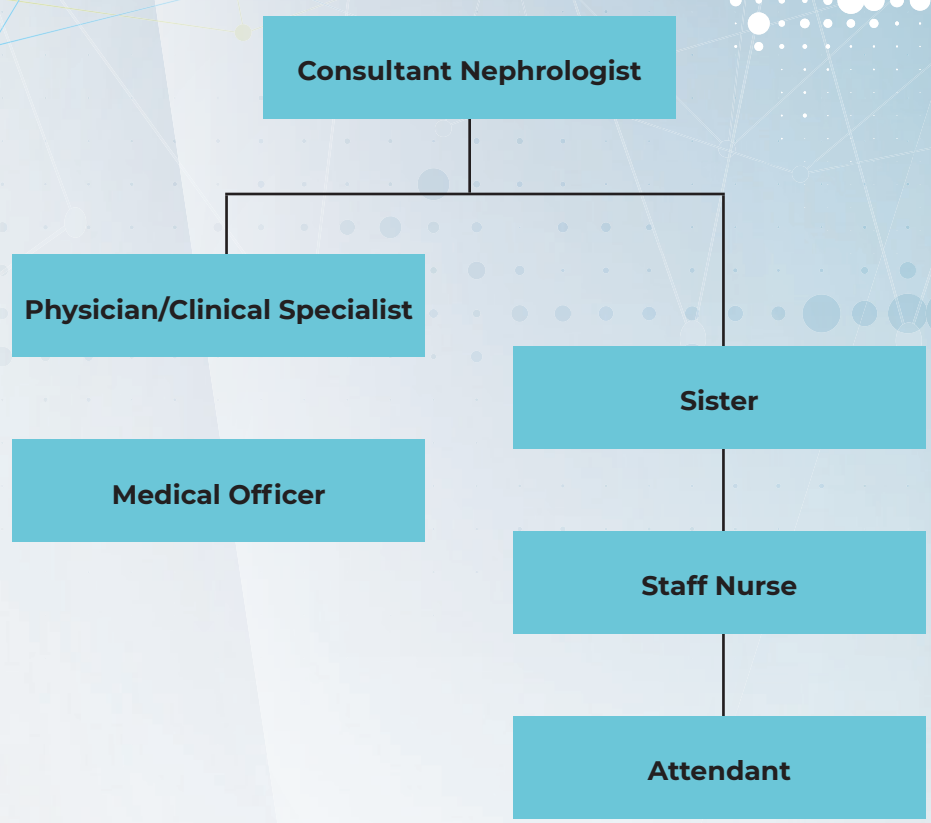
APPENDIX 4

SATELLITE HAEMODIALYSIS UNIT ORGANISATION CHART IN HEALTH CLINIC



APPENDIX 5

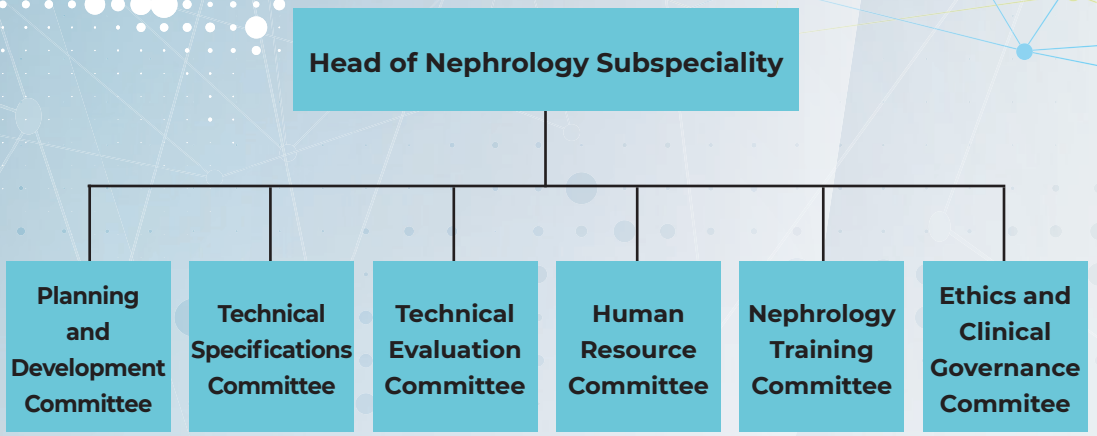
NEPHROLOGY WARD/CLINIC ORGANISATIONAL CHART AT HOSPITAL WITH RESIDENT NEPHROLOGIST*



* Where nephrology wards are available

APPENDIX 6

ORGANISATIONAL CHART OF THE NEPHROLOGY MANAGEMENT COMMITTEE AT NATIONAL LEVEL



TERMS OF REFERENCE FOR MANAGEMENT COMMITTEES

The management committees are responsible for formulating, implementing and monitoring strategic plans for development of Nephrology service. Members shall be appointed by the National Advisor of the Nephrology Service.

Terms of reference

A. Planning & Development Committee.

- Strategic planning for nephrology, dialysis and transplant services
- To consolidate and upgrade existing dialysis units
- To develop new kidney replacement therapy centres and vascular access suites
- To improve PD and kidney transplant rates in treatment of ESKD
- To initiate quality improvement programs e.g., Nutrition centre, CKD-MBD centre in specified hospitals
- To allocate budget for drugs, equipment and consumables
- To plan CKD management and prevention programs

B. Technical Specification Committee.

- To prepare, deliberate, describe and record the technical specifications of items to be procured
- To plan the evaluation of the items to be procured including the quantity and centres for evaluation
- To submit the prepared specification of the items to be procured to the Procurement Division, Ministry of Health
- To update and renew the specification of the item from time to time based on needs and circumstances

C. Technical Evaluation Committee.

- To receive the tender items for evaluation from the Procurement Division MOH
- To record the items received and plan for evaluation method and strategy
- To conduct/perform the evaluation of the quality and performance of the tender item based on the specifications described
- To record/summarise the findings from the evaluation using the pre specified format
- To determine/decide on suitability, acceptability (or otherwise) of the product for recommendation to the Procurement Division Ministry of Health
- To submit and present the findings of the technical evaluation to the Procurement Division Ministry of Health
- To receive feedback on procured items

D. Human Resource Committee.

- To determine the human resource requirements in particular that of paramedics and other allied health personnel
- To develop strategy and policy in matters relating to training, development and motivation of paramedics and allied health personnel
- To study and plan for future human resource requirements

E. Nephrology Training Committee.

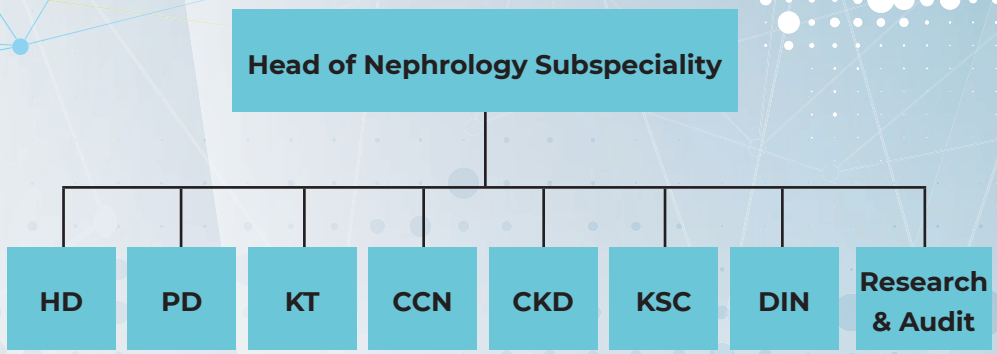
- To plan, review and coordinate the Nephrology subspecialty training in MOH and shall include:
- Selection of applicants
- Formulating, reviewing and updating the MOH training program
- Accreditation of training sites and credentialing of trainers
- Identify potential overseas training centres and collaborate with established organisations for advanced Nephrology training
- Monitoring the trainees and training program
- Posting of trainees during and after their Nephrology training
- Presiding on all disciplinary cases and appeals that are related to training and postings
- To assist with the post basic kidney course offered by MOH. This shall include:
  a) Reviewing and updating the syllabus for the post basic kidney course
  b) Identifying training centres
  c) Assisting in the examinations

F. Ethics and Clinical Governance Committee.

- To promote and maintain a professional and ethical code of conduct for all staff
- To identify, define and monitor key performance indicators
- To advise on measures to maintain the quality and standard of Nephrology services in MOH including annual audits on dialysis units
- To review adverse clinical incidents and complaints

APPENDIX 7

ORGANISATIONAL CHART OF THE NEPHROLOGY CLINICAL SUBCOMMITTEE AT NATIONAL LEVEL



APPENDIX 8

ADMINISTRATION: STAFF ROLES AND FUNCTIONS

The head of department shall be responsible for the overall administration of the department's activities and the clinical units in the department i.e., General Nephrology, Dialysis, Transplant Unit, CCN, DIN and KSC. Each unit head (where more than one consultant/specialist exists) shall be responsible for the administration, organisation, development, QA and CME activities, research in each of their units.

Ideally, a senior paramedic in the capacity of a **supervisor** shall be identified to oversee, regulate and administer the day-to-day services and activities involving the renal replacement therapy program i.e., HD unit, PD unit, transplant unit and the pre-dialysis clinic. The person shall possess suitable experience and skills and have completed a post basic renal nursing course. Another senior paramedic in the capacity of a **nursing matron** shall be identified to oversee, regulate and administer the day-to-day service and activities involving clinical services i.e., the Nephrology ward (if existing), general Nephrology clinic and the National Renal Registry.

A **nursing sister** shall be responsible for the administration of the Nephrology ward. It is preferred that the person had undergone a post basic renal nursing course in order to be familiar with Nephrology related nursing processes and provide effective guidance to the nursing staff under her supervision.

The haemodialysis unit shall be headed by a **sister or senior assistant medical officer** while the PD unit shall be headed by a **sister or a senior nurse** as the team leader. Both the haemodialysis and PD managers will be responsible to oversee, regulate and administer the day-to-day services and activities involving their respective units.

Administration of dialysis related activities e.g., quality control, QA studies, ordering stocks, stock flow tracking and trending, budgeting and setting up of new dialysis unit shall be under the HD manager and PD manager.

The clinicians and paramedics providing Nephrology services shall include the following categories:

1. Consultant

Individuals that possess either MRCP diplomas, Fellowships of Royal Colleges of Australia, UK, or Ireland, American Board certification or Masters in Internal Medicine from institutions recognised by the Malaysian Medical Council and have completed a three-year postgraduate training in various areas of nephrology in institutions with accredited nephrology units or departments either in Malaysia or overseas. Since 2003, it is mandatory for doctors to pass the Nephrology exit examination before he/she can be credentialed as a nephrologist by the National Specialist Register.

1.1 Administrative

- To plan, implement and monitor the unit's activities according to the policies and procedure of the unit, department, hospital and MOH
- To prepare the budget of the unit and be responsible for effective use of resources
- To implement and monitor QA activities and ensure remedial measures
- To participate in the hospital's QA activities
- To conduct regular meetings with unit personnel
- To organise CME activities
- To audit department activities and prepare annual report
- To conduct yearly assessment of all staff in the unit

1.2 Clinical

- To conduct assessment of the patient and plan treatment
- To counsel patients
- To provide professional clinical leadership and supervision to the specialist and medical officers
- To lead the management of patients
- To organise and undertake training of Fellows, Masters students, medical officers and nurses

- To undertake call duties as per roster
- To continue CME activities and pursuit of knowledge

2. Clinical Specialist

Individuals that had obtained a recognised postgraduate qualification but had not completed the three-year postgraduate nephrology training. His/her duties are:

2.1 Administrative

- To assist the head of department in carrying out administrative duties
- To carry out non-clinical duties as directed by the head of department or hospital director
- To organise CME for personnel of the department
- To attend talks, courses, seminars and conferences to improve and update knowledge
- To participate in and to implement departmental activities such as CME activities, morbidity and mortality meetings and Key Performance indicators
- To participate in departmental meetings

2.2 Clinical

- To conduct ward rounds in the ward
- To provide Nephrology services for patients in intensive care units
- To supervise medical officers in the diagnosis, investigation and management of patients
- To provide health education to patients regarding their disease and medications
- To supervise medical officers in procedures such as peritoneal dialysis, femoral and internal jugular catheterisation
- To perform Nephrology specialised procedures such as renal biopsies and insertion of tunnelled cuffed catheters
- To perform on-call duties

3. Medical Officer

Individuals in possession of basic medical degrees recognised by the Malaysian Medical Council and had completed the compulsory 2-year internship. His/her duties are:

- To care for patients in the Nephrology ward and to attend to all referrals
- To attend the Nephrology clinics under specialist supervision
- To perform procedures such as peritoneal dialysis and insertion of double lumen dialysis catheters
- To perform on-call duties as per roster
- To participate on a regular basis in the educational and audit program within the department

4. Assistant Medical Officer

Individuals with suitable qualifications and had preferably completed a six-month post basic renal nursing course. His/ her duties are:

- To provide haemodialysis treatment to patients with acute and end stage renal disease
- To perform on-call duties as per roster
- To recognise acute complications of haemodialysis, take remedial measures and inform the Doctors
- To counsel and educate patients on dietary control, medication compliance and basic functions of haemodialysis machines
- To train patients for self-care when possible
- To adhere to infection control policies
- To comply with nephrology practice protocols and guidelines
- To trace laboratory investigations, compile haemodialysis records and document the patients' progress in the patients' case notes
- To collect patients' data for National Renal Registry
- To attend CME activities
- To assist in counselling of new patients for haemodialysis
- To assist in haemodialysis clinic
- To assist in clinical audit
- To maintain and update the potential cadaveric renal transplant waiting list

5. Peritoneal Dialysis Nurse

- Individuals with suitable qualifications and had preferably completed a six-month post basic renal nursing course. His/her duties are:
- To identify prospective patients for PD treatment and assessing the suitability for such treatment or otherwise
- To organise and maintain schedules on the following: PD training, PD catheter insertion, regular follow up, supply of PD consumables and solutions, changing of PD transfer set, PET (Peritoneal Equilibration Test) and adequacy test, home visits and retraining of patients
- To ensure the facilities for outpatients or inpatients to carry out their regular PD exchanges are in good condition and clean
- To provide feedback to the clinicians on the status of the PD patients e.g. exit site status, patient's compliance
- To assist in the PD clinic
- To assist in clinical audit
- To provide counselling to prospective, new and regular patients
- To provide data to the National Renal Registry annually
- To maintain and update the potential cadaveric renal transplant waiting list

6. Staff nurse

Individuals with a diploma or degree in nursing from institutions recognised by the Malaysian Nursing Board and preferably had completed a six-month post basic renal nursing course.

The nursing staff in the Nephrology wards should be able to carry out the following procedures after six months of service in the Nephrology department/unit:

- To assist the clinicians in haemodialysis catheter insertions
- To assist the clinicians in performing renal biopsy
- To assist the clinicians in insertion of rigid peritoneal dialysis catheter
- To connect a patient with either a rigid or standard PD catheter to a PD cycler
- To set up and operate a PD cycler machine
- To disconnect a patient for a PD cycler machine
- To perform nursing care in a patient with newly inserted PD catheter

- To perform dressing and heparinisation of a PD catheter
- To perform dressing and heparinisation or a temporary or permanent HD catheter

7. Transplant Coordinator

Individuals with recognised nursing qualification with experience or training in handling living or cadaveric renal transplant related activities that include: public education, counselling of the potential donor or donor families, donor screening and donor maintenance, keeping an updated potential recipient list and shortlisting suitable patients for transplantation as well as transplant coordination activities involving members of the different transplant teams within or outside the hospital.

APPENDIX 9A

STARTER PACK TO ESTABLISH A HAEMODIALYSIS UNIT

ESSENTIAL		NON-ESSENTIAL
MEDICAL	**NON- MEDICAL**	**MEDICAL and NON-MEDICAL**
HD machine	Dialysis chair and cardiac table	Online hemodiafiltration machine (HDF)
Automated dialyser reprocessors (if centre practices reuse)	Sitting +/- platform weighing scale	Slow Extended Dialysis Machine
Reverse Osmosis Unit	Refrigerator (medical grade)	CKRT machine
Oxygen supply	Computer with internet connectivity	Non-invasive vascular access monitor
Dressing trolleys		Bio-impedance analyser
Emergency trolley with standard resuscitation medication		Handheld/portable ultrasound
Defibrillator		Infra-red light therapy device (medical grade)
Non-invasive Blood pressure monitoring (NIBP) sets		Hospital Bed
Pulse oximeters		Ambulatory BP monitoring
Volumetric infusion pumps		
Glucose monitoring set		
Nebuliser		
Suction apparatus		

APPENDIX 9B

LIST OF MEDICATIONS for HAEMODIALYSIS SERVICES

1. Erythropoietin stimulating agents (ESA) (intravenous and subcutaneous)
2. Vitamin D and analogues (intravenous and oral)
3. Iron (intravenous and oral)
4. Phosphate binders [calcium carbonate, lanthanum carbonate, sevelamer, sucroferric, oxyhydroxide (velphoro)]
5. Calcimimetics (Cinacalcet)
6. Midodrine

The list of medications may be updated as new drugs become available.

APPENDIX 10

INFECTION CONTROL IN THE HAEMODIALYSIS UNIT

1. Universal Precautions
   a) Wash hands in between patients
      - Use soap and clean running water or an alcohol-based hand rub or foam
      - Hands-free tap shall be provided
   b) Wear gloves
      - Change in between patients
      - Wash hands after removal of gloves
   c) Do not recap needles
   d) Use designated sharps bin
      - Place as close as is practical to the point of use
      - Sealed and disposed when 3/4 full
   e) Staff attire
      - Wear plastic gown
      - Remove protective wear as soon as possible on completion of treatment
      - Ensure clean work attire for every shift
2. Clean trolley & preparation of medication
   a) A clean area shall be designated for preparation of medications and syringes
   b) Medications and syringes used in the patient's station shall not be returned to the clean area
   c) Single-use vials are strongly encouraged. Multiple-use vials (e.g., heparin) if used, are to be prepared in a clean area and all doses to be drawn in the same session
   d) DO NOT RE-USE needles or syringes

3. Disinfection of machines, external surfaces and equipment
   a) Clean exterior surface of machines in between patients and at the end of the day
   b) Disinfect the chairs, beds, tables and all environmental surfaces between patients

c) Use external pressure transducers for each patient and do not re-use
d) Hemodialyzer port caps, interior pathways of dialysis machine shall be disinfected at the end of the day or after dialysing a patient with unknown viral status
e) Scissors, clamps, stethoscopes shall be disinfected
f) Use dedicated blood pressure cuffs for hepatitis positive area

4. Cleaning & housekeeping
   a) Bins, floors and bench tops shall be cleaned with an appropriate disinfectant
   b) All spilled blood MUST be removed immediately

5. Handling of clinical wastes
   a) Waste shall be segregated and contained at source
   b) Waste bags shall be appropriately colour-coded
   c) Gloves must be worn when handling waste bags

6. General rules
   a) Ensure general cleanliness of the unit
   b) Avoid over-crowding, provide adequate space between each dialysis patient
   c) Provide routine staff training and education on infection control practices
   d) Provide routine training and education for patients and their families on infection control

APPENDIX 11

POLISI PENERIMAAN PESAKIT TUMPANG SEMENTARA RAWATAN HEMODIALISIS DI FASILITI KEMENTERIAN KESIHATAN MALAYSIA (KKM)

1. Polisi ini tertakluk kepada pesakit ESKD yang menjalani rawatan hemodialisis kronik di fasiliti KKM sahaja
2. Permohonan perlu dibuat sekurang-kurangnya 14 hari bekerja sebelum tarikh tumpang rawatan hemodialisis. Permohonan lewat adalah tertakluk kepada kelulusan pakar nefrologi dan pengurus unit hemodialisis yang dimohon
3. Tempoh tumpang sementara rawatan hemodialisis tertakluk kepada kekosongan dan kebenaran pakar nefrologi unit hemodialisis yang dimohon
4. Pesakit atau waris tidak dibenarkan berurusan secara terus ke unit hemodialisis yang dipohon
5. Setiap pesakit dikehendaki membawa sendiri:
   a) Surat rujukan, salinan keputusan ujian saringan viral (HbsAg, antiHCV, HIV screening) dan preskripsi hemodialisis
   b) Dialyzer (jika menggunakan dialyzer khas)
   c) Suntikan erythropoietin
6. Setiap pesakit dikehendaki menggunakan single use dialyser di sepanjang waktu tumpang sementara bagi tujuan kawalan jangkitan silang
7. Bayaran untuk rawatan hemodialisis perlu dikutip oleh Pembantu Tadbir mengikut caj rawatan yang diluluskan dalam Akta Fi
8. Pesakit akan diberikan rawatan mengikut tarikh dan masa yang telah ditetapkan.
9. Pesakit hendaklah mengikut segala peraturan seperti yang telah ditetapkan oleh fasiliti yang berkenaan
10. Pesakit yang mempunyai tanda-tanda atau gejala “respiratory tract infection” dikehendaki membuat ujian Covid-19 menggunakan Rapid Test Kit terlebih dahulu sebelum menjalani rawatan HD

APPENDIX 12A

STARTER PACK TO ESTABLISH A PERITONEAL DIALYSIS UNIT

ESSENTIAL		NON-ESSENTIAL
MEDICAL	**NON- MEDICAL**	**MEDICAL and NON-MEDICAL**
PD Cycler machine	Hanging scale	Bio-impedance analyser
Y-Tec peritoneoscopic set	Sitting +/- platform weighing scale	Handheld/portable ultrasound
Oxygen supply	Refrigerator (medical grade)	Hospital Bed
Dressing trolleys	Computer with internet connectivity	Ambulatory BP monitoring
Emergency trolley with standard resuscitation medication	PD exchange station table, chair and hanging rod	
Defibrillator		
Non-invasive Blood pressure monitoring (NIBP) sets		
Pulse oximeters		
Volumetric infusion pumps		
Glucose monitoring set		

APPENDIX 12B

LIST OF MEDICATIONS for PERITONEAL DIALYSIS SERVICES

1. Erythropoietin stimulating agents (ESA) (intravenous and subcutaneous)
2. Vitamin D and analogues (intravenous and oral)
3. Iron (intravenous and oral)
4. Phosphate binders [calcium carbonate, lanthanum carbonate, sevelamer, sucroferric oxyhydroxide (velphoro)]
5. Calcimimetics (Cinacalcet)

The list of medications may be updated as new drugs become available.

APPENDIX 13

STARTER PACK TO ESTABLISH A GENERAL NEPHROLOGY CLINIC

ESSENTIAL		NON-ESSENTIAL
MEDICAL	**NON- MEDICAL**	**MEDICAL and NON-MEDICAL**
Ultrasound machine with curvilinear and linear +/- phase arrayed probes	Sitting +/- platform weighing scale	Ambulatory BP monitoring
Renal biopsy gun +/- guard	Computer with internet connectivity	Refrigerator (medical grade)
Oxygen supply		
Dressing trolleys		
Emergency trolley with standard resuscitation medication		
Defibrillator		
Non-invasive Blood pressure monitoring (NIBP) sets		
Pulse oximeters		
Volumetric infusion pumps		
Glucose monitoring set		

APPENDIX 14

REFERRALS

Patients may be referred to the Nephrology service either electively or on an urgent basis from either within or outside of the hospital. The referrals shall be from specialist to specialist as far as possible. Nevertheless, in many hospitals this may not always be possible. Referrals will be handled as outlined below:

1. Inpatient Referrals

1.1 During office hours

a) Non-urgent

- Referrals shall be reviewed on the same day by the designated officer/specialist

b) Urgent

- Urgent referrals shall be reviewed as soon as possible by the designated officer
- Evaluation by the specialist or consultant shall be made as soon as possible

1.2 After office hours

a) After office hours all referrals shall be seen by the designated on-call officer

b) Ill patients shall be reviewed by the on-call specialist or consultant as soon as possible

c) The on-call team shall pass over the case to the designated team the following day

2. Outpatient Referrals

- Patients referred to the outpatient nephrology clinic will be given appointments as per hospital policy
- Urgent referrals will be screened by the designated doctor and will be seen on the same day if needed or admitted for further assessment
- Referrals for admission shall be as per hospital admission policy

3. Shared management/transfer to Nephrology ward

- Patients from other wards requiring haemodialysis treatment may remain in the respective ward and shall receive haemodialysis treatment in the haemodialysis unit if stable
- Patients requiring temporary peritoneal dialysis shall be transferred back to the initial ward upon completion of treatment unless repeat peritoneal dialysis treatment is highly likely in which case such patients shall be retained in the Nephrology ward
- Patients shall be transferred to the Nephrology/Medical ward if the Nephrology and primary team consider this to be in the patients' best interest for further management

APPENDIX 15A

STARTER PACK TO ESTABLISH KIDNEY TRANSPLANTATION

SERVICES	TESTS/PROCEDURES
Laboratory services • General • Specialised	Blood biochemistry, haematology, urine examination, viral screening, Blood grouping HLA typing, Cross-match testing
Imaging services • General • Specialised	Xray, Ultrasound, CT scan, MRI Radio nuclear imaging – EDTA, DTPA, DMSA
Cardiology services • General • Specialised	EST, ECHO Coronary angiogram, nuclear perfusion studies
Respiratory services	Lung function test, IGRA
Psychiatry services	For psychiatry input
Endoscopy services	OGDS
Dental services	For dental assessment
Urology services	For assessment, procurement and transplantation
Pharmacy services	TDM monitoring, counselling

APPENDIX 15B

LIST OF MEDICATIONS for KIDNEY TRANSPLANTATION SERVICES

- Calcineurin inhibitors: Cyclosporin, Tacrolimus
- Inhibitor of inosine monophosphate dehydrogenase (IMPDH):
- Mycophenolate Mofetil, Mycophenolate sodium, Azathioprine
- Steroids: Prednisolone, Methylprednisolone, Hydrocortisone
- mTOR inhibitors: Sirolimus, Everolimus
- Biologicals e.g., Thymoglobulin, Basiliximab, Rituximab
- Intravenous Immunoglobulin

The list of medications may be updated as new drugs become available.

APPENDIX 16

STARTER PACK TO ESTABLISH A CRITICAL CARE SERVICE

MEDICAL	NON- MEDICAL
CKRT machine	Refrigerator (medical grade)
HD machine	Computer with internet connectivity
Slow Extended Dialysis Machine	
PD cycler	
Reverse Osmosis Unit	
Oxygen supply	
Dressing trolleys	
Emergency trolley with standard resuscitation medication	
Defibrillator	
Continuous patient monitoring system	
Ultrasound machine – portable	
Volumetric infusion pumps	
Glucose monitoring set	

APPENDIX 17

STARTER PACK TO ESTABLISH A DIAGNOSTIC AND INTERVENTIONAL SERVICE

MEDICAL	NON- MEDICAL
Ultrasound machine with curvilinear and linear +/- phase arrayed probes	Computer with internet connectivity
Renal biopsy gun +/- guard	Adjustable table for suitable patient positioning
Oxygen supply	High intensity surgical lights
Dressing trolleys	
Emergency trolley with standard resuscitation medication	
Defibrillator	
Non-invasive Blood pressure monitoring (NIBP) sets	
Pulse oximeters	
Volumetric infusion pumps	
Glucose monitoring set	
Access to C-arm fluoroscopy for real-time imaging and digital subtraction angiography (Advanced)	
Lead aprons, thyroid, head shield with goggles for staff protection	

APPENDIX 18

ADVANCE CARE PLANNING FOR CHRONIC KIDNEY DISEASE PATIENTS

Shared decision-making between healthcare professionals, patients, and their families

This form serves as communication tool and should be filled and signed by nephrologists or, if not available, general internal medicine physicians or family medicine specialists. If the patient is co-managed at other healthcare institutions, a copy of this form should be attached to the referral letter and the patient's follow-up card or books. The following groups of patients should undergo advance care planning (ACP):

1. Chronic Kidney Disease Stage 5
2. Upon commencing renal replacement therapy
3. Annually for patients on maintenance dialysis
4. When patients deteriorate while on maintenance dialysis (eg hospital admissions or development of complications) or opt for dialysis withdrawal

Name:	Date:
IC:	

A OPTION OF RENAL REPLACEMENT THERAPY

Tick One

This decision should be made through shared decision-making between patients, families and nephrologists, or if unavailable, family medicine specialists or internal medicine physicians.

- ☐ Hemodialysis
- ☐ Peritoneal Dialysis
- ☐ Non-dialysis therapy / conservative care
- ☐ Unsure of options, including delay in commencement of dialysis
- ☐ Patient is already on dialysis therapy

B CARDIOPULMONARY RESUSCITATION (CPR):

Tick One

If patient has no pulse and is not breathing.
If patient is NOT in cardiopulmonary arrest, follow orders in Sections C and D.

- ☐ **Attempt Resuscitation/CPR** (Selecting CPR in Section B **requires** selecting Dialysis and Full Treatment in Section C)
- ☐ **Do Not Attempt Resuscitation/DNR** (Allow Natural Death)

C MEDICAL INTERVENTIONS: *If patient is found with a pulse and/or is breathing/ very ill state:*

- ☐ **Dialysis– the primary goal is to prolong life by all medically effective means.**
  Patients agree to try dialysis if they present very ill as an emergency. **Patients and families must be informed that in the event of emergency, if patient is clinically unstable, dialysis may not be possible.**

  AND/OR

- ☐ **Full Treatment – the primary goal is to prolong life by all medically effective means.**
  In addition to treatments described in Selective Treatment and Comfort-Focused Treatment, this includes emergency dialysis, use intubation,advanced airway interventions, mechanical ventilation, and cardioversion as indicated.
  - ☐ ***Trial Period of Full Treatment*** (withdraw if no improvement following time trial treatment),

  _____

- ☐ **Selective Treatment – the goal is to treat medical conditions while avoiding burdensome measures.** In addition to treatments described in Comfort-Focused Treatment, this include use medical treatment, IV antibiotics, and IV fluids as indicated, avoidance of intubation, may use non-invasive positive airway pressure and general avoidance of intensive care.
- ☐ **Comfort focused Treatment – the primary goal is to maximize comfort (without dialysis)**
  Relieve pain and suffering with medication by any route as needed, use oxygen, suctioning, and manual treatment of airway obstruction, avoidance of treatments listed in Full and Selective Treatment unless consistent with the comfort goal.

Additional Orders (this may include goals of care and care preferences): _____

_____

_____

_____

D ARTIFICIALLY ADMINISTERED NUTRITION:

Offer food by mouth if feasible and desired.

- ☐ Long-term artificial nutrition, including feeding tubes. Additional Orders: _____
- ☐ Trial period of artificial nutrition, including feeding tubes.
- ☐ No artificial means of nutrition, including feeding tubes.

E INFORMATION AND SIGNATURES:

Discussed with: ☐ Patient (Patient Has Capacity) ☐ Next of kin

Signature of Nephrologist / Physician / Family Medicine Specialist:

My signature below indicates to the best of my knowledge that these orders are consistent with the patient's medical condition and preferences.

Name of Nephrologist: MMC no:

Nephrologist's Signature: *(required)* Date:

Signature of Patient

I am aware that this form is voluntary. By signing this form, this request regarding resuscitative measures is consistent with the known desires of, and with the best interest of, the individual who is the subject of the form.

Print Name:

Signature: *(required)* Date:

Signature of Next of Kin

I am aware that this form is voluntary. By signing this form, the next of kin acknowledges that this request regarding resuscitative measures is consistent with the known desires of, and with the best interest of, the individual who is the subject of the form.

Print Name:

Relationship: *(write self if patient)*

Signature: *(required)* Date:

ACP promotes good communication. It is not legally binding, and treatment decisions will require clinical judgement and discussions with family during acute clinical presentations.

APPENDIX 19

CRITERIA FOR CREDENTIALING OF NURSES & ASSISTANT MEDICAL OFFICERS IN DIALYSIS CARE

	NEW CRITERIA	HAEMODIALYSIS		PERITONEAL DIALYSIS	
1	Basic Academic Qualification	Recognized Diploma/Degree for Assistant Medical Officer/Nursing, AND		Recognized Diploma/Degree for Assistant Medical Officer / Nursing, AND	
2	Post Graduate / Basic Qualification	Recognized Post Basic Renal Nursing Certificate or Advanced Diploma in Renal Nursing or equivalent, AND		Recognized Post Basic Renal Nursing Certificate or Advanced Diploma in Renal Nursing or equivalent, AND	
3	Experience	APPLICANT	REQUIREMENT	APPLICANT	REQUIREMENT
		Those currently working for more than 1 year in an accredited Hemodialysis Facility.	Recommendation from Visiting Consultant Nephrologist **or** the Head of Department. First application for credentialing must be endorsed by a Consultant Nephrologist. Assessor for log book should be Supervisor/ Manager	Those currently working for more than 6 months in an accredited Peritoneal Dialysis Facility.	Recommendation from Visiting Consultant Nephrologist **or** the Head of Department. First application for credentialing must be endorsed by a Consultant Nephrologist. Assessor for log book should be staff in charge of PD Unit.
		Those with more than 3 years of experience in an accredited hemodialysis facility who may have left Haemodialysis Services but have returned to the Unit within 2 years.	Serve in accredited Haemodialysis Facility continuously for 6 months and complete log book within the period. Recommendation from Visiting Consultant Nephrologist **or** the Head of Department. First application for credentialing must be endorsed by a Consultant Nephrologist. Assessor for log book should be Supervisor/ Manager.	Those with more than 3 years of experience in an accredited peritoneal dialysis facility but have worked outside the PD facility for less than 1 year.	Recommendation from Visiting Consultant Nephrologist **or** the Head of Department. First application for credentialing must be endorsed by a Consultant Nephrologist. Assessor for log book should be staff in charge of PD Unit.
		Those with more than 3 years of experience in an accredited Haemodialysis Facility and have been out of Haemodialysis Facility for more than 2 years.	Serve in accredited hemodialysis facility continuously for 6 months and complete log book within the period. Recommendation from Visiting Consultant Nephrologist **or** the Head of Department. First application for credentialing must be endorsed by a Consultant Nephrologist. Assessor for log book should be Supervisor/ Manager.	Those with more than 3 years of experience in accredited Peritoneal Dialysis Facility but have not worked in Peritoneal Dialysis for more than 1 year.	Serve in accredited Peritoneal Dialysis Facility continuously for minimum 6 months and complete log book within the period. Recommendation from Visiting Consultant Nephrologist **or** the Head of Department. First application for credentialing must be endorsed by a Consultant Nephrologist. Assessor for log book should be staff in charge of PD Unit.
		Those with experience of less than 3 years and currently not working in Haemodialysis Facility.	Serve in accredited Haemodialysis Facility continuously for 12 months and complete logbook within the period. Recommendation from Visiting Consultant Nephrologist **or** the Head of Department. First application for credentialing must be endorsed by a Consultant Nephrologist. Assessor for log book should be Supervisor/ Manager.		
4	*Log Book	All Applications for credentialing from 1st January 2017 onwards must be accompanied with a completed summary of the log book.		All Applications for credentialing from 1st January 2018 onwards must be accompanied with a completed summary of the log book.	

LIST OF PROCEDURES FOR CREDENTIALING IN HAEMODIALYSIS

NO	PROCEDURES
1.	Assessment of patient for Haemodialysis Treatment
2.	Care of Arterio-venous fistula (native and graft)
3.	Care of Haemodialysis catheter (cuffed and non-cuffed)
4.	Anti-coagulation therapy
5.	Preparation of Haemodialysis Machine
6.	Setting up and Priming of Dialyzer and Bloodline
7.	Cannulation Technique
8.	Initiation of Haemodialysis Treatment
9.	Termination of Haemodialysis Treatment
10.	Disinfection and Decalcification of Haemodialysis Machine
11.	Reprocessing of Dialysis
12.	Management of Intradialytic Complication
13.	Identification of component and functions of Haemodialysis Machine
14.	Monitoring and Management of Water Treatment System
15.	Parenteral Iron Administration
16.	Management of Erythropoiesis Stimulating Agents
17.	Assessment of Dialysis Adequacy
18.	Cannulation of fistula using ultrasonography

LIST OF PROCEDURES FOR CREDENTIALING IN PERITONEAL DIALYSIS

NO	PROCEDURES
1.	Assessment of Patient (and or Assistant) for Peritoneal Dialysis Treatment
2.	Care of PD catheter Pre and Post Operatively
3.	Flushing of PD catheter
4.	PD Prescription
5.	Continuous Ambulatory Peritoneal Dialysis (CAPD) Training
6.	Automated Peritoneal Dialysis Training (APD)
7.	Application and change of transfer Set
8.	Exit site care
9.	Management of Peritonitis
10.	Peritoneal Equilibration Testing (PET)
11.	Assessment of Dialysis Adequacy
12.	PD Effluent Sampling for Microbiological Testing
13.	Obtaining Swab Samples from Exit- Site and Tunnel Infections
14.	Nasal Swab Sampling for Culture
15.	Intraperitoneal Antibiotic Administration
16.	Parenteral Iron Administration
17.	Home Visits
18.	Handling PD Effluent in Patients with Infective Risk (Hepatitis B, C or HIV)
19.	Calculation and Reporting of PD Peritonitis Rates

LIST OF PROCEDURES FOR CREDENTIALING IN CRITICAL CARE NEPHROLOGY

NO	CORE PROCEDURES
1.	Preparation, Initiation, maintenance and termination of CKRT treatment
2.	Preparation, Initiation and termination of Therapeutic Plasma exchange/ apheresis
3.	Preparation, Initiation, maintenance and termination of SLEDD treatment

LIST OF PROCEDURES FOR CREDENTIALLING OR PRIVILEGING IN DIN SERVICES

NO	CORE PROCEDURE	CATEGORY OF STAFF					
		Paramedics	Medical officer	General Physician	Nephrology Trainee	Nephrologist	Interventional Nephrologist
	Point of care kidney ultrasound		√	√	√	√	√
	Kidney biopsy – native and graft				√	√	√
	Insertion of non- cuffed (temporary) HD catheter – femoral and IJV		√	√	√	√	√
	Insertion of cuffed HD catheter – femoral and IJV				√	√	√
	Peritoneoscope PD catheter insertion				√	√	√
	Seldinger PD catheter insertion +/- ultrasound guided				√	√	√
	Ultrasound assessment of newly created AVF/AVG				√	√	√
	Ultrasound guided cannulation of AVF/AVG	√ AMO, MA, Nurse	√	√	√	√	√

Credentialling and privileging procedures to various categories of staff vary from hospital to hospital depending on its needs.

APPENDIX 20

BORANG MAKLUMAT PESAKIT DAN BORANG KEBENARAN UNTUK AKUT HEMODIALISIS

Risalah ini bertujuan untuk memberi maklumat berkenaan prosedur hemodialisis akut. Anda dikehendaki untuk menandatangani borang persetujuan untuk prosedur tersebut. Sebelum menandatangani borang persetujuan, anda digalakkan untuk berbincang dengan doktor mengenai prosedur ini.

PENGENALAN

Hemodialisis merupakan salah satu kaedah rawatan untuk kegagalan buah pinggang yang serius. Secara amnya, buah pinggang berfungsi untuk mencuci darah dari sisa buangan dan menyingkirkan lebihan air dan garam. Dengan hemodialisis, mesin akan mengambil alih fungsi buah pinggang anda.

PENERANGAN MENGENAI PROSEDUR

Semasa hemodialisis, darah akan disalurkan dari badan anda ke mesin hemodialisis. Untuk kebanyakan pesakit, prosedur ini dijalankan menggunakan fistula. Dua jarum akan dicucuk pada fistula untuk mengalirkan darah ke mesin hemodialisis dan untuk menyalurkan darah yang bersih kembali ke badan pesakit.

Sekiranya anda memerlukan dialisis sebelum fistula anda sedia digunakan, kateter perlu dipasang dalam saluran darah di bahagian pangkal peha atau di leher. Kateter ini boleh digunakan sejurus selepas dimasukkan. Kateter akan disambung ke mesin hemodialisis melalui tiub penyambung.

Secara purata, proses hemodialisis mengambil masa antara dua hingga empat jam. Hemodialisis akut boleh dijalankan di wad atau di unit hemodialisis. Anda mungkin memerlukan lebih daripada satu sesi hemodialisis. Regime rawatan anda akan ditentukan oleh doktor yang merawat.

RISIKO DAN KOMPLIKASI HEMODIALISIS AKUT

Prosedur ini mempunyai risiko dan komplikasinya. Ini termasuk (bukan terhad kepada):

- Komplikasi yang kerap berlaku:
  a) Kekejangan otot
  b) Pendarahan dari fistula atau kateter terutamanya kateter yang baru dimasukkan
  c) Loya dan muntah

d) Sakit kepala
e) Pening
f) Penurunan tekanan darah

- Risiko dan komplikasi yang jarang berlaku:
  a) Alahan kepada dialiser
  a) Konfusi
  a) Ritma jantung yang tidak teratur
  a) Pendarahan disebabkan pemutusan dari tuib penyambung

- Risiko dan komplikasi yang amat jarang:
  a) Air embolism – udara termasuk ke dalam salur darah
  a) Kematian adalah sangat jarang tetapi boleh berlaku

- Komplikasi lewat yang kerap berlaku:
  a) Infeksi – bakteria, virus
  a) Pembekuan darah di fistula atau kateter
  a) Pemecahan sel darah merah (hemolisis)

KEBENARAN KEIZINAN (CONSENT FORM)

Risiko tidak menjalani prosedur ini *(Doktor akan mendokumentasikan di bawah atau di dalam rekod pesakit.)* .....
.....
.....
.....

Saya telah dimaklumkan bahawa:

Keadaan medikal saya dan prosedur tersebut, termasuk rawatan tambahan sekiranya doktor mendapati timbulnya masalah di luar jangkaan. Saya telah memahami risiko yang diterangkan dan risiko lain yang spesifik kepada saya.

Saya telah memahami risiko yang diterangkan dan risiko lain yang spesifik kepada saya. Prosedur/ rawatan lain yang relevan dan risiko yang terlibat. Peramalan kejadian ikutan penyakit dan risiko tidak menjalani prosedur ini. Bahawanya tiada jaminan yang prosedur ini akan memulihkan penyakit saya walaupun dijalankan mengikut rawatan profesional.

Prosedur ini mungkin memerlukan transfusi darah. Sekiranya berlaku situasi yang boleh membahayakan nyawa semasa prosedur ini dijalankan, ia akan dirawat dengan sepatutnya berdasarkan perbincangan dengan doktor. Paramedik yang akan menjalankan prosedur ini.

Saya telah diberikan risalah maklumat pesakit mengenai hemodialisis akut. Saya juga diberi peluang untuk bertanya kepada doktor tentang penyakit saya, prosedur terlibat, risiko dan pilihan rawatan yang diberikan. Pertanyaan dan kebimbangan saya telah dibincangkan dan dijawab dengan memuaskan. Saya faham bahawa saya berhak menarik balik persetujuan ini pada bila-bila masa, tetapi sebaiknya tertakluk kepada perbincangan dengan doktor yang merawat.

Berdasarkan pernyataan- pernyataan di atas, saya mengizinkan prosedur dijalankan:

Tandatangan pesakit: .....
Nama pesakit: .....
No KP: .....
Tarikh: .....

Untuk pesakit yang tidak berupaya untuk memberi persetujuan, keizinan mesti diambil daripada penjaga:

Tandatangan penjaga : .....
Nama penjaga : .....
Hubungan kepada pesakit : .....
No KP: .....
Tarikh: .....

APPENDIX 21

BORANG MAKLUMAT PESAKIT DAN BORANG KEBENARAN UNTUK BIOPSI BUAH PINGGANG

Risalah ini akan memberi maklumat mengenai biopsi buah pinggang. Anda akan diminta menandatangani borang persetujuan. Oleh itu, anda digalakkan untuk berbincang dengan doktor sebelum menandatangani borang persetujuan tersebut.

PENGENALAN

Sekiranya anda mengambil ubat-ubatan untuk mencairkan darah, anda mungkin akan diarahkan untuk berhenti mengambilnya sebelum prosedur dijalankan. Anda akan diarahkan untuk dimasukkan ke hospital sehari sebelum prosedur. Ujian darah dan air kencing akan diambil untuk memastikan anda sesuai untuk menjalani prosedur tersebut.

TATACARA BIOPSI BUAH PINGGANG

Prosedur ini akan dijalankan di bilik prosedur. Bacaan vital (tekanan darah dan denyutan nadi) akan direkodkan sebelum prosedur. Anda akan diarahkan untuk berada berbaring atau meniarap di atas bantal semasa prosedur dijalankan. Prosedur akan dijalankan di bawah imbasan *ultrasound* untuk mengenalpasti lokasi yang paling sesuai untuk mengambil spesimen di buah pinggang anda. Suntikan bius setempat akan diberikan di bawah kulit yang telah dikenalpasti lokasinya. Anda akan merasa kebas selepas suntikan tersebut.

Jarum biopsi akan dimasukkan pada bahagian kulit yang telah dikenalpasti tadi. Langkah ini mungkin diulangi beberapa kali untuk mendapatkan spesimen buah pinggang yang mencukupi.

Selepas prosedur dijalankan, anda akan diarahkan untuk berbaring di atas katil selama 6 jam dan “sand bag” akan diletakkan ditempat prosedur.

Anda diarahkan untuk mengumpul air kencing setiap kali kencing kerana anda mungkin akan mengalami kencing berdarah selepas prosedur. Pada hari berikutnya, tempat luka akan diperiksa oleh doktor. Anda boleh dibenarkan keluar dari hospital sekiranya tiada sebarang komplikasi

RISIKO DAN KOMPLIKASI PROSEDUR BUAH PINGGANG

Terdapat beberapa risiko dan komplikasi berikutan prosedur ini.

Antaranya termasuk di bawah ini (tetapi tidak terhad kepada yang berikut):

- Sakit di bahagian biopsi
- Boleh berlaku jangkitan
- Pendarahan
  a) Pada kebanyakan pesakit, pendarahan akan berhenti sendiri tanpa rawatan. Kehilangan darah yang banyak, termasuk pendarahan di sekeliling buah pinggang atau keluar ketulan darah dalam air kencing boleh berlaku. Akan tetapi, ia sangat jarang berlaku iaitu kurang daripada 1 dalam 100 prosedur biopsi.
  a) Pemindahan darah diperlukan jika kehilangan darah yang banyak.
  a) Terdapat risiko kecil yang buah pinggang mungkin perlu dibuang melalui pembedahan (nephrectomy) jika pendarahan tidak boleh dihentikan dengan cara lain. Ini boleh berlaku kepada 1 dalam 1000 hingga 1 dalam 1500 prosedur biopsi.

- Kecederaan organ dan pembentukan ketulan darah beku yang besar boleh berlaku tetapi sangat jarang. Sekiranya terjadi, prosedur lain mungkin diperlukan untuk menghentikan pendarahan tersebut.
- Arterio-venous malformation.
- Kemungkinan berlaku kematian akibat daripada prosedur ini.

KEBENARAN PESAKIT (CONSENT FORM)

Risiko jika anda tidak menjalani prosedur ini. (Doktor perlu mencatat dalam bahagian ini)

.....

.....

.....

Prosedur ini mungkin memerlukan ubat bius am/ setempat . (Doktor untuk mencatatkan jenis bius yang akan diberi)

.....

.....

Saya mengakui bahawa doktor telah menerangkan;

Keadaan kesihatan saya dan prosedur yang dicadangkan, termasuk rawatan tambahan sekira diperlukan. Saya memahami risiko, termasuk risiko yang khusus kepada saya. Sekiranya rawatan bius diperlukan saya memahami risiko. Rawatan/prosedur alternatif untuk saya dan risiko berkaitan.

Risiko sekiranya saya tidak menjalani prosedur tersebut. Tiada jaminan bahawa prosedur akan memulihkan keadaan saya walaupun ia telah dilakukan dengan profesional. Prosedur ini boleh melibatkan pemindahan darah. Jika keadaan yang mengancam nyawa berlaku semasa prosedur dijalankan, rawatan kecemasan diberi berdasarkan perbincangan saya dengan doktor.

Doktor selain daripada Pakar boleh menjalankan prosedur. Ada kemungkinan doktor dalam latihan menjalani prosedur ini.

Saya telah **menerima dan membaca** risalah maklumat prosedur ini. Saya boleh mengutarakan kebimbangan dengan doktor mengenai keadaan saya, prosedur yang dicadangkan dan risiko, dan pilihan rawatan saya. Soalan dan kebimbangan saya telah dibincangkan dan dijawab dengan memuaskan.

Saya memahami bahawa saya mempunyai hak untuk mengubah fikiran saya pada bila-bila masa, termasuk selepas saya telah menandatangani borang ini setelah perbincangan diadakan dengan doktor saya.

Berdasarkan kenyataan di atas, saya memohon untuk menjalani prosedur ini:

Tandatangan : .....
Nama Pesakit : .....
No. KP : .....

Tarikh : .....

Jika pesakit yang tidak berupaya untuk memberikan persetujuan (persetujuan hendaklah diperolehi daripada penjaga)

Tandatangan :.....
Nama : .....
Hubungan dengan pesakit : .....
No. KP :.....
Tarikh :.....

Saya telah menerangkan kepada pesakit semua perkara di atas di bawah Kebenaran Pesakit dan
saya berpendapat bahawa pesakit / penjaga telah memahami maklumat.

Tandatangan :.....
Nama doktor :.....
Jawatan :.....
Tarikh :.....

Kenyataan Saksi:
Saya telah menterjemah .....
.....
(Nyatakan bahasa pesakit di sini) borang
kebenaran pesakit (secara lisan) dan maklumat tambahan sama ada lisan atau bertulis yang diberikan kepada pesakit / penjaga oleh doktor.

Tandatangan :.....
Nama Saksi :.....
KP No :.....
Tarikh :.....

APPENDIX 22

BORANG MAKLUMAT PESAKIT DAN BORANG KEBENARAN UNTUK PEMASANGAN KATETER FEMORAL

Risalah ini akan memberi maklumat mengenai pemasangan kateter femoral. Anda akan diminta menandatangani borang persetujuan. Oleh itu, anda digalakkan untuk berbincang dengan doktor sebelum menandatangani borang persetujuan tersebut.

PENGENALAN

Ini adalah prosedur dimana kateter dipasang untuk tujuan menjalani rawatan hemodialisis. Ianya diletakkan di dalam salur darah pembuluh yang besar di bahagian pangkal paha. Kateter ini mempunyai dua lumen (laluan), satu digunakan untuk mengeluarkan darah dari badan dan satu lagi untuk darah kembali semula ke dalam badan selepas melalui proses hemodialisis.

TATACARA PEMASANGAN KATETER FEMORAL

Prosedur ini akan dijalankan di bilik prosedur. Bacaan vital (tekanan darah dan denyutan nadi) akan direkodkan sebelum prosedur. Anda akan diarahkan untuk berada diposisi berbaring semasa prosedur dijalankan. Prosedur akan dijalankan di bawah imbasan *ultrasound* untuk mengenalpasti lokasi yang paling sesuai untuk pemasangan kateter femoral. Suntikan bius setempat akan diberikan di bawah kulit yang telah dikenalpasti lokasinya. Anda akan merasa kebas selepas suntikan tersebut. Jarum akan dimasukkan ke dalam saluran darah pembuluh. Seterusnya satu wayar kecil akan dimasukkan melalui jarum tersebut. Kateter femoral akan diletakkan ke dalam saluran darah pembuluh. Anda mungkin merasa tidak selesa atau sedikit tekanan semasa prosedur ini dilakukan.
Selepas prosedur dijalankan, anda akan diarahkan untuk berbaring di atas katil untuk mengelakkan pendarahan di bahagian pangkal paha. Tempat luka akan diperiksa oleh doktor. Anda tidak dibenarkan pulang ke rumah selagi kateter femoral tersebut tidak dikeluarkan.

RISIKO DAN KOMPLIKASI PEMASANGAN KATETER FEMORAL

Terdapat beberapa risiko dan komplikasi berikutan prosedur ini. Antaranya termasuk di bawah ini (tetapi tidak terhad kepada yang berikut):

- Komplikasi yang selalu berlaku secara serta-merta termasuk:
  a) Pendarahan dan lebam di tempat prosedur dilakukan
  b) Sakit di tempat prosedur dilakukan

- Komplikasi yang boleh berlaku termasuk:
  a) Kateter tidak berjaya dimasukkan ke dalam saluran darah pembuluh dan prosedur tersebut perlu diulang dibuat di bahagian lain
  b) Saluran darah arteri yang berdekatan mungkin tercedera semasa prosedur
  c) Pendarahan berterusan boleh berlaku dan memerlukan pembedahan

- Risiko yang jarang berlaku termasuk:
  a) Alahan kepada ubat bius
  b) Kecederaan pada organ yang lain seperti usus dan pundi kencing dan mungkin memerlukan pembedahan
  c) Kecederaan saluran pembuluh darah dan mungkin memerlukan pembedahan (psudoaneurysm)
  d) Arterio-venous malformasi
  e) Embolism- udara atau darah beku masuk ke saluran darah pulmonari dan menyebabkan kesesakan bernafas

- Risiko yang jarang berlaku termasuk: Kematian akibat daripada prosedur ini.

- Komplikasi yang lewat tetapi kerap berlaku termasuk: Jangkitan kuman

KEBENARAN PESAKIT(CONSENT FORM)

Risiko jika anda tidak menjalani prosedur ini. (Doktor untuk mencatat dalam Rekod Perubatan)

.....
.....
.....

Prosedur ini mungkin memerlukan ubat bius am/setempat. (Doktor untuk mencatatkan jenis bius yang akan diberi) .....
.....
.....
.....

Saya mengakui bahawa doktor telah menerangkan;

Keadaan kesihatan saya dan prosedur yang dicadangkan, termasuk rawatan tambahan sekira diperlukan. Saya memahami risiko, termasuk risiko yang khusus kepada saya. Sekiranya rawatan bius diperlukan saya memahami risiko. Rawatan/prosedur alternatif untuk saya dan risiko berkaitan.

Risiko sekiranya saya tidak menjalani prosedur tersebut. Tiada jaminan bahawa prosedur akan memulihkan keadaan saya walaupun ia telah dilakukan dengan profesional. Prosedur ini boleh melibatkan pemindahan darah. Jika keadaan yang mengancam nyawa berlaku semasa prosedur dijalankan, rawatan kecemasan diberi berdasarkan perbincangan saya dengan doktor.

Doktor selain daripada Pakar boleh menjalankan prosedur. Ada kemungkinan doktor dalam latihan menjalani prosedur ini.

Saya telah **menerima dan membaca** risalah maklumat prosedur ini. Saya boleh mengutarakan kebimbangan dengan doktor mengenai keadaan saya, prosedur yang dicadangkan dan risiko, dan pilihan rawatan saya.

Soalan dan kebimbangan saya telah dibincangkan dan dijawab dengan memuaskan.

Saya memahami bahawa saya mempunyai hak untuk mengubah fikiran saya pada bila-bila masa, termasuk selepas saya telah menandatangani borang ini tetapi sebaik-baiknya setelah perbincangan diadakan dengan doktor saya.

Berdasarkan kenyataan di atas, saya memohon untuk menjalani prosedur ini:

Tandatangan : .....
Nama Pesakit : .....
No. KP : .....
Tarikh : .....

Jika pesakit yang tidak berupaya untuk memberikan persetujuan (persetujuan hendaklah diperolehi daripada penjaga)

Tandatangan : .....
Nama : .....
Hubungan dengan pesakit :.....
No. KP : .....
Tarikh : .....

Saya telah menerangkan kepada pesakit semua perkara di atas di bawah Kebenaran Pesakit dan saya berpendapat bahawa pesakit/penjaga telah memahami maklumat.

Tandatangan : .....
Nama doktor : .....
Jawatan : .....
Tarikh : .....

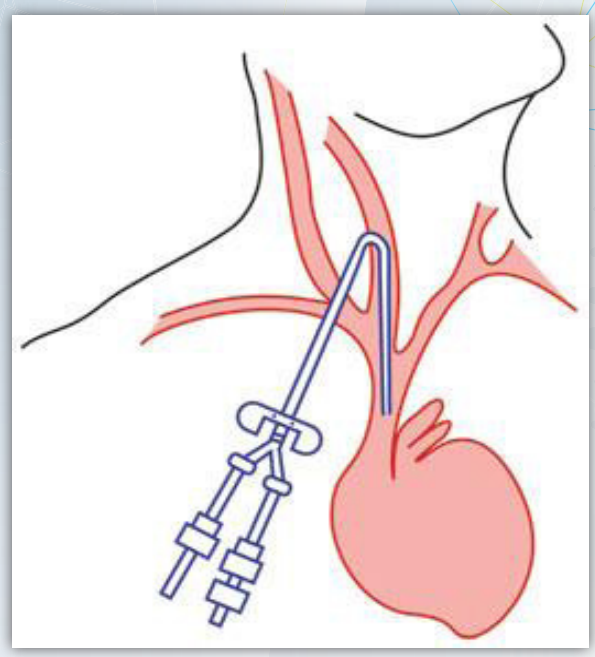
Kenyataan Saksi:
Saya telah menterjemah .....
.....
(Nyatakan bahasa pesakit di sini) borang kebenaran pesakit (secara lisan) dan maklumat tambahan sama ada lisan atau bertulis yang diberikan kepada pesakit/penjaga oleh doktor.

Tandatangan : .....
Nama Saksi : .....
No. KP: .....
Tarikh : .....

APPENDIX 23

BORANG MAKLUMAT PESAKIT DAN BORANG KEBENARAN UNTUK PEMASANGAN KATETER INTERNAL JUGULAR

Risalah ini akan memberi maklumat mengenai pemasangan kateter internal jugular. Anda akan diminta menandatangani borang persetujuan. Oleh itu, anda digalakkan untuk berbincang dengan doktor sebelum menandatangani borang persetujuan tersebut.



PENGENALAN

Ini adalah prosedur dimana kateter dipasang untuk tujuan menjalani rawatan hemodialisis.

Ianya diletakkan di dalam salur darah pembuluh yang besar. Penghujung tiub itu akan berada berdekatan dengan jantung. Kateter ini mempunyai dua lumen (laluan); satu digunakan untuk mengeluarkan darah dari badan dan satu lagi untuk darah kembali semula ke dalam badan selepas melalui proses hemodialisis.

TATACARA PEMASANGAN KATETER

Prosedur ini akan dijalankan di bilik prosedur. Bacaan vital (tekanan darah dan denyutan nadi) akan direkodkan sebelum prosedur. Anda akan diarahkan untuk berada diposisi berbaring semasa prosedur dijalankan. Prosedur akan dijalankan di bawah imbasan *ultrasound* untuk mengenalpasti lokasi yang paling sesuai untuk pemasangan kateter internal jugular di bahagian leher. Suntikan bius setempat akan diberikan di bawah kulit yang telah dikenalpasti lokasinya. Anda akan merasa kebas selepas suntikan tersebut.

Jarum akan dimasukkan ke dalam saluran darah. Seterusnya satu wayar kecil akan dimasukkan melalui jarum tersebut. Kateter internal jugular akan diletakkan ke dalam saluran darah pembuluh dan wayar kecil dikeluarkan. Anda mungkin merasa tidak selesa atau sedikit tekanan semasa prosedur ini dilakukan.

Selepas prosedur dijalankan, anda akan diarahkan untuk berbaring di atas katil untuk mengelakkan pendarahan di bahagian leher. Tempat luka akan diperiksa oleh doktor. Imbasan *X-ray* akan digunakan untuk memastikan kedudukan kateter tersebut.

RISIKO DAN KOMPLIKASI PEMASANGAN KATETER INTERNAL JUGULAR

Terdapat beberapa risiko dan komplikasi berikutan prosedur ini. Antaranya termasuk di bawah ini (tetapi tidak terhad kepada yang berikut):

- Komplikasi yang selalu berlaku secara serta-merta termasuk:
  a) Pendarahan dan lebam di tempat prosedur dilakukan
  b) Sakit di tempat prosedur dilakukan
  c) Denyutan jantung yang tidak normal untuk beberapa saat semasa prosedur

- Komplikasi yang boleh berlaku termasuk:
  Kateter tidak berjaya dimasukkan ke dalam saluran darah pembuluh dan prosedur tersebut perlu diulang dibuat di bahagian lain.
  a) Saluran darah arteri yang berdekatan mungkin tercedera semasa prosedur
  b) Pendarahan berterusan boleh berlaku dan memerlukan pembedahan
  c) Denyutan jantung yang tidak normal mungkin berterusan dan memerlukan rawatan dengan ubatan atau "elektrik shock"

- Risiko yang jarang berlaku termasuk:
  a) Alahan kepada ubat bius
  b) Kecederaan saluran pembuluh darah (pseudoaneurysm) dan mungkin memerlukan pembedahan
  c) Arterio-venous malformasi
  d) Embolism- udara atau darah beku masuk ke saluran darah pulmonari dan menyebabkan kesesakan bernafas dan boleh membawa maut
  e) Pneumothorax/Hemothorax di mana udara/darah berkumpul di ruang kaviti pleura dan mungkin memerlukan pemasangan tiub atau pembedahan

- Risiko yang jarang berlaku termasuk:
  a) Kematian akibat daripada prosedur ini
  b) Angin ahmar
  c) Kecederaan kepada injap jantung atau dinding jantung

- Komplikasi yang lewat tetapi kerap berlaku termasuk:
  a) Jangkitan kuman
  b) Saluran Pembuluh Darah yang sempit (Central Vein Stenosis) yang boleh menyebabkan bengkak di bahagian muka, leher dan dada

KEBENARAN PESAKIT(CONSENT FORM)

Risiko jika anda tidak menjalani prosedur ini. (Doktor untuk mencatat dalam Rekod Perubatan)

.....
.....
.....

Prosedur ini mungkin memerlukan ubat bius am/setempat. (Doktor untuk mencatatkan jenis bius yang akan diberi) .....
.....
.....
.....

Saya mengakui bahawa doktor telah menerangkan;
Keadaan kesihatan saya dan prosedur yang dicadangkan, termasuk rawatan tambahan sekira diperlukan. Saya memahami risiko, termasuk risiko yang khusus kepada saya. Sekiranya rawatan bius diperlukan saya memahami risiko. Rawatan/prosedur alternatif untuk saya dan risiko berkaitan.

Risiko sekiranya saya tidak menjalani prosedur tersebut.

Tiada jaminan bahawa prosedur akan memulihkan keadaan saya walaupun ia telah dilakukan dengan profesional.

Prosedur ini boleh melibatkan pemindahan darah. Jika keadaan yang mengancam nyawa berlaku semasa prosedur dijalankan, rawatan kecemasan diberi berdasarkan perbincangan saya dengan doktor. Doktor selain daripada Pakar boleh menjalankan prosedur. Ada kemungkinan doktor dalam latihan menjalani prosedur ini.

Saya telah **menerima dan membaca** risalah maklumat prosedur ini. Saya boleh mengutarakan kebimbangan dengan doktor mengenai keadaan saya, prosedur yang dicadangkan dan risiko, dan pilihan rawatan saya.
Soalan dan kebimbangan saya telah dibincangkan dan dijawab dengan memuaskan.

Saya memahami bahawa saya mempunyai hak untuk mengubah fikiran saya pada bila-bila masa, termasuk selepas saya telah menandatangani borang ini tetapi sebaik-baiknya setelah perbincangan diadakan dengan doktor saya.

Berdasarkan kenyataan di atas, saya memohon untuk menjalani prosedur ini:

Tandatangan : .....
Nama Pesakit : .....
No. KP : .....
Tarikh : .....

Jika pesakit yang tidak berupaya untuk memberikan persetujuan (persetujuan hendaklah diperolehi daripada penjaga)

Tandatangan : .....
Nama : .....
Hubungan dengan pesakit :.....
No. KP : .....
Tarikh : .....

Saya telah menerangkan kepada pesakit semua perkara di atas di bawah kebenaran pesakit dan saya berpendapat bahawa pesakit/penjaga telah memahami maklumat.

Tandatangan : .....
Nama doktor : .....
Jawatan : .....
Tarikh : .....

Kenyataan Saksi:
Saya telah menterjemah .....
.....
(Nyatakan bahasa pesakit di sini) borang kebenaran pesakit (secara lisan) dan maklumat tambahan sama ada lisan atau bertulis yang diberikan kepada pesakit / penjaga oleh doktor.

Tandatangan: .....
Nama Saksi: .....
No. KP: .....
Tarikh : .....

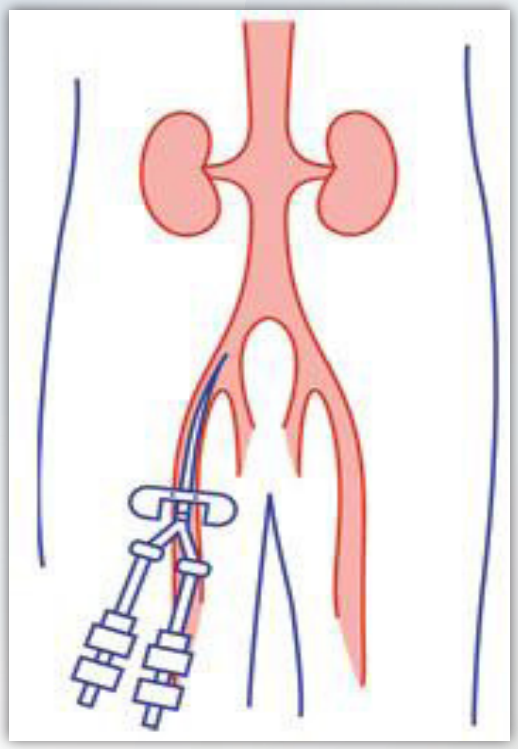
APPENDIX 24

BORANG MAKLUMAT PESAKIT DAN BORANG KEBENARAN UNTUK PEMASANGAN KATETER FEMORAL BERKAF

Risalah ini akan memberi maklumat mengenai pemasangan kateter femora berkaf. Anda akan diminta menandatangani borang persetujuan. Oleh itu, anda digalakkan untuk berbincang dengan doktor sebelum menandatangani borang persetujuan tersebut.

PENGENALAN

Ini adalah prosedur dimana kateter dipasang untuk tujuan menjalani rawatan hemodialisis. Ianya diletakkan di dalam salur darah pembuluh yang besar di bahagian pangkal paha. Kateter ini mempunyai dua lumen (laluan); satu digunakan untuk mengeluarkan darah dari badan dan satu lagi untuk darah kembali semula ke dalam badan selepas melalui proses hemodialisis. Kateter dialisis berkaf mempunyai sebahagian kateter ditanam di bawah kulit untuk mengurangkan risiko jangkitan kuman.



TATACARA PEMASANGAN KATETER FEMORAL BERKAF

Prosedur ini akan dijalankan di bilik prosedur. Bacaan vital (tekanan darah dan denyutan nadi) akan direkodkan sebelum prosedur. Anda akan diarahkan untuk berada diposisi berbaring semasa prosedur dijalankan. Prosedur akan dijalankan di bawah imbasan *ultrasound* untuk mengenalpasti lokasi yang paling sesuai untuk pemasangan kateter femoral. Suntikan bius setempat akan diberikan di bawah kulit yang telah dikenalpasti lokasinya. Anda akan merasa kebas selepas suntikan tersebut.

Jarum akan dimasukkan ke dalam saluran darah pembuluh. Seterusnya satu wayar kecil akan dimasukkan melalui jarum tersebut. Kateter femoral berkaf akan diletakkan ke dalam saluran darah pembuluh dan sebahagian daripadanya akan ditanam dibawah kulit. Anda mungkin merasa tidak selesa atau sedikit tekanan semasa prosedur ini dilakukan.

Selepas prosedur dijalankan, anda akan diarahkan untuk berbaring di atas katil untuk mengelakkan pendarahan di bahagian pangkal paha. Tempat luka akan diperiksa oleh doktor.

RISIKO DAN KOMPLIKASI PEMASANGAN KATETER FEMORAL BERKAF

Terdapat beberapa risiko dan komplikasi berikutan prosedur ini. Antaranya termasuk di bawah ini (tetapi tidak terhad kepada yang berikut):

- Komplikasi yang selalu berlaku secara serta-merta termasuk:
  a) Pendarahan dan lebam di tempat prosedur dilakukan
  b) Sakit di tempat prosedur dilakukan

- Komplikasi yang boleh berlaku termasuk:
  a) Kateter tidak berjaya dimasukkan ke dalam saluran darah pembuluh dan prosedur tersebut perlu diulang dibuat di bahagian lain
  b) Saluran darah arteri yang berdekatan mungkin tercedera semasa prosedur
  c) Pendarahan berterusan boleh berlaku dan memerlukan pembedahan

- Risiko yang jarang berlaku termasuk:
  a) Alahan kepada ubat bius
  b) Kecederaan pada organ yang lain seperti usus dan pundi kencing dan mungkin memerlukan pembedahan
  c) Kecederaan saluran pembuluh darah dan mungkin memerlukan pembedahan (psudoaneurysm)
  d) Arterio-venous malformasi
  e) Embolism – udara atau darah beku masuk ke saluran darah pulmonari dan menyebabkan kesesakan bernafas dan boleh membawa maut

- Risiko yang jarang berlaku termasuk: Kematian akibat daripada prosedur ini

- Komplikasi yang lewat tetapi kerap berlaku termasuk: Jangkitan kuman

KEBENARAN PESAKIT(CONSENT FORM)

Risiko jika anda tidak menjalani prosedur ini. (Doktor untuk mencatat dalam Rekod Perubatan)

.....

.....

.....

Prosedur ini mungkin memerlukan ubat bius am/setempat . (Doktor untuk mencatatkan jenis bius yang akan diberi) .....

.....

.....

.....

Saya mengakui bahawa doktor telah menerangkan;

Keadaan kesihatan saya dan prosedur yang dicadangkan, termasuk rawatan tambahan sekira diperlukan. Saya memahami risiko, termasuk risiko yang khusus kepada saya. Sekiranya rawatan bius diperlukan saya memahami risiko. Rawatan/prosedur alternatif untuk saya dan risiko berkaitan.

Risiko sekiranya saya tidak menjalani prosedur tersebut. Tiada jaminan bahawa prosedur akan memulihkan keadaan saya walaupun ia telah dilakukan dengan profesional. Prosedur ini boleh melibatkan pemindahan darah. Jika keadaan yang mengancam nyawa berlaku semasa prosedur dijalankan, rawatan kecemasan diberi berdasarkan perbincangan saya dengan doktor.

Doktor selain daripada Pakar boleh menjalankan prosedur. Ada kemungkinan doktor dalam latihan menjalani prosedur ini.

Saya telah **menerima dan membaca** risalah maklumat prosedur ini. Saya boleh mengutarakan kebimbangan dengan doktor mengenai keadaan saya, prosedur yang dicadangkan dan risiko, dan pilihan rawatan saya. Soalan dan kebimbangan saya telah dibincangkan dan dijawab dengan memuaskan.

Saya memahami bahawa saya mempunyai hak untuk mengubah fikiran saya pada bila-bila masa, termasuk selepas saya telah menandatangani borang ini tetapi sebaik-baiknya setelah perbincangan diadakan dengan doktor saya.

Berdasarkan kenyataan di atas, saya memohon untuk menjalani prosedur ini:

Tandatangan : .....
Nama Pesakit : .....
No. KP : .....
Tarikh : .....

Jika pesakit yang tidak berupaya untuk memberikan persetujuan (persetujuan hendaklah diperolehi daripada penjaga)

Tandatangan : .....
Nama : .....
Hubungan dengan pesakit : .....
KP No : .....
Tarikh : .....
Saya telah menerangkan kepada pesakit semua perkara di atas di bawah kebenaran pesakit dan saya berpendapat bahawa pesakit / penjaga telah memahami maklumat.

Tandatangan : .....
Nama doktor : .....
Jawatan : .....
Tarikh : .....

Kenyataan Saksi:
Saya telah menterjemah .....
.....
(Nyatakan bahasa pesakit di sini) borang kebenaran pesakit (secara lisan) dan maklumat tambahan sama ada lisan atau bertulis yang diberikan kepada pesakit / penjaga oleh doktor.

Tandatangan : .....
Nama Saksi : .....
No. KP : .....
Tarikh : .....

APPENDIX 25

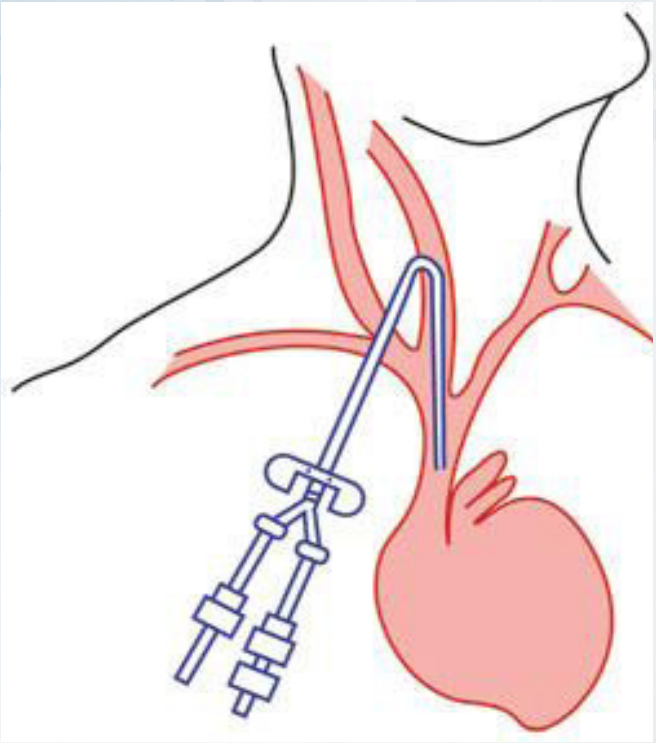
BORANG MAKLUMAT PESAKIT DAN BORANG KEBENARAN UNTUK PEMASANGAN KATETER INTERNAL JUGULAR BERKAF

Risalah ini akan memberi maklumat mengenai pemasangan kateter internal jugular berkaf. Anda akan diminta menandatangani borang persetujuan. Oleh itu, anda digalakkan untuk berbincang dengan doktor sebelum menandatangani borang persetujuan tersebut.

PENGENALAN

Ini adalah prosedur dimana kateter dipasang untuk tujuan menjalani rawatan hemodialisis.

Ianya diletakkan di dalam salur darah pembuluh yang besar. Penghujung tiub itu akan berada berdekatan dengan jantung. Kateter ini mempunyai dua lumen (laluan); satu digunakan untuk mengeluarkan darah dari badan dan satu lagi untuk darah kembali semula ke dalam badan selepas melalui proses hemodialisis. Kateter berkaf mempunyai sebahagian kateter ditanam di bawah kulit. Ini bertujuan mengurangkan risiko jangkitan kuman.



TATACARA PEMASANGAN KATETER

Prosedur ini akan dijalankan di bilik prosedur. Bacaan vital (tekanan darah dan denyutan nadi) akan direkodkan sebelum prosedur. Anda akan diarahkan untuk berada diposisi berbaring semasa prosedur dijalankan. Prosedur akan dijalankan di bawah imbasan *ultrasound* untuk mengenalpasti lokasi yang paling sesuai untuk pemasangan kateter internal jugular berkaf di bahagian dada. Suntikan bius setempat akan diberikan di bawah kulit yang telah dikenalpasti lokasinya. Anda akan merasa kebas selepas suntikan tersebut.

Jarum akan dimasukkan ke dalam saluran darah pembuluh. Seterusnya satu wayar kecil akan dimasukkan melalui jarum tersebut. Kateter internal jugular berkaf akan diletakkan ke dalam saluran darah pembuluh dan sebahagiannya akan ditanamkan di bawah kulit. Anda mungkin merasa tidak selesa atau sedikit tekanan semasa prosedur ini dilakukan.

Selepas prosedur dijalankan, anda akan diarahkan untuk berbaring di atas katil untuk mengelakkan pendarahan di bahagian dada dan leher. Tempat luka akan diperiksa oleh doktor. Imbasan *X-ray* akan digunakan untuk memastikan kedudukan kateter tersebut.

RISIKO DAN KOMPLIKASI PEMASANGAN KATETER INTERNAL JUGULAR BERKAF

Terdapat beberapa risiko dan komplikasi berikutan prosedur ini. Antaranya termasuk di bawah ini (tetapi tidak terhad kepada yang berikut):

- Komplikasi yang selalu berlaku secara serta-merta termasuk:
  a) Pendarahan dan lebam di tempat prosedur dilakukan
  b) Sakit di tempat prosedur dilakukan
  c) Denyutan jantung yang tidak normal untuk beberapa saat semasa prosedur

- Komplikasi yang boleh berlaku termasuk:
  a) Kateter tidak berjaya dimasukkan ke dalam saluran darah pembuluh dan prosedur tersebut perlu diulang dibuat di bahagian lain
  b) Saluran darah arteri yang berdekatan mungkin tercedera semasa prosedur
  c) Pendarahan berterusan boleh berlaku dan memerlukan pembedahan
  d) Denyutan jantung yang tidak normal mungkin berterusan dan memerlukan rawatan dengan ubatan atau *"electric shock"*

- Risiko yang jarang berlaku termasuk:
  a) Alahan kepada ubat bius
  b) Kecederaan saluran pembuluh darah dan mungkin memerlukan pembedahan (pseudoaneurysm)
  c) Arterio-venous malformasi
  d) Embolism - udara atau darah beku masuk ke saluran darah pulmonari dan menyebabkan kesesakan bernafas dan boleh membawa maut
  e) Pneumothorax/Hemothorax di mana udara/darah berkumpul di ruang kaviti pleura dan mungkin memerlukan pemasangan tiub atau pembedahan

- Risiko yang jarang berlaku termasuk:
  a) Kematian akibat daripada prosedur ini
  b) Angin ahmar
  c) Kecederaan kepada injap jantung atau dinding jantung

- Komplikasi yang lewat tetapi kerap berlaku termasuk:
  a) Jangkitan kuman
  b) Saluran Pembuluh Darah menjadi sempit *(Central vein stenosis)* yang boleh menyebabkan bengkak di bahagian mula, leher dan dada

KEBENARAN PESAKIT(CONSENT FORM)

Risiko jika anda tidak menjalani prosedur ini. (Doktor untuk mencatat dalam Rekod Perubatan)
.....
.....
.....

Prosedur ini mungkin memerlukan ubat bius am/setempat . (Doktor untuk mencatatkan jenis bius yang akan diberi) .....
.....
.....
.....

Saya mengakui bahawa doktor telah menerangkan;

Keadaan kesihatan saya dan prosedur yang dicadangkan, termasuk rawatan tambahan sekira diperlukan. Saya memahami risiko, termasuk risiko yang khusus kepada saya. Sekiranya rawatan bius diperlukan saya memahami risiko. Rawatan/prosedur alternatif untuk saya dan risiko berkaitan.

Risiko sekiranya saya tidak menjalani prosedur tersebut. Tiada jaminan bahawa prosedur akan memulihkan keadaan saya walaupun ia telah dilakukan dengan profesional. Prosedur ini boleh melibatkan pemindahan darah.

Jika keadaan yang mengancam nyawa berlaku semasa prosedur dijalankan, rawatan kecemasan diberi berdasarkan perbincangan saya dengan doktor.

Doktor selain daripada Pakar boleh menjalankan prosedur. Ada kemungkinan doktor dalam latihan menjalani prosedur ini.

Saya telah **menerima dan membaca** risalah maklumat prosedur ini. Saya boleh mengutarakan kebimbangan dengan doktor mengenai keadaan saya, prosedur yang dicadangkan dan risiko, dan pilihan rawatan saya. Soalan dan kebimbangan saya telah dibincangkan dan dijawab dengan memuaskan.

Saya memahami bahawa saya mempunyai hak untuk mengubah fikiran saya pada bila-bila masa, termasuk selepas saya telah menandatangani borang ini tetapi sebaik-baiknya setelah perbincangan diadakan dengan doktor saya.

Berdasarkan kenyataan di atas, saya memohon untuk menjalani prosedur ini:

Tandatangan : .....
Nama Pesakit : .....
No. KP : .....
Tarikh : .....

Jika pesakit yang tidak berupaya untuk memberikan persetujuan (persetujuan hendaklah diperolehi daripada penjaga)

Tandatangan :.....
Nama : .....
Hubungan dengan pesakit : .....
No. KP : .....
Tarikh : .....

Saya telah menerangkan kepada pesakit semua perkara di atas di bawah Kebenaran Pesakit dan
saya berpendapat bahawa pesakit / penjaga telah memahami maklumat.

Tandatangan : .....
Nama doktor : .....
Jawatan : .....
Tarikh : .....

Kenyataan Saksi:
Saya telah menterjemah .....
.....
(Nyatakan bahasa pesakit di sini) borang kebenaran pesakit (secara lisan) dan maklumat tambahan sama ada lisan atau bertulis yang diberikan kepada pesakit / penjaga oleh doktor.

Tandatangan : .....
Nama Saksi : .....
No. KP : .....
Tarikh : .....

APPENDIX 26

RENAL BIOPSY PROCEDURE (suggested)

Pre-biopsy investigation

Blood samples are sent to the laboratory for full blood count, renal profile, coagulation screen (PT/APTT), UFEME and Group and Save. This is performed the day prior to procedure.

Pre-biopsy monitoring and preparation

- Clerking and review during admission.
- Baseline vital signs are taken and recorded to detect any abnormalities i.e., elevated blood pressure. The patients' blood pressure has been well controlled, as an elevation in blood pressure could increase the risk of haemorrhage post biopsy. There is no need to fast patients for biopsies that are being performed by Nephrologists at ward level. The patient needs to fast from twelve midnight only if procedure is planned in the radiology department or sedation may be administered.
- Administer pre-medication if required, as prescribed by the medical team, one hour prior to the biopsy, in order to sedate the patient, making it safer to biopsy (ANNA 2006).
- The patient is advised to empty his/her bladder before the pre-medication is administered and instructed to remain in bed following same.

Equipment and instrument preparation

- Portable ultrasound and sterile ultrasound probe
- Renal biopsy needle (16G or 18G) - option for disposable or using biopsy gun
- Bottles for specimen
- Sterile gown x 1, Surgical 3 ply mask x 1, Gloves x 1, Surgical cap x 1
- Surgical drapes x 2
- Chlorhexidine for skin preparation
- Lignocaine 1-2% LA x 10-20mL
- 10cc syringe x 1
- 21G Green needle x 1, 23G Blue needle x 1 , 22G Spinal needle x 1
- Scalpel x 1
- Gauze x 10 pieces
- Sandbag for post-procedure
- Prepare 3 x urine bottles for urine inspection post biopsy

Handling of specimen

Specimens for Immunofluorescence will need fresh tissue and formalin fixed for light microscopy examination

- Specimen must be fully immersed within the phosphate buffer solution
- Specimen labelled properly
- Transported in ice

The procedure

The patient is correctly positioned for the biopsy i.e. prone on pillows compressing the abdomen and fixing the kidney, the back slightly rounded, shoulders tipping the mattress and the arms over the head. The location and depth of the kidney is checked by ultrasound, by the performing doctor.

- The puncture site is marked approximately 1cm within the lower limit of the kidney. This is done so that the biopsy can be obtained from a safe area of the cortex, away from the hilum where the main blood vessels are located
- The double drape is removed from the top of the trolley to expose the equipment
- Following hand washing the doctor performing the procedure puts on the sterile gown and gloves
- The patient's skin is thoroughly cleansed around the site of the biopsy then the minor surgery drape is applied
- The sterile cover is applied to the probe of the ultrasound machine with sterile ultrasound gel inside the cover and on the patients' skin
- Local anaesthetic injection of lignocaine 1-2% is given sub-cutaneous
- A spinal needle is inserted through the skin and the patient is asked to hold their breath, while the needle is pushed through the lumber fascia. The contact with the capsule of the kidney gives a characteristic firm and granular sensation. Alternatively, if a co-axial needle is used, the needle is positioned perpendicular. The needle moves upwards on inspiration and downwards on expiration
- The biopsy needle is then inserted through the skin and, under guidance of ultrasound, pushed through to the cortex of the kidney. It may be necessary to make a very small incision using a scalpel before the biopsy needle is introduced
- The patient holds their breath so that the kidney is in the correct position for biopsy and the needle is pushed into the kidney. A minute core of kidney tissue is then detached
- The biopsy needle is then withdrawn while the patient once again holds their breath

- It is usually necessary to take two specimens. Maximal unsuccessful attempts are 2 times by an operator and help should be sought
- It is the medical practitioner's responsibility to place the saline in the jar provided and label it

Current Best Practice for Renal Biopsies

Two cores of tissue should be taken to ensure that there are sufficient numbers of 11 glomeruli for examination – not less than 10 for light microscopy and immunofluorescence. This applies to native and allograft kidneys

Post-biopsy observation

- Lie down for 6 hours post-procedure
- Vital signs 4 x every 15 minutes, 4 x every 30 minutes and hourly x 4 times (total close observation: 6 hours)
- Urine inspection x 3
- Watch out for signs of bleeding (severe pain over biopsy site, haematuria and abnormal vital signs such as tachycardia). If any of these happen, the nephrologist should be informed **immediately**
- Review for fitness for discharge
- Prepare post-discharge MC for 2 weeks
- Give nephrology clinic appointment 2 weeks after discharge

APPENDIX 27

NON-CUFFED CATHETER INSERTION

Preprocedure preparation

- Consent process (including information given)
- Indication of the catheter is appropriate
- Medical assessment of the patient – clerking and review during admission

Equipment and instrument preparation

- Portable ultrasound, Sterile ultrasound probe
- Dialysis catheter set
- Sterile gown x 1, Surgical 3 ply mask x 1, Gloves x 1, Surgical cap x 1
- Surgical drapes x 2
- Chlorhexidine for skin preparation
- Lignocaine 1-2% LA x 5-10mL,10cc syringe x 2,5cc syringe x 2
- 21G Green needle x 1, 23G Blue needle x 1
- Scalpel x 1, Artery x 1, Forceps x 1, Scissors x 1
- Suture holder, Suture 2.0 x 1
- Gauze x 10 pieces
- Heparin 1000 or 5000 unit
- Normal saline (for IV) approximately 100ml

Post-procedure observation

- Vital signs will be monitored in a recovery room / day-care (15 minutes x 2)
- Observation post-procedure for 15-30 minutes before the patient can be discharged. If there is any bleeding, doctor will need to be informed
- Review for fitness of discharge. Discharge summary to be completed

APPENDIX 28

CUFFED CATHETER INSERTION

Preprocedure preparation

- Consent process (including information given)
- Indication of the catheter is appropriate
- Medical assessment of the patient – clerking and review during admission

Equipment and instrument preparation:

- Portable ultrasound
- Sterile ultrasound probe
- Dialysis catheter set
- Extra guidewires if necessary (such as micro puncture, benson, roadrunner)
- Fluoroscopy
- Sterile gown x 1, Surgical 3 ply mask x 1, Gloves x 1, Surgical cap x 1
- Surgical drapes x 3
- Chlorhexidine for skin preparation
- Lignocaine 1-2% LA x 10-20mL,10cc syringe x 3, 5cc syringe x 1
- 21G Green needle x 1, 23G Blue needle x 1, 22G Spinal needle x 1
- Artery x 1, Forceps x 1, Scissors x 1, Scalpel x1
- Suture holder, Suture 2.0 x 1
- Gauze x 10-15 pieces
- Heparin 1000 or 5000 unit
- Normal saline (for IV) approximately 100ml

Post-procedure observation

- Vital signs will be monitored in a recovery room / daycare (15 minutes x 4)
- Observation post-procedure for one hour before patient can be discharged. If there is any bleeding, doctor will need to be informed
- Review for fitness for discharge. Discharge summary to be completed
- Prescription of pain medication and topical antibiotics to prevent infection is required

APPENDIX 29

REMOVAL OF CUFFED CATHETER

Equipment and instrument preparation

1. Sterile gown x 1, Surgical 3 ply mask x 1, Gloves x 1, Surgical cap x 1
2. Surgical drapes x 3
3. Chlorhexidine for skin preparation Lignocaine 1-2% LA x 10-20mL 10cc syringe x 2
4. 21G Green needle x 1 ,23G Blue needle x 1
5. Artery x 1, Forceps x 1
6. Scissors x 1
7. Suture holder, Suture 2.0 x 1
8. Scalpel x 1
9. Gauze x 5-10 pieces

Post-procedure observation

- Vital signs will be monitored in a recovery room / daycare (15 minutes x 2)
- Observation post-procedure for 30 minutes before the patient can be discharged. If there is any bleeding, the doctor will need to be informed.

APPENDIX 30

CHECKLIST FOR CENTRAL VENOUS CATHETER INSERTION

Patient's name:			NRIC/other IDs			
Date:						
Procedure location:	ED	Medical ward	HDW	ICU	Procedure room	Others
Insertion site:	IJV	Femoral vein	SV	EJV	Side of body: Right / Left	
Guidewire exchange of previous catheter:	Yes / No					
Indications:	Initiation of HD		Optimisation for TC insertion		Optimisation for surgery	
	Thrombosed AVF		Malfunction catheter		Others:	

Critical Steps	Yes	No	Comments
Confirm the indication for CVC insertion			
Consent obtained from patient after detail explanation with information sheet (Refer to 7)			
RaCeVA, site assessed and marked			
Blood pressure, SPO2 and continuous cardiac monitoring (IJV insertion)			
Any concern about the procedure?			Comment if Yes:
Concern mitigated?			Comment if Yes:
Pre-Procedure			
Patient positioned for procedure			
Equipment assembled and verified			

All team members identified and roles assigned			
Proper infection control measures followed: Hand wash, sterile gloves, sterile gown, hat/cap, mask and eye protection			
Skin prep performed with alcoholic chlorhexidine			
Patient's body covered by sterile drape from head to toe			
U/S probe preparation for real time cannulation under sterile technique			
During procedure			
Local anesthetic given under real time U/S			
Under real time U/S identified vein cannulated and blood aspirated into the syringe			
Blunt end of guidewire inserted through introducer needle for about 15-20cm			
Needle removed and a skin nick is made at the guidewire entry point			
Dilator advance by 'pushing and rotating' method till entry into vein			
Dilator removed and catheter is thread over the guidewire Wire will exit the blue lumen			
Guidewire removed and blood is withdrawn from both the lumen to confirm placement within vessel lumen			
Saline flush and heparin block with amount mentioned on the catheter hub			
Catheter secured with non-absorbable suture and sterile dressing done			

Complications			If Yes: Hematoma Arrythmia Bleeding Arterial puncture Pneumothorax Catheter misplacement
Less than 3 attempts			
More than 3 attempts			
Number of catheters used >1			Comment if Yes:
After Procedure			
Verify placement by CXR for IJC			
CVC approved for use			
Steps taken to deal with complications during procedure			Comment if Yes:

***Procedure Deviation: If there is a deviation from process, immediately notify the operator and stop the procedure until corrected.**
Distribution Instructions: Please return the completed form to the designated person at the Nephrology procedure room.
Signature and Official Stamp is required for each personnel.

Operator:
Form filled by:

Supervisor:

APPENDIX 31

PERITONEAL DIALYSIS (PD) CATHETER INSERTION (SELDINGER)

Instruction to patients
- Fast before the procedure
- Bowel preparation prior to procedure date

Pre-insertion evaluation
- Blood: FBC, RP, coagulation screening (PT/APTT)
- Clerking and review during admission
- The patient should be explained about the catheter insertion procedure and informed about complications – consent process
- The patient should be evaluated for any evidence of hernias, eventration and any weakness of the abdominal wall, that may need surgical input and repair
- The exit site should be identified to the catheter insertion. The exit site should be either above or below the belt line and should not lie on a scar or within the abdominal folds and placed laterally

Pre-insertion preparation
- The preparation of the skin should be done properly prior to insertion
- The patient should, if possible, have a shower/bath with a chlorhexidine soap and abdomen should be cleaned with betadine or disinfectant soap (these may vary).
- Shave skin hair adequately
- Ensure that the bladder is empty before the surgery
- IV access obtained.Prophylactic antibiotics administered; choice will depend on local guidelines

Equipment and instrument preparation
- PD catheter and set
- PD fluid x 1 and drainage set, maybe needed depending on operator
- Sterile gown, Surgical 3 ply mask, Gloves, Surgical cap, Surgical drapes
- Chlorhexidine for skin preparation, lignocaine 1-2% LA
- 10cc syringe 2, 21G Green needle x 1, 23G blue needle x 1
- Stylet maybe required
- Set should include Artery x 1, Forceps x 1, Scissors x 1, Scalpel x 1, Suture holder
- Suture 2.0 x 1
- Gauze x 10-20 pieces

Post-procedure observation

- Vital signs will be monitored in a recovery room / day-care /wards/ procedure room
- Observation post-procedure, patient reviewed before discharge. If there is any bleeding, doctor will be informed

APPENDIX 32

REMOVAL OF PD CATHETER INSERTED PERCUTANEOUSLY

Pre-procedure preparation
- Clerking and review during admission
- The patient should be explained about the procedure and informed about complications-consent process

Equipment and instrument preparation
- Sterile gown, Surgical 3 ply mask, Gloves, Surgical cap, Surgical drapes
- Chlorhexidine for skin preparation
- Lignocaine 1-2% LA x 10-20mL
- 10cc syringe x 1, 21G Green needle x 1, 23G Blue needle x 1
- Set should include Artery x 1, Forceps x 1, Scissors x 1, Suture holder, Scalpel x1
- Suture 2.0 x 1
- Gauze x 5-10 pieces

Post-procedure observation
- Vital signs will be monitored in a recovery room /day-care/ wards/ procedure room
- Observation post-procedure should be performed and patient reviewed before discharge. If there is any bleeding, doctor will be informed

APPENDIX 33

ACUTE HAEMODIALYSIS PRESCRIPTION (ORDER) FORM

Name: _____ Ward: _____

IC No: _____ Date: _____

Biohazard Screening:

Rapid test (Date:) Hep B Reactive/ NR, Hep C Reactive/NR, HIV Reactive/ NR

Serology Test (Date:) Hep B Reactive/ NR, Hep C Reactive/NR, HIV Reactive/ NR

Haemodialysis Prescription:

Date	Modality HD SU SLED	Access Fistula Catheter	Time hours	UF litres	Qb ml/min	Qd ml/min	Heparin Normal Tight Free	Dialysate	Special Order Temp/ Dialyser	Others Transfusion/ Medication	Order by

APPENDIX 34

ACUTE HAEMODIALYSIS MONITORING CHART

ACUTE HAEMODIALYSIS CHART

Name : _____ Ward: _____
I/C NO : _____ Date : _____
Time Dialysis Started : _____ by: _____
Time Dialysis Completed : _____ by: _____

Biohazard Screening:

Rapid test (Date:_____) Hep B: R/ NR Hep C: R/ NR HIV: R/ NR
Serology test(Date:_____) Hep B: R/ NR Hep C: R/ NR HIV: R/ NR

Haemodialysis Prescription

Modality: HD / Gentle HD/ Modified SLED/ SU
Access: AVF : RCF/ BCF/ BBF
Catheter: Non-cuffed IJC/ Non-cuffed Femoral Right/Left
Cuffed IJC/ Cuffed Subclavian/ Cuffed Femoral Right/Left
Duration: _____ hours Heparin: Normal / Tight/ Free
Qb: _____mls/min Qd:_____mls/min
Dialyser: Low Flux/ High flux Dialysate: K3/ K5/ K6
Temperature: _____

Drugs/ Transfusion

Blood products sent by:_____ Transfusion: Time (start)_____by_____
Blood products received by:_____ Time (end)_____by_____
IV Drugs: _____ by _____

	Pre	Post
BP lying/sitting	_____	_____
BP standing	_____	_____
Pulse	_____	_____
Weight	_____	_____
Temperature	_____	_____
Pain Score	_____	_____

Staff (starting): _____
Staff (ending): _____

TIME	BP/ PR	Temp	Qd ml/min	Qb ml/min	VP	HEP	Saline

Total Infused (L): _____
TOTAL UF : _____
NETT UF : _____
Locking solution: Heparin/ citrate/ saline
by:_____

Remarks:

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