

Nurse Practitioner Townsville Health Service District

Health Management Protocol for the Management of Adults (16 years and over) with Chronic Kidney Disease Requiring Renal Replacement Therapy

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Glossary of terms

Acronym	Meaning
ACEi	Angiotensin converting enzyme inhibitors
ARB	Angiotensin 2 receptor blockers
AMH	Australian Medicines Handbook
BMI	Body Mass Index
BP	Blood pressure
CARI	Caring for Australians with Renal Impairment – Evidence Based Guidelines for Clinical Practice
CKD	Chronic kidney disease
ESA	Erythropoietic stimulating agent
ESKD	End Stage Kidney Disease
FRACP	Fellow of the Royal College of Physicians
GP	General Practitioner
HD	Haemodialysis
HMP / DTP	Health Management Protocol / Drug Therapy Protocol
IP	Intraperitoneal administration
IV	Intravenous administration
NP	Nurse Practitioner
NSAID	Non steroidal anti-inflammatory drug
PD	Peritoneal Dialysis
PBS	Pharmaceutical Benefits Scheme
PCCM	Primary Clinical Care Manual
RRT	Renal Replacement Therapy
S/c	Subcutaneous
THSD	Townsville Health Service District

Description of Health Service:

The Department of Nephrology within the Townsville Health Service District consists of both CKD Multidisciplinary clinics, and dialysis services. It consists of Nephrology, CKD and acute dialysis at The Townsville Hospital; CKD and chronic dialysis in Satellite Services; and Home Therapy outreach services to Townsville, Mackay and Mt Isa Health Service Districts. The service currently covers an area approximately 500,000sq km, much of which includes both rural and remote practice. The Nurse Practitioner (NP) role will provide services to community dialysis clients in these districts.

Demographically, this district's population is very different to the South East corner of Queensland. The 2006 census reported that rural, remote and Indigenous Australians have a higher prevalence of chronic disease risk factors and higher mortality rates from most chronic diseases compared to urban dwellers. Groups with the poorest health status and life expectancy are

- Aboriginal and Torres Strait Islander peoples
- Socio-economically disadvantaged people and
- Those living in rural and remote locations.

THSD is well represented by all these groups.

The service focuses on promoting the health and well being of patients by assisting them to manage their kidney disease, dialysis requirements and related conditions. Included is delivery of education and health promotion for patients with chronic diseases adversely affecting their renal function.

The goal of dialysis service is to enable patients to remain as well as possible while undertaking their own dialysis in or close to their own homes. The service also provides telephone support, home visits and community outreach. This would include, but not limited to the following activities:

- Educate patients on:
 - how to perform their dialysis
 - how to manage their renal disease
 - How to identify any complications of dialysis or renal disease
 - How to manage their medication requirements
- Support the patient and their families to enable dialysis to remain in the community setting
- Prevent complications of their disease and dialysis process.
- Manage the complications of their disease and dialysis process.
- Reduce hospital admissions wherever possible
- Prepare the patient for kidney transplant or
- Refer for conservative management / palliative care as appropriate
- Support Medical, Nursing and Allied Health staff to manage dialysis patients in their community especially in rural and remote areas.
- Provide Outreach/visiting service to the patient and their community to ensure prevention of hospitalisation and /or return to hospital based dialysis.

Model of Care

The model of care is person centred, placing the patient at the centre of their care. This model supports respect, dignity, autonomy and promotes informed decision making. “Self management and empowerment of people in managing chronic illness is essential in achieving...optimal self-care” (Queensland Health, 2008).

Nephrologists are scarcer in the North. THSD has two full time nephrologists, equivalent to a ratio of 1:137 dialysis patients. Queensland State wide Renal Health Services (2008) benchmarked staffing recommendations as part of workforce modelling, comparing with current services. The recommended benchmark for nephrologists is 1:50 dialysis patients, where 1 is 0.71 contact time). Currently, North Queensland has 1:137.

Patients are referred from Hospital Dialysis Service and Chronic Kidney Disease (CKD) clinic for nursing lead multidisciplinary management and education on their dialysis needs, preparation and transfer to home. Clinical collaboration and support is provided by the Consultant Nephrologists for routine and urgent / emergent situation in person and by phone / email when required.

THSD also has a large indigenous and elderly population. An innovation of the Nephrology Nurse Practitioners is their very successful multidisciplinary outreach with combined Allied Health and Nursing clinics across several districts. The patient population often has to travel hundreds, even thousands of kilometres to see specialist medical staff (nephrologists, endocrinologists just to name two). By providing local community and home visits with the team, we are able to improve access, reduce financial and distance barriers and provide specialist support to carers and health care providers in rural and remote locations. This is aimed at improving patient outcomes and compliance.

The Nurse Practitioner provides support to:

- Home Therapy Clients undertaking dialysis across Townsville; Mackay and Mt Isa Health Service Districts.
 - Including support to patients and staff in Aboriginal Communities under their services in particular Doomadgee, Mornington Island; Dajarra and Palm Island.
- Self Care Sites in the following Hospitals:
 - Charters Towers
 - Doomadgee
 - Mornington Island
- North Ward Satellite Dialysis Service
- Home Hill Satellite Dialysis Service
- Mt Isa Satellite Dialysis Service
- Palm Island Satellite Dialysis Service

Scope of practice

The nurse practitioner is responsible and accountable for making professional judgements about when the patient's condition is beyond their scope of practice. In this situation they will initiate consultation with a medical officer or other member of the health care team.

Beyond the scope of this document are:

- Acute renal failure / acute glomerulopathies
- Children
- Pregnancy
- Kidney transplantation

Management of Dialysis patients includes:

- Haemodialysis Prescription
- Peritoneal Dialysis Prescription
- Management of dialysis access (peritoneal dialysis catheter or vascular access for haemodialysis)
- Blood pressure and fluid volume
- Cardiovascular risk factors
- Anaemia
- Mineral and bone disease
- Nutrition and metabolism
- Health prevention / immunisation
- Self management / support
- Transplant work-up
- Treatment of complications of dialysis (including infective complications)

Overview of Clinical Assessment by the Nurse Practitioner

The nurse practitioner utilises advanced practice knowledge and skills to manage a caseload of patients, and to make a thorough health assessment of individual patients by:

- Obtaining a comprehensive health history
- Performing a physical assessment
- Initiating and evaluating diagnostic procedures and laboratory tests
- Accessing and reviewing results of other diagnostic studies
- Analysing information in order to formulate a differential diagnosis

- Assessing barriers to achieving treatment targets
- Developing and implementing a management plan to achieve evidence based treatment targets, addressing any barriers identified
- Educating, counselling and gaining agreement to the management plan with the patient, family, and community
- Linking with other health professionals who may need to provide care for this patient or group
- Evaluating patient's adherence and response to the plan of care
- Documenting in the patient's record according to established guidelines
- Organising referrals, consultations and coordinating patient care
- Regularly meeting with the Nephrology Consultants where the clinical care of each patient is discussed and having access to the consultants at all times to discuss urgent or difficult case findings

(ANNA, 2001; Salem, 2006; Russell, 2008)

Management Plan:

Patients are managed using individualised treatment plans.

- Treatment targets are based on national guidelines and approved Department of Nephrology procedures, protocols or workplace instructions. Targets may be adjusted based on individual patient characteristics e.g. it may be inappropriate to aim for a blood pressure of < 125/75 in patient with significant carotid artery disease or high falls risk.
- Where targets are adjusted or are not being achieved, the rationale and / or barriers will be documented in the patient record and referral or notification to Nephrologist will be made as appropriate
- Medication doses being managed by the nurse practitioner (either prescribing or titrating) will be on the "start low – go slow" principle.
- Patients will be educated about any medications being prescribed and will be provided with approved Consumer Medicines Information and / or locally developed and endorsed Medicines Information sheets.

Follow-up:

- The nurse practitioner utilises clinic or home visit consultations as well as telephone follow up to monitor patient's response to therapy, and/or make changes in therapy as well as assess suitability to continue with drug titration.
- Actions taken by the nurse practitioner are communicated to nursing staff, GP, allied health professionals, including Health workers, nephrologist and other physicians and surgeons, who may follow up patient.
- The nurse practitioner will collaborate with the nursing staff in the home therapy unit, and community dialysis units, to ensure best practice is followed and appropriate follow up is made.
- Frequency of nurse practitioner follow up is determined by individual patient requirements and the treatment plan, and may be either direct or indirect, but must be undertaken a minimum of every 2 months

Investigations

The nurse practitioner has full pathology test ordering privileges as a Requesting Officer in Pathology Queensland as per Pathology Queensland Analytical Service Policy: 14475. Other diagnostic investigations will include:

- Plain x ray
- Diagnostic Ultrasound
- Vascular Doppler(inc Renal and Vascular mapping)

- Echocardiogram
- Sleep studies
- Other non-radiology / non-invasive investigations

Referral

The nurse practitioner role includes assessment and management of clients using advanced nursing knowledge and skills and may include but is not limited to:

- Direct referral of clients to other health care professionals
- Prescribing medications
- Requesting diagnostic investigations.

Currently in Australia nurse practitioners do not have access to a Medicare provider number. Consequently until this situation changes a referral from a nurse practitioner may cause financial disadvantage for the patient. To ensure that patients are not financially disadvantaged arrangements for private referral are as follows:

- The Consultant Nephrologist will make any private referrals required for patients being managed by the nurse practitioner.

The nurse practitioner should consider referral to a medical officer in the following situations:

- Persistent signs and symptoms despite treatment
- Treatment required in rural or remote location, when nurse practitioner not able to be present at that location
- Symptomatic or laboratory evidence of previously unidentified decreased or decreasing function of any vital organ or system
- Signs of recurrent or persistent infection
- Signs of dialysis access failure
- Any atypical presentation of a common illness or unusual response to treatment
- When a patient's condition deteriorates unexpectedly
- Assistance with end of life planning is required
- All potentially life threatening situations

When undertaking outreach in rural or remote areas, it is expected that the Nurse Practitioner will provide support for all CKD clients, including those not yet undertaking dialysis, within their scope of practice. The Nurse Practitioner will refer to Nephrology Nurse Practitioner for CKD clients as required.

The nurse practitioner should consider referral to an Allied Health professional (eg. Dietician, Social Worker, Psychologist or Health Worker) in the following situations:

- Complex specialist intervention required eg. malnutrition
- Complex social situations affecting learning or ability to perform dialysis
- Cultural aspects of life affecting lifestyle and dialysis schedule

Clinical Practice Guidelines

The nurse practitioner will utilise the Caring for Australians with Renal Impairment (CARI) guidelines for managing the care of the patient cohort. These guidelines have been specifically developed for this purpose and make recommendations for evidence based best practice. In

They provide guidance for:

- Biochemical and haematological targets
- Medication administration and review
- Dialysis prescriptions
- Areas of clinical practice – eg, Education.

In addition to these guidelines the NP will also utilise the Queensland Health Chronic Disease Guidelines (CDG). In situations where the CARI, or the CDG are unable to provide guidance other guidelines such as the United States National Kidney Foundation Guidelines - Dialysis Outcomes Quality Initiative (K/DOQI) and the European Best Practice guidelines for the management of patients with chronic renal failure (EBPG) will guide practice, as determined by the consultant Nephrologists within the Service.

Because of the high ratio of Indigenous patients attached to the Townsville service and the rural and remote outreach the NP will provide, other guidelines will be required to be used. For example, in the presence of parasite infections such as scabies, the Primary Clinical Care Manual (PCCM) provides guidelines for care. Across the district, there are currently 198 patients having RRT; 68% of them are Indigenous.

One of the most common infections related to peritoneal dialysis is peritonitis which needs to be treated immediately to reduce mortality and morbidity. Intraperitoneal (IP) antibiotics are the gold standard according to all guidelines.

The Australian Medicines Handbook (AMH), Monthly Index of Medical Specialities (MIMS) and The Renal Drug Reference Guide (RDRG) will be used extensively by the nurse practitioner to assist in determining the dose/therapy length and repeats for prescriptions.

DRUG THERAPY PROTOCOL

Drug Therapy Protocol - Framework

If non pharmacological interventions are unsuccessful, pharmacological therapy is required. Choice of pharmacological therapy must be guided by National Guidelines, approved unit protocols and the Australian Medicines Handbook, within the parameters of the Standard Drug List for Queensland Hospitals and in accordance with their stage of renal impairment and dialysis schedules.

The Renal Consultant is the lead clinician for the co ordination of the patients' care and thus any new medications, titration of medications and recommended discontinuation of medications must be communicated to them. The General Practitioner may be the lead clinician for non renal/dialysis related matters and thus any new medications, titration of medications and recommended discontinuation of medications must also be communicated to them.

All Patients under the care of the nurse practitioner will have Renal Impairment and dialysis therefore all medications prescribed or titrated will require the precautions associated with this to be included in the decision making process.

The nurse practitioner must verify that the choice of drug is suitable for the patient after carefully considering the additional individualised patient information, such as:

- Age
- Previous allergies,
- Adverse drug reactions,
- Co-morbidities such as hepatic dysfunction
- Concomitant medications for potential drug interactions
- Pregnant and or lactating women

The Queensland Health Safe Medication Practice Unit has identified specific medications and patient groups where extra precautions are necessary. These groups are listed below and must be considered carefully when selecting drug treatment to avoid adverse medication events.

High Risk Patient Groups

- Renal impairment (Cervelli, 2007)
- Cardiac disease
- Liver disease
- Transplantation
- Mental Health problems
- Cancer
- Paediatrics
- Elderly
- Pregnant and Breastfeeding

The Queensland Health Safe Medication Practice Unit has identified specific medications and patient groups where extra precautions are necessary. These groups are listed below and must be considered carefully when selecting drug treatment to avoid adverse medication events.

High Risk Medications

- drugs with a narrow therapeutic range i.e. digoxin, lithium
- drugs requiring specialised monitoring or interpretation i.e. therapeutic dose monitoring
- anticoagulants
- cytotoxics
- NSAIDS or COX-2 inhibitors
- opiate analgesics
- aminoglycosides
- anti-epileptics
- insulin
- IV electrolyte supplementation
- weekly dosing regimens i.e. methotrexate.

Currently in Australia nurse practitioners do not have access to the pharmaceutical benefits scheme. Consequently, until this situation changes prescriptions from a nurse practitioner may cause financial disadvantage for the patient. To ensure that

patients are not financially disadvantaged arrangements for dispensing of the nurse practitioner prescription are as follows:

- The Consultant Nephrologist or medical officer designated by them will write any PBS or Authority prescriptions required for patients being managed by the nurse practitioner.
- A copy of the approved HMP/DTP must be available in the pharmacy for identification and signatory purposes.

Drug Therapy – Prescribing

Drug groups to be prescribed by Nurse Practitioner

1. Anti-infectives
 - a. Antibiotics
 - b. Antifungals
 - c. Anthelmintics, Scabicides and Pediculicides
2. Anticoagulants
3. Antihypertensives
4. Diuretics
5. Haematinics
6. Vitamins
7. Lipid lowering agents
8. Drugs for electrolyte Imbalance
9. Gout Medications
10. Calcimimetics and phosphate binders
11. Anaesthetics
12. Antiemetics and laxatives
13. Vaccines
14. Peritoneal Dialysis Fluids
15. Haemodialysis Dialysis Fluids
16. Simple Analgesics
17. Neuropathic Pain Medications
18. Drugs for Diabetes

1. Anti-infectives
 - a. Antibiotics

Generic Name	Form	Indications, dose schedule and duration of drug supply
Flucloxacillin	Capsule	AMH section 5.1.8 ;MIMS Penicillins section:8(a); PCCM pp201-207; CARI: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.1 CDG section 6: pp358-366
Dicloxacillin	Capsule	AMH section 5.1.8; MIMS section: 8(a);CARI: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.1; PCCM pp201-207;
Norfloxacin	Tablet	AMH section 5.1.9; MIMS section 8(e); CARI: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.1 CDG section 6: pp358-366
Cephalexin	Capsule	AMH section 5.1.9; MIMS section: 8(b);CARI: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.1 CDG section 6: pp358-366
Trimethoprim	Tablets	AMH section 5.1.13; MIMS section 8 (g) RDRG section 4.1; CDG section 6: pp358-366

Piperacillin	Injection IV & IP	AMH section 5.1.8; MIMS section: 8(a);CARI: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.1
Ceftriaxone	Injection IV & IP	AMH section 5.1.3; MIMS section: 8(b) ;CARI: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.1
Cephalothin	Injection IV & IP	AMH section 5.1.3; MIMS section: 8(b) ;CARI : Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.1
Vancomycin	Injection IV & IP	AMH section 5.1.4; MIMS section: 8(g) ;CARI: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.1
Gentamycin	Injection IV & IP	AMH section 5.1.1; MIMS section: 8(f); CARI: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.1
Tobramycin	Injection IV & IP	AMH section 5.1.1; MIMS section: 8(f); CARI: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.1
Mupirocin	Topical	AMH section 8.3.3; MIMS section: 15(i); Evidence for Peritonitis Treatment and Prophylaxis; PCCM pp201-207

b. Antifungals

Generic Name	Form	Indications, dose schedule and duration of drug supply
Fluconazole	Capsule	AMH section 5.2.1; MIMS section: 8(h); ;CARI: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.3
Nilstatin	Tablets, lozenge & liquid	AMH section 5.2.2; MIMS section: 8(b) PCCM p180: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.3;
Clotrimazole	Cream& Pessary	AMH section 8.3.1; MIMS section: 8(b); PCCM pp214-219; : Evidence for Peritonitis Treatment and Prophylaxis; CDG section 6: pp449-451
Miconazole	Topical paint & gel	AMH section 8.3.1; MIMS section: 8(b); PCCM pp214-219; PCCM p180
Bifonazole	Topical	AMH section 8.3.1; MIMS section: 8(b); PCCM pp214-219;

c. Anthelmintic, Scabicides and Pediculicides

Generic Name	Form	Indications, dose schedule and duration of drug supply
Mebendazole	Tablet	AMH section 5.6.1; MIMS section: 8(i);PCCM pp282-485
Albendazole	Tablet	AMH section 5.6.1; MIMS section: 8(i);PCCM pp282-485;
Ivermectin	Tablet	AMH section 5.6.2 & section 8.4 PCCM pp282-485 & 214-219; MIMS section: 8(i)
Permethrin	Topical	AMH section 8.4; MIMS section 15(h); PCCM pp220-223

2. Anticoagulants

Generic Name	Form	Indications, dose schedule and duration of drug supply
Aspirin	Tablet	AMH section 3.1; MIMS section 2(k)
Heparin	IV	Haemodialysis anticoagulation: AMH section 7.3.1; MIMS section 2(k)
Enoxaparin	IV	Haemodialysis anticoagulation AMH section 7.3.1 MIMS section 2(k)
Heparinoid	Topical	MIMS section 15(k)

3. Antihypertensives (refers to all drugs in class unless individually named)

Generic Name	Form	Indications, dose schedule and duration of drug supply
Angiotensin converting enzyme inhibitors	Tablet	AMH section 6.4.4; MIMS section 2 (a)
Angiotensin 2 antagonists	Tablet	AMH section 6.4.5; MIMS section 2 (a)
Beta blockers	Tablet	AMH section 6.4.3; MIMS section 2 (a)
Calcium channel blockers	Tablet	AMH section 6.4.6; MIMS section 2 (a)
Methyldopa	Tablet	AMH section 6.4.8 ; MIMS section 2 (a)
Prazosin	Tablet	AMH section 6.4.10; MIMS section 2 (a)
Hydralazine	Tablet	AMH section 6.4.7; MIMS section 2 (a)

4. Diuretics

Generic Name	Form	Indications, dose schedule and duration of drug supply
Hydrochlorothiazide	Tablet	AMH section 6.4.1; MIMS section 2 (c)
Indapamide	Tablet	AMH section 6.4.1; MIMS section 2 (c)
Furosemide	Tablet	AMH section 6.4.1; MIMS section 2 (c)

5. Haematinics

Generic Name	Form	Indications, dose schedule and duration of drug supply
Ferrous sulphate	Tablet	AMH section 7.6 ; MIMS section 21 (i)
Ferrous sulphate with folic acid	Tablet	AMH section 7.6 ; MIMS section 21 (i)
Iron polymaltose	Injection	AMH section 7.6; MIMS section 21 (i); CARI: Biochemical and Haematological targets, Iron, The Townsville Hospital Renal Unit IV iron infusion protocol

6. Vitamins

Generic Name	Form	Indications, dose schedule and duration of drug supply
Ascorbic Acid	Tablet	MIMS section 21(a); CARI: Biochemical and Haematological Targets, Iron; RDRG section 1.3
Vitamin B	Tablet	AMH section 7.5.2; MIMS section 21(e) CARI Biochemical and Haematological Targets; RDRG section 1.3
Folic Acid	Tablet	AMH section 7.5.2; MIMS section 21(e) CARI Biochemical and Haematological Targets; RDRG section 1.3

7. Lipid Lowering Agents

Generic Name	Form	Indications, dose schedule and duration of drug supply
Statins	Tablet	AMH section 6.6.1; MIMS section 2 (f)
Fibrates	Tablet	AMH section 6.6.3; MIMS section 2 (f)

8. Drugs for electrolyte imbalance

Generic Name	Form	Indications, dose schedule and duration of drug supply
Bicarbonate	Capsule	AMH section 7.7.3 & 10.3.2 MIMS section 7(a) CARI Biochemical and Haematological Targets
Sodium Chloride	Tablet	AMH section 7.7.3 MIMS section 19(d) CARI Biochemical and Haematological Targets
Potassium	Tablet	AMH section 7.6.1; MIMS section 19(d) CARI Biochemical and Haematological Targets
Polystyrene Sulphonate resin	Powder Oral & Rectal	AMH section 7.6.1; MIMS section 20(a) CARI Biochemical and Haematological

9. Gout Medications

Generic Name	Form	Indications, dose schedule and duration of drug supply
Allopurinol	Tablet	AMH section 15.3; MIMS section 2 (f)
Colchicine	Tablet	AMH section 15.3; MIMS section 2 (f)

10. Phosphate binders

Generic Name	Form	Indications, dose schedule and duration of drug supply
Calcium Carbonate	Tablet	AMH section 7.6.2; MIMS section 1(a); CARI: Biochemical and Haematological Targets; CARI: Vitamin D, Calcimimetics and Phosphate Binders
Calcium Gluconate	IP Injection	AMH section 7.6.3; CARI: Biochemical and Haematological Targets Guidelines CARI: Vitamin D, Calcimimetics and Phosphate Binders Guidelines
Aluminium Hydroxide	Tablet	AMH section 7.6.2 MIMS section 1(a) CARI Biochemical and Haematological Targets; CARI: Vitamin D, Calcimimetics and Phosphate Binders Guidelines
Magnesium aspartate	Tablet	AMH section 7.6.3 .MIMS section 21(b) CARI Biochemical and Haematological Targets; CARI: Vitamin D, Calcimimetics and Phosphate Binders
Cholecalciferol	Capsule	AMH section 10.3.2; MIMS section 6(g); CARI Biochemical and Haematological Targets ; RDRG section 7.3

11. Local Anaesthetic(for IV cannulation)

Generic Name	Form	Indications, dose schedule and duration of drug supply
Lignocaine 1%	S/c injection	AMH section 2.5.1; MIMS 16(a)
Lignocain & Prilocain	Topical cream	AMH section 2.5.1; MIMS 16(a)

12. Vaccine

Generic Name	Form	Indications, dose schedule and duration of drug supply
Hepatitis B	Vial	AMH section 20.1; MIMS section 10(a); PCCM pp 239-236;

13. Peritoneal Dialysis Fluid

Generic Name	Form	Indications, dose schedule and duration of drug supply
Amino acid PD Solution	IP liquid	MIMS section 16(e); CARI Biochemical and Haematological Targets
Glucose PD Solution	IP liquid	MIMS section 16(e); CARI Biochemical and Haematological Targets
Icodextrin PD Solution	IP liquid	MIMS section 16(e); CARI Biochemical and Haematological Targets
Variable Additive Glucose PD Solution	IP liquid	MIMS section 16(e); CARI Biochemical and Haematological Targets

14. Haemodialysis Solutions

Generic Name	Form	Indications, dose schedule and duration of drug supply
Acid (Part A) Concentrated Electrolyte Solutions	Liquid	On review of bloods CARI Biochemical and Haematological
Sodium Bicarbonate (Part B)	Liquid	On review of monthly bloods CARI Biochemical and Haematological
Sodium bicarbonate (Part B)	Powder pre-packaged cartridges /bags	On review of monthly bloods CARI Biochemical and Haematological
Calcium Gluconate	Powder	On review of monthly bloods CARI Biochemical and Haematological Targets
Calcium Chloride	Liquid	On review of monthly bloods CARI Biochemical and Haematological Targets
Potassium chloride	Prepared Liquid Additive	On review of monthly bloods CARI Biochemical and Haematological
Sodium phosphate monobasic	Pre-packaged liquid	On review of monthly bloods CARI Biochemical and Haematological Targets

15. Analgesics

Generic Name	Form	Indications, dose schedule and duration of drug supply
Paracetamol	Tablet	AMH section 3.1; MIMS section 4(b)
Paracetamol with Codeine	Tablet	AMH section 3.2; MIMS section 4(c)

16. Neuropathic Pain Medications (including treatment of restless leg syndrome)

Generic Name	Form	Indications, dose schedule and duration of drug supply
Carbamazine	Tablet	AMH section 18.4.1; MIMS section 3 (g); RDRG section 12; CARI Biochemical and Haematological Targets
Levodopa	Tablet	AMH section 16.2.1; MIMS section 3 (g); RDRG section

		12; CARI Biochemical and Haematological Targets
Diazepam	Tablet	AMH section 16.1.2; MIMS section 3 (b);RDRG section 13; CARI Biochemical and Haematological Targets
Clonazepam	Tablet	AMH section 16.1.2; MIMS section 3 (b);RDRG section 13; CARI Biochemical and Haematological Targets

17. Drugs for Diabetes

Generic Name	Form	Indications, dose schedule and duration of drug supply
Sulphonylureas	Tablets	AMH section 10.1.1; MIMS section 6 (e); CDG section 6: pp319-323
Metformin	Tablets	AMH section 10.1.1; MIMS section 6 (e); CDG section 6: pp319-323
Insulin	Injection	AMH section 10.1.1; MIMS section 6 (d); CDG section 6: pp319-323

Drug Therapy – Titration and Cessation

Drug groups to be titrated or ceased by Nurse Practitioner

1. Anti-infectives
 - a. Antibiotics
 - b. Antifungals
 - c. Anthelmintics, *Scabicides and Pediculicides*
2. Anticoagulants
3. Antihypertensives
4. Diuretics
5. Local Anaesthetics
6. Analgesics
7. Haematinics
8. Lipid lowering agents
9. Vitamins
10. Drugs for electrolyte Imbalance
11. Calcimimetics and Phosphate binders
12. Antiemetics and laxatives
13. Gout Medications
14. Vaccines
15. Peritoneal Dialysis Fluids
16. Haemodialysis Dialysis Fluids
17. Erythropoietin stimulating agents
18. Drugs for Neuropathic Pain
19. Drugs for Diabetes

1. Anti-infectives

a. Antibiotics

Generic Name	Form	Indications, dose schedule and duration of drug supply
Flucloxacillin	Capsule	AMH section 5.1.8 ;MIMS Penicillins section: 8(a); PCCM pp201-207; CARI: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.1
Dicloxacillin	Capsule	AMH section 5.1.8; MIMS section: 8(a);CARI: Evidence for Peritonitis Treatment and Prophylaxis Guidelines; RDRG section 4.1; PCCM pp201-207

Norfloxacin	Tablet	AMH section 5.1.9; MIMS section 8(e); CARI: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.1
Ciprofloxacin	Capsule	AMH section 5.1.9; MIMS section:8(b);CARI: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.1
Cephalexin	Capsule	AMH section 5.1.3; MIMS section: 8(b) ;CARI: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.1
Piperacillin	Injection IV & IP	AMH section 5.1.8; MIMS section: 8(a);CARI: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.1
Cephalothin	Injection IV & IP	AMH section 5.1.3; MIMS section: 8(b) ;CARI : Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.1
Vancomycin	Injection IV & IP	AMH section 5.1.4; MIMS section: 8(g) ;CARI: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.1
Gentamycin	Injection IV & IP	AMH section 5.1.1; MIMS section:8(f); CARI: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.1
Tobramycin	Injection IV & IP	AMH section 5.1.1; MIMS section: 8(f);CARI: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.1
Ceftriaxone	Injection IV & IP	AMH section 5.1.3 MIMS section:8(b);CARI: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.1
Mupirocin	Topical	AMH section 8.3.3; MIMS section:5(i); Evidence for Peritonitis Treatment and Prophylaxis; PCCM pp201-207

b. Antifungals

Generic Name	Form	Indications, dose schedule and duration of drug supply
Fluconazole	Capsule	AMH section 5.2.1; MIMS section: 8(h);CARI: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.3
Nilstatin	Tablets, lozenge & liquid	AMH section 5.2.2; MIMS section:8(b) PCCM p180: Evidence for Peritonitis Treatment and Prophylaxis; RDRG section 4.3
Clotrimazole	Cream & Pessary	AMH section 8.3.1; MIMS section: 8(b); PCCM pp214-219; : Evidence for Peritonitis Treatment and Prophylaxis; CDG section 6: pp449-451
Miconazole	Topical paint & gel	AMH section 8.3.1; MIMS section: 8(b); PCCM pp214-219; PCCM p180
Bifonazole	Topical	AMH section 8.3.1; MIMS section: 8(b); PCCM pp214-219;

c. Anthelmintic, Scabicides and Pediculicides

Generic Name	Form	Indications, dose schedule and duration of drug supply
Mebendazole	Tablet	AMH section 5.6.1; MIMS section: 8(i);PCCM pp282-485;
Albendazole	Tablet	AMH section 5.6.1; MIMS section: 8(i);PCCM pp282-485;

Ivermectin	Tablet	AMH section 5.6.2 & section 8.4 PCCM pp282-485 & 214-219; MIMS section: 8(i)
Permethrin	Topical	AMH section 8.4; MIMS section 15(h); PCCM pp220-223

2. Anticoagulants

Generic Name	Form	Indications, dose schedule and duration of drug supply
Aspirin	Tablets	AMH section 3.1; MIMS section 2(k)
Heparin	IV	Haemodialysis anticoagulation: AMH section 7.3.1; MIMS section 2(k)
Enoxaparin	IV	Haemodialysis anticoagulation AMH section 7.3.1 MIMS section 2(k)
Heparinoid	Topical	MIMS section 15(k)

3. Antihypertensives (refers to all drugs in class unless individually named)

Generic Name	Form	Indications, dose schedule and duration of drug supply
Angiotensin converting enzyme inhibitors	Tablet	AMH section 6.4.4; MIMS section 2 (a)
Angiotensin 2 antagonists	Tablet	AMH section 6.4.5; MIMS section 2 (a)
Beta blockers	Tablet	AMH section 6.4.3; MIMS section 2 (a)
Calcium channel blockers	Tablet	AMH section 6.4.6; MIMS section 2 (a)
Methyldopa	Tablet	AMH section 6.4.8; MIMS section 2 (a)
Prazosin	Tablet	AMH section 6.4.10; MIMS section 2 (a)
Hydralazine	Tablet	AMH section 6.4.7; MIMS section 2 (a)

4. Diuretics (refers to all drugs in class unless individually named)

Generic Name	Form	Indications, dose schedule and duration of drug supply
Hydrochlorothiazide	Tablet	AMH section 6.4.1; MIMS section 2 (c)
Indapamide	Tablet	AMH section 6.4.1; MIMS section 2 (c)
Furosemide	Tablet	AMH section 6.4.1; MIMS section 2 (c)
Ethacrynic acid	Tablet	AMH section 6.1.1; MIMS section 2 (c)
Chlorthalidone	Tablet	AMH section 6.4.1; MIMS section 2 (c)
Spirolactone	Tablet	AMH section 6.1.1; MIMS section 2 (c)

5. Local Anaesthetic (for IV cannulation)

Generic Name	Form	Indications, dose schedule and duration of drug supply
Lignocaine 1%	S/c injection	AMH section 2.5.1; MIMS 16(a)
Lignocain & Prilocain	Topical cream	AMH section 2.5.1; MIMS 16(a)

6. Analgesics

Generic Name	Form	Indications, dose schedule and duration of drug supply
Paracetamol	Tablets	AMH section 3.1; MIMS section 4(b)
Paracetamol with Codeine	Tablets	AMH section 3.2; MIMS section 4(c)

7. Haematinics

Generic Name	Form	Indications, dose schedule and duration of drug supply
Ferrous sulphate	Tablet	AMH section 7.6; MIMS section 21 (i) CARI Biochemical and Haematological
Ferrous sulphate with folic acid	Tablet	AMH section 7.6; MIMS section 21 (i) CARI Biochemical and Haematological
Iron polymaltose	IV Injection	AMH section 7.6; MIMS section 21 (i); CARI Biochemical and Haematological; The Townsville Hospital Renal Unit intravenous iron infusion protocols
Iron sucrose	IV Injection	AMH section 7.6; MIMS section 21 (i); CARI Biochemical and Haematological; The Townsville Hospital Renal Unit intravenous iron infusion protocols

8. Lipid Lowering Agents

Generic Name	Form	Indications, dose schedule and duration of drug supply
Statins	Tablet	AMH section 6.6.1; MIMS section 2 (f)
Fibrates	Tablet	AMH section 6.6.3; MIMS section 2 (f)

9. Vitamins

Generic Name	Form	Indications, dose schedule and duration of drug supply
Ascorbic Acid	Tablet	MIMS section 21(a); CARI: Biochemical and Haematological Targets Guidelines; RDRG section 1.3
Vitamin B	Tablet	AMH section 7.5.2; MIMS section 21(e); CARI Biochemical and Targets Guidelines; RDRG section 1.3
Folic Acid	Tablet	AMH section 7.5.2; MIMS section 21(e); CARI Biochemical and Haematological Targets Guidelines; RDRG section 1.3

10. Drugs for electrolyte imbalance

Generic Name	Form	Indications, dose schedule and duration of drug supply
Bicarbonate	Capsules	AMH section 7.7.3 & 10.3.2; MIMS section 7(a); CARI Biochemical and Haematological Targets Guidelines
Sodium Chloride	Tablets	AMH section 7.7.3; MIMS section 19(d); CARI Biochemical and Haematological Targets Guidelines
Potassium	Tablet	AMH section 7.6.1; MIMS section 19(d); CARI Biochemical and Haematological Targets Guidelines
Polystyrene Sulphonate resin	Powder Oral & Rectal	AMH section 7.6.1; MIMS section 20(a); CARI Biochemical and Haematological Targets Guidelines

11. Calcimimetics & Phosphate binders

Generic Name	Form	Indications, dose schedule and duration of drug supply
Calcium Carbonate	Tablet	AMH section 7.6.2 MIMS section 1(a); CARI: Biochemical and Haematological Guidelines; CARI: Vitamin D, Calcimimetics and Phosphate Binders
Calcium Gluconate	IP Injection	AMH section 7.6.3; CARI: Biochemical and Haematological Targets Guidelines; CARI: Vitamin D, Calcimimetics and Phosphate Binders

Aluminium Hydroxide	Tablet	AMH section 7.6.2 MIMS section 1(a) CARI Biochemical and Haematological Targets Guidelines; CARI: Vitamin D, Calcimimetics and Phosphate Binders
Magnesium aspartate	Tablet	AMH section 7.6.3 .MIMS section 21(b); CARI Biochemical and Haematological; CARI: Vitamin D, Calcimimetics and Phosphate Binders
Sevelamer	Tablet	AMH section 7.6.2 .MIMS section 21(b) CARI: Biochemical and Haematological Targets Guidelines; CARI: Vitamin D, Calcimimetics and Phosphate Binders
Cinacalcet	Tablet	AMH Section 10.3.3. MIMS section 6(g); RDRG section 7.3; CARI: Biochemical and Haematological Targets; CARI: Vitamin D, Calcimimetics and Phosphate Binders
Cholecalciferol	Capsule	AMH section 10.3.2; MIMS section 6(g); CARI Biochemical and Haematological Targets Guidelines; RDRG section 7.3
Calcitriol	Tablet	AMH section 10.3.2; MIMS section 6(g); CARI Biochemical and Haematological Guidelines; RDRG section 7.3

12. Antiemetics & Laxatives (refers to all drugs in class unless individually named)

Generic Name	Form	Indications, dose schedule and duration of drug supply
Stool softeners	Tablet, capsule liquid, powder & suppository	AMH section 12.4.1; MIMS section 1(c); CARI: Peritoneal Dialysis Guidelines; RDRG section 8.4
Stimulant Laxatives	Tablet, capsule liquid, powder & suppository	AMH section 12.4.2; MIMS section 1(c) ; CARI: Peritoneal Dialysis Guidelines; RDRG section 8.4
Osmotic laxatives	Tablet, capsule liquid, powder & suppository	AMH section 12.4.3; MIMS section 1(c) ; CARI: Peritoneal Dialysis Guidelines; RDRG section 8.4
Bulking Agents	Tablet, capsule, liquid, powder & suppository	AMH section 12.4.4; MIMS section 1(c) ; CARI: Peritoneal Dialysis Guidelines; RDRG section 8.4
Metoclopramide	Tablet, Injection	AMH section 12.2 MIMS section 3(h); RDRG section 8.3

13. Gout Medications

Generic Name	Form	Indications, dose schedule and duration of drug supply
Allopurinol	Tablet	AMH section 15.3; MIMS section 2 (f)
Colchicine	Tablet	AMH section 15.3; MIMS section 2 (f)

14. Vaccine

Generic Name	Form	Indications, dose schedule and duration of drug supply
Hepatitis B	Vial	AMH section 20.1; MIMS section 10(a); PCCM pp 239-236

15. Peritoneal Dialysis Fluid

Generic Name	Form	Indications, dose schedule and duration of drug supply
Amino acid Peritoneal Dialysis	IP liquid	MIMS section 16(e); CARI Biochemical and Haematological Targets Guidelines

Glucose Peritoneal Dialysis Solution	IP liquid	MIMS section 16(e); CARI Biochemical and Haematological Targets Guidelines
Icodextrin Peritoneal Dialysis Solution	IP liquid	MIMS section 16(e); CARI Biochemical and Haematological Targets Guidelines
Variable Additive Glucose Peritoneal Dialysis Solution	IP liquid	MIMS section 16(e); CARI Biochemical and Haematological Targets Guidelines

16. Haemodialysis Solutions

Generic Name	Form	Indications, dose schedule and duration of drug supply
Acid (Part A) Concentrated Electrolyte Solutions	Liquid	On review of bloods CARI Biochemical and Haematological Guidelines
Sodium Bicarbonate (Part B)	Liquid	On review of monthly bloods CARI Biochemical and Haematological
Sodium bicarbonate (Part B)	Powder pre-packaged cartridges/bags	On review of monthly bloods CARI Biochemical and Haematological
Calcium Gluconate	Powder	On review of monthly bloods CARI Biochemical and Haematological Targets
Calcium Chloride	Liquid	On review of monthly bloods CARI Biochemical and Haematological Targets
Potassium chloride	Prepared Liquid Additive	On review of monthly bloods CARI Biochemical and Haematological
Sodium phosphate monobasic	Pre-packaged liquid	On review of monthly bloods CARI Biochemical and Haematological Targets

17. Erythropoietin Stimulating Agents

Generic Name	Form	Indications, dose schedule and duration of drug supply
Darbepoetin alfa	Injections S/c & IV	AMH section 7.5.1; MIMS section 6 (i); CARI Biochemical and Haematological Targets
Epoetin alfa	Injection S/c & IV	AMH section 7.5.1 / MIMS section 6 (i); CARI Biochemical and Haematological Targets
Epoetin beta	Injection S/c & IV	AMH section 7.5.1 / MIMS section 6 (i); CARI Biochemical and Haematological Targets

18. Neuropathic Pain Medications (including treatment of restless leg syndrome)

Generic Name	Form	Indications, dose schedule and duration of drug supply
Carbamazine	Tablet	AMH section 18.4.1; MIMS section 3 (g); RDRG section 12; CARI Biochemical and Haematological Targets
Levodopa	Tablet	AMH section 16.2.1; MIMS section 3 (g); RDRG section 12; CARI Biochemical and Haematological Targets
Diazepam	Tablet	AMH section 16.1.2; MIMS section 3 (b); RDRG section 13; CARI Biochemical and Haematological Targets
Clonazepam	Tablet	AMH section 16.1.2; MIMS section 3 (b); RDRG section 13; CARI Biochemical and Haematological Targets

19. Drugs for Diabetes

Generic Name	Form	Indications, dose schedule and duration of drug supply
Sulphonylureas	Tablets	AMH section 10.1.1; MIMS section 6 (e); CDG section 6: pp319-323
Metformin	Tablets	AMH section 10.1.1; MIMS section 6 (e); CDG section 6: pp319-323
Insulin	Injection	AMH section 10.1.1; MIMS section 6 (d); CDG section 6: pp319-323

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