



THE HEALTH MANAGEMENT PLAN FOR END STAGE KIDNEY DISEASE



The CARI Guidelines
Caring for Australians with Renal Impairment



HUNTER NEW ENGLAND
NSW HEALTH

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These management plans are aimed at achieving the best possible End Stage Kidney Disease (ESKD) care.

This document should not be viewed as a set of rules to be applied without the clinical input and discretion of the managing health professional. Each patient should be evaluated individually and a decision made as to appropriate management in order to achieve optimal clinical outcomes. Each area Health Service is responsible for ensuring the development of local protocols based on these management plans.

Area Health Services are also responsible for ensuring that all staff managing dialysis patients are educated in the use of locally developed wellness check management plans and protocols.

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FOREWORD

Professor Ranjit Nanra
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It is important to have proper management plans that optimise health outcomes in patients with End-Stage Kidney Disease. Therefore, the development of these health management plans for kidney disease, in accordance with CARI guidelines, is a significant step in the delivery of best practice health care in a collaborative manner.

As a Nephrologist, I support these management plans.

Prof Ranjit S Nanra

Associate Professor Rowan Walker
Chair, CARI Guidelines Steering Committee

CARI like other Clinical Practice Guideline Groups is keen to support endeavours aimed at improving patient outcomes. Thus the CARI organisation would support the broad thrust of the document 'Australian Health Management Plan for End Stage Kidney Disease' as a potentially useful tool for the implementation of important evidence-based clinical practice guidelines for patients on dialysis. It will be with considerable interest that the CARI & the nephrological community will wait for the impact of this document and other similar documents on the achievement of CARI targets and more importantly on any improvement in patient outcomes.

A/Prof Rowan Walker
On behalf of the CARI Steering Committee

AMGEN

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INTRODUCTION

aim

To enhance patient centred health promotion strategies in End Stage Kidney Disease (ESKD) patients through a model of care that utilises clinical nursing assessment (EN, RN, and CNS), cost effective investigations, collaborative management (nursing, medical, allied health) and education strategies drawn from evidence based Australian Nephrology Guidelines ('CARI'-Caring for Australians with Renal Impairment). ESKD patients on dialysis require a unified surveillance management plan to maintain their 'wellness'. The management plans should provide an early detection tool for the prevention of further complications resulting from ESKD.

background

The number of Community and Centre (hospital) based dialysis patients is increasing progressively. Nephrology Teams are currently finding it difficult to address patients' needs. Traditional renal care is reactive, complication-managed rather than proactive. By incorporating preventative management through health promotion aimed at patient 'wellness' in this group of patients with complex problems who require multidisciplinary input, many adverse events could be prevented.

ESKD patients assume they should experience poor health and often the staff deem complications the patients experience as inevitable. There are preventative strategies available that could prevent many complications from occurring.

Limited numbers of specialised and experienced renal staff (nurses and nephrologists) has led to the introduction of changes to the nephrology workforce structure. This consists of skill and staff dilution with the addition of Enrolled Nurses, new graduate Nurses on rotation programs and non-renal trained nurses. Awareness and use of evidence based guidelines such as CARI and of cost effective, collaborative approaches to the management of kidney disease is lacking. The expertise needed for proactive treatment is limited.

To ensure maintenance of high standards of collaborative renal care that includes health promotion, appropriate assessment, investigations, multidisciplinary management and education based on evidence based medicine within this changing workforce, a cost effective, unified approach is needed. There are no universal assessment tools for renal staff to provide a guide for clinical assessment in health promotion and prevention strategies

Response

In response to the shortage of specialised renal staff, we are seeing a change to the workforce structure within Nephrology Departments. The services of Nurse Practitioners, Enrolled Nurses, first and second year graduate Registered nurses on rotation programs, and non-renal trained Registered Nurses are now being engaged.

Whilst the quality of care is high, there is a lack of awareness of treatment targets and knowledge of cost-effective investigations. Proactive targeted treatment requires expertise to avoid over-investigating and although nurses cannot formally request investigations, they can influence and prompt decision-making. A tool specific to health promotion in ESKD patients would assist in guiding the process of biological and haematological investigations as well as vascular access surveillance and maintenance of an ideal dry weight.

To ensure that the standard of care is maintained with the changing workforce, a unified and cost effective, evidence based approach to investigative strategies for the dialysis patients is essential.

Solution

A tool that provides a guide for assessment, investigation, management and education for anaemia management, calcium and phosphate management, vascular access management and dry weight assessment has been developed by adapting CARI guidelines into cost effective approaches for 'wellness check' management plans. These plans;

- Embrace workforce changes
- Address cost of care
- Are evidence based
- Improve the current level of care through health promotion

Management plans

These management plans are a guide to a health check rather than a reactive approach to care. They demonstrate a cost effective approach, will allow the detection of complications earlier and therefore ensure appropriate treatment is delivered in advance of complications.

Using the flow charts

The flow charts are preceded by a brief overview of cause and effect. They provide a guide to the process of surveillance, questioning, examination, investigations and management that should/could occur in the routine practice of health promotion in dialysis patients. Any strategy for the care of dialysis patients is a collaborative process that engages the nurse, nephrologist, medical team, GP and allied health team.

The management tool affords guidance for a consistent and ongoing comprehensive assessment of the patient with kidney disease whether or not they have commenced kidney replacement therapy.

Included in the flow charts is the management strategy for nurses. This is to engage dialysis nurses (whether they are the patients primary nurse or not) in health promotion strategies that are within nurses' scope of practice and knowledge.

N.B: These flow charts do not cover all ESKD complications that can occur.

KEY for surveillance flow charts



Nursing management.



Indicates medical officer, nurse practitioner or authorised nurse can order tests.



Symbolises a result. Must be reviewed by medical officer or nurse practitioner.

END STAGE KIDNEY DISEASE MANAGEMENT PLAN AND REVIEW CALENDAR

SURNAME

FIRST NAME

MRN

ADDRESS

DOB

M F

This review calendar is for nurses in dialysis, primary, community and shared care roles, and can be completed by any team member (EN,RN,NP,Doctor, Nephrologist) as per CARI Guidelines or renal protocol for each aspect of the plan.

CARE PLAN	FREQ. per year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Biological & Haematological Targets	Min yearly	/	X	/	/	X	/	/	X	/	/	/	X
Haemoglobin	6												
Iron studies	4												
Phosphate & Calcium	4												
Urea and electrolytes	12												
Lipids	2												
HbA _{1c} (in diabetes only)	4												
Virology screening	PRN												
PTH	4												
Dialysis adequacy													
URR or Kt/V	4												
PET	2												
Vascular access													
Regular review	12												
Duplex	4												
Fluid assessment													
Target weight surveillance	12												
Specialist services													
GP	4												
Psychologist/Psychiatrist	Annual												
Dietitian	2												
Nephrologist	4												
Endocrinologist (in diabetes)	Annual												
Vascular surgeon	PRN												
Optometrist	Annual												
Podiatrist (in diabetes)	Annual												
ECG	Annual												
Dentist	Annual												
Transplant team	PRN												
Cardiologist (if required)	Annual												
Social worker	2												
Echocardiogram	Annual												
Bone density													
Other													
PSA or Pap smear	Annual												
Exit site	12												

RENAL HEALTH CHECK ASSESSMENT TOOL

SURNAME	FIRST NAME	MRN
ADDRESS	DOB	M <input type="checkbox"/> F <input type="checkbox"/>
Aboriginal or TSI Y <input type="checkbox"/> N <input type="checkbox"/>	Spoken language (specify)	Written language (specify)

PERSONAL HEALTH STORY (Circle answer)

Cause of kidney failure

Allergies	Details			
Other illness	Diabetes YES NO	Heart problem YES NO	Breathing problem YES NO	Other YES /NO
Dialysis commence date:		Dialysis modality SYSTEM	HD Home HD NHD APD CAPD CCPD Baxter Fresenius Gambro	Dialysis Incentre undertaken Satellite Home

CURRENT DIALYSIS DATA/PRESCRIPTION (Circle answer)

Mode of dialysis	Ideal (Dry) weight	Vascular Access: AVF Graft Catheter
Ultrafiltration method	Hours of dialysis	Blood flow rate
Dialysate	Additives (circle) K+1 K+2 K+3 Mg++ Glucose	
Anticoagulant:	Load Dose	Hourly dose
Dialyser		

MEDICATIONS

Medication	Dose (last review date)	Rationale

NUTRITION

--	--

SLEEP PATTERN

--	--

ELIMINATION PATTERN

Urine	
Bowels	

ANAEMIA SURVEILLANCE (circle answer)*Observations*

Heart rate at rest			
Respirations	Rate	Effort	
BP			
Skin/mucous membrane colour	Pale	Unchanged	
Chest pain	Yes	No	

Haemoglobin

Date	Onsite Hb monitor	Reported (circle) Yes No GP NP LMO NEPHROLOGIST	Orders
Date	Formal Hb	Reported (circle) Yes No GP NP LMO NEPHROLOGIST	Orders
Date	FBC	Reported (circle) Yes No GP NP LMO NEPHROLOGIST	Orders
Date	Other tests i.e Fe studies	Reported (circle) Yes No GP NP LMO NEPHROLOGIST	Orders

NURSING MANAGEMENT

Information transferred to NP and/or Nephrologist

Patient education	ESKD / Anaemia	
	Anaemia signs and symptoms	
	Anaemia Management	

CALCIUM AND PHOSPHATE SURVEILLANCE (Circle answer)

Adherence to diet	Yes	No	Problems
Adherence to medications	Yes	No	Problems
Skin problems	Yes	No	Describe
Eyes-red	Yes	No	Describe
Headache	Yes	No	Describe
Joint problems	Yes	No	Describe
Any recent GI problems	Yes	No	Describe
Menopausal status			
Parathyroidectomy	Yes	No	Date:
Medications (Phosphate binders, calcium supplements, Vitamin supplement (Name) Vitamin D substances, calcium supplements, calcium channel blockers, calcimimetics)			
Dialysate (calcium component)			
Dialysis hours			

Blood Results

Serum Phosphate	
Corrected (or Ionised Ca++)	
Current diet recommendations	

NURSING MANAGEMENT

Information transferred (circle): Dietitian Nephrologist NP GP	
Patient education	ESKD / Calcium and phosphate Calcium and Phosphate signs and symptoms of abnormality Calcium and Phosphate Management

IDEAL (DRY) WEIGHT SURVEILLANCE

Noticeable weight change	Yes	No		
Dyspnoea	Yes	No		
Orthopnoea	Yes	No		
Cough	Yes	No		
Dizziness	Yes	No		
Hypotensive episodes during dialysis	Yes	No		
Cramping episodes during dialysis	Yes	No		
BP lying and standing pre and post dialysis	Yes	No		
Oedema	Yes	No	Peripheral	Central
Heart rate and sounds				
Lung sounds				
Skin turgor				
Diet review - SGA				

NURSING MANAGEMENT

Information transferred: GP LMO NP Nephrologist	
Patient education	ESKD / Diet, salt and water retention, malnutrition Weight changes- signs and symptoms of abnormality Management of: <ul style="list-style-type: none">• weight changes• thirst

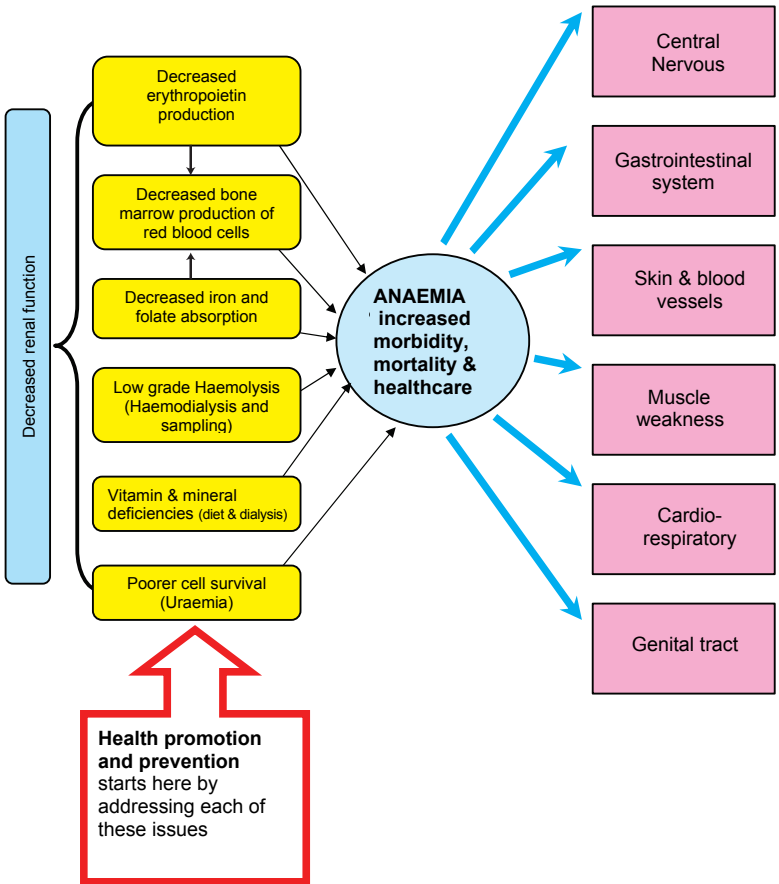
VASCULAR ACCESS SURVEILLANCE

Weekly observational comment (redness, aneurysm, bruising etc)	
Monthly comparison of arterial pressures changes	
Monthly comparison of venous pressures changes	
Monthly recirculation check	
Biannual routine duplex scan	

NURSING MANAGEMENT

Information transferred GP LMO NP Nephrologist	
Patient education	ESKD / need for vascular access Signs and symptoms of access problems Management of access Routine care of access
Develop cannulation plans/strategies	

PATHOPHYSIOLOGY AND CONSEQUENCES OF ANAEMIA



ANAEMIA SURVEILLANCE PLAN

ESKD Receiving renal replacement therapy

Prepare a yearly plan for regular anaemia surveillance. Check Hb monthly initially, then at least 2 monthly (CARI, 2005). Check iron studies at least 3 monthly (CARI 2005) unless ordered otherwise. Sampling should relate to the nephrologist's regular review. For sampling outside routine surveillance, confirm with NP or medical officer.

RATIONALE

- To prevent adverse consequences of anaemia that increase the patient's morbidity & mortality
- To detect modifiable issues early for health promotion & prevention strategies

BEGIN WITH

PATIENT HISTORY

- Respiratory effort and exercise tolerance, any recent changes
- Appetite - recent changes
- Any chest pain
- Current anaemia management

PHYSICAL EXAMINATION

- Heart rate at rest
- Respiratory rate and effort
- Skin and mucous membrane colour

Hb 110-120 if significant CV disease present or likely, OR Hb 120-140 if no significant CV disease (CARI,2005)

Review again as per Surveillance plan

On-site Haemoglobin monitor (g/L).
If no on-site monitor, formal Haemoglobin(g/L)

Hb <110 in CV disease or <120 if no CV disease (CARI, 2005)

MCV<80fl
RDW>16%
(small cells)

Full blood count
[Hb, RDW, MCV]

MCV>100fl
(large cells)

Iron Studies

MCV normal
RDW>16%

MCV normal
RDW normal

B12 & Folate

Review again as per surveillance plan unless otherwise instructed

When acceptable & stable

Refer for management with supporting findings from history & examination

SURVREILLANCE AND INVESTIGATIONS

MANAGEMENT

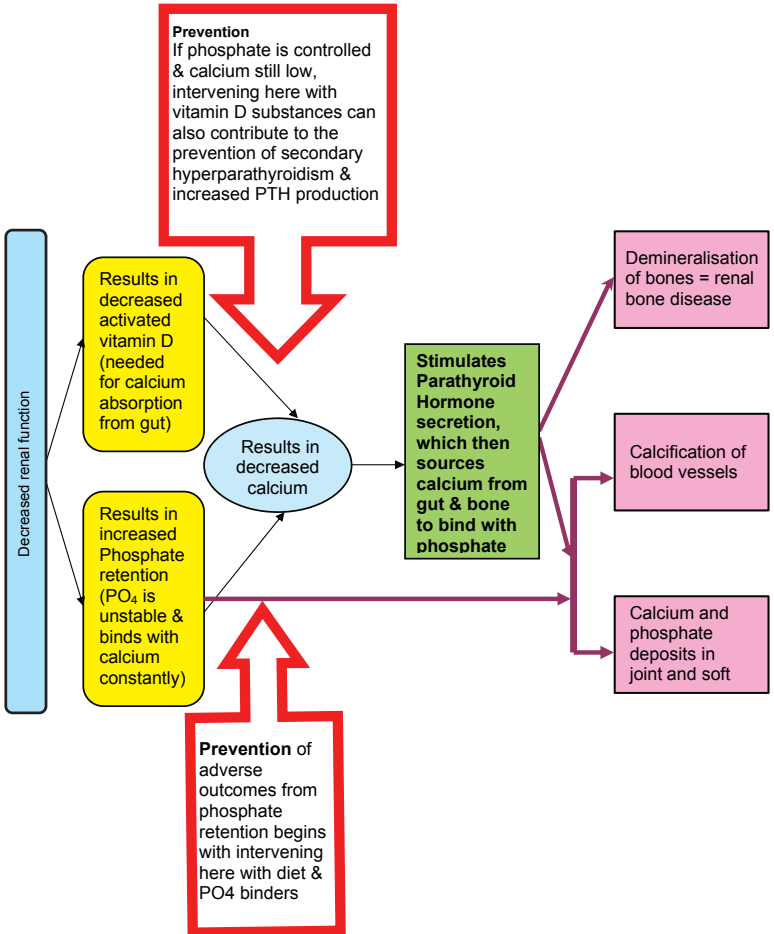
- ### Nursing Management
- Collaborate with nephrologist & NP
 - Encourage adherence with medications
 - Patient education
 - ESKD & anaemia
 - Signs & symptoms
 - Management
 - Ongoing information exchange

- ### Medical Management
- As per CARI and Pharmaceutical Guideline recommendations



Note-any changes in prescribed treatment takes at least 7-28 days to see effect

PATHOPHYSIOLOGY AND CONSEQUENCES OF END STAGE KIDNEY DISEASE ON CALCIUM AND PHOSPHATE



CALCIUM AND PHOSPHATE SURVEILLANCE PLAN

ESKD Receiving renal replacement therapy

Prepare a yearly plan for regular calcium and phosphate surveillance. Predialysis sample and routinely taken (CARI, 2000). Biochemical targets: being updated) unless ordered otherwise. Sampling should relate to the nephrologist's regular review. For sampling outside routine surveillance, confirm with NP or medical officer.

RATIONALE

- To prevent the complications of calcium & phosphate deposits & activation of parathyroid production, which results in, bone disease, calcification of blood vessels and deposits in joints.
- To detect modifiable issues early for health promotion & prevention strategies

BEGIN WITH

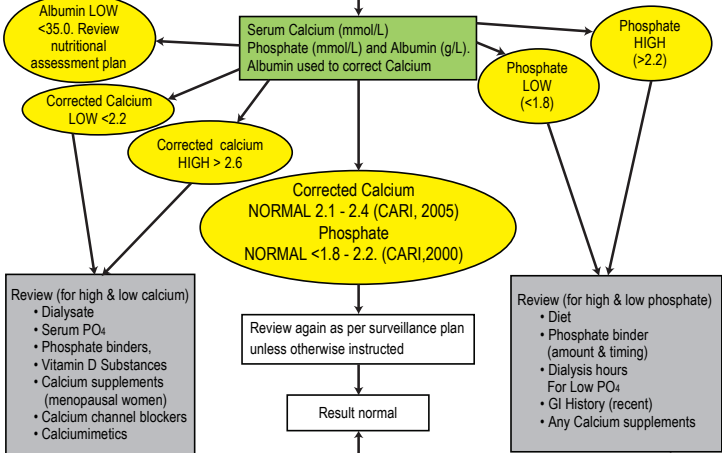
PATIENT HISTORY

- Adherence to diet & medications
- Skin problems
- Headache
- Joint enlargement or bone pain
- History of recent fractures including stress fractures
- Menopausal status
- Current medications including phosphate binders, Vitamin D substances, calcium supplements (menopausal women) calcium channel blockers, calcimimetics

PHYSICAL EXAMINATION

- Skin
- Joints for calcium deposits
- Eyes for redness or inflammation

SURVEILLANCE AND INVESTIGATIONS



MANAGEMENT

Nursing Management

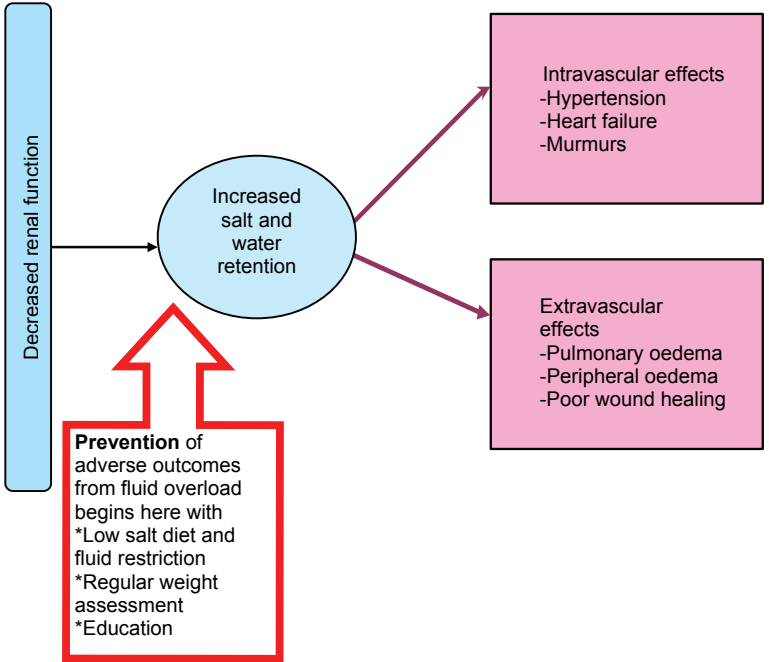
- Collaborate with nephrologist and NP
- Encourage adherence with medications
- Patient education
 - ESKD: calcium and phosphate
 - Signs and symptoms
 - Management
 - Ongoing information exchange

Medical Management

As per CARI and Pharmaceutical Guideline recommendations



PATHOPHYSIOLOGY AND CONSEQUENCES OF FLUID OVERLOAD



IDEAL (DRY) WEIGHT SURVEILLANCE PLAN

ESKD Receiving renal replacement therapy

Prepare a yearly plan for regular ideal, dry weight assessment. Regular weight re-evaluation (CARI, 2005. Dialysis adequacy: HD guidelines) unless ordered otherwise. Sampling should relate to the nephrologist's regular review.
For sampling outside routine surveillance, confirm with NP or medical officer.

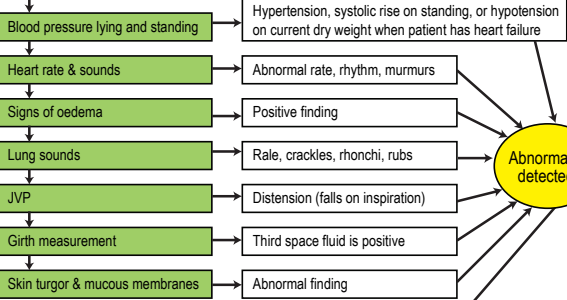
RATIONALE

- To prevent adverse consequences of fluid and nutritional imbalances which increase patients' morbidity & mortality
- To detect modifiable issues early for health promotion and prevention strategies
- Early detection of weight changes that require dietary review or dry weight changes
- To prevent loss of vascular access from dehydration

PATIENT HISTORY

Recent weight changes? Recent hospitalisation?
Current medications Dyspnoea: when?
Orthopnea: is it possible to sleep lying flat?
Dizziness when standing (orthostasis)? (If yes, need to exclude medications and peripheral neuropathy as cause of postural changes)
Response to ultrafiltration: hypotensive episodes or cramping?
Response post dialysis? History of cramps: during or after dialysis?
Cough: productive or non-productive? Visible oedema?
Interdialytic girth changes Clothes fit - any changes?
Diet changes: salt intake, protein intake, fluid intake Clothing attire - weight of clothing (summer/winter weather)

PHYSICAL EXAMINATION



Review again as per surveillance plan or as needed

When dry weight achieved (physical assessment supports new dry weight)

Refer for management with supporting findings from history & examination

Medical Management
As per CARI and Pharmaceutical Guideline recommendations

Nursing Management

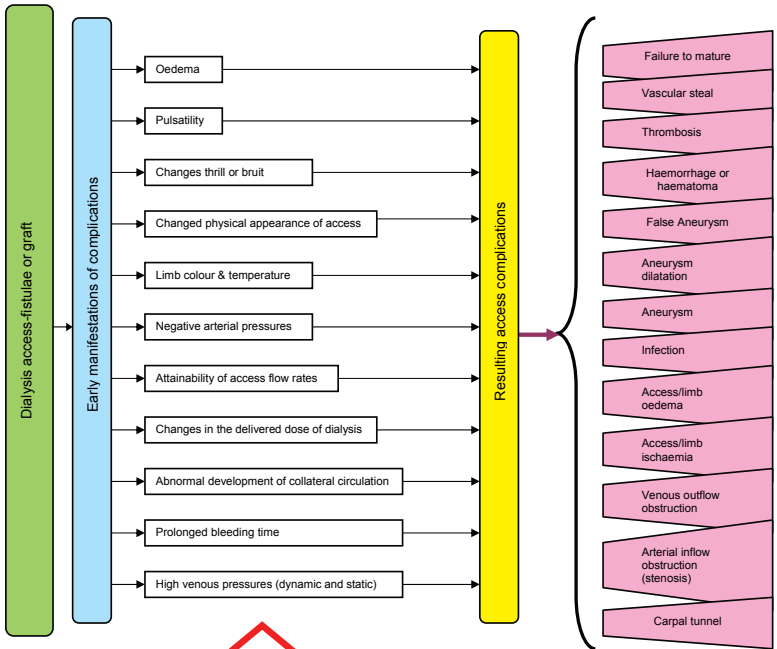
- Collaborate with nephrologist and NP
- Subjective global assessments
- Encourage adherence with medications
- Ultrafiltration strategy to maintain cardiovascular stability
- Patient education
 - ESKD and fluid overload, malnutrition
 - Signs and symptoms
 - Thirst management
 - Ongoing information exchange
 - Diet and food diary



SURVEILLANCE AND INVESTIGATIONS

MANAGEMENT

VASCULAR ACCESS COMPLICATIONS AND MANIFESTATIONS



Prevention is more desirable than dealing with adverse events. Nurses have the skills and technology available to provide thorough surveillance of these accesses and intercede before initial manifestations escalate to adverse events resulting in surgery, sepsis or loss of the access (all increasing the morbidity and mortality of the patient)

VASCULAR ACCESS SURVEILLANCE PLAN

ESKD Receiving renal replacement therapy

Prepare a yearly plan for clinical evaluation of access (CARI 2000, Vascular Access Guideline - Surveillance of venous access: level B evidence).

RATIONALE

- To prevent loss of vascular access
- To detect the manifestations that present prior to a complication
- To detect modifiable issues early for health promotion & prevention strategies

BEGIN WITH

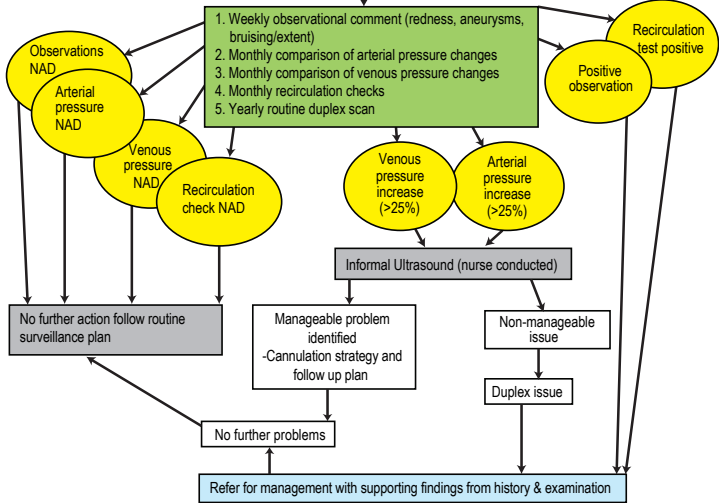
PATIENT HISTORY

- Noted changes in thrill, or visual appearance or pain
- Febrile
- Current medication regimen

PHYSICAL EXAMINATION

Look for any manifestations indicating complications - Oedema, Changes thrill or bruit, pulsatility. Changes to the physical appearance of the access, Changes in the delivered dose of dialysis, Attainability of access flow rates, Negative arterial pressures, High venous pressures (dynamic and static), Abnormal development of collateral circulation, Prolonged bleeding time, limb colour & temperature, Vascular complication Failure to mature, vascular steal, Thrombosis, Haemorrhage or haematoma, False Aneurysm, Aneurysm dilatation, Aneurysm, Infection, Access/limb oedema, Access/limb ischaemia, venous outflow obstruction (stenosis, thrombosis) Arterial inflow obstruction (stenosis, thrombosis), Carpal tunnel

SURVILLANCE AND INVESTIGATIONS



MANAGEMENT

Nursing Management

- Develop cannulation plans/strategies
- Collaborate with nephrologist and NP
- Encourage patient to report change
- Patient education
 - Signs and symptoms
 - Management
 - Ongoing information exchange



Medical Management

As per CARI and Pharmaceutical Guideline recommendations

Other investigations

- Ultrasound examination
- Colour-coded duplex-sonography
- Angiography, •Magnetic resonance angiography (MRA)

APPENDIX 1: MEDICARE BENEFITS SCHEDULE 2006

(<http://www9.health.gov.au/mbs/search>)

Pathology test	Item no.	Fee	Description
Haematology			
Haemoglobin	65060	7.95	Haemoglobin, erythrocyte sedimentation rate, blood viscosity - 1 or more tests
Full blood count	65070	17.20	Erythrocyte count, haematocrit, haemoglobin, calculation or measurement of red cell index or indices, platelet count, leucocyte count and manual or instrument generated differential count
Biochemistry			
1 test from list (eg glucose, ionised calcium)	66500	9.75	Quantitation in serum, plasma, urine or other body fluid of: acetoacetate, acid phosphatase, alanine aminotransferase, albumin, alkaline phosphatase, ammonia, amylase, aspartate aminotransferase, betahydroxybutyrate, bicarbonate, bilirubin (total), bilirubin (any fractions), C-reactive protein, calcium (total or corrected for albumin), chloride, creatine kinase, creatinine, gamma glutamyl transferase, globulin, glucose, lactate, lactate dehydrogenase, lipase, magnesium, phosphate, potassium, pyruvate, sodium, total protein, urate or urea
2 tests from list (eg Calcium and Phosphate)	66503	11.75	
3 tests	66506	13.75	
4 tests (eg liver function tests)	66509	15.75	
5 tests (eg Urea and electrolytes)	66512	17.80	
6 or more tests	66515	19.80	
Vitamin D	66608	41.70	Vitamin D or D fractions - 1 or more tests
Beta 2 microglobulin	66629	19.90	Quantitation in serum, urine or other body fluids - 1 or more tests
Serum B12	66599	24.35	Serum B12 or red cell folate and, if required, serum folate (Item is subject to rule 23)
Iron studies	66596	36.70	Quantitation of: (a) serum iron; (b) transferrin or iron binding capacity; and (c) ferritin
Lipids (fasting)	66539	31.15	Patient who: (a) has a serum cholesterol level >5.5mmol/L; or (b) has a fasting serum triglyceride level > 2.0 mmol/L; or (c) is on a lipid lowering drug prescribed by a medical practitioner; each episode to a maximum of 4 episodes in a 12 month period (Item is subject to rule 9)
HbA _{1c}	66551	17.10	Quantitation of glycosylated haemoglobin performed in the management of established diabetes - each test to a maximum of 4 tests in a 12 month period
Beta-2 microglobulin	66629	20.50	Quantitation in serum, urine or other body fluids: - 1 or more tests

Pathology test	Item no.	Fee	Description
PTH (1 test)	66695	30.70	Quantitation of hormones and hormone binding proteins - ACTH, aldosterone, androstenedione, C-peptide, calcitonin, cortisol, cyclic AMP, DHEAS, 11-deoxycortisol, dihydrotestosterone, FSH, gastrin, glucagon, growth hormone, hydroxyprogesterone, insulin, LH, oestradiol, oestrone, progesterone, prolactin, PTH, renin, sex hormone binding globulin, somatomedin C(IGF-1), free or total testosterone, urine steroid fraction or fractions, vasoactive intestinal peptide, vasopressin (ADH)
Homocysteine	66752	25.10	Quantitation of citrate, oxalate, total free fatty acids or amino acids including cysteine, homocysteine, cystine and hydroxyproline
Virology screen			
Hepatitis screen	69462	29.45	Determination of immune status to Hepatitis B and testing for Hepatitis C, including: (a) Hepatitis C antibody test; and (b)Hepatitis B core antibody test or Hepatitis B surface antibody test
Other			
Pap smear		17.80	
Microalbuminuria		19.90	Microalbumin in proven diabetes mellitus - quantitation in urine - 1 or more tests
PSA (1 test)	66656	20.50	Prostate specific antigen - quantitation in the monitoring of previously diagnosed prostatic disease

APPENDIX 2: ACKNOWLEDGEMENTS

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APPENDIX 3: REFERENCES

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CARI guidelines online. www.cari.org.au

Northern Territory Chronic Disease Management Plan. 2004.

Medicare Benefits Schedule <http://www9.health.gov.au/mbs/search> (accessed 28.3.06)

Additional copies of this book are available from

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