The St. George Hospital

Departments of Renal Medicine/Nutrition and Dietetics

Nutrition Protocols for the Management of People with Renal Failure

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This document has been developed by the Nephrologists and Dietitians of The St George Hospital, Kogarah NSW

These protocols are only intended to provide general guidelines for the dietary management of patients with Renal Failure. Each patient will receive an individualised diet prescription and education by the dietitian.
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A. **Common Nutritional Goals For Renal Disease Management:**

- To attain and maintain optimal nutritional status.  
  (This includes general good nutrition with optimal energy and balanced intake of all essential nutrients.)

- To attain and maintain ideal body weight (IBW) and lean body mass (LBM).

- Prevention of malnutrition and undesirable change of body weight.

- Control of uraemia and related symptoms.

- To maintain fluid and electrolyte balance.

- Control of hypertension.

- Control of lipid abnormalities.

- Control of hyperphosphataemia.

- To possibly slow the progression of renal failure (in non-dialysis CRF).

- Optimal glycaemic control (in patients with diabetes).

- To encourage regular exercise and physical activities.
B. Guidelines and Policy for Referrals (both inpatient and outpatients)

All patients are to be assessed and counselled by the dietitian according to guidelines in sections C and E or individual variations as per nephrologist.

1. By Medical Officer referral only:

   Documentation of referral from AMO is required to initiate dietary intervention of the following:

   - Early/moderate/advanced renal failure, in particular a **protein restricted diet**.
   - Nephrotic Syndrome
   - Acute Renal Failure
   - Renal Calculi/metabolic disorders
   - Others: e.g. diabetes, hypertension, weight, lipid, sodium and fluid management in patients who do not have renal impairment.

2. Blanket Referral:

   - CKD clinic
   - Dialysis – Haemodialysis and Peritoneal Dialysis (CAPD, APD and IPD)
   - Transplantation.
C. Guidelines and Policy of Nutrition Related Issues

- Medication Used
  
  - Phosphate binders:

  Patients are to be educated to control their Phosphorus intake (if applicable) and to take the phosphate binders as prescribed by their AMO. If any extra phosphate binders are required for in-between meal supplementary snacks and fluids, the dietitian should refer the patients to their AMO to adjust the dosage and timing of the binders used.

  - Oral hypoglycaemic agents (OHAs) and insulin:

  Adjusting OHAs or insulin dosage may be required when incorporating renal and diabetic diet therapy, for example inclusion of simple carbohydrate may be required for diabetic patients to meet their energy requirements. The dietitian should liaise with the AMO re adjusting their OHAs or insulin accordingly.

- Vitamin and Mineral Supplements

  All vitamins and minerals are to be prescribed by the AMO. The recommended levels of supplementation are described in Section E. In special conditions which alter the vitamin and mineral requirements, e.g. poor oral intake, wound healing, burns, malabsorption, pregnancy etc., the dietitian should liaise with the AMO re prescribing the appropriate supplements.

D. Abbreviations Used

BMI - Body Mass Index
CKD – Chronic Kidney Disease
CHO - Carbohydrate
/d - per day
GFR - Glomerular Filtration Rate
HBV - High Biological Value
IBW - Ideal body weight (for height)
nPCR - normalised Protein Catabolic Rate
RDI - Recommended daily intake (for healthy Australian)
URR - Urea Reduction Ratio
E. Nutrition Management Protocols

1. Hypertension (General)

Referral: Medical Officer referral required.

Remarks: The guidelines below are applicable to people with or without renal impairment. However, dietary prescription must be adjusted according to the individual's conditions, e.g. hyperkalaemia, hyperphosphataemia, diabetes etc.

Dietary Protocol:

In General: Healthy eating as per Dietary Approaches to Stop Hypertension (DASH) recommendations (see reference) and Australian Dietary Guidelines.

Energy: Aim to attain and maintain IBW
Overweight patients may need weight reduction to aid blood pressure control.

Sodium: No added salt diet, 80-100 mmol/d Na+.

Alcohol: No more than 2 standard drinks per day or advised by AMO.

Increased Consumption of: Fruit, vegetables and low fat dairy products for increased intake of potassium, magnesium, calcium and fibre.

Moderate Consumption of: Protein

Decreased Consumption of: Saturated fat, total fat and cholesterol.
2. **Early Renal Failure**

**Description:**
- Stage 1-2 CKD
- Asymptomatic

**Referral:** Medical Officer referral required

**Remarks:** Use of **dietary protein restriction** is **not** recommended.

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**Dietary Protocol:**

**In General:** Healthy eating as per Australian Dietary Guidelines.

**Protein:** Usually no restriction.

**Energy:**
- 35-45 Kcal (150-190KJ)/kg IBW/d
- 30-35 Kcal (130-150KJ)/kg IBW/d for individuals 60 years of age or older.
  Aim to attain and maintain IBW
  Overweight patients may need weight reduction to aid blood pressure control.

**Sodium:** If hypertension or oedema present:
- Approximately 80mmol/d (no added salt)
  - may need lower sodium intake if severe oedema present
  - may need higher sodium intake in patients with salt-losing nephropathy.

**Lipids:** If hyperlipidaemia present:
- Cholesterol <300mg/d
- Saturated fat <10% of energy.
3. Moderate Renal Failure

Description:
- Stage 3 CKD

Referral: Medical Officer referral required.

Dietary Protocol:

In General: Healthy Eating as per dietary guidelines.

Protein: If a restricted protein diet is required:
Approximately 0.75g/kg IBW/d (Australian RDI) or level as requested by AMO
Approximately 70% HBV protein.

Energy: 35-45kcal(150-190KJ)/kg IBW/d
30-35 Kcal (130-150KJ)/Kg IBW/d for individuals 60 years of age or older.
Aim to attain and maintain IBW.

Overweight patients may need weight reduction to aid blood pressure control.

Sodium: Approximately 80mmol/d (no added salt)
- may need lower sodium intake if hypertension and/or oedema is a problem
- may need higher sodium intake in patients with salt-losing nephropathy.

Potassium: No restriction unless hyperkalaemia present
40-70mmol/d if restriction required.

Phosphorus: <1000mg/d if hyperphosphataemia present.

Lipids: Cholesterol <300mg/d
Saturated fat <10% of energy.

Other Vitamins & Minerals intake: near RDI

Vitamins & Minerals (supplementation): May need individualised Calcium, Iron and Vitamin D supplementation. May need supplementation of Vitamin B complex, Vitamin C and folate acid near RDI levels if protein intake is <60g/day.

Fluid: UO + 500ml/d, depending on balance.
4. Advanced Renal Failure (Pre-Dialysis)

Description:
- Stage 4-5 CKD
- Symptomatic

Referral: Medical Officer referral required or from “Blanket referral of the CKD clinic"

Dietary Protocol:

Protein: Approximately 0.6g/kg IBW/d (or as requested by AMO)
Approximately 70% HBV protein.

Energy: 35-45 kcal (150-190KJ)/kg IBW/d
30-35 Kcal (130-150KJ)/kg IBW/d for individuals 60 years or older.

Aim to attain and maintain IBW
- energy from CHO approximately 50-60%
- energy from Fat approximately 30-35%.

Sodium: Approximately 80mmol/d (no added salt)
- may need lower intake if oedema present
- may need higher sodium intake in patients with salt-losing nephropathy.

Potassium: No restriction unless hyperkalaemia present
40-70mmol/d if restriction required.

Phosphorus: <800mg/d if hyper phosphataemia present.

Lipids: Cholesterol <300mg/d
Saturated fat <10% of energy.

Other Vitamins & Minerals intake: near RDI

Vitamins & Minerals (supplementation): Individualized Calcium, Iron and Vitamin D. May need supplementation of Vitamin B complex, Vitamin C and folate acid if protein intake is <60g/day.

Fluid: Depending on balance and/or severity of oedema if present. Restriction as documented by medical officer.
5. **Nephrotic Syndrome**

**Referral:** Medical Officer referral required.

**Additional Goals in Dietary Management:**

1. Control of proteinuria.
2. Control of fluid balance.
3. Control of lipid abnormalities.

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**Dietary Protocol:**

**Protein:** Depends on the degree of renal function, usually no dietary protein modification required.

Remark – high protein diet as recommended in the past is no longer considered beneficial.

If dietary protein modification required:
0.8-1.0g/kg IBW/d approximately 70% HBV protein
Lower protein diet – 0.6-0.8g/kg IBW/d (or level as advised by AMO) may be indicated in patients with progressive renal failure.

**Energy:**

35-45kcal(150-190KJ)/kg IBW/d
30-35 Kcal (130-150KJ)/kg IBW/d for individuals 60 years of age or older.
Aim to attain and maintain IBW.
Patients on steroid therapy may need to control body weight.

**Sodium:**

If severe oedema present, approximately 50mmol/d (low sodium).
Otherwise 80-100 mmol/d (no added salt)

**Calcium:**

Patients on steroid therapy require adequate calcium intake (>RDI ie. 800-1000mg/d).

**Lipids:**

Cholesterol <300mg/d
Saturated fat <10% of energy.

**Fluid:**

Restriction as documented by medical officer.
6. Acute Renal Failure

Referral: Medical Officer referral required

Dietary Protocol:

Non-Dialysed: See dietary protocol for Advanced CRF (4).

Haemodialysis
Or CVVHD:

Energy & Higher requirements for malnourished and hypercatabolic Protein: patients to prevent negative nitrogen balance. (See guidelines on next page).

Sodium: Individualised
Anuric or oliguric phase, 60-80mmol/d
Polyuric phase, no restriction or higher intake to replace urinary losses.

Potassium: Individualised
If hyperkalaemia present, 40-70mmol/d
Polyuric phase – may need high K⁺ diet.

Vitamins & Minerals: As per advanced CRF and Haemodialysis protocols (4 & 7).

Fluid: 500ml + losses, generally UO
Restriction as documented by medical officer.
Calculation of daily energy requirements in ARF:

**CALCULATION OF DAILY CALORIE NEEDS**

A) Calculated Resting Energy Expenditure: Modified from the Harris-Benedict Equation

Males (Kcal/d): \[66.47 + 13.75W + 5.0H – 6.76A\]

Females (Kcal/d): \[655 + 9.56W + 1.85H – 4.6A\]

W = weight in kilograms; H = height in centimetres; A = age in years

Total Calorie Needs = Calculated Resting Energy Expenditure \times Activity Factor \times Injury Factor

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<th>ACTIVITY FACTOR</th>
<th>INJURY FACTOR</th>
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<td>Surgery</td>
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<td>Minor 1.2</td>
</tr>
<tr>
<td>Ambulatory</td>
<td>Major 1.3</td>
</tr>
<tr>
<td>1.3</td>
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B) Measured Resting Energy Expenditure: Indirect Calorimetry

This involves measurement of:

- Oxygen Consumption (VO$_2$ mL/min)
- Carbon Dioxide Production (VCO$_2$ mL/min)

And subsequent calculations using the Weir formula.

Abbreviated Weir Formula

\[3.9 \text{ VO}_2 + 1.1 \text{ VCO}_2 = \text{Kcal/min} \times 1,440 = \text{Kcal/d}\]

Extracted from: Nutrition in ARF. A Reappraisal for 1990’s.
7. Haemodialysis (Stage 5 CKD)

Referral: Blanket referral.

Dietary Protocol:

**Protein:** 1.2-1.4g/kg IBW/d (depending on type of dialyser used)

To aim:
- nPCR ~1.1-1.2g/kg IBW/d
- URR ≥ 65%
- pre-dialysis urea ~ 25 mmol/l

Higher requirements for malnourished patient (~1.5g/kg IBW/d)

Approximately 60-70% HBV protein.

**Energy:** 35-45kcal(150-190KJ)/kg IBW/d
  30-35kcal(130-150KJ)/kg IBW/d for individuals 60 years of age or older.

Aim to attain and maintain IBW
- energy from CHO approximately 50-60%
- energy from Fat approximately 30-35%.

**Sodium:** ~80mmol/d (no added salt).

**Potassium:** Restricted if hyperkalaemia present, 40-70mmol/d.

**Phosphorus:** <1000mg/d plus the use of phosphate binders.

**Lipids:** Cholesterol <300mg/d
  Saturated fat <10% energy.

**Other Vitamins & Minerals intake:** RDI levels

**Vitamins & Minerals: (supplementation):**

Vitamin B complex and Vitamin C and folic acid near the RDI levels. Individualised Vitamin D, Iron and Calcium supplement

**Fluid:** 500ml + previous day losses
Aim <0.5kg/d fluid gain, ie. <2-2.5kg interdialytic fluid gain.
8. Peritoneal Dialysis (Stage 5): Continuous Ambulatory Peritoneal Dialysis (CAPD)

Referral: Blanket referral.

Addition Goals of Dietary Management:
High protein diet to replace high peritoneal protein loss.

Dietary Protocol:

Protein: 1.3 -1.5g/kg IBW/d
Approximately 60-70% HBV.

Maintenance – 1.2g/kg IBW/d
Repletion or peritonitis – 1.5g/kg IBW/d
To aim serum urea ~20-25 mmol/l
nPCR ~1.2g-1.5g/kg IBW/d

Energy: Total energy from oral intake and dialysate:
35-45kcal(150-190KJ)/kg IBW/d & 30-35 Kcal (130-150KJ)/kg IBW/d for individuals 60 years of age or older.
On average, glucose absorption from dialysate provides ~500kcal/day. So recommend oral intake:
25-35kcal (105-150KJ)/kg IBW/d & 20-30kcal (80-120KJ)/kg IBW/d for individuals 60 years of age or older.
Aim to attain and maintain IBW
Weight control may be required in view of high absorption of glucose.

Sodium: Approximately 80mmol/d (no added salt), lower if hypertensive.

Potassium: Restricted if hyperkalaemia present, 40-70mmol/d
High potassium diet if hypokalaemia present.
(Remarks: clearance of potassium in CAPD is usually good and potassium restriction is not usually needed)

Phosphorus: <1200mg/day plus the use of phosphate binders.

Lipids: Cholesterol <300mg/d
Saturated fat <10% energy.

Other Vitamins & Minerals intake: RDI levels

Vitamins & Minerals: Vitamin B complex and Vitamin C and folic acid near the RDI levels. Individualised Vitamin D, Iron and Calcium supplement (supplementation):

Fluid: Depending on balance (usually 1,000-1,500ml/d).
9. Peritoneal Dialysis (Stage 5): Automated Peritoneal Dialysis (APD) 
also known as Continuous Cyclic Peritoneal Dialysis (CCPD)

Referral: Blanket referral.

Goals of Dietary Management:

As per CAPD.

Dietary Protocol:

Protein: 

Energy: 

Sodium: 

Potassium: *

Phosphorus: as for CAPD protocol

Lipids: 

Vitamins & Minerals: 

Fluid: 

Remark: To monitor serum K+ as potassium restriction is often needed in APD 
due to the nature of the procedure – night dialysis only.
10. Peritoneal Dialysis (Stage 5): Intermittent Peritoneal Dialysis (IPD)

Referral: Blanket referral.

Goals of Nutritional Management:

As per CAPD

Remark: – this procedure has rarely been performed in SGH over last few years. It is usually used in patients needing respite care and attending hospital PD. – The literature has suggested different diets for dialysis and inter-dialysis days.* However, to minimise confusion to patients, the following diet prescription will be implemented for all days.

Dietary Protocol for Dialysis and Inter-dialysis Days:

<table>
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<th></th>
<th>Dialysis Day (usually in Hospital)</th>
<th>Inter-dialysis Days (home)</th>
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<tbody>
<tr>
<td><strong>Protein</strong></td>
<td>1.2-1.5g/kg IBW/d</td>
<td>0.8g/kg IBW/d</td>
</tr>
<tr>
<td><strong>Energy</strong></td>
<td>As per CAPD</td>
<td>35kcal/kg IBW/d</td>
</tr>
<tr>
<td><strong>Sodium</strong></td>
<td>Normal, unless hypertensive</td>
<td>Usually ~80mmol/d (no added salt) depending on blood pressure</td>
</tr>
<tr>
<td><strong>Potassium</strong></td>
<td>Normal, unrestricted</td>
<td>If hyperkalaemia present, 40-70 mmol/d</td>
</tr>
<tr>
<td><strong>Phosphorus</strong></td>
<td>1200mg/d</td>
<td>&lt;800mg/d</td>
</tr>
<tr>
<td><strong>Lipids</strong></td>
<td>As for CAPD</td>
<td>As for CAPD</td>
</tr>
<tr>
<td><strong>Vitamins &amp; Minerals</strong></td>
<td>As for CAPD</td>
<td>As for CAPD</td>
</tr>
<tr>
<td><strong>Fluid</strong></td>
<td>Depending on balance. Restricted as advised by RMO</td>
<td>Previous day losses + 500ml</td>
</tr>
</tbody>
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* Suggested guidelines from literature:
11. Renal Transplant

Referral: Blanket referral.

1. Immediate Post-Transplant (about 6 weeks)

   Pre-transplant diet (see haemodialysis or CAPD protocol) and protein and energy requirement as below until graft functions.

   For patient with a functional graft:

   Protein: 1.3-1.5g/kg IBW/d
   Energy: 30-48 kcal (120-200KJ)/kg IBW/d
   Remarks: "Immuno-compromised diet"
   To practice strict food hygiene and to avoid foods that may have high bacteria counts in view of immunosuppressant therapy.

2. Chronic Post-Transplant Phase

   In General: Healthy and balanced eating as per Australian Dietary Guidelines.

   Energy: To maintain a BMI between 20-25.

   Protein: Approximately 15% total energy.

   Fat: <30% total energy
   Cholesterol <300mg/d
   Saturated fat <10% energy.

   CHO: 50-60% total energy, encourage high complex CHO intake.

   Calcium: Approximately 1200-1500mg/d.

   Phosphorus: Approximately 1200-1500mg/d.

   Sodium: Restricted if hypertension present, i.e. 80-100 mmol/d.

   Potassium: Patients on Cyclosporine A may need K+ restriction if serum K+ is elevated.
12. Metabolic Disorders (Renal Related)

Referral: Medical Officer referral required.

Common Dietary Protocol:

1. Maintain adequate energy intake and a balanced intake of nutrients.

2. **Fluid:** High and regular fluid intake, about 2.0-3.0 L/d, preferably **WATER**, to produce at least 2 litres urine per day. Regular intake throughout the day, say second hourly. If suggested by the MO, drink enough fluid at bed-time to aim for nocturia, and to consume extra fluid after voiding.

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1. **Hypercalciuria:**

   - **Calcium:** Approximately 800mg/d (Australian RDI)
     **Remark:** Dietary calcium restriction is no longer found to be useful. A low calcium diet may lead to negative Ca\(^{2+}\) balance.

   - **Protein:** Usually no dietary modification
     **Remark:** High protein intake may increase urinary calcium losses.

   - **Sodium:** Approximately 80mmol/d, i.e. no added salt.

   - **Fibre:** High fibre diet, i.e. 30-40g fibre/d.

2. **Hyperoxaluria:**

   - **Oxalate:** Low Oxalate diet, i.e. 60-70mg oxalate/d.

   - **Calcium:** Approximately 800mg/d (Aust. RDI)
     **Remark:** Dietary calcium restriction is no longer found to be beneficial as it enhances oxalate absorption and excretion and will therefore increase urinary oxalate.

   - **Protein:**
   - **Sodium:** As per hypercalciuria
   - **Fibre:**

   - **Vitamin C:** Avoid supplementation

   - **Vitamin D:** Avoid supplementation

   - **Pyridoxine:** As prescribed by AMO
3. **Hyperuricosuria:**

   - **Purine:** Low purine diet
     Optimal protein food intake to avoid excess purine intake.
   - **Energy:** Aim to attain and maintain IBW. Overweight patients require weight reduction.
   - **Sodium:** Approximately 80mmol/d (no added salt).
   - **Alcohol:** Limit alcoholic beverages or use sparingly.

4. **Cystinuria**

   - **Protein:** Normal intake
     A low methionine diet is not applicable as it is restrictive and impractical.
13. **Nutritional Support**

**Nutritional Support may be indicated when:**

1. Poor nutritional status is indicated by unintentional loss of body weight, abnormal nutrition parameters, e.g. total protein, albumin etc.

2. Nutritional requirements cannot be met by food and beverage consumption.

3. Increased in nutritional requirements, e.g. catabolism, wound healing, post-surgical stress, malabsorption etc.

**Routes of Nutritional Support:**

1. First line of action is oral nutrition supplementation.

2. If oral nutrition supplementation fails, liaise with AMO re indication for enteral feeding.

3. Other routes of nutritional support to be "ordered" by the AMO if appropriate:
   - Intradialytic Parenteral Nutrition (IDPN) for HD patients.
   - Intraperitoneal amino acid (IPAA) dialysate for CAPD patients.
14. Renal Diagnostic Test Diets

<table>
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<tr>
<th>TEST</th>
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<tbody>
<tr>
<td>Vanillylmandelic acid (VMA)</td>
<td>No special diet</td>
</tr>
<tr>
<td>Renin Study</td>
<td>No special diet</td>
</tr>
</tbody>
</table>
References

General References

1. CARI – Caring for Australasians with Renal Impairment Guidelines
2. The National Kidney Foundation Kidney Disease Outcomes Quality Initiative
3. Evidence Based Practice Guidelines for Nutritional Management of Chronic
   Kidney Disease. Dietitians Association of Australia. Journal of Nutrition and
   Dietetics Vol.63, Supp.2, 2006 S35–S45
4. Clinical Practice Guidelines for Nutrition in Chronic Renal Failure, American
5. Kopple JD & Massry SG, Nutritional Management of Renal Disease, Williams &
   Wilkins 1997.
   2002.
7. A clinical guide to nutrition in End Stage Renal Disease, 2nd Edition, The
   American Dietetics Association 1994.

Hypertension

1. Harsha D. W. et.al. Dietary Approaches to Stop Hypertension, a summary of
   study results. Journal of the American Dietetics Association 1999;99 (supp): S35-
   S39.
2. Vogt T. et.al. Dietary Approaches to Stop Hypertension - various articles in the

Pre-Dialysis CRF

1. Kopple J.D., Nutritional Management of non-dialysized patient with CRF. Kopple
   JD & Massry SG, Nutritional Management of Renal Disease, Williams & Wilkins
   1997, Chapter 17
2. Walsher M. et.al. Should protein intake be restricted in predialysis patients?
3. Burgess E. Conservative treatment to slow deterioration of renal function.
   Evidence-based recommendations, Kidney International Vol. 55 Suppl. 70 (1999)
   SS17-SS25.
4. Kasiske B.L. et.al. A Meta - Analysis of the Effects of Dietary Protein Restriction
5. Delahanty, L. Implications of the Diabetes Control and Complications Trial for
   8, No 2, April 1998 pp 158-161.
7. Hadfield c. The Nutritional Adequacy of Low Protein Diet, J. Renal Nutrition,
   1992;2 (3) suppl. 37-41.
**Nephrotic Syndrome**


**Acute Renal Failure**


**Haemodialysis**


**CAPD**


**Transplantation**


**Vitamins & Minerals**

1. Chazot, C. & Kopple JD, Vitamin Metabolism and requirements in Renal Disease and Renal Failure, Kopple JD & Massry SG, Nutritional Management of Renal Disease, Williams & Wilkins 1997, Chapter 15 & 16.


**Nutritional Support**


**Metabolic Disorders**