

# Outcome Models and Care Pathways for Renal Dietetics

Renal Nutrition Group Outcomes Working Group

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### Contents

Page	Contents
2	Clinical Outcomes Model for Oral Nutrition Support in Pre Dialysis and Dialysis Patients
6	Clinical Outcomes Model for Management of Serum Phosphate in Pre-dialysis and Dialysis Patients
10	Clinical Outcomes Model for Management of Serum Potassium in Pre-dialysis and Dialysis Patients
14	Dietetic Care Pathway for Management of Undernutrition in Patients with Chronic Kidney Disease
15	Dietetic Care Pathway for Management of Phosphate in Patients with Chronic Kidney Disease
16	Dietetic Care Pathway for Management of Potassium in Patients with Chronic Kidney Disease

# **BDA RNG:** Clinical Outcomes Model for Oral Nutrition Support in Pre-Dialysis and Dialysis Patients

#### Outcome (end point)

To achieve and maintain a measurable improvement in nutritional status using one or more of the following nutritional markers:

- 3 or 7 point SGA scale
- Dry Weight
- Body Mass Index (BMI)
- % weight change in 3 or 6 months
- Mid arm muscle circumference (MAMC)
- Tricep skinfold (TSF)
- Handgrip strength

Note: These are the most common markers used in assessment of renal patients. However this list is not exhaustive and other methods to assess nutritional status can be used.

#### Timeframe

To achieve and maintain a measurable improvement in nutritional status using within \_\_\_\_\_ months (or following initial dietetic assessment/advice and \_\_\_\_ dietetic reviews).

\*Refer to the appropriate care pathway for guidance.

#### **Rationale for Outcome**

#### Current recommendations for energy intake:

CKD 4-5 (not on dialysis): 30-35 kcals/kg ideal body weight/d<sup>1</sup> Haemodialysis: 30-40 kcals/kg ideal body weight/d<sup>2</sup> Peritoneal Dialysis: 30-35 kcals/kg/d in non-obese (taking into account energy derived from peritoneal glucose absorption)<sup>1,2</sup>

#### Current recommendations for protein intake:

CKD 4-5 (not on dialysis): 0.75g/kg ideal body weight/d<sup>1</sup> Haemodialysis: Minimum 1.1g/kg ideal body weight/d<sup>4</sup> Peritoneal Dialysis: Minimum 1.0-1.2g/kg ideal body weight/d<sup>4</sup>

Protein-energy wasting is a strong predictor for increased morbidity and mortality and decreased quality of life in patients undergoing maintenance dialysis<sup>5-14</sup>. It is also recognised that patients nearing end stage renal failure may be at risk of deteriorating nutritional status as energy intake may spontaneously reduce with reducing glomerular filtration rate and increasing uraemic symptoms<sup>15</sup>. Furthermore a poorer nutritional status prior to starting dialysis increases risk of mortality<sup>16</sup>.

Nutrition support including the use of oral nutritional supplements, enteral tube feeding and intra-dialytic parenteral nutrition has been shown to improve anthropometric markers, biochemical markers and dietary intake in patients with chronic kidney disease<sup>17-20</sup>. This in turn may improve long-term clinical outcomes. Best practice guidance on the use of nutrition support in chronic kidney disease with a step-by-step pathway has been produced by the Renal Nutrition Group of the British Dietetic Association<sup>21</sup>.

Category	Goal	Code	Indicator with suggested tools
Anthropometry	To increase dry weight	G10	Dry weight
	To prevent loss of dry weight	G11	Dry weight
	To maintain or improve BMI	G8	BMI
	To improve or maintain MUAMC	G9	MUAMC
Clinical	To reduce frequency of (diet related) symptoms e.g. itching, dry mouth, bowel function	G4	Patient reported frequency and severity of symptoms Bristol stool scale Visual analogue scale Waterlow Pressure Ulcer Score
	To improve or maintain level of physical function) e.g. handgrip, ADLs	G5	Patient reported ADL's Handgrip strength <u>Examples:</u> Duke Activity Status Index (DASI) Handgrip dynamometer
Dietary intake	To meet estimated energy and/or protein requirements	G1	Patient reported oral intake Examples: Diet history Food Frequency Questionnaire
	To increase dietary protein and/or energy intake	G2	Patient reported oral intake Examples: Diet history Food Frequency Questionnaire
	To achieve agreed dietary change(s)	G14	Patient reported oral intake Examples: Diet history Food Frequency Questionnaire
Environmental, behavioural and social <b>Knowledge</b> <b>Knowledge</b>	To increase knowledge and understanding benefits of dietary advice	G12	Able to state benefits of dietary advice
	To increase knowledge and understanding of how to make dietary change(s)	G13	Able to identify/state ways of increasing energy and/or protein intake Able to state prescribed oral nutritional supplements

Environmental, behavioural	To increase or maintain adherence with agreed dietary change(s)	G15	Patient reported motivation/change in behaviour
and social Motivation	To increase or maintain adherence with prescribed products	G16	Patient reports taking oral nutritional supplements as recommended/ prescribed
Patient choice	To achieve patient's chosen/identified goal	G17	Patient's own choice goal PROMS tools eg Outcome STARs

#### Intervention and Plan

The Renal Dietitian will provide a specific intervention and plan that is individual to the patient and will help them to achieve the goals jointly agreed on.

This should include a plan for follow-up if required.

#### **Guidelines and References**

#### **Guidelines:**

- 1. UK Renal Association. Nutrition in CKD Clinical Practice Guidelines. 2009.
- Fouque D, Vennegoor M, Wee PT, Wanner C, Basci A, Canaud B et al. EPBG Guideline on Nutrition. *Nephrology, Dialysis and Transplantation* 2007; 22 S2: ii45-ii87
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# BDA RNG: Clinical Outcomes Model for Management of Serum Phosphate in Pre-dialysis and Dialysis Patients

#### Outcome (end point)

To achieve and maintain target serum phosphate level within nationally agreed target ranges whilst ensuring an adequate dietary protein intake

#### Timeframe

To achieve and maintain target serum phosphate level (and an adequate dietary protein intake) within \_\_\_\_\_ months (or following initial dietetic assessment and advice and \_\_\_\_ dietetic reviews.)

\*Refer to the appropriate care pathway for guidance.

#### **Rationale for Outcome**

High serum phosphate levels in patients with CKD are associated with hyperparathyroidism, mineral and bone disorder, increased vascular calcification, cardiovascular events and increased mortality.

Low serum phosphate levels and low dietary protein intakes in patients with CKD are associated with increased mortality and protein energy wasting.

NICE recommends that the initial management of hyperphosphataemia should be provided by a specialist renal Dietitian, who should give individualised information and advice on dietary phosphate management. It is important to ensure that the patient maintains an adequate protein intake when reducing their dietary phosphate intake. The patient should receive support and guidance to increase their dietary knowledge on foods high in phosphate and foods that contain phosphate additives. Appropriate food choices, together with the use of appropriate medication for phosphate control where necessary, should lead to lower incidence of hyperparathyroidism, CKD MBD and CVD.

#### An adequate dietary protein intake whilst achieving a serum phosphate level within an acceptable range should reduce the risk of mortality and morbidity in patients with CKD

#### Current recommended target range for serum phosphate:

- CKD 3b-5 (not on dialysis) 0.9-1.5 mmol/l <sup>2,5</sup>
- CKD 5D 1.1-1.7mmol/l <sup>2,5</sup> (measured before a "short gap" dialysis session in HD)

#### Current recommended target range for dietary protein intake:

- CKD 4-5 (not on dialysis): 0.75g/kg ideal body weight/d<sup>6</sup>
- Haemodialysis: Minimum 1.1g/kg ideal body weight/d<sup>1</sup>
- Peritoneal Dialysis: Minimum 1.0-1.2g/kg ideal body weight/d<sup>1</sup>

Category	Goal	Code	Indicator with suggested tools
Anthropometry	To increase dry weight	G10	Dry weight
Biochemistry	To achieve serum phosphate within target range	G7	Serum phosphate level
Clinical/Physical	To reduce frequency of (diet related) symptoms e.g itching	G4	Patient reported level of symptoms: itching or red eyes
Dietary Intake	To meet estimated energy and/or protein requirements	G1	Patient reported oral intake <u>Examples:</u> Diet history Food Frequency Questionnaire
	To achieve recommended dietary phosphate intake	G3	Assessment of dietary protein intake and phosphate intake
Environmental, behavioural and social <b>Knowledge</b>	To increase knowledge and understanding of benefits of dietary advice	G12	Knowledge questionnaire e.g. state 3 foods (ETDNA)
	To increase knowledge and understanding of how to make dietary change(s)	G13	
Environmental, behavioural and social <b>Motivation</b>	To increase or maintain adherence with agreed dietary change(s)	G15	Patient reported motivation / change in behavior
	To achieve agreed dietary change(s)	G14	0-10 0-10 0-10 0-10
	To increase or maintain adherence with prescribed product(s)	G16	Patient reported taking correct dose of binders etc at correct time
Patient Experience	Patient's chosen goal or Client's identified goal	G17	Patient's own choice goal PROMS tools eg Outcome STARs

Plan		

The Renal Dietitian will provide specific intervention that is individual to the patient and will help them to achieve the outcome jointly agreed.

This should include a plan for follow up if required.

#### References

#### **Current Relevant Guidelines**

- 1. BDA Renal Nutrition Group. *Evidence Based Dietetic Guidelines: Protein Requirements Of Adults On Haemodialysis And Peritoneal Dialysis*.2011
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# BDA RNG: Clinical Outcomes Model for management of Serum Potassium in Pre-dialysis and Dialysis Patients

#### **Outcome (end point)**

To achieve and maintain target serum potassium levels within nationally agreed target ranges.

#### Timeframe

To achieve and maintain target serum potassium levels within \_\_\_\_\_ months (or following initial dietetic assessment and advice and \_\_\_\_ dietetic reviews). \*Refer to the appropriate care pathway for guidance.

#### **Rationale for Outcome**

There is a significant risk for cardiac arrhythmias during both hypo- and hyperkalaemia. <sup>3-5</sup>

Both pre-dialysis hypokalaemia <sup>6</sup> and hyperkalaemia <sup>6,7</sup> have been shown to have associations with higher mortality in maintenance haemodialysis patients.

Pre-dialysis hyperkalaemia is associated with higher all-cause and cardiovascular mortality in patients who are on maintenance heamodialysis.<sup>8</sup> Hyperkalaemia may contribute to 2-5% of deaths among end stage renal failure patients and accounts for up to 24% of emergency heamodialysis sessions in these patients.<sup>9-11</sup>

#### Current recommended target range for serum potassium:

- **CKD 3b-5** (not on dialysis): None available therefore use hospital/trust recommendations or best practice.
- CKD 5D Haemodialysis: 3.5-6.0 mmols/l<sup>1</sup> (measured before a "short gap" dialysis session on HD)<sup>1</sup>.

Peritoneal Dialysis: 3.5-5.5 mmols/l.<sup>2</sup>

Category	Goal	Code	Indicator with suggested tools
Anthropometry	To increase dry weight	G10	Dry weight
Biochemistry	To achieve serum potassium within target range	G6	Serum potassium level
Clinical/Physical	To reduce frequency of (diet related) symptoms eg itching, dry mouth, bowel function	G4	Patient reported symptoms eg muscle cramps/ weakness Clinical reports of diastolic dysfunction etc.
Dietary Intake	To meet estimated energy and/or protein requirements	G1	Patient reported oral intake Examples: Diet history Food Frequency Questionnaire
	To achieve recommended dietary potassium intake	G3	Assessment of dietary protein intake and potassium intake
Environmental, behavioural and social <b>Knowledge</b>	To increase knowledge and understanding of benefits of dietary advice	G12	Knowledge questionnaire e.g. state 3 foods (ETDNA)
	To increase knowledge and understanding of how to make dietary change(s)	G13	
En úran en tel	To increase or maintain adherence with agreed dietary change(s)	G15	Patient reported motivation / change in behavior Importance scaling 0-10 Confidence scaling 0-10
behavioural and social Motivation	To achieve agreed dietary change(s)	G14	
Patient Experience	Patient's chosen goal or Client's identified goal	G17	Patient's own choice goal PROMS tools eg Outcome STARs

#### Intervention and Plan

The Renal Dietitian will provide specific intervention that is individual to the patient and will help them to achieve the outcome jointly agreed.

This should include a plan for follow up if required.

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#### **References: Potassium and Mortality Outcomes**

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#### Dietetic Care Pathway for Management of Undernutrition in Patients with Chronic Kidney Disease



#### Dietetic Care Pathway for Management of Phosphate in Patients with Chronic Kidney Disease





#### Dietetic Care Pathway for Management of Potassium in Patients with Chronic Kidney Disease



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