Adult Refeeding Syndrome Clinical Guideline

1. Guiding Principles

The purpose of this guideline is to establish minimum practice standards for the care and management of refeeding syndrome in adults throughout the WA Country Health Service (WACHS).

Refeeding syndrome (RFS) is a potentially fatal shift in fluids and electrolytes that may occur in severely malnourished or starved patients when first re-introduced to feeding¹ either via oral, enteral or parenteral routes. The condition typically appears in the first days of refeeding and is potentially fatal if not recognised promptly¹.

The primary feature of RFS is hypophosphatemia however other biochemical disturbances that may also occur include hypokalaemia and hypomagnesaemia; disorders of sodium and fluid balance; changes in glucose, protein, and fat metabolism and thiamine deficiency².

The clinical manifestations of RFS occur as a result of the functional deficits of electrolytes and vitamins and the rapid change in basal metabolic rate. There is a spectrum associated with these clinical features which are patient specific ranging from asymptomatic cases to life threatening symptoms. Low levels of these electrolytes and vitamins can manifest into clinical conditions listed in Appendix 1.

2. Guideline

A multi-disciplinary approach to the management of RFS is essential. The Dietitian, Medical Officer (MO), Nursing and Pharmacy staff should work together to manage patients with RFS. Critical points for management include:

i. Recognize patients at risk (refer to 2.1) and assess level of RFS risk (refer to 2.2)
   - Once patients have been identified as a refeeding risk they should be referred to a Dietitian for full nutritional assessment and Medical Officer for medical work up
   - Dietitian/ Medical Officer to assess level of refeeding risk.

ii. Screen/monitor for electrolyte deficiency and replacement (prior to feeding where possible)
   - Before the initiation of nutrition support, the treating Medical Officer is to order biochemistry for kidney function (UEC), calcium/magnesium/phosphate, Full Blood Count (FBC), Liver function tests (LFTs).
   - Medical Officer to prescribe thiamine prior to commencing any nutrition support and then prescribe daily along with a multivitamin and trace element supplements (refer to 2.5)
• The treating Medical Officer is to supplement and/or correct biochemistry levels as indicated. It is not necessary to correct electrolyte levels before starting feeding. However, blood levels of potassium, magnesium, calcium and phosphate should be measured daily and aggressively corrected as feeding proceeds.

• Cardiac monitoring should be considered if the patient requires IV supplementation or at extreme risk of RFS.

iii. Gradual Feeding: increase based on resolution of symptoms and biochemistry (refer to 2.4)

• Dietitian to prescribe nutrition support according to nutrition assessment, risk level and choice of nutrition support route (oral, enteral or parenteral)

• Feeding to be slow and gradual under guidance of Dietitian and treating medical team

• Strict fluid balance monitoring. The treating Medical Officer is to correct any fluid imbalances. Careful rehydration is important in RFS as many patients are dehydrated. The ideal is to maintain a zero fluid balance to reduce the risk of pulmonary oedema.

Note: Please refer to WAEDOCS guidelines for specific guidelines for management of RFS in eating disorder patients

2.1 Screening for RFS
On admission, patients should have their nutrition and hydration status assessed and documented by nursing or medical staff. This is documented on:

• MR111 WACHS Nursing Admission, Screening and Assessment Tool - Adults
• RC5 Resident Admission Assessment Form
• MR60.1.5 WACHS Malnutrition Screening Tool (MST)

Please refer to the Nutrition Clinical Practice Standard for more information on nutrition screening and assessment. All patients at risk of malnutrition and refeeding are referred to the Dietitian for full nutrition assessment and nutrition care planning.

Identifying at risk patients for RFS
There are well documented patient groups who are at risk of RFS, where undernutrition may be a predominant factor:

• Anorexia nervosa
• Chronic Alcoholism and/or other drug abuse
• Oncology patients
• Post-operative patients
• Frail elderly patients (with low BMI)
• Uncontrolled diabetes
• Long term antacid and diuretic users
- Patients with chronic malnutrition
- Prolonged fasting, or chronically low intake
- Morbid obesity with rapid weight loss
- High stress patient unfed for >7 days
- Malabsorptive syndromes (inflammatory bowel disease, chronic pancreatitis, cystic fibrosis, short bowel syndrome).

When considering patients at high risk of RFS, the following criteria should be used:

<table>
<thead>
<tr>
<th>One or more of the following:</th>
<th>Two or more of the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Body Mass Index (BMI) less than 16kg/m²</td>
<td>• Body Mass Index (BMI) of less than 18.5kg/m²</td>
</tr>
<tr>
<td>• Unintentional weight loss greater than 15% in past 3-6 months</td>
<td>• Unintentional weight loss greater than 10% in past 3-6 months</td>
</tr>
<tr>
<td>• Little or no nutritional intake for more than 10 days</td>
<td>• Little or no nutritional intake for more than 5 days</td>
</tr>
<tr>
<td>• Low levels of potassium, phosphate or magnesium prior to feeding.</td>
<td>• History of alcohol or drug misuse, including insulin, chemotherapy, antacids or diuretics.</td>
</tr>
</tbody>
</table>

### 2.2 Assessment of RFS clinical risk

The level of clinical risk associated with RFS is compounded by pre-existing nutritional status. Refer to Table One (1) below to assess level of risk with RFS.

<table>
<thead>
<tr>
<th></th>
<th>Moderate RFS²,⁴</th>
<th>High Risk RFS¹,⁵</th>
<th>Extreme Risk RFS¹,⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>BMI &lt;20kg/m²</td>
<td>BMI &lt;18.5kg/m²</td>
<td>BMI &lt;14kg/m²</td>
</tr>
<tr>
<td>Weight loss</td>
<td>Unintentional weight loss &gt;5% within 3-6 months</td>
<td>Unintentional weight loss &gt;10% within 3-6 months</td>
<td>Unintentional weight loss &gt;10% within 3-6 months</td>
</tr>
<tr>
<td>Intake</td>
<td>Very little or no food intake for &gt;5 days</td>
<td>Very little or no food intake for &gt;5 days</td>
<td>Negligible intake for &gt;15 days</td>
</tr>
<tr>
<td>Biochemistry</td>
<td>Levels within normal limits</td>
<td>Low levels potassium, phosphate or magnesium prior to feeding</td>
<td>Low levels potassium, phosphate or magnesium prior to feeding</td>
</tr>
</tbody>
</table>

Table One (1): Identifying level of risk associated RFS

Referral to the Dietitian is required to undertake a full nutrition assessment of the patient’s clinical risks associated with their level of RFS. Please refer to Appendix 2 for details of multiple factors to consider when completing nutritional assessments².
2.3 Oral Nutrition Support

The goal of nutrition support in patients at risk of RFS is to reach estimated nutritional requirements while minimising metabolic and clinical complications, and maintaining normal biochemistry. In patients identified as refeeding (excluding patients with Anorexia Nervosa) the rate of energy repletion should be based on the assessed severity of the patient’s malnutrition prior to refeeding as per Dietitians recommendations.

It is recommended:

- Feeding is only commenced once nutrition and laboratory assessments have been carried out.
- Feeding is commenced under strict supervision of a Dietitian where possible (for afterhours / weekends, please refer to If Dietitian is not available within 24-48hrs)
- Oral diet should be encouraged initially. This includes a small ward diet as tolerated based on meeting recommended energy requirements as outlined in Table Two below. The Dietitian may prescribe a special meal plan for the patient to meet their requirements through oral diet.
- No food is to be provided from outside the hospital.
- Commence oral nutrition sip supplements only if diet is not tolerated and at the discretion of the Dietitian and Medical Officer.
- Oral nutrition sip supplements are to be low in energy (ie 1cal/ml); examples of 1cal/ml oral nutrition sip supplements include Sustagen® RTD, Resource Protein, Glucerna
- Oral nutrition sip supplements should be increased after assessment of oral intake and meeting recommended energy requirements as outlined in Table Two below.

See Table Two (2) below for recommendations regarding starting nutrition support requirements and increasing levels slowly to meet patient’s nutritional needs.

<table>
<thead>
<tr>
<th>Grading of Nutrition</th>
<th>Moderate risk</th>
<th>High risk</th>
<th>Extremely risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days 1 and 2</td>
<td>50% requirements Or 20kcal/kgIBW/day (84kJ/kgIBW/day)</td>
<td>10kcal/kg/day (42kJ/kgIBW/day)</td>
<td>5kcal/kg/day (21kJ/kgIBW/day)</td>
</tr>
<tr>
<td>Day 3+</td>
<td>Increase as per clinical condition and biochemistry until requirements met</td>
<td>Increase by 21kJ/kgIBW/day as per clinical condition and biochemistry until requirements met</td>
<td>Increase by 21kJ/kgIBW/day as per clinical condition and biochemistry until requirements met</td>
</tr>
</tbody>
</table>

Table Two (2) : Nutrition support recommendations

Note: If underweight use current weight not IBW
Estimating protein requirements for patients at risk of RFS²

Current literature indicates it is suitable to aim for protein intakes of 1.2 - 1.5g/kg/day in patients at risk of RFS, although some patients may have increased (eg. severe trauma, severe burns) or decreased protein requirements (eg. renal failure with uraemia)³.

If a Dietitian is not available within 24-48 hours⁶:

- Order the patient small meal serves from the standard hospital diet with no snacks or desserts, and no food is to be provided from outside the hospital
- Do not provide any oral nutrition sip supplements to the patient.
- If the patient requires enteral feeding, refer to Appendix 10: Adult After Hours Enteral Feeding Regimen in the WACHS Enteral Tubes and Feeding – Adult Clinical Practice Standard

2.4 Enteral or Parenteral Feeding:

If the patient requires enteral or parenteral feeding, please refer to WACHS Enteral Tubes and Feeding – Adult Clinical Practice Standard or WACHS Total Parenteral Nutrition Clinical Practice Standard for establishing feeding and refer to the Dietitian. Nutrition support should also be introduced cautiously in patients requiring enteral or parenteral feeding who present with refeeding risk⁴.

Enteral feeding:

- Administer enteral feed continuously via pump over 24 hours
- It should be started at no more than 50% of the estimated target energy and protein needs, and gradually increase according to metabolic and gastrointestinal tolerance⁴
- Suggested starting rates: 30ml/hr and grade up 10ml every 12 hours until reach target rate OR as per Dietitian feeding plan.

Parenteral feeding (PN):

- PN should only be started after careful consideration and planning by the medical team, with consultation with the Dietitian and Pharmacy.
- Suggested starting rates: 20ml/hr for 24 hours or 42kJ/kg IBW/day OR as per Dietitian’s feeding plan.

Do not discontinue feeding if biochemistry levels fall. Electrolytes cannot be successfully corrected without nutritional provision. However, where serum potassium, magnesium or phosphate levels are significantly low, feeding should not be advanced further until supplementation has occurred⁵.
2.5 Vitamin and Electrolyte Supplementation

**Multivitamin**

Patients at *risk/ high risk* of RFS should commence a balanced daily multivitamin and trace element supplement\(^6\) for the first 10 days of refeeding or until nutrition support provides the recommended intake of micronutrients \(^1,\ 2-4\). Patients with malabsorption (from conditions such as gastrointestinal surgeries, chronic pancreatitis or cystic fibrosis) may benefit from IV administration; for example:

- 5ml multivitamin vial/day and 10ml vial/day trace element (Refer to local guidelines or [MiMS online](#) for advice on how to administer)

**Thiamine**

Thiamine is an essential co-enzyme in carbohydrate metabolism, and deficiency can result in Wernicke-Korsakoff encephalopathy if patients are fed carbohydrate when deficient in thiamine. Chronic alcohol intake is a high risk factor for thiamine deficiency, as it reduces absorption of oral thiamine as well as impairing the utilisation of thiamine due to decreased production of thiamine related enzymes.

Medical officer to prescribe thiamine *before* starting nutrition support\(^5\):

- At risk patients:
  - Thiamine 200-300mg oral/ enteral for first 10 days\(^1,\ 4,\ 6\)

- High/very high risk:
  - Thiamine 200mg IV TDS for 3 days then 100mg oral/enteral once daily\(^2\)

- Please note IV route is more appropriate for patients with a history of alcohol abuse / Wernicke’s. Dose may vary between 200mg-500mg IV TDS depending on the patient and clinical decision by the medical officer\(^1,\ 9\).

**Electrolyte Replacement Therapy**\(^1,\ 4,\ 10,\ 11\)

For patients with electrolyte deficits, feeding can still be commenced immediately, but with caution and supervision. If there is evidence of severe deficiency, then it is recommended to withhold nutrition and replace electrolytes over 1-2 days\(^3\).

<table>
<thead>
<tr>
<th>Electrolyte</th>
<th>Range(^1)</th>
<th>Estimated requirement(^4)</th>
<th>Examples of Preparations(^6)</th>
<th>Administration Guide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium</td>
<td>3.5-5.1 mmol/L</td>
<td>2-4mmol/kg/day</td>
<td>Chlorvescent tabs(^®) : 14mmol/tab</td>
<td>WACHS High Risk Medications Procedure</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Slow release potassium tab: 8mmol/tab</td>
<td>WACHS Specialised Medication - Potassium Supply Policy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>IV: Potassium Chloride 10mmol /100mL premixed bags</td>
<td></td>
</tr>
<tr>
<td>Magnesium</td>
<td>0.77–1.33 mmol/L</td>
<td>0.2mmol/L/kg/day intravenously OR 0.4mmol/L/kg/day</td>
<td>Magnesium 400mg capsule : 16.5mmol/capsule /capsule IV: Magnesium Sulfate</td>
<td>WACHS High Risk Medications Procedure</td>
</tr>
</tbody>
</table>
These can be given orally, enterally or IV based on clinical presentation of the patient.

Please refer to the following standard clinical resources for more information on administration of the above electrolytes:


### 2.6 Monitoring of nutritional clinical indicators with RFS

Below is the recommended monitoring frequency for clinical indicators in patients at risk and/or who have been identified as refeeding. More frequent monitoring may be indicated in the initial days of nutrition repletion, especially in patients who manifest symptoms of hypophosphataemia².

<table>
<thead>
<tr>
<th>Clinical Indicator</th>
<th>Frequency of Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>UEC</td>
<td>Baseline, daily until patient is clinically stable, then 1-2 times / week</td>
</tr>
<tr>
<td>LFTs and albumin</td>
<td>Baseline, twice weekly until stable and then weekly Albumin weekly after baseline</td>
</tr>
<tr>
<td>FBC</td>
<td>Baseline, then 1-2 times / week</td>
</tr>
<tr>
<td>Calcium, magnesium, phosphate</td>
<td>Baseline, daily until patient is clinically stable and then weekly</td>
</tr>
<tr>
<td>Blood sugar levels</td>
<td>4 hourly until patient is clinically stable; then as clinically indicated ie 1-2 times per day</td>
</tr>
<tr>
<td>Vitals (heart rate, blood pressure, respiratory rates)</td>
<td>4 hourly or QID</td>
</tr>
<tr>
<td>Weight</td>
<td>Daily body weights until fluid balance is stable</td>
</tr>
</tbody>
</table>
### 3. Definitions

<table>
<thead>
<tr>
<th>Carer</th>
<th>A person who provides personal care, support and assistance to another individual who needs it because they have a disability, a medical condition (including a terminal or chronic illness) or a mental illness, or are frail and/or aged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient</td>
<td>A person who is receiving care in a health service organisation</td>
</tr>
<tr>
<td>Wenicke’s Encephalopathy</td>
<td>A condition caused by thiamine deficiency, in which a person has one or more of: acute confusion, coma, reduced consciousness, memory disturbances, ataxia, nystagmus, ophthalmoplegia, hypothermia or unexplained hypotension.</td>
</tr>
<tr>
<td>Malnutrition</td>
<td>Malnutrition refers to deficiencies, excesses or imbalances in a person’s intake of energy and/or nutrients. The term malnutrition covers 2 broad groups of conditions. One is ‘undernutrition’—which includes stunting (low height for age), wasting (low weight for height), underweight (low weight for age) and micronutrient deficiencies or insufficiencies (a lack of important vitamins and minerals). The other is overweight, obesity and diet-related non-communicable diseases (such as heart disease, stroke, diabetes and cancer).</td>
</tr>
</tbody>
</table>

### 4. Roles and Responsibilities

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All Staff are required to work within policies and guidelines to make sure that WACHS is a safe, equitable and positive place to be.

<table>
<thead>
<tr>
<th>Role</th>
<th>Responsibilities</th>
</tr>
</thead>
</table>
| **Medical Officer** | • Considers the patient’s mental and physical ability to feed  
|                  | • Requests daily pathology                                                      
|                  | • Prescribes micronutrient and electrolyte supplementation.                     |
| **Nursing Staff** | • Performs nutrition screening in collaboration with the MDT  
|                  | • Coordinate protected meal times and facilitate food/oral nutrition sip supplements intake  
|                  | • Monitor diet intake as per Dietitian request, including completing strict food intake charts  
|                  | • Completes fluid balance charts, stool charts and monitors weight as requested  
|                  | • Monitors the patient closely for signs and symptoms of RFS  
|                  | • Deliver and monitor enteral/parenteral nutrition.                             |
| **Dietitian**    | • Performs nutrition assessment  
|                  | • Identify status of RFS risk and coordinates care with treating medical team and pharmacist  
|                  | • Plans and sets goals for nutrition support in liaison with MDT and patient  
|                  | • Prescribes therapeutic diets and oral nutrition supplements  
|                  | • Prescribes and monitors of enteral/parenteral nutrition  
|                  | • Educates patients and significant other(s)/carers  
|                  | • Liaises with catering department and members of the MDT  
|                  | • Organises nutrition support for discharge  
|                  | • Provides health service staff education regarding refeeding, nutrition and screening. |
| **Pharmacist**   | • Advises on the prescription of micronutrient and electrolyte supplementation  
|                  | • Advises on parenteral nutrition composition and compatibilities  
|                  | • Ensures supply of parenteral nutrition solutions  
|                  | • Advises on drug nutrient interactions and drug delivery.                      |
5. Compliance

Failure to comply with this policy document may constitute a breach of the WA Health Code of Conduct (Code). The Code is part of the Employment Policy Framework issued pursuant to section 26 of the Health Services Act 2016 (WA) and is binding on all WACHS staff which for this purpose includes trainees, students, volunteers, researchers, contractors for service (including all visiting health professionals and agency staff) and persons delivering training or education within WACHS.

WACHS staff are reminded that compliance with all policies is mandatory.

6. Records Management

Records Management Policy
Health Record Management Policy

7. Evaluation

Review of this document is to be carried out by WACHS Dietetic Area Coordinator, every five (5) years using the following means or tools:
- Review with key stakeholders

8. Standards

National Safety and Quality Health Service Standards: 1.7, 1.8, 1.27, 5.27, 5.28

9. Legislation

( Accessible via: Government of Western Australia (State Law Publisher or ComLaw) )
Carers Recognition Act 2004
Equal Opportunity Act 1984
Equal Opportunity Regulations 1986
Health Practitioner Regulation National Law Act 2010 (WA)
Occupational Safety and Health Act 1984 (WA)
Occupational Safety and Health Regulations 1996
Privacy Act 1988
State Records Act 2000 (WA)

10. References

1. Irish Society for Clinical Nutrition and Metabolism. Prevention and Treatment of Refeeding Syndrome in the Acute Care Setting, Nov 2013

11. Related Forms

MR111 WACHS Nursing Admission, Screening and Assessment Tool - Adults
MR111P WACHS Paediatric Nursing Admission / Discharge Assessment
MR120 WACHS Adult Nursing Care Plan
MR120P WACHS Paediatric Nursing Care Plan
MR 144c WACHS Food Intake Chart
MR 144 WACHS Fluid Balance Work Sheet
MR60.1.12 WACHS Oral Nutrition Support Chart
MR60.1.10 WACHS Adult Enteral Feeding Form
RC5 Resident Admission Assessment Form
RC7 Resident Care Plan.

12. Related Policy Documents

WACHS Nutrition Clinical Practice Standard
WACHS Enteral Tubes and Feeding – Adult
WACHS Total Parenteral Nutrition
WACHS Allied Health Clinical Handover Policy
WACHS Medication Administration Policy
WACHS High Risk Medications Procedure
WACHS Specialised Medication - Intravenous Phosphate Supplementation in Adults Guideline
WACHS Specialised Medication - Potassium Supply Policy

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13. Related WA Health System Policies

- MP0053/17 WA Clinical Alert (Med Alert) Policy
- MP0086/18 Recognising and Responding to Acute Deterioration Policy
- MP0095/19 Clinical Handover Policy
- OD0611/15 Clinical Incident Management Policy
- OD0657/16 WA Health Consent to Treatment Policy
- OD0561/14 WA High Risk Medication Policy

14. Policy Framework

Clinical Governance, Safety and Quality

15. Appendices

Appendix 1: Clinical Manifestations of RFS¹¹
Appendix 2: Pathophysiology of RFS¹,²
Appendix 3: Detailed Nutrition Assessment for RFS¹,²
## Appendix 1: Clinical Manifestations of RFS

<table>
<thead>
<tr>
<th>Deficiency</th>
<th>Clinical implications</th>
</tr>
</thead>
</table>
| **Hypophosphataemia** (normal range 0.8–1.45 mmol/l) | • Cardiovascular: heart failure, arrhythmia, hypotension, cardiomyopathy shock, death  
• Renal: acute tubular necrosis, metabolic acidosis  
• Skeleton: rhabdomyolysis, weakness, myalgia, diaphragm weakness  
• Neurology: delirium, coma, seizures, tetany  
• Endocrine: hyperglycaemia, insulin resistance, osteomalacia  
• Haematology: haemolysis, thrombocytopenia, leukocyte dysfunction.                                                                                     |
| **Hypokalemia** (normal range 3.5–5.1 mmol/l)       | • Cardiovascular: hypotension, ventricular arrhythmias, cardiac arrest, bradycardia or tachycardia  
• Respiratory: hypoventilation, respiratory distress, respiratory failure  
• Skeleton: weakness, fatigue, muscle twitching  
• Gastrointestinal: diarrhoea, nausea, vomiting, anorexia, paralytic ileus, constipation  
• Metabolic: metabolic alkalosis.                                                                                                                        |
| **Hypomagnesaemia** (normal range 0.77–1.33 mmol/l) | • Cardiovascular: paroxysmal atrial or ventricular arrhythmias, repolarisation alternans  
• Respiratory: hypoventilation, respiratory distress, respiratory failure  
• Neuromuscular: weakness, fatigue, muscle cramps (Trousseau and Chvostek) weakness, ataxia, vertigo, paraesthesia, hallucinations, depression, convulsions  
• Gastrointestinal: abdominal pain, diarrhoea, vomiting, loss of appetite, and constipation  
• Other: anaemia, hypocalcaemia  
• NB: many cases of hypomagnesaemia do not manifest clinically till very late.                                                                           |
| **Hyponatremia** (normal range 136–145 mmol/l) due to hyperglycaemia | • Cardiovascular: heart failure and arrhythmia  
• Respiratory: respiratory failure, pulmonary oedema  
• Renal: renal failure  
• Skeleton: muscle cramps, fatigue, fluid retention and swelling (oedema).                                                                 |
| **Thiamine**                             | • Neurology: Wernicke-Korsakoff syndrome, Karsakoff’s psychosis  
• Cardiovascular: congestive heart failure and lactic acidosis, beriberi disease.                                                                         |
Appendix 2: Pathophysiology of RFS\textsuperscript{1,2}

During **prolonged starvation**, insulin secretion is decreased in response to the lack of carbohydrates, and as a result, fat and protein are metabolised as the primary energy source. The shift to protein catabolism causes the gradual loss of cellular and/or muscle mass, with major organs such as the heart, lungs, liver and intestines the most severely affected.

There is usually severe depletion of phosphate, magnesium and potassium but as they are primarily intracellular electrolytes this may not be reflected in serum concentrations. Thiamine, a water soluble vitamin, is also depleted in malnourished patients.

After starvation, **reintroduction of nutrition** stimulates insulin release, carbohydrate metabolism and synthesis of glycogen, fat and protein. This is associated with intracellular movement of phosphate, magnesium and potassium, which are already depleted, resulting in a dramatic fall in serum levels. Hypophosphataemia, the hallmark sign of RFS, typically occurs on or between the second to fourth days of refeeding. While mild to moderate hypophosphatemia is often asymptomatic and may go unrecognised, severe derangements may lead to widespread dysfunction of cellular processes and are associated with increased adverse effects. Thiamine, which is also depleted, is rapidly metabolised as a coenzyme in glucose oxidation. Although gluconeogenesis is initially suppressed, continuation of feeding results in hyperglycaemia\textsuperscript{4, 5, 2}.

Appendix 3: Detailed Nutrition Assessment for RFS¹⁻²

There are multiple factors which Dietitians must consider when assessing patients' risk of RFS including²:

**Anthropometric measurements** to evaluate body composition such as
- Height
- Current weight and weight history
- Percentage weight changes; and
- BMI.

**Diet history** to establish the extent to which a patient's nutritional requirements are being met such as
- Recent food and fluid (including alcohol and intravenous hydration) intake
- Extent of variation to usual intake and duration of inadequacy
- Comparison of energy and protein intake to individual estimated nutritional requirements
- Social Considerations including psychosocial, socioeconomic, environmental and educational factors. Note: Indigenous Australians may fast for cultural reasons such as sorry business.

**Physical assessment** such as
- Physical appearance including assessment of fat and/or muscle loss, oedema, skin colour and turgor
- Subjective Global Assessment (SGA) and Patient Generated – SGA (PG-SGA)
- Mobility and ambulatory capacity
- Fluid status, heart rate, blood pressure
- Clinical or functional signs of nutritional deficiencies.

**Biochemical and haematological indices** such as
- Pre-feeding serum levels of electrolytes, specifically phosphate, potassium, magnesium and sodium
- Thiamine status and levels of other vitamins
- Blood glucose levels
- Albumin, however possible confounding factors such as fluid status and inflammatory state should be considered.

**Clinical considerations**: Injury, acute or chronic illness and surgery can significantly impact nutritional status due to the direct effects of disease and indirect effects on food intake. Factors to consider include:
- Altered nutritional requirements
- Impaired nutrient ingestion/ dysphagia
- Gastrointestinal function and impaired digestion and/or absorption ie vomiting, diarrhoea
- Increased nutrient losses
- Medications may affect nutrient intake, absorption, metabolism and/or excretion. Consider supplements (eg. vitamins or minerals), diuretics, oral hypoglycaemic agents and insulin
- Mood, psychological factors.