

REFEEDING SYNDROME: RISK ASSESSMENT AND MANAGEMENT

Although rare, refeeding syndrome is a potential complication of refeeding and may be fatal. Any patient requiring intensive refeeding will be at risk of refeeding syndrome and should be managed accordingly.

WHAT IS REFEEDING SYNDROME?

Refeeding syndrome arises when severe electrolyte and fluid shifts associated with metabolic abnormalities occur with refeeding. Cardiac arrest and sudden death may result. This generally occurs within the first two weeks of refeeding and may occur regardless of the route of feeding (oral or enteral). The specific mechanisms behind refeeding syndrome remain unclear.

Clinical signs of refeeding syndrome may include:

Acute cardiac failure	Seizures
Delirium	Sudden death
Arrhythmia	

ASSESSMENT: IDENTIFYING PATIENTS AT RISK

Risk factors for refeeding syndrome may include the following:

- Patients requiring intensive refeeding
- Those with no oral nutrition for 7-10 days
- Patients who are severely underweight (BMI ≤ 14)
- Abnormal electrolytes before refeeding (phosphate, potassium and magnesium)
- Prolonged QTc interval on ECG
- Prolonged malnutrition or rapid weight loss whether underweight, overweight or a healthy weight (e.g., >1kg per week over several weeks)

PREVENTION OF REFEEDING SYNDROME

The following may assist in preventing the occurrence of refeeding syndrome:

- Check electrolytes and correct abnormalities **before commencing refeeding**
- Monitor electrolytes during refeeding
- Commence vitamin and mineral supplementation in those at risk as follows:

Vitamin/Mineral	Recommended Dose
Thiamine (if not covered by multivitamin)	100mg daily
Multivitamin and Mineral	RDI levels
Phosphate	1000mg daily

- Limit high carbohydrate fluid (soft drink, fruit juices, cordials) and nutrient-dense foods
- Commence refeeding incrementally
- For those indicated at risk of refeeding syndrome, caloric intake should be restricted and spread throughout the day to minimise excessive nutritional load. As tolerated, feeds may then be increased by gradual amounts. It may take up to 7-10 days to reach a final feeding regime.

MONITORING DURING REFEEDING

The principal biochemical hallmark of refeeding syndrome is severe, acute hypophosphataemia which usually occurs within 3–4 days of refeeding, although it may occur during the first two weeks. This may be associated with hypokalaemia, hypomagnesaemia, hypoglycaemia, sodium and fluid retention, and thiamine deficiency.

The following tests are recommended for monitoring the risk of refeeding syndrome:

Test	Days 1-14	Days 14 +	After Supplements Ceased
Electrolytes (including phosphate and magnesium)	Daily	Weekly	Once Weekly
Blood Glucose	Daily	Weekly	Once Weekly
Urinalysis	Daily		
Blood Pressure	4 th hourly	Daily	Daily
Pulse	4 th Hourly	Daily	Daily
Temperature	4 th Hourly		
Respiratory Rate	4 th Hourly		
Signs of Fluid Overload and Oedema	Daily		
Signs of Deterioration of Strength or Mental State	Daily		
ECG (if other cardiac indicators abnormal)	Weekly		

If a patient is dehydrated electrolyte levels may be misleading. It is important to repeat electrolyte studies daily in the first few days when a patient is hypovolemic.

MANAGEMENT OF REFEEDING SYNDROME

If signs of refeeding syndrome become evident (biochemical or clinical), urgent medical consultation should be requested. The following can be used as a general guide to managing complications:

If serum levels fall substantially (but are still within the reference range):

- **DO NOT INCREASE FEEDS**
- Maintain feeds at the current rate
- Correct electrolyte levels with supplementation
- Recheck electrolytes every 24hours
- Gradually increase feeds when electrolytes are stable

If serum levels fall below the normal range:

- **REDUCE FEEDS**
- Commence daily ECG monitoring
- Correct electrolyte levels with supplementation
- Recheck electrolytes every 24hours
- Increase feeds gradually when electrolytes are stable

OBSERVATION AND PHYSICAL MONITORING

Medical monitoring during refeeding is essential.

1. Assess vital signs, fluid input, output, electrolytes (including phosphate) and observation for oedema, rapid weight gain, congestive cardiac failure (CCF) and gastrointestinal symptoms.
2. A familiar nurse should weigh the patient at approximately the same time of day. The frequency of weighing will vary between units and may depend upon medical stability or patient progress.
3. Continue to monitor nutrition, mental state, skin care, mobility and general physical wellbeing.

Alert
Blood results alone do not indicate medical safety.
Normal vital sign parameters do not guarantee normal physiological status.

Parameters		Critical signs & thresholds	On Admission	Ongoing Monitoring
Vital Signs	Pulse*	<50 bpm/ irregular	✓	Daily or as per medical team
	Temperature**	<35.5°C	✓	Daily or as per medical team
	Blood Pressure	Standing	✓	Daily or as per medical team
		Sitting	✓	Daily or as per medical team
		Postural drop	✓	Daily or as per medical team
Biochemistry	Electrolytes	K+ <3.0 mmol/ L	✓	Daily
	Phosphate	< 0.8 mmol/ L	✓	Daily
	Magnesium	<0.6 mmol/ L	✓	Daily
	Monitor for signs of refeeding syndrome			Daily during first 2 weeks of refeeding
	Risk assessment (self harm, suicidality, absconding)		✓	Daily
	Weight	• BMI <5 th centile • Disproportion in height & weight Centiles	✓	Weekly
	Height	• Weight Loss >1 kg/wk	✓	Every 3 months
	Mental state exam		✓	Daily
	Blood Glucose Level (finger prick)	<3.0 mmol/ L	✓	4 th hourly until normoglycaemia
	Ward urinalysis		✓	
	12 lead ECG (QTc interval)	>450msecs	✓	Daily until normal
	Food & fluid intake (24hr history)		✓	Strict record daily
	Bowel movements (history) & gastrointestinal symptoms		✓	
	Skin integrity check		✓	

* Counting an accurate pulse rate may be more difficult than is commonly recognised. A 15-sec count time is the least accurate way of measuring pulse rate. A 60-sec count is probably the most accurate and efficient measure.

** Patients should not have their temperature taken within 15-20 minutes of drinking hot or cold fluids.