

Refeeding Syndrome

Dr Andrew Rochford

Consultant Gastroenterologist

Royal Free London Hospitals NHS Foundation Trust

Conflicts of Interests Declaration

- Received honoraria for educational work with Fresenius Kabi
- Improvement Clinical Director, Royal College of Physicians
- Member of BAPEN Medical committee
- Member of BSG, BAPEN and ESPEN
- Previous BAPEN Executive and Council member, Chair of Education & Training committee

Overview / Learning objectives

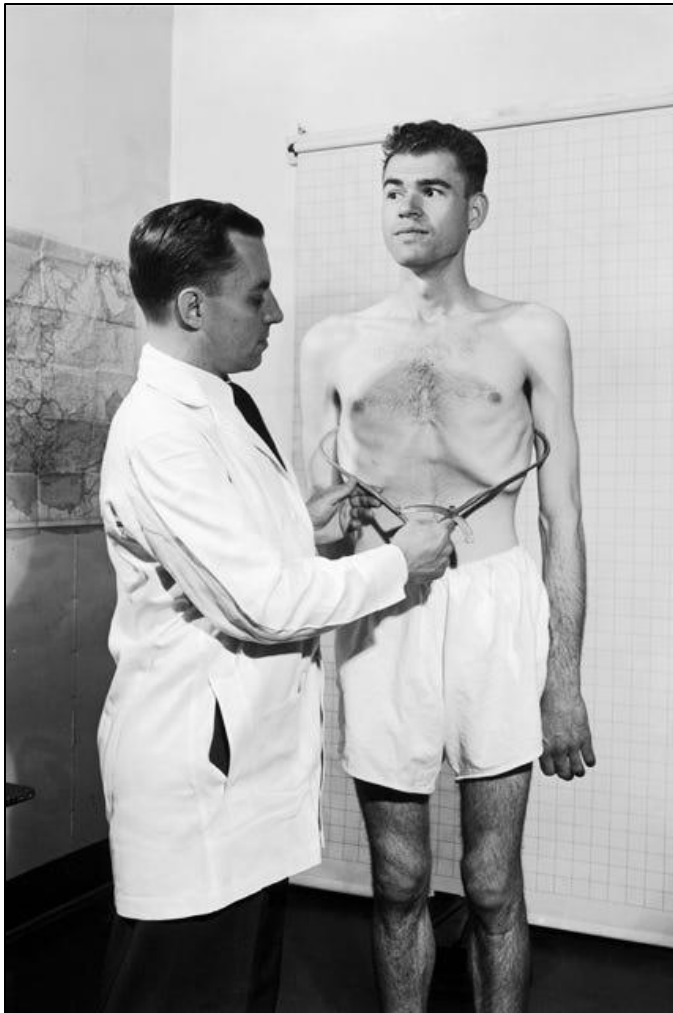
- Review the history of refeeding syndrome (RFS)
- Discuss the clinical presentation
- Provide an overview of the pathophysiology
- Outline risk factors and (proposed) diagnostic criteria
- Discuss treatment options
- Highlight high risk cases

History

- AD 70 after the Siege of Jerusalem by the Romans
- AD 543 after the Siege of Naples by the Ostrogoths
- Scientific literature started during WWII
 - Siege of Leningrad (1940)
 - Release of Japanese Prisoners of War (1945)
 - Liberation of Holland (1944-45)
- Anecdotal / observational, confounding factors, little documentation of Mg^{2+} & PO_4^-

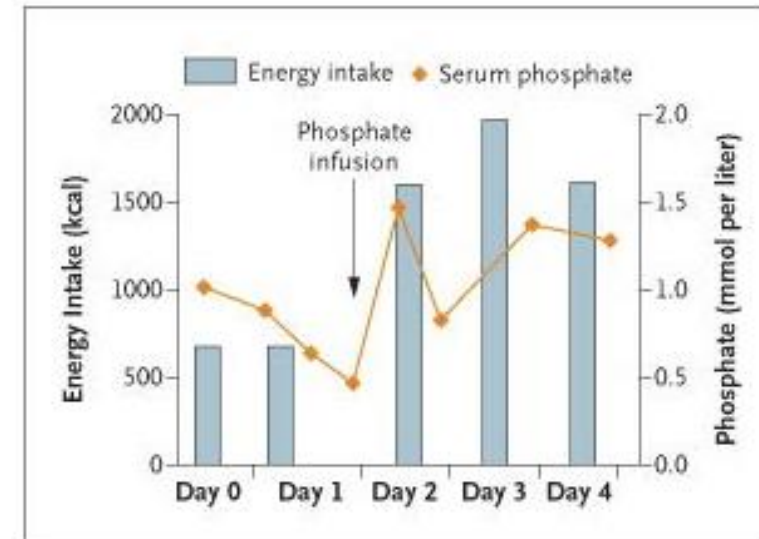
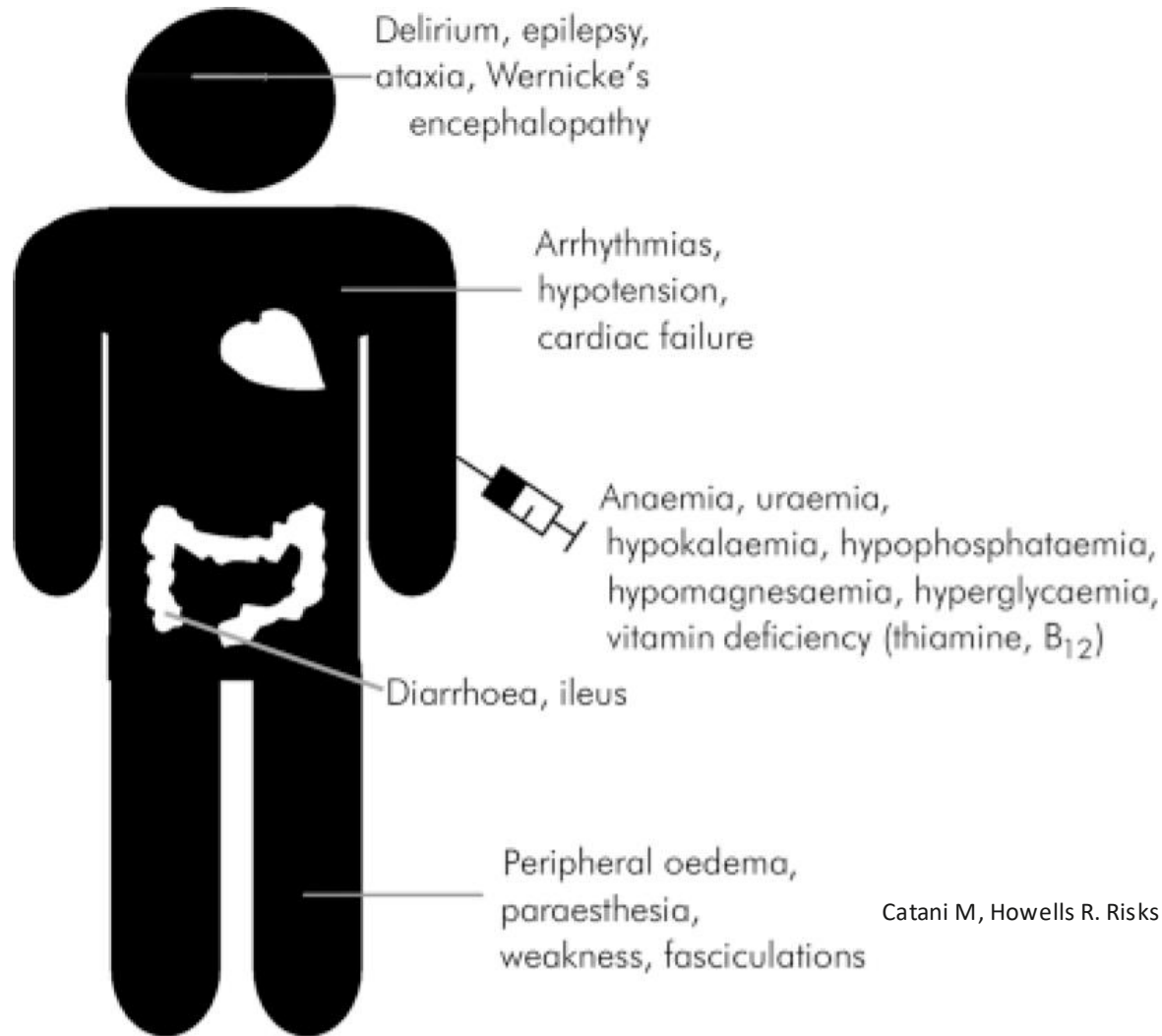
Refeeding Syndrome A. De Silva and J. M.D. Nightingale J. M.D. Nightingale (ed.), Intestinal Failure, https://doi.org/10.1007/978-3-031-22265-8_23 Springer Nature Switzerland AG 2023

'The Minnesota Experiment'



- 36 young male conscientious objectors
- Semi-starvation diet 24/52
 - 1560 kcal/day
- Prescribed exercise
 - Walking 22 miles/week
- >25% loss of body weight
- 4 refeeding regimens
 - 400, 800, 1200, 1600 kcal more than in semi-starvation
- No deaths

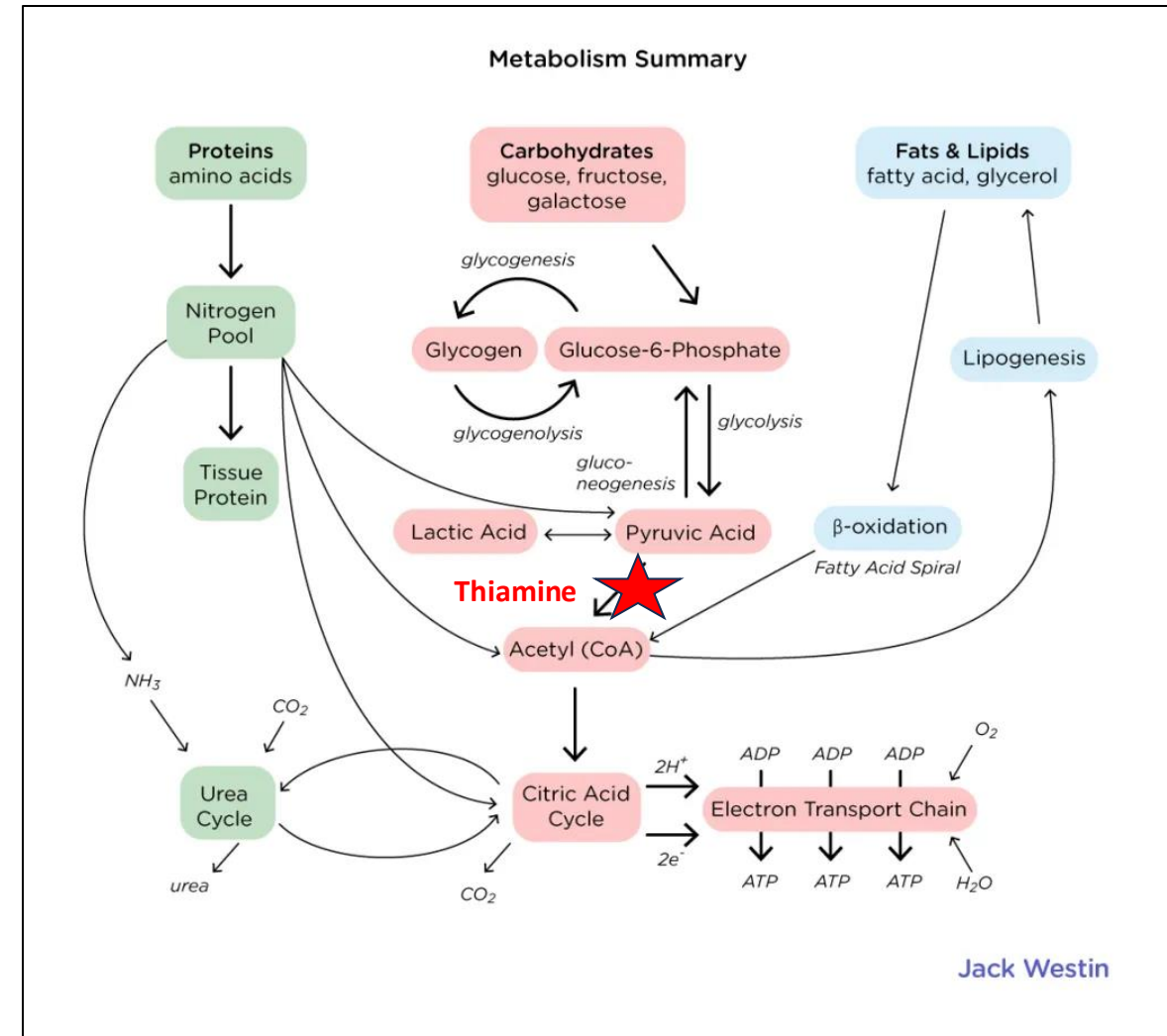
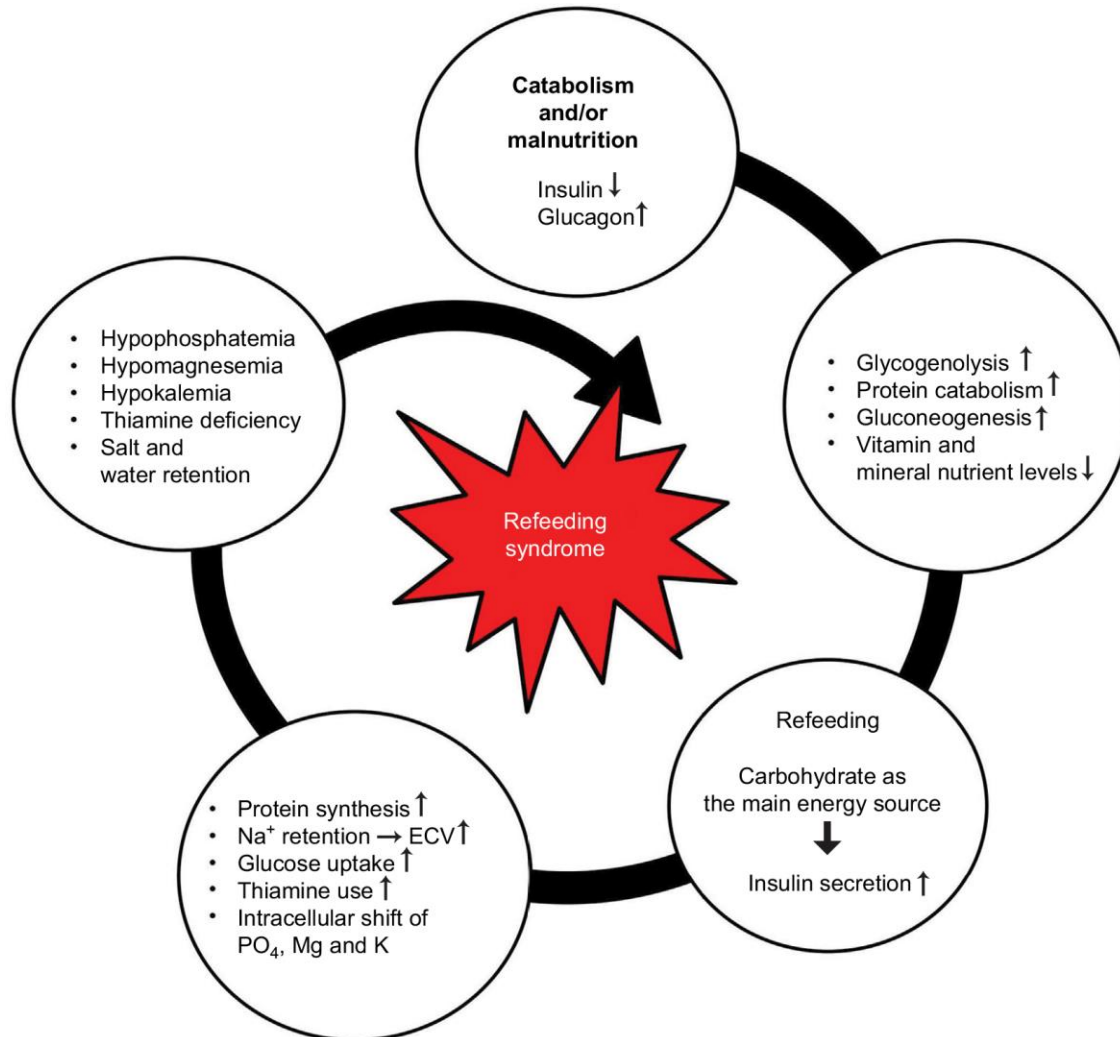
Clinical presentation



Korbonitis M, Blaine D, Elia M and Powell-Tuck J. Metabolic and hormonal changes during the refeeding period of prolonged fasting. *Eur J Endo.* 2007;157:157-166

Catani M, Howells R. Risks and pitfalls for the management of refeeding syndrome in psychiatric patients. *Psychiatric Bulletin.* 2007;31(6):209-211

Pathophysiology



Jack Westin

Clinical sequelae

	Cardiac	Respiratory	Neuromuscular
Phosphate	Altered myocardial function, arrhythmia, congestive heart failure	Acute respiratory failure	Lethargy, weakness, seizures, confusion, coma, paralysis, rhabdomyolysis
Potassium	Arrhythmia, cardiac arrest	Respiratory distress	Paralysis, weakness, rhabdomyolysis
Magnesium	Arrhythmia, tachycardia	Respiratory depression	Ataxia, confusion, muscle tremors, weakness, tetany
Thiamine	Congestive heart failure	Pulmonary oedema Pleural effusion	Wernicke-Korsakoff syndrome, muscle weakness
Fluid/glucose	Congestive heart failure Cardiomegaly	Pulmonary oedema Respiratory depression	Hyperosmotic non-ketotic coma

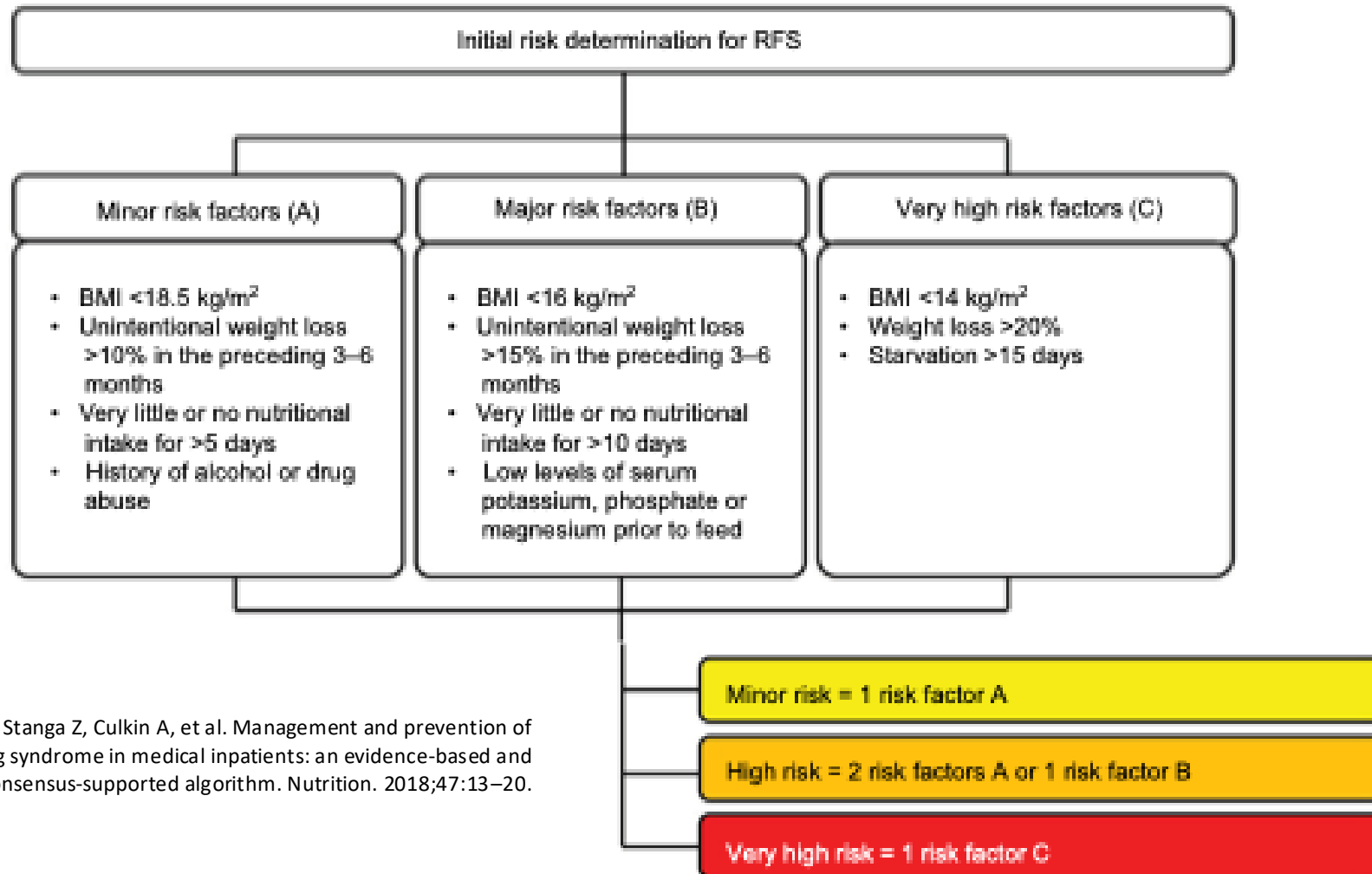
Table courtesy of A. Culkin, personal communication

Evidence base

- What are the definitions used for RFS?
 - Highly heterogeneous studies relying on electrolyte disturbances only and others including clinical symptoms
- What is the incidence of RFS?
 - 0% and 80% depending on definition and patients
- When does RFS occur?
 - Within the first 72 hours of nutritional therapy
- Is RFS associated with adverse clinical outcome?
 - Largely unclear
- What are the risk factors for RFS?
 - In accordance with NICE guidelines, but older age & enteral feeding
- What are therapeutic strategies to prevent or treat RFS?
 - Largely unclear

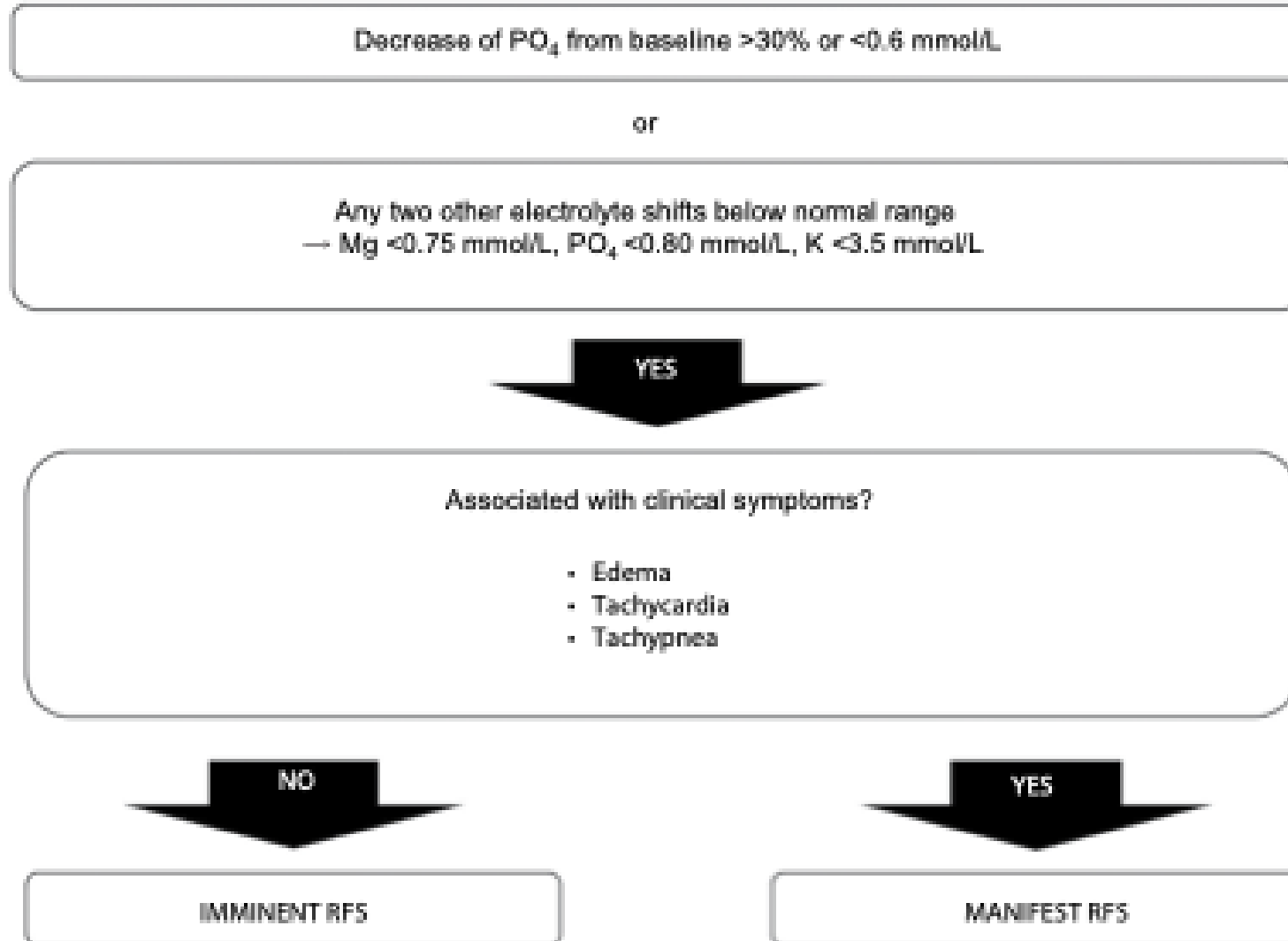
Friedli N, *et al* (2017) Revisiting the refeeding syndrome: Results of a systematic review, *Nutrition*, 35:151–160
Adapted courtesy of A. Culkin, personal communication

Risk factors



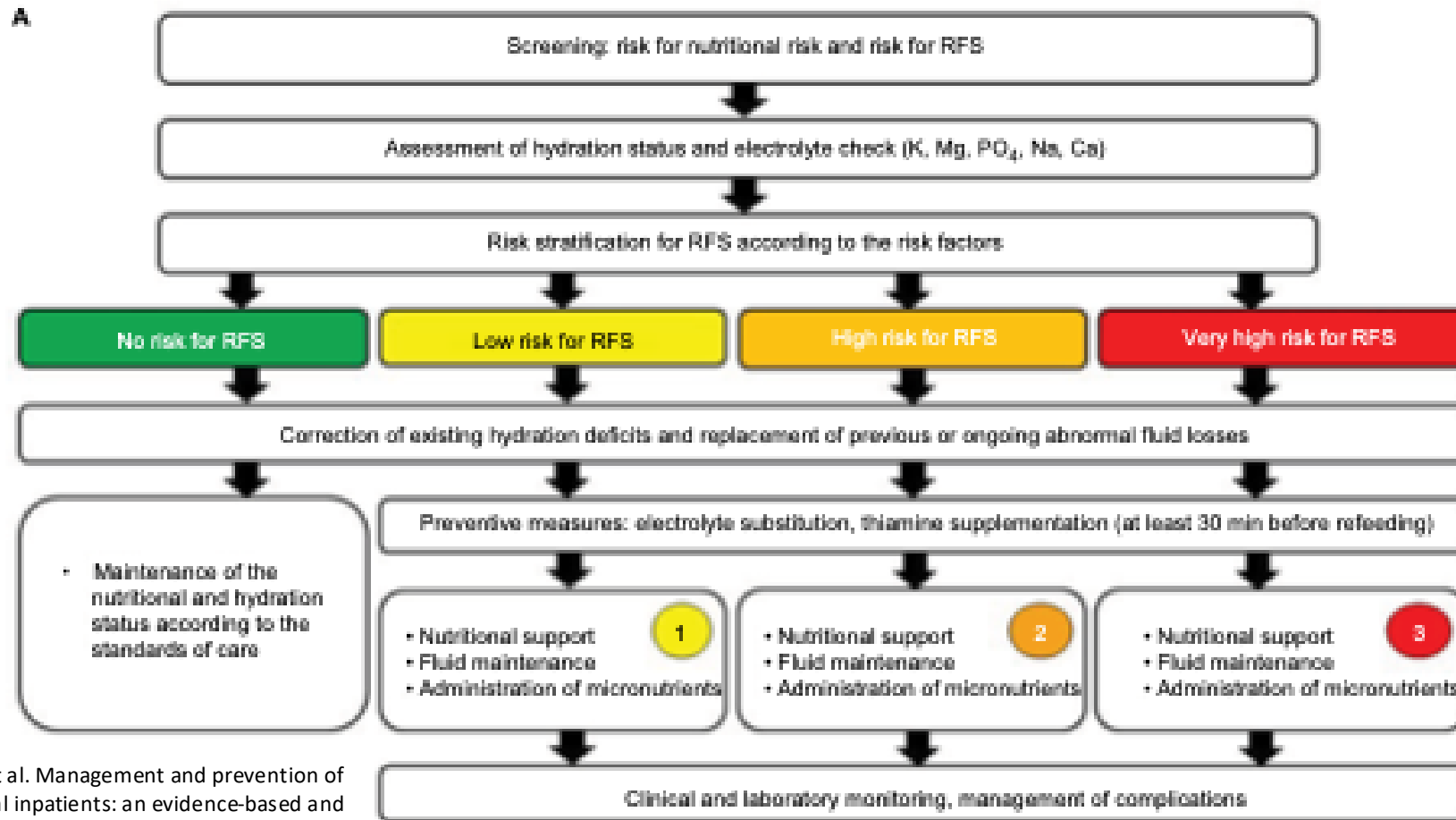
Friedli N, Stanga Z, Culkin A, et al. Management and prevention of refeeding syndrome in medical inpatients: an evidence-based and consensus-supported algorithm. *Nutrition*. 2018;47:13–20.

Diagnosis



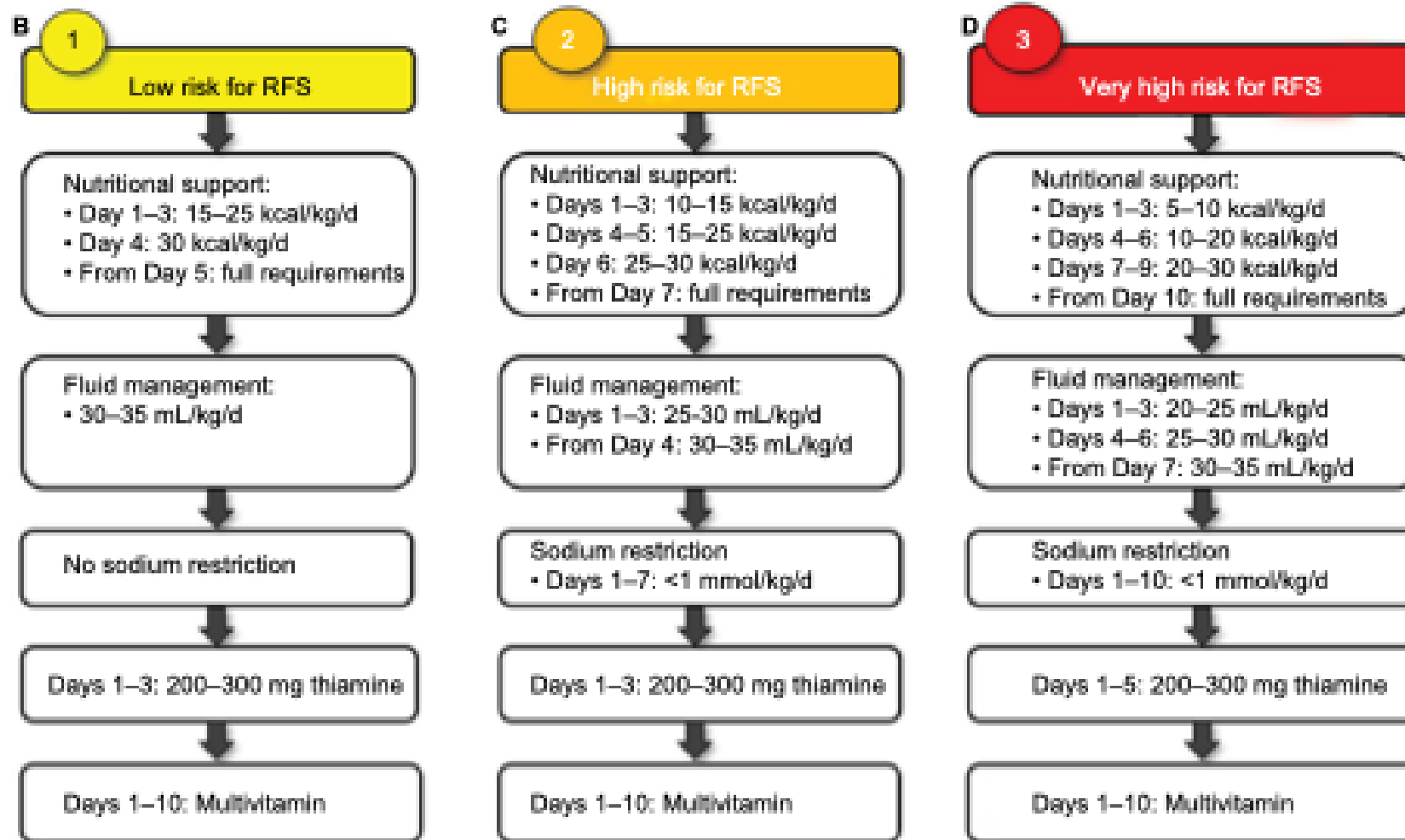
Friedli N, Stanga Z, Culkin A, et al.
Management and prevention of refeeding syndrome in medical inpatients: an evidence-based and consensus-supported algorithm. Nutrition. 2018;47:13–20.

Management algorithm



Friedli N, Stanga Z, Culkin A, et al. Management and prevention of refeeding syndrome in medical inpatients: an evidence-based and consensus-supported algorithm. *Nutrition*. 2018;47:13–20.

Management algorithm



Friedli N, Stanga Z, Culkin A, et al. Management and prevention of refeeding syndrome in medical inpatients: an evidence-based and consensus-supported algorithm. *Nutrition*. 2018;47:13–20.

High risk

Appendix 3: Medical emergencies in eating disorders risk checklist for clinicians

Assessing

Does the patient have an eating disorder?

Yes: Anorexia nervosa- Bulimia nervosa- Other

Not sure: Request psychiatric review

Is the patient medically compromised?

- BMI <13 (adults); m%BMI <70% (under 18)?
- Recent loss of >1kg for 2 consecutive weeks?
- Acute food or fluid refusal/intake <400kcal per day?
- Pulse <40?
- BP low, BP postural drop >20mm, dizziness?
- Core temperature <35.5°C?
- Na <130mmol/L?
- K <3.0mmol/L?
- Raised transaminase?
- Glucose <3mmol/L?
- Raised urea or creatinine?
- Abnormal ECG?
- Suicidal thoughts, behaviours?

Is the patient consenting to treatment?

Yes:

No: Mental health assessment requested

Refeeding

High risk for refeeding syndrome?

- Low initial electrolytes
- BMI <13 (adults) or %mBMI <70% (under 18s)
- Little or no intake for >4 days
- Low WBC
- Serious medical comorbidities, e.g. sepsis

High risk? Management:

- <20 kcal per kg per day
- Monitor electrolytes twice daily
- build up calories swiftly
- avoid underfeeding

Lower risk? Management:

- Start at 1,400–2,000kcal per day (50 kcal/kg/day) and build by 200 kcal/day, to 2,400kcal/day or more
- Aim for weight increase of 0.5–1kg/week
- Avoid underfeeding

Monitoring

- Electrolytes (especially P, K, glucose)
- ECG
- Vital signs
- BMI

Managing

Are medical and psychiatric staff collaborating in care?

Yes:

No: Psych. consultation awaited

Are nurses trained in managing medical and psychiatric problems?

Yes

No and appropriately skilled staff requested/training in place

Are there behaviours increasing risk?

- Falsifying weight
- Disposing of feed
- Exercising
- Self-harm, suicidality
- Family to stress/anxiety
- Safeguarding concerns

Mobilise psychiatric team to advise on management

Note:

%mBMI = mean percentage BMI

Please do not use BMI as a single indicator of risk

Summary

- RFS can occur in any patient; it is not just exclusively in patients on parenteral nutrition
- There are now clearer guidelines on identifying the risk factors and clinical diagnosis of RFS
- Treatment algorithms are available based on clinical risk
- The key strategy is:
 - Identify
 - Intervene
 - Monitor

References / Further reading

- ESPEN guideline on hospital nutrition. Thibault, Ronan et al. *Clin Nut.* 2020;40(12):5684 - 5709
- Friedli N, Stanga Z, Culkin A, et al. Management and prevention of refeeding syndrome in medical inpatients: an evidence-based and consensus-supported algorithm. *Nutrition.* 2018;47:13–20.
- Refeeding Syndrome A. De Silva and J. M.D. Nightingale J. M.D. Nightingale (ed.), *Intestinal Failure*, https://doi.org/10.1007/978-3-031-22265-8_23 Springer Nature Switzerland AG 2023.
- Aubry E, Friedli N, Schuetz P, Stanga Z. Refeeding syndrome in the frail elderly population: prevention, diagnosis and management. *Clin Exp Gastroenterol.* 2018;11:255-264.
- MEED Guidelines <https://www.rcpsych.ac.uk/improving-care/campaigning-for-better-mental-health-policy/college-reports/2022-college-reports/cr233>

Q & A

