

Patient cases

Tube feeding in neurological patients.
What Fresubin® can do for your patients.





Tube feeding in neurological patients

Patients with neurological diseases are often affected by impaired nutrition. Resulting consequences have a negative impact on morbidity and thus on the patients' mortality. For this reason, implementing appropriate nutritional management is a matter of significant importance.¹



Implications of malnutrition are numerous. Cognitive impairments but also difficulties in swallowing play an important role. Patients concerned with dysphagia caused, for example, by neurological diseases like amyotrophic lateral sclerosis or dementia and stroke, are therefore exposed to a heightened risk - not least by an increased risk of infections, frequent hospital admissions and accelerated functional decline. For example, 2/3 of patients with stroke are affected by dysphagia and therefore are at a higher risk of mortality. In these cases, enteral tube feeding is able to compensate for impaired swallowing.^{2,3}

The following four example cases illustrate how different patients in the field of neurological diseases may benefit from tube feeding.

Case 1

Tube feeding in progressive neuromuscular disease

Clinical summary



Presentation/clinical history

Mr H, 57 years, physical activity teacher

- Diagnosed with motor neurone disease/amyotrophic lateral sclerosis. Life expectancy likely to be ≤ 3 years. Under investigation 12 months prior to diagnosis - initially presented with stroke/TIA symptoms.
- Dysphagia reported and has had 2 recent chest infections. Assessed by speech and language therapist - risk of aspiration reported. Commenced thick pureed diet and stage 2 (mildly thick) fluids.
- Mr H using lightwriter to communicate due to dysarthria.
- Dietetic review at home to discuss feeding options in the longer term, referred to gastroenterologist.* Commenced Fresubin thickened ONS 1-2 x daily as able. Also provided with food fortification advice.
- Medical history: mild hypertension
- Medications: riluzole, hyoscine butylbromide patches, paracetamol
- Biochemistry: Na 141 mmol/l, K 4.4 mmol/l, Ur 6.0 mmol/l, Cr 72 μ mol/l, Ca 2.25 mmol/l, PO₄ 1.08 mmol/l, Mg 0.82 mmol/l



Early enteral nutrition plays an important role meeting nutritional needs in patients with neurological diseases and subsequent dysphagia.



Weight history

Normal weight	86 kg (BMI: 27.5 kg/m ²)
At diagnosis	78 kg (BMI: 24.9 kg/m ²)
Current weight	75.3 kg (BMI: 24.0 kg/m ²)

- Weight loss: **9.3%** before diagnosis - gradual loss continues (total approx. **12.4%** from onset of symptoms)

Nutritional assessment



Estimated nutritional requirements

- Energy: 2823 kcal⁵⁶ (25 kcal x 75.3 kg + 1.5 physical activity factor due to reduced mobility)
- Protein: 75.3-113 g (1-1.5 g/kg)⁷
- Fluid: 2330 ml (using the 100/50/15 formula)⁸

Note: Mr H's energy requirements may be increased due to motor neurone disease, therefore need to use estimate requirements as a baseline. However, need to monitor as likely to gain fat mass and not lean body mass with any excess calories and protein.⁹⁻¹¹



Dietetic assessment

- Reviewed by community dietitian. Discussed feeding options including bolus, intermittent and continuous feeding.
- Oral intake important to help maintain swallow for as long as possible, as well as for quality of life purposes.
- Weight has been falling gradually but as swallowing now deteriorating, nutritional status likely to fall further.
- Intake approx. 800 kcal, 15 g protein and 1200 ml fluid (including ONS) - deficit of approx. 2000 kcal, 60-98 g protein and approx. 1300 ml fluid.

Aim



- Meet nutritional requirements and maintain nutritional status as long as possible due to progressive nature of disease. Ensure Mr H is able to meet hydration requirements despite dysphagia.

Tube feeding with Fresubin



Nutrition therapy

- 15Fr Freka PEG tube sited successfully. Feed to commence 3 hours post PEG insertion.¹²
- Meeting Mr H's protein requirements may help maintain muscle mass and prevent catabolism.
- Fibre feed beneficial to maintain gut physiology.^{13,14}
- A range of container options is beneficial as feed likely to increase over time.
- Home training arranged prior to discharge with patient and family.

Day



Feeding regime

- 1
- 2
- 3

(3 hours post PEG insertion) Fresubin 2 kcal HP Fibre 500 ml at 25 ml/hr for approx. 7 hrs (4 p.m.-11 p.m.) (using 175 ml feed).

(At home) Fresubin 2 kcal HP Fibre 1000 ml at 50 ml/hr x 14 hr (approx. 7 a.m.-9 p.m.) (using 700 ml of feed).

(At home) Fresubin 2 kcal HP Fibre 1000 ml at 75 ml/hr x 13.5 hr.

100 ml water flushes pre- and post-feed to maintain hydration status recommended. Also not going to take all medications via tube therefore advised to take 100 ml pre- and post-feed (at present 4 x daily as regular analgesia commenced).

Feed providing 2000 kcal, 100 g protein, 15 g fibre and 1710 ml fluid. Reinforced need to maintain 30-degree angle during feeding and for 30 min. afterwards.

Week



Monitoring/follow-up

- 1
- 2
- 3

Reviewed Mr H at home and feeling a bit better than previously. Now well hydrated. No problems with feed tolerance, running at 75 ml/hr x 10 hr. Oral intake as per previous assessment and consuming 1 x Fresubin thickened ONS daily. Stoma site slightly red - encouraged to clean and rotate daily. Bowels moving every 2 days - normal for him, urine output good. Weight \downarrow 1.3 kg to 74 kg due to being nil by mouth and not meeting full nutritional requirements prior to tube insertion. Increase feeding to 100 ml/hr x 10 hr Fresubin 2 kcal HP Fibre. Review in 1 week.

Happy with current regime. Tolerating Fresubin 2 kcal HP fibre 1000 ml at 100 ml/hr x 10 hr. Weight is stable to 74.2 kg therefore meeting nutritional requirements. Stoma site looks healthy and no problems reported with bowels or urine output. Increased rate of feed to 125 ml/hr x 8 hrs (aim to reduce feeding time to allow activities during the day).

No new problems with feeding - swallowing has not deteriorated significantly but Mr H is well aware of progressive nature of disease. No chest infections since PEG tube insertion. Continue with feed overnight on Fresubin 2 kcal HP Fibre 1000 ml at 150 ml/hr x 6.5 hrs in the evening with 100 ml water flushes pre- and post-feed and -medication. Review monthly.

Early enteral feeding in patients with motor neurone disease/amyotrophic lateral sclerosis may help to maintain nutritional status and reduce muscle mass depletion.¹⁵

Therapeutic outcome



8 weeks post discharge

- Mr H's motor neurone disease progressing slowly. Continues to use lightwriter for communication and with a pureed diet and stage 2 (mildly thick) fluids. No further reports of any chest infections.
- Weight relatively stable at approx. 72-73 kg, bowel moving and urine output good. Therefore meeting nutrition and hydrations requirements.
- PEG tube also allow medications or increased feed and fluid as his disease progresses.
- Feed with vitamin D may improve muscle strength and muscle function and may help reduce the risk of fractures and falls as mobility likely to decrease as disease progresses.¹⁵⁻¹⁸
- 15 g fibre in 1000 ml Fresubin 2 kcal HP Fibre is beneficial to maintain gut physiology.^{13,14}



Case 2

Enteral nutrition on neuro-rehabilitation

Clinical summary



Presentation/clinical history

Mr J, 37 years, satellite technician

- Admitted to ICU 23 days ago with severe skull, left tibia and left humerus fractures following a fall from a first storey ladder.
- Intracranial epidural haematoma diagnosed and surgery completed to relieve pressure 20 days ago.
- A 8Fr Freka nasogastric (NG) tube in situ due to an induced coma and oral ventilation.
- Medical history: high cholesterol, hypertension, fibromyalgia
- Medications: statin, ibuprofen
- Biochemistry: previously low sodium due to fluid overloading with IV fluid on admission but all biochemistry now stable and within normal values. Na 144 mmol/l, K 4.5 mmol/l, Ur 5.8 mmol/l, Cr 92 µmol/l, Ca 2.21 mmol/l, PO₄ 1.2 mmol/l, Mg 0.8 mmol/l



Weight history

Normal weight/admission weight	108 kg (BMI: 36.1 kg/m ²)
Weight on transfer to neuro-rehab	104.3 kg (BMI: 34.9 kg/m ²)

- Weight loss: **3.4%** - not significant

Tube feeding may reduce malnutrition risk in patients undergoing neuro-rehabilitation.²⁰

Nutritional assessment



Estimated nutritional requirements

- Energy: 2503 kcal⁵⁶ (20 kcal x 104.3 kg + 1.2 stress factor due to trauma. No physical activity due to obesity)
- Protein: 104.3 g (1 g/kg)⁵
(75% actual body weight requirements due to obesity = 78.2 g)²¹
- Fluid: 2765 ml (using the 100/50/15 formula)⁸



Dietetic assessment

- Initially fed via NG tube in ICU with Fresubin Intensive and currently tolerating 1000 ml Fresubin 2 kcal HP Fibre at 75 ml/hr, however now in rehabilitation, nutritional requirements updated.
- Oral intake remains minimal approx. 400 kcal and 10 g protein - pureed diet and stage 3 (moderately thick) thickened fluids.
- Has catheter in situ - fluid balance good and draining good volumes approx. 2000 ml (with 2700 ml fluid input via NG tube through feed and medications and approx. 300 ml orally).
- Referred for PEG as likely to be feeding for a longer term - NG tube has been in for 3 weeks and oral intake remains minimal.



Aim

- Maintain nutritional status throughout rehabilitation and prevent catabolism.
- Also need to avoid over-feeding and meeting fluids requirements to maintain fluid balance. Aim for approx. 3000 ml as per previous fluid balance in ICU.

Tube feeding with Fresubin



Nutrition therapy

- A nutritionally complete feed is required to meet Mr J's requirements as likely to be consuming minimal micronutrients via oral diet.
- Fibre feed beneficial to maintain gut physiology.^{13,14}
- Due to obesity, hypertension and high cholesterol, a feed with fish oil may provide some cardio protection benefits.²²

Day



Feeding regime

- Fresubin Original Fibre 1500 ml at 100 ml/hr x 16 hr approx. 7 a.m.-11 p.m..
- Fresubin Original Fibre 2000 ml at 125 ml/hr x 16 hr approx. 7 a.m.-11 p.m..
- Fresubin Original Fibre 2000 ml at 150 ml/hr x approx. 13.5 hr (7 a.m.-8.30 p.m.) however due to EasyBag, feed can be stopped if required during rehabilitation.

Water flushes: 100 ml pre- and post-feed and 100 ml pre- and post-medications with at least 10 ml in between each medication. Providing 2000 kcal, 76 g protein, 30 g fibre and approx. 2780 ml fluid. Encouraged to maintain position at 30-degree angle to reduce aspiration risks.

Monitoring/follow-up

- Settled into the ward well. Feed tolerated well at 100 ml/hr, bowels moved 1 x and catheter in situ - draining well approx. 1800-2000 ml. Oral intake poor, needs assistance and maximum encouragement. Biochemistry stable. Review in 2 days.
- Feed currently running at 150 ml/hr. Improved tolerance with oral intake - no coughing. Speech also improving slowly. Physiotherapy continues and Mr J able to stand using stand aid. PEG tube insertion booked for 1 week. Weight 103.8 kg - slight reduction, not significant to change feed at present. Monitor again in 2-3 days.
- Oral intake approx. 500 kcal and 10 g protein - no significant changes. Feeding well tolerated at 150 ml/hr x 13.5 hr on Fresubin Original Fibre. Catheter draining approx. 2000 ml - no issues with fluid balance. Weight 104.1 kg - therefore stable and Mr J meeting nutritional requirements. All biochemistry within reference ranges. No changes - await PEG placement.
- PEG sited today with no complications. Feed to recommence after 3 hours on 2000 ml Fresubin Original Fibre at 150 ml/hr. Reviewed by speech and language therapist, lip seal improved and aspiration risk reduced, commenced stage 2 thickened (mildly thick) fluids and mince/mashed diet. Biochemistry remains within normal ranges. Monitor oral intake and weight.
- Rehabbing well, no problems reported with feed tolerance. Oral intake increasing slowly - approx. 900 kcal and 25 g protein therefore reduce feed to Fresubin Original Fibre 1500 ml at 150 ml/hr x 10 hr. Medication now changed to oral therefore increase water flushes to 100 ml pre- and post-feed and encourage with thickened fluid orally. If oral intake not adequate, need to give extra via tube. Catheter removed today - monitor urine output.
- Feeding continues on Fresubin Original Fibre 150 ml x 10 hr. Bowels moving well, urine output very good. Weight stable at 104.5 kg. Encouraged to trial Fresubin thickened ONS to aid oral intake. If Mr J can take Fresubin thickened ONS consistently and keep his weight stable, feed via tube can be reduced however he is likely to be tube-fed for a longer term.

Fresubin Original Fibre provides 30 g fibre in 2000 ml to maintain gut physiology.^{13,14}

Supplemental tube feeding with Fresubin Original Fibre combined with a mildly thick oral diet and texture modified Fresubin ONS helped Mr J to meet his nutritional requirements.

Therapeutic outcome



3 months post admission

- Rehabilitation successful - walking with minimal assistance (walking stick) and discharged home with carers to help with personal care.
- Oral intake improved and managing minced and moist diet with stage 1 (mildly thick) fluids and Fresubin thickened ONS 1-2 x daily.
- Tube remains in situ feeding 1000 ml Fresubin Original Fibre.
- Weight stable at approx. 105 kg, BMI 35 kg/m².
- 30 g fibre in 2000 ml Fresubin Original Fibre is beneficial to maintain gut physiology.^{13,14}
- Micronutrients including vitamin D (20 µg in 1500 ml RDD) is essential to meet nutritional requirements. Due to 3 months' hospital stay and limited mobility, in the long term vitamin D may prevent fractures and falls.¹⁵⁻¹⁸
- A variety of containers sizes are flexible to meet the need of patient during rehabilitation.

Case 3

Short-term nasogastric feeding during acute illness in dementia

Clinical summary



Presentation/clinical history

Mrs K, 72 years, grandmother living with dementia

- Admitted to hospital for IV antibiotics for a recent severe chest infection
- Nutritional screening: identified as high risk as she has lost 11.4% of body weight in the past 6 months. Oral intake is minimal.
- Regular coughing fits following food - reviewed by speech and language therapist. Diagnosed with dysphagia as a consequence of her dementia progression, subsequently commenced on a minced and moist diet with mildly thick fluids (stage 1).
- Feeding with nasogastric (NG) tube in the short term indicated due to very poor oral intake and to overcome chest infection, especially as new onset dysphagia.²³
- Medical history: dementia (2 years ago), reflux, eczema
- Medications: lansoprazole, diprobase cream
- Biochemistry: Na 133 mmol/l, K 3.9 mmol/l, Ur 3.9 mmol/l, Cr 39 µmol, Ca 2.05 mmol/l, PO₄ 0.73 mmol/l, Mg 0.69 mmol/l, CRP 201 mg/l, albumin 30 g/l



Short-term nasogastric tube feeding indicated in patients with dementia to overcome acute illness, especially when dysphagia is newly diagnosed.²³



Weight history

Normal weight	69 kg (BMI: 24.7 kg/m ²)
Current weight	61.1 kg (BMI: 21.9 kg/m ²)

- Weight loss: **11.4%** in 6 months - significant

Nutritional assessment



Estimated nutritional requirements

- Energy: 1760 kcal⁵⁶ (20 kcal x 61.1 kg + 1.2 stress factor due to infection and 1.2 physical mobility factor due to being immobile on ward)
- Protein: 91.7 g (1.5 g/kg)²⁴
- Fluid: 2117 ml (using the 100/50/15 formula)⁸



Dietetic assessment

- Unable to meet nutritional requirements: oral intake very poor for past 2 days, < 1/3 of meals, normally enjoys snacking (est. 300 kcal + 15 g protein). As protein requirements are high especially during chest infection, intensive short-term nutrition support via NG tube indicated.²³
- 7-day course of IV antibiotics to be completed. Currently on 6 hourly IV fluids (2000 ml).
- Significant weight loss (11.4%) over past 3-6 months and magnesium borderline low, therefore moderate risk of re-feeding.²⁰
- Appears to be slightly overhydrated. IV fluid to be reduced to 8 hourly (1500 ml) until feeding established.
- CRP and albumin indicative of inflammation/infection.



Aim

- Meet full nutritional requirements to prevent further depletion in nutritional status and aid recovery from acute illness.

Tube feeding with Fresubin



Nutrition therapy

Type of feeding tube: nasogastric tube - 8Fr Freka

- Moderate risk of re-feeding syndrome but high protein requirement, commence feeding cautiously - not exceeding 50% of requirements on day 1 of feeding.²⁰
- Correct magnesium before starting feed and commence multivitamin until full micronutrients needs are met.²⁰
- Fibre containing feed is indicated to help maintain gut physiology.^{13,25}

Day



Feeding regime

1

Fresubin HP Energy Fibre 500 ml at 25 ml/hr x 16 hr (approx. 7 a.m.-11 p.m.) with 50 ml water flushes pre- and post-feed (using 400 ml).

2

Fresubin HP Energy Fibre 1000 ml at 50 ml/hr x 16 hr (approx. 7 a.m.-11 p.m.) with 50 ml water flushes pre- and post-feed (using 800 ml feed).

3

Fresubin HP Energy Fibre 1000 ml at 75 ml/hr x 13.5 hr (approx. 7 a.m.-8.30 p.m.) with 100 ml water flushes pre- and post-feed.

Full feed provides 1500 kcal, 75 g protein, 15 g fibre, 990 ml fluid and is nutritionally complete in micronutrients. Monitor biochemistry including hydration status. IV fluids can be discontinued on day 3 if oral intake over 1000 ml.

Monitoring/follow-up

2

Tolerated feed very well at 25 ml/hr - feed currently running at 50 ml/hr as per regime. Oral intake remains stable despite change of textures. Sodium, urea and creatinine normalising. Magnesium 0.71 mmol/l, therefore in normal range. Continue feeding regime as planned.

4

Tolerated feed well at 75 ml/hr for 13.5 hr with 100 ml water flushes. Continues on IV antibiotics. Bowels moving well, urine output good. Oral intake slightly improved, approx. 450 kcal and 20 g protein. Weight today 61.4 kg, therefore meeting nutritional requirements - total intake 1950 kcal, 95 g protein and 2100 ml fluid. Increase rate of feed to 100 ml/hr x 10 hr (approx. 7 a.m.-5 p.m.) on 1000 ml Fresubin HP Energy Fibre. Review in 2-3 days.

7

Condition and mobility improving. IV antibiotics to be completed tomorrow. Oral intake as before. Weight 61.8 kg - small increase (no oedema noted), therefore continues to meet nutritional requirements. Continue with feed on Fresubin HP Energy Fibre 1000 ml and increase to 125 ml/hr x 8 hr to reduce length of time on feed and monitor weight.

10

IV antibiotics discontinued. Oral intake improving, managing at least 1/2 minced and moist main courses and enjoying desserts very much. Intake approx. 1350 kcal and 45 g protein. Weight 61.9 kg - stable. Bowels moving well, no problems. Reduce feed to 500 ml Fresubin HP Energy Fibre in the evening (7 p.m.-11 p.m.) at 125 ml/hr with 100 ml water flushes pre- and post-feed. Commence Fresubin thickened ONS 1-2 x per day to maximise oral intake. Review in 2-3 days, if oral intake increased again, nasogastric feeding tube can be removed.

14

Oral intake improved again, approx. 1800 kcal and 80 g protein - eating 2 courses at meal times plus 2 x Fresubin thickened ONS daily, plus extra desserts and milkshakes. Weight 61.9 kg, therefore still meeting nutritional requirements for weight gain. Stop feed and remove feeding tube. Continue with regular meals and snacks on minced and moist diet and mildly thick (stage 1) fluids to ensure weight maintenance.

Supplemental tube feeding using a high protein (20 en%), energy dense (1.5 kcal/ml) feed helped improve nutritional status and support Mrs K through a short period of acute illness where her nutritional requirements were increased and where transition to a texture-modified diet took place.²³

Therapeutic outcome



1 month post discharge

- Outpatient, living with the support of her daughter and continuing on a minced and moist diet with mildly thick (stage 1) fluids. No longer requires oral nutritional supplementation and is able to maintain nutritional status at approx. 62 kg through her texture modified diet with food fortification advice.
- Fresubin HP Energy Fibre provides 15 g fibre to help meet fibre needs and maintain gut physiology.^{13,14,25}
- Meeting protein requirements combined with vitamin D in a small volume with Fresubin HP Energy Fibre, may have also helped to improve muscle strength and muscle function.^{16,17}



Case 4

Long-term feeding in stroke rehabilitation



Clinical summary



Presentation/clinical history

Ms L, 63 years, retired nurse

- Admitted to the acute assessment unit 2 days ago with sudden onset dysarthria and right-sided weakness.
- CT scan has revealed a left-sided ischaemic stroke - transferred to stroke ward.
- Following a water swallow test Ms L was made nil by mouth (no oral intake) and referred to speech and language therapy.
- As per protocol enteral feeding commenced via nasogastric tube within 24 hours of admission, and referred to dietetics.²⁶
- Medical history: hypertension, rheumatoid arthritis
- Medications: sulphasalazine, calcium and vitamin D supplement
- Biochemistry: Na 142 mmol/l, K 4.3 mmol/l, Ur 6.0 mmol/l, Cr 74 µmol/l, Ca 2.15 mmol/l, PO₄ 1.04 mmol/l, Mg 0.81 mmol/l



Enteral nutrition should commence as soon as possible following a failed swallow test to reduce malnutrition risk.²⁵



Weight history

Normal weight **55 kg** (BMI: 22.8 kg/m²)

Current weight **53 kg** (BMI: 22.1 kg/m²)

- Weight loss: **3.6%** - not significant

Nutritional assessment



Estimated nutritional requirements

- Energy: 1272 kcal⁵⁶ (20 kcal x 53 kg + 1.2 physical activity factor due to being bed bound)
- Protein: 63.6 g (1.2 g/kg)²⁴
- Fluid: 1995 ml (using the 100/50/15 formula)⁸



Dietetic assessment

- Seems lethargic on ward and speech remains slurred. Remains nil by mouth, feed currently running as per standard protocol on Fresubin Original at 35 ml/hr x 14 hr during day. No problems with tolerance reported. Not at re-feeding risk, patient normally nourished until stroke. Unable to meet nutritional requirements orally.
- Seen by speech and language therapist: aspirating on all food/fluids.
- On IV fluids 8 hourly (1500 ml), can be discontinued once feeding established.
- Bowels moved today, soft. Urine output good via catheter: 1500 ml.



Aim

- Maintain nutritional status to meet full requirement via feeding tube to aid rehabilitation.

Tube feeding with Fresubin



Nutrition therapy

NG tube: 8Fr Freka, placement confirmed via x-ray as unable to obtain aspirate

- A nutritionally complete feed is required to meet requirements due to being nil by mouth (no oral intake). A feed with fish oil may have cardiovascular protection benefits.²²
- Tube feeding may be for the long term, therefore fibre-containing feed is indicated to maintain gut physiology.^{13,25}

Day



Feeding regime

- 1000 ml Fresubin Energy Fibre at 50 ml/hr x 16 hr (approx. 7 a.m.-11 p.m.).
 - 1000 ml Fresubin Energy Fibre at 75 ml/hr x approx. 13.5 hr (approx. 7 a.m.-8.30 p.m.).
 - 1000 ml Fresubin Energy Fibre at 100 ml/hr x 10 hr during the day (approx. 7 a.m.-5 p.m.).
- 100 ml water flushes pre- and post-feed and 100 ml pre- and post-medications (approx. 4 times daily).
- Providing 1500 kcal, 60 g protein, 15 g fibre and 1760 ml (plus 200 ml via medications).

Monitoring/follow-up

- 2 Feed tolerated well during the day, currently running at 50 ml/hr as per protocol. Request IV fluids to be discontinued. Continue with regime as planned.
- 3 Biochemistry checked, no problems. Patient seems well hydrated and not overloaded, feed running at 75 ml/hr with no problem. Increase to Fresubin Energy Fibre 1000 ml at 100 ml/hr x 10 hr during the day. Bowels moving well, no problems with urine output (catheter is patent and draining well).
- 5 Ms L remains nil by mouth, failed water swallow test again and speech and language therapist due to review tomorrow. Weight 53.2 kg - weight stable therefore meeting nutritional requirements. Feed continues on Fresubin Energy Fibre 1500 ml at 100 ml/hr x 10 hr during the day. Review after speech and language therapy assessment.
- 7 Feed tolerating well. Seen by speech and language therapist - no changes in swallow, not managing oral secretions. For video fluoroscopy assessment, may be a candidate for PEG tube if swallow not improving. Continues rehabilitation with physiotherapist most days. Bowels moving daily, urine output good, catheter draining good volumes approx. 1500 ml. Continue with plan as normal.
- 9 No new changes. Bowels moving, stoma site healthy and biochemistry within reference ranges.
- 14 Ms L continues to tolerate feed well, bowels moving well. Biochemistry within reference ranges. Feed continues on Fresubin Energy Fibre at 100 ml/hr x 10 hr during the day.
- 25 Referred for PEG as swallow not improving - likely long-term feeding as video fluoroscopy shows aspiration on all textures. Nil changes to feed otherwise. Weight stable, biochemistry within reference ranges and bowels moving well.
- 30 15Fr Freka PEG sited, standard protocol followed after insertion (feed to commence after 3 hours). Recommence feed on 1000 ml Fresubin Energy Fibre at 100 ml/hr x 10 hr during the day.²⁰

Fresubin Energy Fibre is a nutritionally complete high energy feed with fibre to meet nutritional needs in a small volume. 1000 ml at 100 ml/hr x 10 hr during the day reduces feeding time and aids sleeping pattern.

Ms L met her nutritional needs within 2 days. Feed with 20 µg vitamin D per RDD may help to improve muscle strength and muscle function and reduce risk of fractures and falls.¹⁵⁻¹⁸

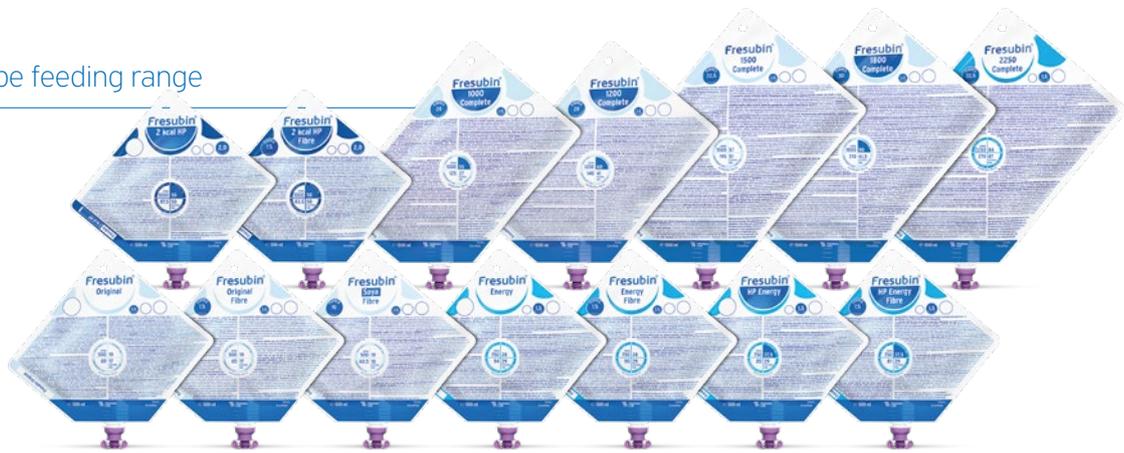
Therapeutic outcome



8 weeks post treatment

- Weight increased and stable at 55.5 kg, BMI 23.1 kg/m² and able to meet full nutritional requirements within 2 days of commencing tube feeding.
- Continues to meet full nutritional requirement via PEG tube and due to this able to participate in rehabilitation including physiotherapy.
- The fish oil in Fresubin Energy Fibre may have cardiovascular protection benefits.²²
- 1000 ml Fresubin Energy Fibre contains 15 g fibre which may help to maintain Ms L's gut physiology.^{13,25}

Fresubin tube feeding range



The Fresubin tube feeding range at a glance



With fish oil

- In the recommended daily intake for adults for cardiovascular protection^{22,27,28}
- Included in all Fresubin standard tube feeds



High-quality protein

- Quality of protein mixture in line with WHO and FAO recommendations²⁹
- Non-dairy protein blends also available - for patients with intolerances, allergies, individual preferences



Vitamin D

- With all micronutrients for complete nutrition including the recommended 20 µg vitamin D per RDD in all Fresubin standard tube feeds per RDD - in line with the latest nutrition recommendations⁴
- Prevents a vitamin D deficiency^{25,30}
- Reduces the risk of fractures and falls by improving muscle strength and muscle function^{15,31,32}



Fibre blend

- Fibre-enriched versions of all Fresubin standard tube feeds
- Blend of soluble/insoluble and fermentable/infermentable fibres to maintain gut physiology^{33,34}



Broad tube feed range

- Broad range of products to meet the individual needs of patients with a wide range of physical conditions
- 27 state-of-the-art products designed to help you provide your patients with a best-fit enteral nutrition solution

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