



**FRESENIUS  
KABI**

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# Patient cases

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





## Tube feeding in cancer patients

Malnutrition is a frequent problem in cancer patients and it is often accompanied by the loss of muscle mass. Both are closely connected to reduced physical activity and a poor dietary intake, but also to catabolic metabolic derangements. The consequence can be a negative clinical outcome.<sup>1</sup>



Approximately half of all cancer patients are at risk of developing a syndrome of cachexia, which results in losing body fat and muscle mass as well as being anorexic. This is not only leading to a decreasing quality of life of the patient, but can also have a negative impact on chemotherapy treatment response and survival rate.<sup>2</sup>

**The following four example cases illustrate how patients with different types of cancer may benefit from tube feeding.**

## Case 1

# Tube feeding during radical chemoradiation for head and neck cancer

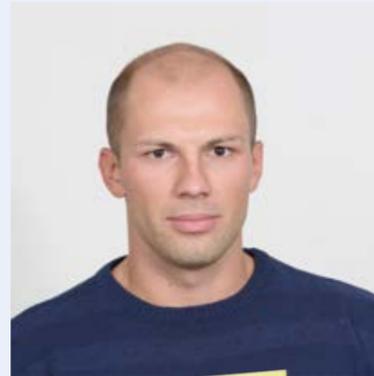
## Clinical summary



### Presentation/clinical history

#### Mr E, 32 years, welder and father of two children

- Diagnosed with a T3N1Mx squamous cell base of tongue tumour.
- Right hemi-glossectomy with free forearm flap completed 2 weeks ago.
- Mr E is to have 7 weeks (34#) of Immune Mediated Radiotherapy Treatment (IMRT) and 2 courses of cisplatin chemo on day 1 and day 21.
- As per protocol prophylactic PEG was sited (15Fr Freka) during surgery prior to adjuvant chemoradiotherapy due to expected odynophagia, dysphagia and weight loss.<sup>1,3</sup>
- Also commenced 2 x Supportan DRINK daily due to surgery and up-coming treatment which may counteract loss of muscle mass and support immune function.<sup>1,4-6</sup>
- Past medical history: none
- Medication: paracetamol 4 x daily following surgery
- Biochemistry: Na 140 mmol/l, K 4.2 mmol/l, Ur 5.6 mmol/l, Cr 82 µmol/l, PO<sub>4</sub> 0.96 mmol/l



Gastrostomy insertion prior to cancer treatment may help to reduce decline in nutritional status.<sup>1</sup>



### Weight history

Normal weight	86 kg (BMI: 30.1 kg/m <sup>2</sup> )
At diagnosis	82 kg (BMI 28.0 kg/m <sup>2</sup> )
Current	79.8 kg (BMI 27.9 kg/m <sup>2</sup> )

- Weight loss since diagnosis: **2.7%**; Total weight loss: **7.2%**

## Nutritional assessment



### Estimated nutritional requirements

- Energy: 2394 kcal<sup>7</sup> (30 kcal x 79.8 kg)
- Protein: 119.7 g (1.5 g/kg)<sup>7</sup>
- Fluid: 2397 ml (using the 100/50/15 formula)<sup>7</sup>



### Dietetic assessment

- Treatment week 3, 1/2 cycles of chemotherapy and 17/34 fractions of radiotherapy completed. No nutritional issues in Week 1 or 2 of treatment, managed normal diet and fluids until 2 days ago. Tolerating Supportan DRINK 2 x daily well - 1 as bolus via PEG and 1 x orally providing 600 kcal, 40 g protein and 2 g EPA.
- Mr E reports odynophagia and xerostomia with solid foods, currently tolerating soups and puddings. Still managing food at meals and snacks, however calorie density lower than normal. Analgesia increased to oral morphine 4 times daily.
- Weight 78.2 kg, ↓1.6 kg over past 2 weeks, and as treatment progresses, oral intake likely to decrease further and may need to use feeding tube as sole source of nutrition.
- No issues with bowels or urine output and biochemistry indicates Mr E is well hydrated.



### Aim

- Commence enteral tube feeding via PEG to minimise depletion in nutritional status during and improve outcomes after treatment.

## Tube feeding with Fresubin



### Nutrition therapy

#### Type of feeding tube: 15Fr Freka percutaneous endoscopic gastrostomy (PEG)

- Mr E needs to travel daily to hospital for radiotherapy therefore would prefer afternoon/evening using pump.
- Due to increased protein needs, high calorie requirements and limited time to feed, Mr E needs concentrated feed to meet requirements.
- Gut physiology may be maintained using a fibre containing feed<sup>8</sup> as Mr E likely to become constipated due to increased analgesia throughout treatment. Supportan DRINK (e.g. Cappuccino flavour) to continue 2 times daily to provide 600 kcal, 40 g protein and 2 g EPA which may counteract loss of muscle mass and support immune function.<sup>1,4-6</sup>
- Training completed on pump assisted feeding using Applix<sup>®</sup> feeding pump and patient provided with 7-day supply of feed.

### Day



### Feeding regime

#### Commence feed on Fresubin Energy Fibre (500 ml):

1

50 ml/hr x 6.5 hr (5.30 p.m.-11 p.m.) with 100 ml water flushes pre- and post-feed.

2

75 ml/hr x approx. 6.5 hr (5.30 p.m.-11 p.m.) with 100 ml water flushes pre- and post-feed.

Providing 750 kcal, 28 g protein, 7.5 g fibre and 770 ml fluid.

Total from tube feed and ONS: 1350 kcal, 68 g protein, 13.5 g fibre and 1074 ml fluid.

### Week



### Monitoring/Follow Up

4

2<sup>nd</sup> cycle of chemotherapy completed. Analgesia as above. Stoma site remains healthy. Oral intake reduced significantly due to odynophagia (<400 kcal and 15 g protein). Weight 80 kg (possible fluid overloading due to chemo). Seen by speech and language therapist: pureed diet and naturally thick fluids. Encouraged to consume desserts as well as 2 x Supportan DRINK orally as enjoys sweet foods. Increase feed to meet deficit in nutritional intake to 1000 ml Fresubin Energy Fibre. Day 1: 100ml/hr x 8 hr, Day 2: 125ml/hr x 8 hr (3.30 p.m.-11.30 p.m.) (total from tube feed and ONS: 2100 kcal, 115 g protein, 21 g fibre and 1644 ml fluid).

5

Currently on fraction 28/34 radiotherapy. Oral intake remains as per week 4 - smooth desserts and milk, and 2 x Supportan DRINK daily. Feeding running at 125 ml/hr and tolerated well. Weight 77.8 kg (↓1.4 kg in 2 weeks) however some loss masked from week 4 (post chemo fluid). Morphine increased due to continued pain. Informed of constipation risk. Consultant has prescribed laxative - monitor. Continue with maximum encouragement with milk and smooth desserts and ONS to maintain swallow. Continue with feed on 1000 ml Fresubin Energy Fibre and increase rate to 150 ml/hr x 6.5 hr with 100 ml water flushes pre- and post-feed.

6

Weight 79.9 kg (2.1 kg in 1 week), Mr E is therefore meeting his nutritional requirements. Fluid intake excellent - 1200-1500 ml orally and 960 ml via feeding tube (including feed). Bowels moving with prescribed laxatives - has been constipated due to increased use of analgesia. Not using laxatives as prescribed however Fresubin feed contains fibre therefore may aid bowel function. Stoma site remains healthy and tube patent.

Encouraged to take analgesia and laxatives as prescribed. Feeding well-tolerated: 1000 ml Fresubin Energy Fibre at 150 ml/hr x 6.5 hr with 100 ml water flushes pre- and post-feed.

## Therapeutic outcome



### 1-month post treatment

- Oral intake improving following treatment (soft diet and normal consistency fluids) and feed reduced to 500 ml Fresubin Energy Fibre. Feeding tube likely to be out in next 1-2 weeks as progressing quickly and continues to tolerate 2 x Supportan DRINK daily.
- Optimising nutritional status with tube feeding has maintained Mr E's nutritional status throughout his treatment (current weight 80.1 kg) which may improve clinical outcome and quality of life in oncology patients.<sup>9</sup>
- Due to reluctance to use laxatives, using Fresubin Energy Fibre was able to help maintain gut physiology.<sup>8,10</sup>
- Fresubin Energy Fibre and Supportan were able to meet the high protein requirements in Mr E. This combined with at least 20 µg vitamin D per RDD, may help maintain muscle mass and function.<sup>11,12</sup>
- Consuming Supportan DRINK 2 x for over 8 weeks has provided a daily dose of 2 g EPA to Mr E. This is needed in cancer patients undergoing multimodal treatment to counteract loss of muscle mass and support immune function.<sup>1,4-6</sup>



Fresubin Energy Fibre along with Supportan DRINK is able to meet the protein need of cancer patients at risk of cachexia.

Low volume nutritionally complete Fresubin Energy Fibre combined with Supportan DRINK was able to meet Mr E's high energy and protein requirements to aid his daily activities and allow him to attend radiotherapy without the need of feeding during the day.

## Case 2

# Short-term naso-gastric tube feeding following lung cancer diagnosis

### Clinical summary



#### Presentation/clinical history

**Mrs F, 42 years, lung cancer patient, diagnosed with T2NOMO left non-small cell lung cancer 6 weeks ago**

- A left pneumonectomy was completed 1 week ago with clear margins reported.
- Rehabilitation in hospital was progressing well but Mrs F developed chest infection 4 days ago.
- Since then, her oral intake has been poor and now struggling to complete physio and has been identified by screening as a high nutritional risk. Currently prescribed 2 x Fresubin ONS daily and taking small amounts regularly.
- As her BMI was already in the lower range, intensive nutritional support is needed.
- Tube feeding to commence to meet nutritional requirements.
- Past medical history: ex-smoker (5 years ago), hypertension, hypercholesterolemia
- Medication: paracetamol, IV doxycycline, oxygen, dalteparin, statin
- Biochemistry: Na 148 mmol/l, K 3.9 mmol/l, Ur 7.5 mmol/l, Cr 86 µmol/l, Ca 2.05 mmol/l, PO<sub>4</sub> 0.73 mmol/l, Mg 0.68 mmol/l, CRP 165 mg/l, Albumin 31 g/l



Short-term naso-gastric feeding meet requirements during period of acute ill health.<sup>13</sup>



#### Weight history

Normal weight	62 kg (BMI: 22.8 kg/m <sup>2</sup> )
At diagnosis	58 kg (BMI 21.3 kg/m <sup>2</sup> )
Current	54.8 kg (BMI 20.1 kg/m <sup>2</sup> )

- Weight loss since diagnosis: **5.5%**. Total weight loss: **11.6%** over approx. 4 months

### Nutritional assessment



#### Estimated nutritional requirements

- Energy: 1644 kcal (30 kcal x 54.8 kg)
- Protein: 82.2 g (1.5 g/kg)
- Fluid: 2022 ml (using the 100/50/15 formula)<sup>7</sup>



#### Dietetic assessment

- Unable to meet nutritional requirements: oral intake very poor, managing approx. 1/4-1/3 of meals but poor snacking. Likes to drink coffee with milk.
- On IV antibiotics for next 3-5 days.
- Very short of breath on minimal exertion, on oxygen therapy via nasal cannula.
- Significant weight loss over passed 3-6 months and magnesium borderline low therefore moderate risk of refeeding syndrome.<sup>14</sup>
- Biochemistry: patient slightly dehydrated and CRP and albumin indicative of inflammation/infection.



#### Aim

- Maintain nutritional status during acute stress and promote rehabilitation.

## Tube feeding with Fresubin



### Nutrition therapy

**Type of feeding tube: naso-gastric tube - 8Fr Freka**

- Due to refeeding syndrome risk, a 1 kcal/ml feed is required in the first instance.
- Correct magnesium before commencing feed and commence multivitamin until full micronutrients needs are met.
- Start feeding cautiously - don't exceed 50% of requirements on day 1 of feeding.<sup>14</sup>
- Fibre containing feed is indicated to maintain gut physiology.<sup>8,10,15,16</sup>

### Day



#### Feeding regime

1

Fresubin Original Fibre 500 ml at 25 ml/hr x 16 hr (approx. 7 a.m.-11 p.m.) with 100 ml water flushes pre- and post-feed.

2

Fresubin Original Fibre 1000 ml at 50 ml/hr x 16 hr (approx. 7 a.m.-11 p.m.) with 100 ml water flushes pre- and post-feed.

3

Fresubin Original Fibre 1500 ml at 75 ml/hr x 16 hr (approx. 7 a.m.-11 p.m.) with 100 ml water flushes pre- and post-feed.

Full feed including flushes providing 1500 kcal, 57 g protein, 22.5 g fibre, 1460 ml fluid and is nutritionally complete in micronutrients. Monitor biochemistry including hydration status, if not improving, reduce feed to previous rate tolerated. May need to consider separate fluids via PEG or IV fluids if hydration status not improved.

#### Monitoring/Follow Up

2

Feed very well tolerated - feed currently on break, due to increase to 50 ml/hr today. Oral intake remains poor approx. 250 kcal and 10 g protein, enjoys milky coffee. Sodium, urea and creatinine improving therefore hydration status normalising. Magnesium: normal range.

4

Tolerating Fresubin Original Fibre well at 75 ml/hr for 16 hr with 100 ml water flushes. Continues on IV antibiotic (1 day left). Breathing improving and managing physiotherapy better but oral intake not improved at present. Bowels moving well and urine output good. Oral intake remains poor, tolerating approx. 300 kcal and 15 g protein. As protein requirements are high with moderate calorie needs - change to **Fresubin HP Energy Fibre** 1000 ml at 75 ml/hr x 13.5 hr with 150 ml water flushes providing 1500 kcal, 75 g protein, 15 g fibre and 1090 ml fluid.

6

Improving and mobile on ward. IV antibiotics discontinued and only needs oxygen therapy after strenuous physical activity. Oral intake as per previous assessment. Weighed today 55.1 kg - stable therefore meeting nutritional requirements. Continue with feed on Fresubin HP Energy Fibre 1000 ml and increase to 100 ml/hr x 10 hr (approx. 9 a.m.-7 p.m.) and monitor weight.

8

Oral intake improving, Mrs F is managing at least 1/2 main courses. Staff on ward making coffees with milk, approx. 1200 kcal and 30 g protein. Weight 55.1 kg, 10.6 kg. Mrs F is keen to get home and motivated to increase physical activity and oral intake. Bowels moving well, no problems. Reduce feed to 500 ml Fresubin HP Energy Fibre in the evening (6 p.m.-11 p.m.) at 100 ml/hr with 150 ml water flushes before and after feed. Commence Fresubin ONS 1-2 x daily to maximise oral intake. Review in 2-3 days, if oral intake increased again, nasogastric feeding tube can be removed.

10

Oral intake improved again, approx. 1500 kcal and 45 g protein - eating 2 courses at meal time and husband bringing in cake to have with milky coffee plus 2 x Fresubin ONS daily. Weight today 55.5 kg, therefore patient meeting nutritional requirements for weight gain. Stop feed and remove feeding tube. Continue with regular meals and snacks to ensure weight maintenance.

### Therapeutic outcome



- Outpatient, living at home independently with her husband. Her oxygen therapy continues as required following strenuous physical activity.
- Supplemental tube feeding on a normocaloric feed (Fresubin Original Fibre) when at refeeding syndrome risk and a changing to a high protein (20%) tube feed with Fresubin HP Energy Fibre helped maintain Mrs F's nutritional status and supported her through period of acute illness where her nutritional requirements were increased.<sup>1</sup>
- Fresubin Original Fibre and Fresubin HP Energy Fibre were able to help meet fibre needs and maintain gut physiology in Mrs F.<sup>8,10,15,16</sup>
- Meeting protein requirements combined with vitamin D in a small volume with Fresubin HP Energy Fibre, may also help maintain muscle mass and function and may reduce the risk of fractures and falls.<sup>12</sup>
- Fresubin ONS continue 2 x daily to help meet nutritional requirements and Mrs F is being followed up by the community dietician in clinic.

Fresubin Original Fibre is a normocaloric nutritionally complete feed providing the RDD of 20 µg of vitamin D, 22.5 g fibre in 1500 ml.

Fresubin Original Fibre and Fresubin HP Energy Fibre were able to help meet fibre needs and maintain gut physiology in Mrs F.<sup>8,15,16</sup>

## Case 3

# Jejunostomy feeding in oesophageal cancer

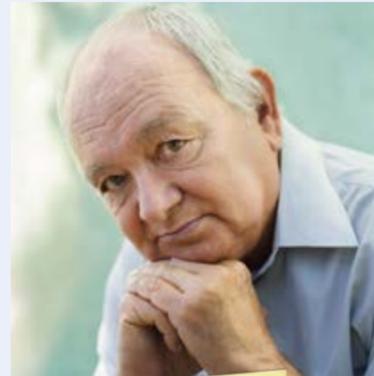
## Clinical summary



### Presentation/clinical history

**Mr G, 68 years, veterinarian, diagnosed with T4aN1M0 oesophageal carcinoma 3 months ago**

- Following 3 cycles of neo-adjuvant chemotherapy, Ivor Lewis oesophago-gastrectomy with lymphadenectomy 10 days ago
- **At surgery 9Fr Freka FCJ surgical jejunostomy tube was sited**
- Transferred to ward from high dependency unit on Fresubin Original Fibre
- Started eating on day 7 following surgery - progressing well
- Past medical history: Barrett's oesophagus, type 2 diabetes
- Medication: omeprazole, morphine, metformin (on temporary sliding scale insulin following surgery), macrogol
- Biochemistry: Na 144 mmol/l, K 4.1 mmol/l, Ur 6.4 mmol/l, Cr 80 µmol/l, PO<sub>4</sub> 1.02 mmol/l, HbA1c 7.1 mmol/l



*Tube feeding following gastrointestinal surgery may reduce malnutrition risk.<sup>13</sup>*



### Weight history

Normal weight	90 kg (BMI: 30.1 kg/m <sup>2</sup> )
At diagnosis	84.7 kg (BMI: 28.3 kg/m <sup>2</sup> )
Current	78.6 kg (BMI: 26.3 kg/m <sup>2</sup> )

- Weight loss since diagnosis: **7.2%**; Total weight loss: **12.7%**

## Nutritional assessment



### Estimated nutritional requirements

- Energy: 2358 kcal<sup>1</sup>  
(30 kcal x 78.6 kg)
- Protein: 117.9 g (1.5 g/kg)<sup>1</sup>
- Fluid: 2379 ml (using the 100/50/15 formula)<sup>7</sup>



### Dietetic assessment

- **Current feeding regime Fresubin Original 1500 ml at 75 ml/hr x 16 hr with 30 ml water flushes pre- and post-feed with sterile water.**
- **Oral intake: managing minimal amounts of soft food and normal consistency fluids < 200 kcal and 5 g protein, appetite good but vomiting regularly - commenced anti-emetics.**
- Bowels moving 1-2 daily, no problems reported.
- Blood glucose 5.6-7.8 mmol/l: stable with sliding scale insulin.
- All 3 fixation sutures still in place and stoma site looks healthy, clear dressing insitu.
- **Not meeting nutritional requirements.**



### Aim

- **Maintain weight and nutritional status to support recovery.**

## Tube feeding with Fresubin



### Nutrition therapy

**Feeding tube 9Fr Freka FCJ-Set surgical jejunostomy tube (3 fixation sutures)**

- High energy and protein requirements and a concentrated nutritionally complete feed is indicated.
- A feed with fish oil may have cardiovascular protection benefits.<sup>12</sup>
- As Mr G's bowels are moving well with fibre-free feed, continue with fibre-free feed; monitor and review as required.
- Monitor biochemistry, blood glucose and bowel function. Weight requested.

### Day



### Feeding regime

**Change feed to 1500 ml Fresubin HP Energy - nutritionally complete in 1500 ml and provides 2250 kcal, 112.5 g protein and 1185 ml fluid**

1

Fresubin HP Energy 1000 ml at 75 ml/hr x 13.5 hr (approx. 7 a.m.-8.30 p.m.) with 30 ml water pre- and post-feed.

2

Fresubin HP Energy 1500 ml at 100 ml/hr x 15 hr (approx. 7 a.m.-10 p.m.) with 30 ml water pre- and post-feed.

3

Fresubin HP Energy 1500 ml at 125 ml/hr x 12 hr (approx. 7 a.m.-7 p.m.) with 30 ml water pre- and post-feed. Providing 2250 kcal, 112.5 g protein and 1245 ml fluid.

### Monitoring/Follow Up

3

**Surgeon reports cancer more extensive than expected** - await pathology results on margins/lymph nodes. Weight 77.8 kg, slight reduction as expected as feed being titrated following surgery. **Tolerating Fresubin HP Energy 1500 ml at 100 ml/hr as per regime.** No new issues with biochemistry or blood glucose levels.

**Bowels moving well, no problems reported. Oral intake remains poor and drinks mostly black tea on normal diet but still vomiting regularly.** Total from feed and oral intake = 2450 kcal, 120 g protein and 2350 ml therefore meeting nutritional requirements. **Continue with plan as above Fresubin HP Energy 1500 ml at 125 ml/hr x 12 hr.**

5

Sliding scale insulin stopped, back on to metformin. Blood glucose 6.6-7.9 mmol/l. Bowels soft and moving daily without need for laxative. Fresubin HP Energy 1500 ml at 125 ml/hr x 12 hr continues to be tolerated well - no changes.

7

**Reviewed by surgeon, patient now palliative,** review as an outpatient. **Continue with feed as tolerated well of 1500 ml Fresubin HP Energy at 125 ml/hr.** Arrange for patient/family training on feeding pump, also advised to use cooled-boiled water for flushing tube.

**Aim changed: minimise further depletion in nutritional status due to palliative diagnosis.**

10

Outpatient, provided with 7-day supply of feed and giving sets. Community dietician to follow-up at home. Last weight recorded 75 kg - not to be weighed now due to palliative nature of disease.

12

Home visit: mood low but glad to be home with family. **Oral intake reported to be regular but not increasing as mild-moderate nausea and vomiting continues despite changed of anti-emetics.** Feed running overnight at 125 ml/hr as per regime.

Some slight discharge from stoma site - encouraged to clean daily. Continue with feeding as above.

15

Mr G is to receive palliative chemo therapy - mood seems to have improved. **Oral intake not progressing and remains minimal. Given further food fortification advice and importance of enjoying food consumed. Vomiting stopped now but nausea continues.** Blood glucose levels are stable approx. 7.6-8.2 mmol/l.

25

**First chemotherapy session completed: feeling well so far. Oral intake remains stable, small regular portions. Unlikely to increase significantly in coming weeks due to chemotherapy. Continue with Fresubin HP Energy 1500 ml at 125 ml/hr x 12 hr with 30 ml cooled-boiled water flushes pre- and post-feed.**

## Therapeutic outcome



- Mr G has been unable to progress with oral intake following surgery and his jejunostomy feeding has reduced pressure on oral intake following surgery and during palliative chemotherapy.
- **Feeding via jejunostomy had minimal impact on nausea and vomiting.**
- Fresubin HP Energy was able to meet Mr G's full nutritional needs in only 1500 ml.

*Fresubin HP Energy is a nutritionally complete high energy, high protein feed to meet need following surgery in a small volume.*

*Tube feeding with Fresubin has helped maintain hydration status and minimise depletion in nutritional status.*

## Case 4

# Short term feeding following stem cell transplant

## Clinical summary



### Presentation/clinical history

Miss H, 25 years, mechanical engineer diagnosed with Hodgkin's lymphoma 6 months ago

- Initially treated with 4 cycles of ABVD chemotherapy (doxorubicin, bleomycin, vinblastine and dacarbazine) and stem cell transplant with radical BEAM chemo (carmustine, etoposide, cytarabine and melphalan) and stem cells replacement in the next 2 days
- Over the past week, stomach pain and vomiting despite the use of anti-emetics during BEAM chemo
- Taste changes and mild mucositis as main symptoms during chemotherapy treatment and previously reluctant with nutritional support including ONS however significant weight loss
- Naso-jejunal tube due to on-going vomiting and poor nutritional status
- Past medical history: tonsillectomy
- Medication: magnesium supplement, calcium supplement, loperamide, IV palifermin, ibuprofen
- Biochemistry: Na 130 mmol/l, K 3.9 mmol/l, Ur 7.0 mmol/l, Cr 79 µmol/l, Mg 0.59 mmol/l, Ca 1.87 mmol/l, PO<sub>4</sub> 0.97 mmol/l



### Weight history

Normal weight	75 kg (BMI: 25.1 kg/m <sup>2</sup> )
At diagnosis	73.1 kg (BMI: 24.4 kg/m <sup>2</sup> )
Current	68.3 kg (BMI: 22.8 kg/m <sup>2</sup> )

- Weight loss since diagnosis (6 months): **6.6%**. Total weight loss: **8.9%**



Short-term tube feeding following chemotherapy may help reduce depletion in nutritional status and support through acute therapy.<sup>1</sup>

## Nutritional assessment



### Estimated nutritional requirements

- Energy: 2049 kcal<sup>1</sup> (30 kcal x 68.3 kg)
- Protein: 102.5 g (1.5 g/kg)<sup>1</sup>
- Fluid: 2225 ml (using the 100/50/15 formula)<sup>7</sup>



### Dietetic assessment

- Looks very lethargic and reports nausea. Commenced domperidone and cyclizine syringe driver for nausea with minimal effect.
- Loose stools reported (4-times daily) likely to be secondary to chemotherapy - loperamide continues three times daily.
- Currently on 8 hourly IV fluids (1500 ml).
- Magnesium and calcium levels also low: again secondary to chemo and loose stools. Supplemented but need to monitor during early days of feeding due to possible refeeding syndrome risk.
- Oral intake significantly reduced over past 2 days,odynophagia due to mucositis and loose stools. Approx. 500 kcal and 10 g protein.
- Trialled ONS but nausea making it difficult with any oral intake.
- Not meeting nutritional requirements and happy to commence feeding via naso-jejunal feeding tube.



### Aim

- To optimise oral intake and maintain weight during treatment to prevent further decline in nutritional status.

## Tube feeding with Fresubin



### Nutrition therapy

- Commence low residue diet.
- Start tube feed slowly due to low magnesium, feed for 16 hr as jejunal feeding likely to have minimal impact on oral intake.
- Fibre free feed indicated due to loose stools secondary to chemotherapy.
- Commence thiamine 100 mg twice daily and multivitamin to aid carbohydrate metabolism due to low magnesium. Not high refeeding syndrome risk as weight loss not significant and previously well nourished.
- Continue with magnesium replacement.

### Day



### Feeding regime

- 1
- 2
- 3

Fresubin 2 kcal HP 1000 ml at 25 ml/hr x 16 hr (approx. 7 a.m.-11 p.m.) with 30 ml sterile water flushes.

Fresubin 2 kcal HP 1000 ml at 50 ml/hr x 16 hr (approx. 7 a.m.-11 p.m.) with 30 ml sterile water flushes.

Fresubin 2 kcal HP 1000 ml at 75 ml/hr x 13.5 hr (approx. 7 a.m.-8.30 p.m.) with 30 ml sterile water flushes.

Providing 2000 kcal, 100 g protein and 720 ml fluid. Monitor magnesium and phosphate.

### Monitoring/Follow Up

- 2
- 4
- 5
- 7
- 10
- 12

No problems with feed at 25 ml/hr. Bowels still opening 4-6 times daily but slightly less loose due to increased loperamide, fibre free feed and low residue diet. Magnesium remains low but stable at 0.60 mmol/l, phosphate level normal and stable at 1.03 mmol/l. Oral intake as per previous assessment as nausea continues. Increase rate as planned on Fresubin 2 kcal HP 1000 ml at 50 ml/hr x 16 hr.

Stem cell transplant completed, no dietetic review today.

Mood increased following successful transplant, and side effects of chemo seem to be improving slowly, oral intake improving. Moving around ward well with feeding pump. Feed currently running on 75ml/hr on Fresubin 2 kcal HP. Bowels continue to move at least 4 x daily but improving. Continues on magnesium replacement all biochemistry within normal range except Mg (improving: 0.63 mmol/l) and Ca (stable at 1.89 mmol/l). Oral intake approx. 900 kcal and 20 g protein, if intake over 1400 kcal at next review, reduce feed via tube.

Further improvements in general well-being reported. Nausea reduced and vomiting now stopped - continues on anti-emetics: now oral. Bowels opening 4 times daily as soft movements and continues to tolerate Fresubin 2 kcal HP 1000 ml at 75 ml/hr x 13.5 hr. Oral intake approx. 1450 kcal and 40 g protein. Weight today increase slightly to 68.7 kg therefore exceeding nutritional requirements. Still not able to meet nutritional requirements orally therefore reduce feed to 500 ml Fresubin 2 kcal HP (1000 kcal and 50 g protein) and also offer 1 x Fresubin ONS (with 10 g protein) daily to increase oral intake. Monitor again in 3-4 days.

Oral intake continues to improve and now off low residue diet, family have been bringing in food for snacks. Managing 2 courses at meal times and 1-2 Fresubin ONS daily. Intake approx. 2000 kcal and 90 g protein (including ONS). Weight increased again to 69.1 kg (BMI 23.1 kg/m<sup>2</sup>) therefore meeting nutritional requirements orally. Continue with feed on 500 ml Fresubin 2 kcal HP for next 2-3 day, if weight stable and oral intake good - stop tube feeding. Continue with maximum encouragement and 2 x Fresubin ONS daily.

Miss H's oral intake continues to improve and nausea resolved. Weight 69.3 kg - stable. Due to be discharged home in 3-4 days and monitored as out-patient. Agreed to naso-jejunal tube removal however to be reviewed as out-patient by haematologist in 1 week. Monitor weight at clinic. Discharged from dietetic care and re-refer if weight or oral intake reduce.

## Therapeutic outcome



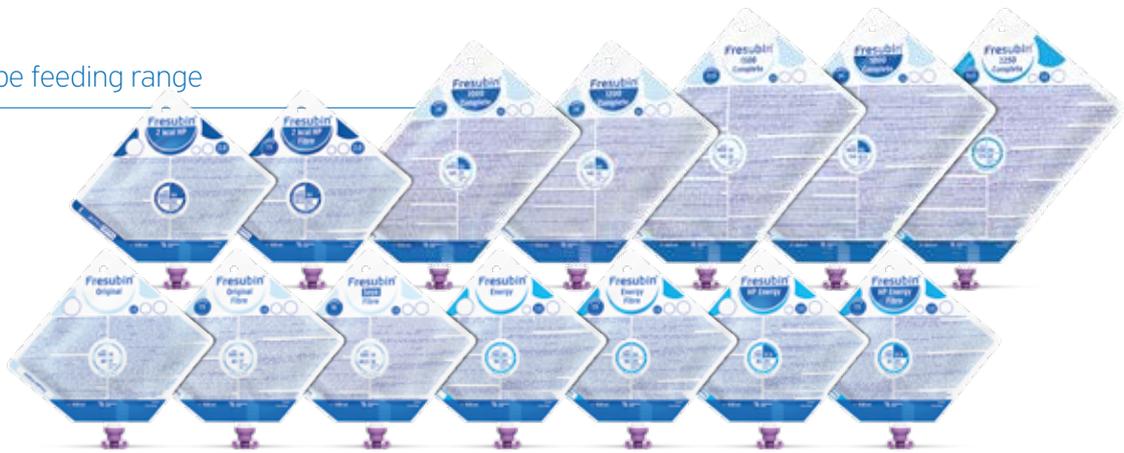
- Miss H was discharged home following a successful stem cell transplant. Continues on 1-2 x Fresubin ONS daily to maintain her weight and her oral intake remains excellent.
- Slow-moderate rate of the fibre-free Fresubin 2 kcal HP was able to provide high energy in reduced volume without impacting on Miss H's bowels movements and oral intake. Ensuring she optimised her nutritional intake despite having numerous treatment side effects.
- Supplemental Fresubin ONS continues to maintain nutritional status and reduce risk of complications following Miss H's in-patient stay.<sup>7</sup>

Fresubin 2 kcal HP is a concentrated high calorie, high protein feed to meet full nutritional requirements and minimise nutritional losses.

Supplemental tube feeding alongside Fresubin ONS was able to maintain Miss H's weight and support her through a period of acute therapy where her nutritional requirements were increased.<sup>1</sup>



## 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<sup>19,20</sup>
- Included in all Fresubin standard tube feeds



### High-quality protein

- Quality of protein mixture in line with WHO and FAO recommendations<sup>21</sup>
- 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 recommendations<sup>22</sup>
- Prevents a vitamin D deficiency<sup>23</sup>
- Reduces the risk of fractures and falls by improving muscle strength and muscle function<sup>10,23</sup>



### Fibre blend

- Fibre-enriched versions of all Fresubin standard tube feeds
- Blend of soluble/insoluble and fermentable/infermentable fibres to maintain gut physiology<sup>8,24</sup>



### 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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