CHAPTER 9  NUTRITION AND BLOOD

<table>
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<tr>
<th>First line drugs – drugs recommended in both primary and secondary care</th>
<th>Second line drugs – alternatives (often in specific conditions) in both primary and secondary care</th>
<th>Specialist drugs – Drugs where specialist input is needed (see introduction for definition)</th>
<th>Hospital only drugs – prescribing principally within secondary care only.</th>
</tr>
</thead>
</table>

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Notes:
1. **Sugar Free Products** are preferred where available and products where a sugar free preparation is available are identified by SF.
2. A number of controls have been imposed on prescribing drugs in this chapter on FP10 prescriptions by the **Selective List Scheme** (SLS) or the **Advisory Committee on Borderline Substances** (ACBS). Drugs affected are highlighted SLS Or ACBS and the explanatory notes provide further guidance. Doctors within secondary care are asked not to ask GPs to prescribe drugs outside of the controls imposed by SLS and ACBS.

| 01/11 | 9.5 Section update | L Houston, ESCHS dietetics team, S Mills G Ells |
| 04/12 | 9.1.3 (Formulary addition), 9.1.1.1 (minor amendment), 9.5.1.2 (NICE guidance), 9.6.3 (Formulary addition) | G Ells |
| 09/12 | 9.6.4 (formulary addition) | G Ells |
| 11/12 | 9.4.1 (Formulary addition) | G Ells |
| 12/12 | 9.6.6 (updated guidance, drug deletion) | A Luck |
| 10/13 | 9.1.4 (NICE guidance) | G Ells |
9.1 Anaemias and some other blood disorders

9.1.1 Iron-deficiency anaemias

9.1.1.1 Oral iron

**WARNING** – Iron tablets may be attractive to children and patients should be warned to store their iron tablets carefully to avoid accidental iron poisoning.

**Ferrous sulphate**
- Tablets 200 mg (equivalent to 65 mg ferrous iron per tablet)

**Ferrous fumarate**
- Tablets 210 mg (equivalent to 68 mg ferrous iron per tablet)

**Ferrous gluconate**
- Tablets 300 mg (equivalent to 35 mg iron per tablet)

**Sodium feredetate (Sytron®)**
- Elixir SF 190 mg in 5 ml (equivalent to 27.5 mg of ferrous iron per 5 ml)

**Notes:**
1. Iron preparations differ in their iron content. As gastro-intestinal side effects are related to the iron content there is a lower incidence of side effects with preparations containing less iron.
2. Patients should be advised to continue taking iron for **3 months after recovery** of haemoglobin to allow replenishment of iron stores.
3. Maximum absorption of iron occurs with TDS dosing. Once or twice a day dosing of iron preparations may be effective for prophylaxis or mild iron deficiency.
4. **Sodium feredetate** is included as the liquid form of iron.
5. **Modified release** preparations are not recommended because they are likely to carry the iron past the first part of the duodenum into an area of the gut where conditions for iron absorption are poor. The low incidence of side effects may well be because of the small amounts of iron available under these conditions. The BNF recommends that these preparations have no therapeutic advantage and should **not** be used.
6. **Pregaday®** is often used but it contains only 350 micrograms of folic acid, which is less than the 400 micrograms recommended for the prevention of neural tube defects in women planning a pregnancy and is inadequate for the treatment of megaloblastic anaemia.

9.1.1.2 Parenteral iron

**Note:**
The dose of all parenteral iron preparations requires calculation on an individual basis.

**Iron dextran (CosmoFer®)**
- Injection 100 mg in 2 ml for **slow intravenous injection** or **intravenous infusion** or **deep intramuscular injection** into the gluteal muscle
- Not recommended for patients under 14 years

**Notes:**
1. The only valid reasons for administering iron parenterally are failure of oral therapy due to lack of patient co-operation, severe gastro-intestinal side effects, continuing severe blood loss or malabsorption and for patients with severe renal failure receiving haemodialysis.
2. A small test dose of **CosmoFer®** should be given prior to commencing treatment because of the risk of anaphylaxis. Prescribers should be vigilant for anaphylaxis.
3. When giving **CosmoFer®**, oral iron therapy should be avoided for 5 days after administration.
9.1.2 Drugs used in megaloblastic anaemias

Folic acid
- Tablets 5 mg
- Tablets 400 micrograms
- Syrup SF 2.5 mg in 5 ml
- Syrup SF 400 microgram in 5 ml
- Folic Acid injection 15mg/ml

Hydroxocobalamin
- Injection 1 mg in 1ml

Cyanocobalamin
- Tablets 50 micrograms

Notes:
1. Folic acid has few indications for long-term therapy since most causes of folate deficiency are self-limiting or will yield to a short course of treatment. It should not be used in undiagnosed megaloblastic anaemia unless vitamin B12 is administered concurrently otherwise neuropathy may be precipitated.
2. Hydroxocobalamin has completely replaced cyanocobalamin as the form of vitamin B12 of choice for therapy; it is retained in the body longer than cyanocobalamin and thus for maintenance therapy can be given at intervals of up to 3 months. For this reason cyanocobalamin injection is blacklisted.
3. Neo-Cytamen® injection is also blacklisted and prescriptions must be written for generic hydroxocobalamin to be allowed on FP10 prescription.
4. Cyanocobalamin tablets can only be prescribed on FP10 for a patient who is vegan or who has a proven vitamin B12 deficiency of dietary origin for treatment or prevention of vitamin B12 deficiency. Such prescriptions must be endorsed SLS.
5. For folinic acid tablets, used to counteract the folate-antagonistic action of methotrexate, see BNF Chapter 8.

PREVENTION OF NEURAL TUBE DEFECTS

Recommendations of an expert advisory group of the Department of Health include the advice that:

- To prevent recurrence of neural tube defect (in a child of a man or woman with spina bifida, or if there is a history of neural tube defect in a previous child). Women who wish to become pregnant (or who are at risk of becoming pregnant) should be advised to take folic acid supplements at a dose of 5 mg daily (reduced to 4 mg daily if a suitable preparation becomes available). Supplementation should continue until the twelfth week of pregnancy. Women receiving antiepileptic therapy need individual counselling by their doctor before starting folic acid.
- To prevent first occurrence of neural tube defect women who are planning a pregnancy should be advised to take folic acid as a medicinal or food supplement at a dose of 400 micrograms daily before conception and during the first 12 weeks of pregnancy. Women who have not been supplementing and who suspect they are pregnant should start at once and continue until the twelfth week of pregnancy.
- There is no justification for prescribing multiple-ingredient vitamin preparations containing vitamin B12 or folic acid.

9.1.3 Drugs used in hypoplastic, haemolytic and renal anaemias

Darbopoetin alfa
(Aranesp®)
- Prefilled syringes – 10,15,20, 30,40,50,60,80,100,130,150, 300,500 micrograms
- Prefilled disposable injection device – 20,40,60,80,100, 150, 300, 500 micrograms

Epoetin beta
(NeoRecormon®)
- Prefilled syringes – 500 units, 1000i.u, 2000i.u, 3000i.u, 4000i.u,
Notes:
1. In East Sussex Health Economy, epoetin is prescribed and supplied on an ongoing basis for renal patients by Brighton & Sussex University Hospitals NHS Trust, not Primary Care.
2. Although clinically indistinguishable the prescription must specify which brand of erythropoetin is required.
3. To achieve the optimum dosage of EPO any ferritin, folate and B12 deficiencies should be corrected first.
4. Patients should be screened prior to prescribing.

**Desferrioxamine**
- 500 mg, 2g injection for I/V infusion

**Deferiprone**
- 500mg tablets

Notes:
1. Desferrioxamine may be used to treat aluminium overload in dialysis patients.
2. Deferiprone is licensed for the treatment of iron overload in patients with thalassaemia major in whom desferrioxamine is contra-indicated or is not tolerated. It has been associated with blood dyscrasias. It is contra-indicated in pregnancy.

### 9.1.4 Drugs used in platelet disorders

**Eltrombopag**
- Revolade® tablets, 25mg, 50mg

**Romiplostim**
- Nplate® injection: powder for reconstitution 250 microgram vial

Eltrombopag and Romiplostim can be used in the treatment of idiopathic thrombocytopenic purpura in accordance with NICE TA 221 April 2011 (romiplostim) and NICE TA 293 July 2013 (eltrombopag). These treatments should be prescribed by a haematologist.

### 9.1.6 Drugs used in neutropenia

**Lenograstim (Granocyte®)**
- Pre filled syringe and vial 33.6 million units (263 micrograms)

Note:
This agent should usually be prescribed by a haematologist or appropriate oncologist.

### 9.2 Fluids and electrolytes

#### 9.2.1 Oral administration

**9.2.1.1 Oral potassium**

**Sando-K®**
- Effervescent tablets each containing 12 mmol potassium

Notes:
1. Potassium supplementation is indicated for proven hypokalaemia.
2. Slow-K® tablets, though frequently used, have not been included because they only contain 8mmol potassium per tablet and are associated with oesophageal ulceration.

### Potassium Removal

**Calcium Resonium**
- Powder calcium polystyrene sulphonate.

**Resonium A**
- Powder sodium polystyrene sulphonate
Notes:
1. Calcium Resonium and Resonium A can be taken orally mixed in water (not fruit juice or other potassium containing fluids) or rectally. Contact your pharmacist for formulation details.
2. Contra-indications: obstructive bowel disease; oral administration or reduced gut motility in neonates; avoid calcium containing resin in hyperparathyroidism, multiple myeloma, sarcoidosis or metastatic carcinoma.

9.2.1.2 Oral sodium and water

Oral rehydration salts

<table>
<thead>
<tr>
<th>Dioralyte® - 5 sachets reconstituted with 1 litre of water contain:</th>
<th>Na⁺</th>
<th>K⁺</th>
<th>Cl⁻</th>
<th>Glucose</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>60 mmol</td>
<td>20 mmol</td>
<td>60 mmol</td>
<td>90 mmol</td>
<td>10 mmol citrate</td>
</tr>
</tbody>
</table>

Notes:
1. Reconstitute one sachet with 200mls water (this should be freshly boiled and cooled for infants).
2. In infants, breast-feeding or formula feeds should be offered between oral rehydration drinks.

Slow Sodium®

- Modified release tablets containing 600 mg sodium chloride (equivalent to 10 mmol Sodium)

9.2.1.3 Oral bicarbonate

Sodium bicarbonate

- Capsules, sodium bicarbonate 500 mg (approx. 6 mmol each of sodium and bicarbonate) Unlicensed

Products routinely used in Primary Care

Sodium chloride 0.9% for injection

- 5ml, 10ml, 20ml ampoules
- 50ml vials

Water for injection

- 5ml, 10ml, 20ml ampoules

9.3 Intravenous nutrition

Notes:
1. Intravenous nutrition should be discussed with the hospital pharmacy department.
2. Any patients in primary care receiving TPN do so via a hospital. Each patient and their GP should be given a contact number for further help and support.
3. GPs will not be asked to prescribe TPN or any component of it.

9.4 Oral nutrition

9.4.1 Foods for special diets
Gluten free products

1. **Coeliac disease** is a medical condition which requires lifelong exclusion of gluten from the diet and dietary compliance is the key to successful management.

2. **Many everyday foods are gluten free** e.g. potatoes, rice, fruit, vegetables, meat, fish, corn and rice based cereals etc.

3. **GPs should only prescribe flour and bread (fresh or long life)**

4. There are a wide range of GF foods available at supermarkets – it is appreciated that these cost more than the equivalent gluten containing foods and it is not the intention to disadvantage patients by stopping prescribing of all Gluten Free foods. It is, however, reasonable to expect patients to spend a similar amount on these foods as they would if they were able to eat gluten. Therefore to cover the increased cost of maintaining a GF diet some GF items will continue to be provided free of charge to those who are exempt from prescription charges or who have a prepayment certificate. Patients may choose to use the money saved as a result of the NHS providing these items towards the purchase of other items such as pasta, cake mix etc.

5. Additional gluten free foods can be found in [Coeliac UK’s Food and Drink Directory](#).

6. For information on which brands can be prescribed on FP10, refer to the current edition of the Drug Tariff which is updated monthly.

7. **All products must be endorsed ACBS.**

8. Refer to dietician for issues relating to dietary management and advice on everyday foods that are gluten free.

For further information contact Department of Nutrition and Dietetics:

- **Eastbourne**
  - Tel: (01323) 444167

- **Uckfield**
  - Tel: (01825) 745003

- **Hastings**
  - Tel: (01424) 758177

9.4.2 **Enteral nutrition**

Sip feeds
Guidance on Re-feeding syndrome

Re-feeding syndrome is where there are severe fluid and electrolyte shifts and related metabolic implications in malnourished patients under going re-feeding. It is most commonly seen in the hospital setting. However it may affect severely malnourished people in the community and people with eating disorders.

Consequences include:
- Hypophosphataemia
- Hypokalaemia
- Hypomagnesaemia
- Altered glucose metabolism
- Fluid balance abnormalities
- Vitamin deficiencies

This can lead to cardiac, respiratory, neuromuscular, renal, metabolic, haematological, hepatic and gastrointestinal problems.

Pathogenesis:
1. During starvation, insulin concentrations decrease and glucagon levels increase. This causes glycogen stores to be rapidly converted to glucose. The body is therefore reliant on gluconeogenesis to provide energy i.e. protein and lipid stores are broken down and converted into glucose.
2. Adipose tissue lipase is activated, causing the release of large amounts of fatty acids and glycerol. Free fatty acids and ketone bodies replace glucose as the main energy source in starvation. This process leads to the loss of lean body mass, water and minerals.
3. During the re-feeding process, there is a change in metabolism from fat to carbohydrate. This causes a release of insulin. With carbohydrate repletion and increase insulin production there is an increased uptake of glucose, phosphorous, potassium and water into cells and anabolic protein synthesis is stimulated.

Criteria for determining people at high risk of developing re-feeding problems:

Patient has one or more of the following:
- BMI less than 16kg\(m^2\)
- Unintentional weight loss greater than 15% within the last 3-6 months
- Little or no nutritional intake for more than 10 days
- Low levels of potassium, phosphate or magnesium prior to feeding

Or patient has two or more of the following:
- BMI less than 18.5kg\(m^2\)
- Unintentional weight loss of greater than 10% within the last 3-6 months
- Little or no nutritional intake for more than 5 days
- A history of alcohol abuse or drugs, including insulin, chemotherapy, antacids or diuretics

Management of people at risk of Re-feeding syndrome (NICE guidance):
1. Refer to community nutrition support dietician to develop an appropriate re-feeding diet / feed regimen.
2. Restore circulatory volume and monitor fluid balance and overall clinical status closely.
3. Provide immediately before and during first 10 days of feeding:
   - Oral thiamine 200-300mg per day, vitamin B co strong 1 or 2 tablets 3 times per day (or full daily IV vitamin B preparation) plus a balanced multi-vitamin and trace element supplement once per day
   - Provide oral, enteral or IV supplements of potassium (likely requirement 2-4mmol/kg/day), phosphate (likely requirement 0.3 –0.6mmol/kg/day) and magnesium (likely requirement 0.2mmol/kg/day IV, 0.4mmol/kg/day oral), unless pre-feeding plasma levels are high.
   - Pre-feeding correction of low plasma levels is unnecessary

‘MALNUTRITION UNIVERSAL SCREENING TOOL’ (‘MUST’)
**Step 1**
BMI score

<table>
<thead>
<tr>
<th>BMI kg/m²</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 20 (&gt; 30)</td>
<td>0</td>
</tr>
<tr>
<td>18.5 – 20</td>
<td>1</td>
</tr>
<tr>
<td>&lt; 18.5</td>
<td>2</td>
</tr>
</tbody>
</table>

**Step 2**
Unplanned weight loss in past 3-6 months

<table>
<thead>
<tr>
<th>%</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 5</td>
<td>0</td>
</tr>
<tr>
<td>5-10</td>
<td>1</td>
</tr>
<tr>
<td>&gt; 10</td>
<td>2</td>
</tr>
</tbody>
</table>

**Step 3**
Acute disease effect score

If patient is acutely ill and there has been or is likely to be no nutritional intake for > 5 days
Score = 2

**Step 4**
Overall risk of malnutrition
Add scores together to calculate overall risk of malnutrition

<table>
<thead>
<tr>
<th>Score</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Low Risk</td>
</tr>
<tr>
<td>1</td>
<td>Medium Risk</td>
</tr>
<tr>
<td>2 or more</td>
<td>High Risk</td>
</tr>
</tbody>
</table>

**Step 5**
Management guidelines

- **0 Low Risk**
  - Routine clinical care
  - Repeat screening
    - Hospital – weekly
    - Care Homes – monthly
    - Community – annually
  - for special groups e.g. those > 75 yrs.

- **1 Medium Risk**
  - Observe
  - Document dietary intake for 3 days if subject in hospital or care home
  - If improved or adequate intake – little clinical concern; if no improvement – clinical concern – follow local policy
  - Repeat screening
    - Hospital – weekly
    - Care Home – at least monthly
    - Community – at least every 2-3 months

- **2 or more High Risk**
  - Treat*
  - Refer to dietitian, Nutritional Support Team or implement local policy
  - Improve and increase overall nutritional intake
  - Monitor and review care plan
    - Hospital – weekly
    - Care Home – monthly
    - Community – monthly
  - * Unless detrimental or no benefit is expected from nutritional support e.g. imminent death.

All risk categories:
- Treat underlying condition and provide help and advice on food choices, eating and drinking when necessary.
- Record malnutrition risk category.
- Record need for special diets and follow local policy.

**Obesity:**
- Record presence of obesity. For those with underlying conditions, these are generally controlled before the treatment of obesity.

Re-assess subjects identified at risk as they move through care settings

See *The ‘MUST’ Explanatory Booklet* for further details and *The ‘MUST’ Report* for supporting evidence.

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**Guidance on Prescribing Oral Nutritional Supplements for Adults in Primary Care**

<table>
<thead>
<tr>
<th>First line drugs</th>
<th>Second line drugs</th>
<th>Specialist drugs</th>
<th>Hospital only drugs</th>
</tr>
</thead>
</table>

Adapted from Plymouth Area Joint Formulary Chapter 9 Nutrition and Blood
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Oral nutritional supplements (ONS) should only be provided to patients who are classed as malnourished or at risk of malnutrition where dietary intervention (such as food fortification, altered meal patterns etc.) has not promoted an improvement in nutritional status. Oral nutritional supplements are intended to ‘supplement’ a nutrient deficient diet. They should not be used as a meal replacement or a sole source of nutrition; unless recommended by a Dietitian.

If a patient is likely to require long term ONS, it is recommended that they are referred to a Dietitian for specialist assessment (NICE 2006).

In some circumstances it may not be appropriate to refer to a Community Dietitian, for example patients with a very limited life expectancy, patients who do not wish to be referred on or patients who are not likely to need ONS for longer than 4 weeks.

Deciding whether the use of nutritional supplements is indicated:

<table>
<thead>
<tr>
<th>Screen for risk of malnutrition using the MUST</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MUST score of 0</strong></td>
</tr>
<tr>
<td>Low risk of malnutrition</td>
</tr>
<tr>
<td><strong>No intervention indicated</strong></td>
</tr>
<tr>
<td>Regular meals and snacks incorporating all the food groups based on the ‘Eat Well’ plate model</td>
</tr>
<tr>
<td><strong>MUST score of 1</strong></td>
</tr>
<tr>
<td>Medium risk of malnutrition</td>
</tr>
<tr>
<td>High calorie, high protein fortified diet</td>
</tr>
<tr>
<td>Regular meals and snacks incorporating all the food groups. Provide ‘Eating Well with a Small Appetite’</td>
</tr>
<tr>
<td>Review MUST in 4 weeks.</td>
</tr>
<tr>
<td><strong>MUST score of 2 or more</strong></td>
</tr>
<tr>
<td>High risk of malnutrition</td>
</tr>
<tr>
<td>High calorie, high protein fortified diet plus over the counter supplements, such as ‘Build Up or Complan’ made with full cream milk up to twice per day</td>
</tr>
<tr>
<td>Regular meals and snacks incorporating all the food groups. Provide ‘Eating Well with a Small Appetite’</td>
</tr>
<tr>
<td>Review MUST in 4 weeks.</td>
</tr>
</tbody>
</table>

4 week review
Re-calculate the patient’s MUST Score and follow the advice, according to their risk score.
Check for barriers to eating and drinking (eg. Constipation, nausea, vomiting, dental problems, lack of cooking facilities and help at home etc.) and try to resolve.
If no improvement in **High Risk patients**, consider referring to Community Nutrition Support Dietitian (if appropriate) or choose an appropriate first line ONS

Does the patient have a MUST score of 2 or more despite following a high calorie, high protein fortified diet with the use of over the counter supplements?  

- **No**  
  - Follow the dietary advice given according to their MUST score.

- **Yes**
  
  Does the patient require additional **fibre** in their diet?

  **Fibre Containing Supplements**
  - Fortisip Multifibre
  - Ensure Plus Fibre
  - Fresubin Energy Fibre

  Will the patient take a **milkshake / Yoghurt style** supplement?

  **Milkshake Style Supplements**
  - Fortisip
  - Ensure Plus
  - Fresubin Energy
  - Fortisip Yoghurt Style
  - Ensure Plus Yoghurt Style
  - Resource Energy

  Would the patient prefer a **juice style** supplement?

  **Juice Style Supplements**
  - Fortijuce
  - Ensure Plus Juice Style
  - Provide Xtra
  - Resource Fruit

  Would the patient prefer a **savoury style** supplement?

  **Savoury Style Supplements**
  - Fortisip Multifibre
  - Ensure Plus Savoury
  - Provide Xtra
Once you have determined what type of product the patient would like to drink, choose the flavours:

<table>
<thead>
<tr>
<th>Milkshake Style</th>
<th>Fortisip Style</th>
<th>Ensure Plus Style</th>
<th>Fresubin Energy Style</th>
<th>Resource Energy Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vanilla, banana, chocolate, orange, strawberry, tropical fruits, toffee, and neutral</td>
<td>Caramel, chocolate, strawberry, banana, fruits of the forest, raspberry, orange, coffee, blackcurrant, peach, vanilla, chicken, mushroom and neutral</td>
<td>Vanilla, strawberry, blackcurrant, banana, cappuccino, tropical fruits, chocolate, lemon, and neutral</td>
<td>Apricot, strawberry / raspberry, coffee, banana, chocolate and vanilla</td>
<td></td>
</tr>
<tr>
<td>300kcal and 12g protein per serving</td>
<td>330kcal and 13.8g protein per serving</td>
<td>300kcal and 11.3g protein per serving</td>
<td>300kcal and 11.2g protein per serving</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Juice Style</th>
<th>Fortijuce Style</th>
<th>Ensure Plus Juice Style</th>
<th>Provide Xtra Style</th>
<th>Resource Fruit Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple, apricot, blackcurrant, forest fruits, lemon, orange, strawberry, tropical</td>
<td>Apple, fruit punch, grapefruit, lemon and lime, orange, peach, pineapple, strawberry</td>
<td>Apple, blackcurrant, carrot-apple, cherry, citrus cola, lemon and lime, melon, orange and pineapple, tomato</td>
<td>Apple, orange, pear-cherry, raspberry-blackcurrant</td>
<td></td>
</tr>
<tr>
<td>300kcal 8g protein per serving</td>
<td>330kcal and 10.6g protein per serving</td>
<td>300kcal and 7.5g protein per serving</td>
<td>254kcal and 8g protein per serving</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Yoghurt Style</th>
<th>Fortisip Yoghurt Style</th>
<th>Ensure Plus Yoghurt Style</th>
<th>Fresubin Energy Fibre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peach and orange, raspberry, vanilla and lemon</td>
<td>Orange, peach, pineapple, or strawberry</td>
<td>Banana, caramel, chocolate, cherry, strawberry, vanilla</td>
<td></td>
</tr>
<tr>
<td>300kcal and 12g protein per serving</td>
<td>330kcal and 13.8g protein per serving</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Fibre Containing | Fortisip Multifibre Style | Ensure Plus Fibre Style | |
|------------------|---------------------------|------------------------|
| Banana, chicken, orange, strawberry, tomato, vanilla and chocolate | Vanilla, chocolate, fruits of the forest, raspberry, strawberry and banana | |
| 300kcal and 12g protein per serving | 305kcal and 12.5g protein per serving | |

<table>
<thead>
<tr>
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</tr>
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</table>

Adapted from Plymouth Area Joint Formulary Chapter 9 Nutrition and Blood
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Set the dose and plan to review the clinical effectiveness of the chosen oral nutritional supplements

- Provide the patient with 1 week supply of a variety of different products to try.
- Advise up to 2 bottles per day *between meals.*
- Provide patient with ‘A Guide to Taking Nutritional Supplements’, available in the ‘Treating Adult Malnutrition in the Community’ Resource folder or from The Department of Nutrition and Dietetics.
- Review patient compliance after 1 week.
- Patient compliant with recommended dose?
  - Yes: Generate 1 month prescription for 2 x patients preferred product per day.
  - No: If patient non-compliant or ONS is clinically ineffective discontinue the prescription and refer to Community Dietitian for specialist assessment.
- Review patient compliance and clinical effectiveness of ONS in 1 month.
  - If patient compliant with dose and ONS is clinically effective, continue prescription and refer to Community Dietitian for continued monitoring*.
  - If patient non-compliant or ONS is clinically ineffective discontinue the prescription and refer to Community Dietitian for specialist assessment.
- + Long term users of ONS, who are clinically stable should be reviewed and re-assessed by a Dietitian every 3 – 6 months (NICE 2006).
Nutrition support is indicated in the following groups of patients, depending on their clinical condition:

- **Malnourished**, defined as:
  - A Body Mass Index (BMI) of less than 18.5 kg\(m^{-2}\).
  - Unintentional weight loss greater than 10% within the last 3 – 6 months.
  - A BMI of less than 20.0 kg\(m^{-2}\) and unintentional weight loss greater than 5% within the last 3 – 6 months.

- **At risk of malnutrition**, defined as:
  - Have eaten little or nothing for more than 5 days and/or are likely to eat little or nothing for the next 5 days or longer.
  - Have a poor absorptive capacity, and/or have high nutrient losses and/or have increased nutritional needs from causes, such as catabolism.

Please use nutritional supplements with extreme caution with the following patient groups:

- Patients with very low BMIs (less than 16kg\(m^{-2}\))
- Patients who have unintentional weight loss:
  - Loss of > 5% body weight in 1 month
  - Loss of > 7.5% body weight in 3 month
  - Loss of > 10% body weight in 6 month
- Low nutrient intakes for more than 7 days
- Increased nutrient losses or decreased nutrient absorption

These patients are at risk of developing **re-feeding syndrome**. This can lead to deficiencies and low plasma levels of potassium, phosphate, magnesium and thiamine combined with salt and water retention. Please contact a Dietitian for advise and further information.

For further information or advice on prescribing ONS in Primary Care, contact a Community Dietitian at:

<table>
<thead>
<tr>
<th>Avenue House</th>
<th>Uckfield Hospital</th>
<th>The Conquest Hospital</th>
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<td>Uckfield</td>
<td>St. Leonards on Sea</td>
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<tr>
<td>BN21 3XY</td>
<td>TN22 5AW</td>
<td>TN37 7RD</td>
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<tr>
<td>Tel. 01323 444167</td>
<td>Tel. 01825 745003</td>
<td>Tel. 01424 758177</td>
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</tbody>
</table>

*Adapted from Plymouth Area Joint Formulary   Chapter 9 Nutrition and Blood   Page 13 of 18*
**Tube Feeds:**
Advice on enteral tube feeding can be obtained from the Department of Nutrition and Dietetics

**Arrangements in the East Sussex Health Economy:**
1. Patients in primary care receiving home enteral tube feeding under the care of the dietitians will be registered with a home enteral feed company.
2. The current contract is with Nutricia Clinical Care.
3. All patients need to be under the care of a Registered Dietitian for assessment and monitoring.
4. Patients should be referred by a GP if necessary.
5. Each patient’s dietitian will request the GP to write the appropriate feed on FP10 prescription, and forward the prescription to the Home Care company.
6. The feed and ancillary equipment will be delivered to the patient’s home on a date agreed by the patient, carer or nursing home etc.
7. Nutricia Clinical Care are contracted in the East Sussex area to provide a pump replacement service, Home Care nurse and 24hour telephone support for patients.
8. Further information on the Nutricia Homeward service can be obtained from the Dietetic Department
9. For further information on Enteral Feeding, please refer to Trust Guidelines for Home Enteral Feeding (adults).

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<thead>
<tr>
<th>Feed</th>
<th>Manufacturer</th>
<th>Calories per ml</th>
<th>Protein g per ml</th>
<th>Added Fibre?</th>
<th>Nutritionally Complete?</th>
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<tr>
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<td>(contains EPA &amp; DHA)</td>
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<tr>
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<td>(contains EPA &amp; DHA)</td>
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<td>In 2000kcal Oligopeptide &amp; MCT containing.</td>
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</table>
9.5 Minerals

9.5.1 Calcium and magnesium

9.5.1.1 Calcium supplements

- **Adcal®**
  - Chewable tablets calcium carbonate containing 600mg calcium
- **Calcium Gluconate BNF**
  - For children
- **Sandocal-400®**
  - Effervescent tablets containing 400 mg calcium
- **Sandocal-1000®**
  - Effervescent tablets containing 1000 mg calcium
- **Calcium Sandoz®**
  - Syrup containing 108.3 mg calcium in 5 ml
- **Calcium Gluconate 10%**
  - 10ml ampoule
- **Calcium Chloride 10%**
  - Min-I-jet 10ml

**Notes:**
1. Patients should be encouraged to increase their dietary intake of calcium.
2. **Calcium supplements** are usually only required where dietary calcium intake is deficient.
3. Approximately 700 mg of calcium is required per day. In osteoporosis double the recommended daily amount reduces the risk of bone loss. For specific advice on the use of calcium in treatment and prophylaxis of osteoporosis see BNF chapter 6 section 6.6 'Drugs affecting bone metabolism'.
4. **Calcium Sandoz® syrup** is included where a liquid form of calcium is required.

9.5.1.2 Hypercalcaemia and hypercalciuria

- **Trisodium Edetate**
  - 1g in 5ml injection
- **Cinacalcet (Mimpara®)**
  - Tablets 30mg, 60mg 90mg

**Note:**
Cinacalet is recommended for use in accordance with NICE TA 117: Cinacalcet for the treatment of secondary hyperparathyroidism in patients with end stage renal disease (July 2007)

Bisphosphonates are usually used in the treatment of Hypercalcaemia of Malignancy. Refer to BNF Chapter 6.

9.5.1.3 Magnesium

- **Magnesium glycerophosphate**
  - Liquid containing 1mmol magnesium per ml
  - Unlicensed product
- **Magnesium sulphate**
  - Injection 50% (approximately 2 mmol magnesium per ml)
  - 2ml and 10ml amps, and 10ml syringe

**Notes:**
1. Magnesium deficiency is rare.
2. **Magnesium glycerophosphate** is unlicensed and should only be prescribed on the recommendation of an appropriate Specialist.
3. **Magnesium sulphate** may be used to treat pre-eclamptic arrhythmias.
4. **Severe acute asthma:** in secondary care, for patients with an inadequate response to initial therapy with oxygen, nebulised therapy and hydrocortisone, magnesium sulphate 2g iv should be available.

9.5.2 Phosphorus

9.5.2.1 Phosphate supplements

- **Phosphate-Sandoz®**
  - Effervescent tablets containing the equivalent of 16.1 mmol phosphate
9.5.2.2 Phosphate-binding agents

Phosex®
- Tablets calcium acetate 1g

Renagel®
- Tablets sevelamer 800mg

Notes:
1. The management of hyperphosphataemia complicating renal failure:
   - **First line**: CALCICHEW® tablets - typically 2 tablets three times a day with meals.
   - **Second line**: PHOSEX® tablets - typically 1-2 tablets three times a day. It has a lower calcium content and is therefore good if patient develops hypercalcaemia with Calcichew®, but it has a lower phosphate binding capacity.
   - **Third line**: RENAGEL® - typically 800-1600mg three times a day. Renegal® is a non-calcium containing ion exchange resin and offers an alternative if the above therapies do not achieve target phosphate or if hypercalcaemia persists. It is very expensive by comparison.
2. Alu-Caps® are no longer routinely used as a phosphate binder due to long term aluminium toxicity/accumulation exacerbated by renal failure (dementia and anaemia). It also causes constipation.

9.5.3 Fluoride

Sodium fluoride
- Daily oral drops containing 550microg sodium fluoride in 0.15ml

Notes:
1. Fluoride supplements should only be used after consultation with a dentist. Most children will not benefit from supplements provided fluoride toothpaste is used daily.
2. Some children with medical conditions (e.g. heart defects) or a family history of tooth decay may benefit from fluoride supplements. This should be discussed with the child’s dentist who may prescribe fluoride supplements on FP10D if this is likely to be helpful.
3. The above supplement is included for use by the Acute Trust dentists.

9.5.4 Zinc

Solvazinc®
- Effervescent tablets zinc sulphate monohydrate 125mg (equivalent 45mg zinc)

Note:
Oral zinc therapy should only be given where there is good evidence of deficiency (hypoproteinaemia spuriously lowers plasma-zinc concentrations).

9.6 Vitamins

9.6.1 Vitamin A

Vitamin A and D
- Capsules vitamin A 4000 iu and vitamin D 400 iu

Notes:
1. Deficiency of vitamin A is rare in Britain.
2. Cod liver oil capsules have not been included because there is no good evidence base to support their use.

9.6.2 Vitamin B

**Vitamin B Compound Strong**
- Tablets containing nicotinamide 20 mg, pyridoxine 2 mg, riboflavin 2mg, thiamine 5mg
- Tablets 50 mg, 100 mg
- **Injection 100mg in 1ml, 50mg in 1ml**
- Tablets 10mg, 20 mg, 50 mg
- Injection I/M High potency
- Injection I/V High potency

**Thiamine**
- Syrup containing thiamine 5mg, riboflavin 2mg, nicotinamide 20mg, pyridoxine 2mg, panthenol 3mg in 5ml

**Pyridoxine**
- Pabrinex®
- Injection I/M High potency
- Injection I/V High potency

**Vigranon B®**
- Not prescribable on FP10

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**Table**: Adapted from Plymouth Area Joint Formulary  Chapter 9 Nutrition and Blood  Page 16 of 18
Notes:
1. **Vitamin B deficiency** is rare but can occur with isoniazid therapy and in chronic alcoholism.
2. It is usual to give any patient undergoing alcohol detoxification at home thiamine (200mg daily), together with other B and C vitamins for 5 – 7 days. However, patients at high risk of developing thiamine deficiency during alcohol withdrawal should be admitted for parental vitamin supplements e.g. Pabrinex®. (Ref: DTB Vol 38 August 2000).
3. **Pyridoxine** There is little sound evidence to support the claims of efficacy in premenstrual syndrome, and over dosage induces toxic effects (BNF no 50 September 2005).
4. Thiamine Injection – see CSM advice in BNF on administration
5. Vigranon B® is a liquid formulation of vitamin B to be used in line with refeeding policy in patients with PEG and Nasogastric tubes.

### 9.6.3 Vitamin C

**Ascorbic Acid**
- Tablets 100mg, 500mg, 1g effervescent

Notes:
1. Deficiency is rare and ascorbic acid is not recommended.
2. Claims that vitamin C ameliorates colds or promotes wound healing have not been proved.
3. In iron deficiency states ascorbic acid may increase gastro-intestinal iron absorption but its role in clinical practice is not established.

### 9.6.4 Vitamin D

**Adcal D₃®**
- Chewable tablets containing 600 mg calcium and 400 units of vitamin D₃
- Caplets containing 300mg calcium and 200 units of vitamin D₃

**Calceos®**
- Chewable tablets containing 500mg calcium and 400 units of vitamin D (as vitamin D₃).

**Alfacalcidol**
- Capsules 250 nanograms, 1 microgram
- Oral drops 2 microgram in 1 ml

**Calcitriol**
- Capsules, 500 nanograms

**Colecalciferol (D₃)**
- **Fultium D₃®**
  - 800 IU (20mcg) capsules
- **Pro D₃®**
  - 400 IU (10mcg); 1000 IU (25mcg); 2500 IU (62.5mcg)
  - 10000 IU (250mcg); 20000 IU (500mcg); 30000 IU (750mcg) capsules
  - 100 IU / drop liquid

1. Vitamin D deficiency as determined by measurement of 25-hydroxyvitaminD (25-OHD) levels should be treated for 12 weeks then reassessed to determine if maintenance treatment is required.
2. Colecalciferol (D₃) is preferred to ergocalciferol (D₂) due to better availability of suitable products and lower cost. There is also some suggestion that it is more effectively utilised by the body.
3. Ergocalciferol Injection 300,000 IU or 600,000 IU can also be given as a single dose but availability of this product may be erratic.

#### Deficiency (25-OHD <25nmol/l)

**Adults**
- 10,000 IU daily for 8-12 weeks or
- 60,000IU weekly for 8-12 weeks or
- 300,000 or 600,000 IU orally once or twice only or
- 300,000 or 600,000 IU by IM injection once or twice only

**Child**
- 1-6 months: 3,000IU daily, adjusted as necessary for 8-12 weeks
- 6 months-12 years: 6,000IU daily, adjusted as necessary for 8-12 weeks or
- 1-12 years: 10,000-25,000IU daily, adjusted as necessary
- 12-18 years: 10,000IU-40,000IU daily, adjusted as necessary
- Over 1 year: 300,000IU as a one off single dose (Stoss regimen)

#### Insufficiency (25-OHD 25-50nmol/l) or maintenance therapy following deficiency

**Adult**
- 1,000-2,000IU daily or 10,000IU weekly

**Child**
- Under 6 months 200-400IU daily
- Over 6 months 400-800IU daily

UKMI Q&A 82.1 What dose of vitamin D should be prescribed for the treatment of vitamin D deficiency?, Oct 2010

4. Vitamin D should not be prescribed in situations other than proven Vitamin D deficiency determined by
measurement of 25-OHD. Patients with risk factors for Vitamin D deficiency wishing to supplement their diet should be encouraged to purchase an appropriate product.

4. **Adcal D₃®** and **Calceos®** included for patients where calcium is required in addition to vitamin D. For specific advice on the use of calcium with or without Vitamin D in osteoporosis see BNF chapter 6 section 6.6 ‘Drugs affecting bone metabolism’.

5. As hydroxylation of calciferol occurs in the kidney patients with renal failure require hydroxylated products.

6. **Alfacalcidol** and **calcitriol** are preferred for patients with renal impairment who have osteoporosis, see BNF chapter 6 section 6.6 ‘Drugs affecting bone metabolism’.

7. Calcium and ergocalciferol tablets are not recommended, as the preparation does not contain sufficient metabolism.

### 9.6.5 Vitamin E

**Alpha tocopheryl acetate**
- Suspension 500 mg in 5 ml

### 9.6.6 Vitamin K

**Phytomenadione**
- Injection 10 mg in 1 ml (Konakion® MM) (slow i.v. injection or by i.v. infusion in 5% glucose. NOT for i.m administration)
- Tablets 10 mg
- Oral administration (Konakion® MM Paediatric) 2mg in 0.2ml (by mouth, i.m injection or i.v injection administration)

**Menadiol sodium phosphate**
- Tablets 10 mg

**Notes:**
1. **Vitamin K in the newborn** – All babies need vitamin K at birth. The recommendation is that infants are given either:
   - Intramuscular vitamin K 1mg as a single dose. *(Konakion® MM Paediatric 2mg in 0.2 ml)*
   - Oral vitamin K 2mg as a course of 2 or 3 doses given at birth, 4-7 days and a 3rd dose at 1 month for exclusively breast-fed babies. *(Konakion® MM Paediatric 2 mg in 0.2 ml)*

2. Menadiol sodium phosphate is water-soluble and is included for use where patients have fat malabsorption syndromes.

### 9.6.7 Multivitamin preparations

**Vitamins**
- Capsules BPC
- Drops 25 ml, 50 ml

**Abidec®**
- Tablets

**Ketovite®**
- Tablets
- Liquid

**Forceval®**
- Capsules

**Phlexy-vits®**
- Sachets 7g

**Notes:**
1. Vitamins are rarely needed.
2. If diet is deficient in multiple food groups e.g. fruit + vegetables + protein, a general multivitamin and mineral supplement providing no more than 100% RNI (reference nutrient intake) should be recommended. These can be purchased from pharmacies and other retail outlets. Common names include Sanatogen, Centrium and most outlets stock their own brands.
3. Ketovite tabs (taken three times a day) and liquid (5ml daily in addition to the tablets) are included for use in disorders of carbohydrate or amino acid metabolism.
4. Forceval® and Phlexy-vits® are vitamin and mineral supplement for use in the hospital setting in accordance with refeeding guidelines.

### 9.7 Bitters and tonics

**Note:**
Bitters and tonics are generally **not** recommended and therefore are not included in the formulary.