

Chapter 16

NUTRITION

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16.1 ELECTROLYTES AND INTRAVENOUS NUTRITION

Electrolytes and IV solutions are given to meet normal fluid and electrolyte requirements or to replenish substantial deficits or continuing losses, when the patient is nauseated or vomiting and is unable to take adequate amounts by mouth.

In an individual patient the nature and severity of the electrolyte imbalance must be assessed from the history and clinical and biochemical examination.

Sodium, potassium, chloride, magnesium, phosphate and water depletion can occur singly and in combination with or without disturbances of acid base balance.

16.1.1 ELECTROLYTES

Normal Saline: Sodium chloride (0.9%) in isotonic solution provides the most important extracellular ions in near physiological concentration and is indicated in sodium depletion, which may arise from such conditions as gastroenteritis, diabetic ketoacidosis, ileus and ascites. In a severe deficit of from 4 to 8 litres, 2 to 3 litres of isotonic sodium chloride may be given over 2-3 hours; thereafter infusion can usually be given at a slower rate.

Compound sodium lactate:

(*Hartmann's Solution*) can be used instead of isotonic sodium chloride solution during surgery or in the initial management of the injured or wounded patients.

ORAL REHYDRATION SALTS (ORS)

Indications: fluid and electrolyte loss in diarrhea.

Dose: according to fluid loss, usually 200–400mL solution after every loose motion; INFANT 1–1½ times usual feed volume; CHILD 200ml after every loose motion

Proprietary Preparations

see section 2.4

NORMAL SALINE ^[ED]
(Sodium chloride 0.9%)

Indication : electrolyte imbalance

Cautions: restrict intake in impaired renal function of large doses may give rise to sodium accumulation and oedema

Dose: are discussed above. Usual strength of Sodium chloride is 0.9%; this strength being available in normal saline for injection

IV infusion of 0.9% sodium chloride as isotonic solution

Proprietary Preparations

0.9% Sodium Chloride (*Opsonin*), Inj., 0.9%, Tk. 13.58/5 ml

Isoline IV (*General*), Inj. (IV Infusion), 0.9%, Tk. 74/100 ml

Normal Saline (*Opso Saline*), Inj. (IV Infusion), 0.9%, Tk. 13.27/500 ml; Tk. 50.86/500 ml

Normalin IV (*Popular*), Inj. (IV Infusion), 0.9%, Tk. 47.00/100 ml, Tk. 56.00/250 ml, Tk. 67.64/500 ml, Tk. 87.13/1000 ml, Tk. 116.94/2000 ml

Normasol (*Libra*), Inj. (IV Infusion), 0.9%, Tk. 47.73/100 ml; Tk. 53.47/250 ml; Tk. 67.64/500ml; Tk. 87.13/1000 ml

Salinor (*ACI*), Inj. (IV Infusion), 0.9%, Tk. 50.00/100 ml

Saloride (*Beximco*), Inj. (IV Infusion), 9%, Tk. 67.64/500 ml; Tk. 53.50/250 ml; Tk. 87.13/1000 ml; Tk. 47.90/100 ml

Salpac (*Orion*), Inj. (IV Infusion), 0.9%, Tk. 47.73/100 ml; Tk. 67.24/500 ml; Tk. 87.13/1000 ml

Xenosol (*Beacon*), Inj. (IV Infusion), 0.9%, Tk. 74/100 ml; Tk. 85/250 ml; Tk. 108/500 ml

ORAL BICARBONATE

Sodium bicarbonate is given by mouth for chronic acidotic states such as uraemic acidosis or renal tubular acidosis. The dose for correction of metabolic acidosis is not predictable and the response must be assessed; sodium bicarbonate 4.8 g daily (57 mmol each of Na⁺ and HCO₃⁻) or more may be required. For severe metabolic acidosis, sodium bicarbonate can be given intravenously

Proprietary Preparations

Sodinate (*Opsonin*), Tab., 600mg, Tk. 4.53/Tab

Sodicarb (*Popular*), Tab., 600 mg, Tk. 6.02/Tab

Compound Sodium Lactate Infusion

(Hartmann's Solution for injection)

Intravenous infusion contains sodium chloride 0.6%, sodium lactate 0.25%, potassium chloride 0.04%, and calcium chloride 0.027%.

Proprietary Preparations

Lactoride (*Beximco*), Inj., (IV Infusion), Tk. 91.72/1000 ml; Tk. 71.09/500 ml

Hartman (*Orion*), Inj., (IV Infusion, Tk. 71.09/500 ml; Infusion, Tk. 91.72/1000 ml

Hartsol (*Libra*), Inj., (IV Infusion) Tk. 71.09/500 ml; Tk. 91.72/1000 ml

Ringer's Solution For Injection:

Intravenous infusion contain: Calcium Chloride (dihydrate) 322microgram, Potassium Chloride 300microgram. Calcium chloridiae 8.6mg/ml. providing the following ions (in mmol/litre), Ca²⁺ 2.2, K⁺ 4, Na⁺ 147, Cl⁻ 156

Proprietary Preparations

Ringer's Solution (*Opsosaline*), IV Infusion Tk. 45.17/500ml

INTRAVENOUS POTASSIUM

IV infusion of potassium chloride + sodium chloride and potassium chloride + glucose are used to correct severe hypokelamia and depletion and when sufficient potassium cannot be taken by mouth. Potassium chloride containing ampoules of 1.5 g (20 mmol K⁺ in 10 ml), may be added to 500 ml of sodium chloride or glucose IV infusion and given slowly over 2-3 hours with specialist

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advice and ECG monitoring in difficult cases. Repeated measurements of plasma potassium are necessary to determine whether further infusions are required and to avoid the development of hyperkalaemia; especially liable to occur in renal impairment.

POTASSIUM CHLORIDE ^[ED]

Indications: electrolyte imbalance and also for oral potassium supplements

Cautions: for IV infusion the concentration of solution should not usually exceed 3.2 g.

Side-effects: rapid infusion is toxic to heart

Dose: by slow IV infusion, depending on the deficit or the daily maintenance requirements

Proprietary Preparations

KT (*Jayson*), Inj., 150 mg/ml, Tk. 15.00/Vial; Syrup, 500 mg/5 ml, Tk. 30.00/100 ml

KCL (*Opsonin*), Inj., 150 mg/ml, Tk. 7.52/Vial; Syrup, 500 mg/5 ml, Tk. 15.09/100 ml; Tab., 600 mg, Tk. 0.45/Tab.

Electro-K (*Acme*), Tab., 600 mg, Tk. 0.60/Tab.; Syrup, 500 mg/5 ml, Tk. 25/100 ml

POTASSIUM CHLORIDE AND GLUCOSE IV INFUSION

Usual strength for IV infusion, potassium chloride 0.3% with 5% of anhydrous glucose.

POTASSIUM CHLORIDE AND SODIUM CHLORIDE IV INFUSION

Usual strength for IV infusion, potassium chloride 0.3% (3 g/litre) and sodium chloride 0.9% (9 g/litre).

POTASSIUM CHLORIDE, SODIUM CHLORIDE AND DEXTROSE IV INFUSION

Usual strength for IV infusion: Sodium chloride 0.18% with 4% anhydrous glucose (dextrose monohydrate) and required amount of potassium chloride to

provide 10-40 mmol of potassium ion/litre.

16.1.2 INTRAVENOUS NUTRITION

When the patient can not take food through the alimentary tract, nutrients are to be given through IV infusion. It may be in addition to oral or tube feeding-which is known as supplemental parenteral nutrient, or IV nutrient may be the sole source of nutrition-total parenteral nutrition (T.P.N)

Indication for IV nutrition: Undernourished patients for surgery, chemotherapy, or radiation therapy; severe or prolonged disorder of gastrointestinal tract; trauma or burns; prolonged coma or refused to eat; and some patients with hepatic or renal failure.

Total parenteral nutrition (T.P.N):

Solution is infused through a central venous catheter inserted under full surgical procedures. T.P.N requires the use of solution containing amino acid, glucose, fat, electrolyte, trace elements, and vitamins .

Partial Parenteral nutrition (P.P.N):

Is given as infusion through a peripheral vein. It is used as supplementary nutrition for periods of up to a month; to correct serious deficits appropriate biochemical test are to be carried out before starting the infusion. Nutrition and electrolyte status is to be monitored throughout treatment.

AMINO ACID

Ideally all essential amino acid should be included with a wide variety of non-essential ones to provide sufficient nitrogen together with electrolytes. Available solution vary in their composition of amino acids; they often contain energy source (usually glucose) and electrolytes.

Proprietary infusion fluid for parenteral Feeding

Amino acid + Glucose + Electrolytes

Aminomix (*Acme*), Inj. (IV infusion), Tk. 351.32/500 ml
Aminosin plus (*Ibn Sina*), Inj. (IV infusion), Tk. 400/500 ml
Aminosol Gold (*Opso Saline*), Inj.(IV infusion), Tk. 301.89/500 ml
Clinosol Gold (*Opsonin*), Inj. (IV infusion), Tk. 301.89/500 ml
Nutrimin D (*Beximco*), Inj. (IV infusion),Tk. 410/500 ml
Powersol Plus (*General*), Inj. (IV infusion), Tk. 400/500 ml
Proliv-Plus (*Orion*), Inj. (IV infusion),, Tk. 401.51/500 ml
Prosol (*Incepta*), Inj. (IV infusion), Tk. 350/500 ml
Protinex (*Easkayef*) Inj. (IV infusion) Tk.350/500ml
Protinex (*Eskayef*), Infusion, Tk. 350/500 ml
Repotyn Max (*ACI*), Infusion, Tk. 400/500 ml
Xemocid Gold (*Beacon*), Infusion, Tk.550/500ml

Human milk based Amino Acid

Protinex (*Easkayef*) Inj. (IV infusion) Tk.280/500ml

Amino acid

Amilac (*Biopharma*), Inj.(IV infusion), Tk. 350/500 ml
Aminomax (*Globe*), Inj. (IV infusion), Tk. 350/500 ml
Aminoplex (*Acme*), Inj. (IV infusion), Tk. 401.51/500 ml
Aminosin (*Ibn Sina*), Inj. (IV infusion), Tk. 350/500 ml
Aminosol (*Opso Saline*), Inj.(IV infusion), Tk. 264.15/500 ml
Clinosol (*Opsonin*), Inj.(IV infusion), Tk. 264.15/500 ml
Nutrimin (*Beximcoj*), Inj. (IV infusion), Tk. 350/500 ml
Nutrilve (*Healthcare*), Inj. (IV infusion), Tk. 350/500 ml
Powersol (*General*), Inj. (IV infusion), Tk. 350/500 ml
Proliv (*Orion*), Inj. (IV infusion), Tk. 130.49/100 ml
Repotyn (*ACI*), Inj. (IV infusion), Tk. 351.32/500 ml
Xemocid (*Beacon*), Inj. (IV infusion), Tk. 500/500 ml
Prosol (*Incepta*), Inj., (IV Infusion), Tk. 350/500 ml
Protemin (*Easkayef*), Inj.(IV infusion),, Tk. 351.32/500 ml

16.1.3 GLUCOSE (DEXTROSE MONOHYDRATE) SOLUTION

Dextrose solutions (5 are mainly used to replace water deficits and should be given alone when there is no significant loss of electrolytes. Average water requirements in a healthy adult are 1.5 to 2.5 liters daily and this is needed to balance unavoidable losses of water through the skin and lungs and to provide sufficient for urinary excretion. Dehydration tends to occur when these losses are not matched by a comparable intake.

Excessive loss of water without loss of electrolytes is uncommon, occurring in fever, hyperthyroidism and in uncommon water-losing renal states such as diabetes insipidus or hypercalcaemia.

Glucose solutions are also given in regimens with calcium, bicarbonate and insulin for the emergency management of hyperkalaemia. They are also given, after correction of hyperglycemia, during treatment of diabetic ketoacidosis, when they must be accompanied by continuing insulin infusion.

GLUCOSE (DEXTROSE MONOHYDRATE) [ED]

Indications: fluid replacement, provision of energy

Side-effects: may cause venous irritation and thrombophlebitis

Dose: dose of water replacement described above. Energy source, 1-3 liters daily of 20-50% solution

Proprietary Preparations

Dexaqua (*Beximco*), Inj. (IV Infusion) DS 10%, Tk. 77.96/500 ml;Tk. 105.48/1000 ml ; 5%, Tk. 71.09/500 ml; Tk. 91.72/1000 ml
Dextropac, (*Orion*),Inj(IV Infusion), 25%, Tk. 73.00/250 ml ;Tk. 48.00/100 ml , 10%, Tk. 77.96/500 ml ;Tk. 105.48/1000 ml ; 5%, Tk. 71.09/500 ml ; Tk. 91.72/1000 ml
Dextrose, (*Opso Saline*), Inj., (IV Infusion,) 10%, Tk. 79.31/100 ml; Tk. 58.62/500 ml; 25%, Tk. 21.7/100 m;Tk. 45.29/250 ml; Tk. 6.89/25 ml;5%, Tk. 44.47/1000 ml; Tk. 53.45/500 ml

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Glucolin DS (*Popular I*), Inj (IV Infusion), 10%, Tk.77.96/500 ml.; Tk. 105.48/1000 ml, 5%, Tk. 71.09/500 ml, Tk. 91.72/1000 ml
Infusol (*Beacon*), Inj., (IV Infusion), 10%, Tk. 125.00/500 ml
Libott-10 (*Libra*), Inj., (IV Infusion), 10%, 500ml, Tk. 77.96/500 ml; Tk. 105.48/1000 ml; 25%, Tk. 73.00/250ml; 5%, Tk. 91.72/1000 ml
Nutridex (*Beximco*), Inj., (IV Infusion,) 25%, Tk. 37.40/100 ml; Tk. 61.00/250 ml;

16.1.4 DEXTROSE (GLUCOSE) SALINE

Sodium chloride and glucose solutions are indicated when there is combined water and sodium depletion. A 1 :1 mixture of isotonic sodium chloride and 5% glucose allows some of the water (free of sodium) to enter body cells which suffer most from dehydration while the sodium salt with a volume of water determined by the normal plasma sodium ions remains extracellular. Combined sodium, potassium, chloride and water depletion may occur in severe diarrhoea or persistent vomiting. In that case replacement is carried out with sodium chloride intravenous infusion 0.9% and glucose intravenous infusion 5% with potassium as appropriate. IV infusion of sodium and glucose: normal strength sodium chloride 0.18% and 4% of anhydrous glucose.

Proprietary Preparations

Dextrose Anhydrous + Sodium Chloride APN (*Opso Saline*), I.V. Fluid, 100 mg + 2.25 mg/ml, Tk. 64.90/1000 ml
Babysol (*Opso Saline* Inj., (IV Infusion), 50 mg + 2.25 mg/ml, Tk. 54.31/500 ml
Babysol Junior (*Opso Saline*), Inj (IV Infusion), 50mg+4.5mg/ml, Tk. 55.18/500 ml
Dexoride (*Beximco*), Inj., (IV Infusion), 5% + 0.9%, Tk. 100.89/1000 ml ;Tk. 75.66/500 ml
Dextrose (*Opso Saline*), Inj., (IV Infusion), 50 mg + 9 mg/ml, Tk. 56.89/500 ml; 43 mg + 1.8 mg/ml, Tk. 45.29/100 ml
Glucosol M (*Popular*), Inj., (IV Infusion), 0.18gm + 4.3gm/100ml, Tk. 71.09/500 ml, Tk. 93.80/1000 ml
Glucosol (*Popular*), Inj., (IV Infusion), 0.9gm + 5gm/100ml, Tk.75.66/500 ml, Tk.100.89/1000ml
Infusol Plus (*Beacon*), Inj., (IV Infusion), 5gm + 900 mg/100 ml, Tk. 115.00/500 ml
Isoride (*Beximco*), Inj., (IV Infusion), 4.3% + 0.18 %, Tk. 91.06/1000 ml; Tk. 71.09/500 ml

Neosol DS (*Beximco*), Inj (IV Infusion), 5% + 0.45%, Tk. 55.04/250 ml; Tk. 73.38/500 ml
Neosol (*Beximco*), Inj (IV Infusion), 5% + 0.225%, Tk. 55.04/250 ml
Pedisol (*Popular*), Inj (IV Infusion), 0.225gm + 0.50gm / 100ml, Tk. 64.50/500 ml, Tk. 55.04/250 ml
Pedisol DS (*Popular*), Inj., (IV Infusion), 0.225gm + 10gm / 100ml, Tk. 65.87/100 ml

Dextrose Monohydrate + Sodium Chloride

ADS (*Libra*), Inj(IV Infusion), 11 gm + 0.225 gm/100 ml, Tk. 87.25/1000 ml; Tk. 65.87/500 ml
Baby Saline (*Libra*), Inj., (IV Infusion), 5.50 gm + 0.225 gm/100 ml, Tk. 72.02/500 ml
Baby Saline (*Libra*), Inj., (IV Infusion), 5.50 gm + 0.225 gm/100 ml, Tk. 55.04/100 ml
Baby Sol Junior (*Opso Saline*), Inj., (IV Infusion), Dextrose 5% NaCl 0.45% Tk, 35/500 ml
Baby Sol (*Opso Saline*), Inj., (IV Infusion), Dextrose 5% NaCl 0.225%, Tk. 35/500ml
Dextrosal (*Orion* , Inj., (IV Infusion), 5% + 0.9%, Tk. 75.66/500 ml; Tk.100.89/1000 ml
Dextrosal-Baby (*Orion*), Inj., (IV Infusion),, 5% + 0.225%, Tk. 72.02/500 ml
Dextrosal-ISO (*Orion*), Inj., (IV Infusion), 4.3% + 0.18%, Tk. 71.09/500 ml ; Tk. 93.80/1000 ml
Dextrosal-Mini (*Orion*), Inj., (IV Infusion), 5% + 0.45%, Tk. 73.38/500 ml
Electrodex-10 (*Orion*), Inj., (IV Infusion), 10% + 0.225%, Tk. 65.87/500 ml ; Tk. 87.26/1000 ml
Libott-M (*Libra*), Inj.,(IV Infusion), 4.73 gm + 0.18 gm/100 ml, Tk. 71.09/500 ml; Tk. 93.80/1000 ml
Libott-S Jr (*Libra*), Inj., (IV Infusion), 5.50 gm + 0.45 gm/100 ml, Tk. 73.38/100 ml
Libott-S (*Libra*), Inj., (IV Infusion), 5.50 gm + 900 mg/100 ml, Tk. 76.00/500 ml; Tk.100.89/1000 ml

16.1.5 PLASMA AND PLASMA SUBSTITUTES

Albumin solutions are used for the treatment of severe hypoproteinaemia, particularly when associated with a low plasma volume. Concentrated albumin solutions may also be used to obtain a diuresis in hypoalbuminaemic patients. The use of albumin solutions in acute plasma or blood loss may be wasteful; plasma substitutes are more appropriate.

HUMAN ALBUMIN SOLUTION

Indications: albumin solutions are used for the treatment of severe hypoproteinaemia, particularly when associated with a low plasma volume. A solution of protein derived from human plasma, serum or normal placenta; at least 95% of the protein is albumin. The solution may be isotonic; concentration varies from 4-5% to 15-25%

Cautions: cardiac or circulatory disease (to avoid rapid rise in blood pressure and cardiac failure administer slowly and monitor cardiovascular and respiratory function)

Contra-indications: cardiac failure; severe anaemia

Side-effects: allergic reactions with nausea, vomiting, increased salivation, fever, tachycardia, hypotension and chills reported

Proprietary Preparations

Albumin Human ^(*l*) (*Octapharma*), IV Infusion 20% Bottles 50ml, 100ml; Tk.3806.34/100ml; Tk.1903.17/50ml

Albutein ^(*l*) (*Therapeutic Corp.*) IV Infusion 5%.Tk.3144.37/250ml; 25%, Tk.2676.83/50ml; Tk.5281.80/100ml 20%.Tk 2052/50ml; 4046.61/100ml

Biotest Human Albumin ^(*l*) (*Biotest.*), IV Infusion 20%; Tk.2802/50ml.

Human Albumin Baxter^(*l*) (*Baxter*) IV Infusion 20%; Tk.3435.83/50ml; Tk.6634.71/ 100ml

PLASMA ISOTONIC SOLUTIONS

Indications: acute or sub-acute loss of plasma volume in case of burns, pancreatitis, trauma and complications of surgery and plasma exchange

Usual concentration is Human Albumin Solution 4.5%

HUMAN PLASMA CONCENTRATED SOLUTIONS (20-25%)

Indications: severe hypoalbuminaemia associated with low plasma volume and generalised oedema where salt and water restriction with plasma volume expansion are required; adjunct in the

treatment of hyperbilirubinaemia by exchange transfusion in the newborn

PLASMA SUBSTITUTES

Plasma substitutes should be used to maintain plasma volume in conditions like burns or peritonitis where there is loss of plasma protein, water and electrolytes over periods of several days or weeks. In these conditions, plasma or plasma protein fractions containing large amounts of albumin should be given.

Dextrans, gelatin and hetastarch, pentastarch (etherified starches) are the plasma substitutes generally used which are metabolised slowly.

Dextran 70 by IV infusion is used predominantly for volume expansion. Dextran 40 IV infusion is used in an attempt to improve peripheral blood flow in ischaemic disease of the limbs.

DEXTRAN 40

Indications: peripheral local slowing of the blood flow; prophylaxis of post-surgical thromboembolic disease

Cautions: plasma substitutes should be used with caution in patients with cardiac disease or renal impairment. Monitoring urine output is necessary during treatment. Care should be taken to avoid haematocrit concentration from falling below 25-30% and the patient should be monitored for hypersensitivity reactions

Side-effects: hypersensitivity reactions may occur including, rarely, severe anaphylactoid reactions

Dose: by IV infusion, initially 500-1000 ml; further doses are given according to the patient's condition

Generic Preparations

IV Infusion 10% Saline in Dextrose 5%
10% Solution Normal Saline

DEXTRAN 70 ^[E^D]

Indications: for short-term blood volume expansion

Cautions: see notes for Dextran 40

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Side-effects: see notes for Dextran 40

Dose: by intravenous infusion, after moderate to severe haemorrhage or in the shock phase of burn injury (initial 48 hours), 500-1000 ml rapidly initially followed by 500 ml if necessary

Generic Preparation

Dextran-70 6% in Normal Saline (IV Infusion) 500 ml bag.

GELATIN

Indication: low blood volume

Cautions: used with caution in patients with cardiac disease or renal impairment

Side-effects: hypersensitivity reactions may occur, transient increase in bleeding time may occur

Dose: by IV infusion, initially 500-1000 ml of a 3.5-4% solution

Generic Preparation

IV Infusion 3.5-4% Modified Gelatin Solution

HETASTARCH, HEXASTARCH AND PENTASTARCH (ETHERIFIED STARCH)

These are starches composed of more than 90% of amylopectin that has been etherified with hydroxyethyl groups

Hetastarch has a higher degree of etherification than pentastarch

Etherified starches are macromolecular substances, which are metabolised slowly. They are used at the outset to expand and maintain blood volume in shock arising from conditions such as burns or septicaemia

Indications: to maintain blood volume

Cautions: should not be used to maintain plasma volume in conditions such as burns or peritonitis where there is loss of plasma protein, water and electrolytes over periods of several days or weeks. In these situations, plasma or plasma protein fractions containing large amounts of albumin should be given

Side-effects: hypersensitivity reactions, severe anaphylactoid reactions

Proprietary Preparations

Haes Steril⁽¹⁾ (Fresenius), IV Infusion, 6%Tk. 607.77/500ml

Plasmex (Beacon), IV Infusion, 6% Tk. 650/500ml

Voluven⁽¹⁾ (Fresenius), IV Infusion, 6% Tk. 631/500ml

16.2. ORAL NUTRITION

16.2.1 FOODS FOR SPECIAL DIET

Malnutrition is one of the most important health problems of Bangladesh population. Apart from the highly prevalent nutritional diseases, particularly affecting mothers and children, malnutrition is the underlying cause of many associated diseases from which millions suffer almost every day. The most prevalent nutritional diseases or states are protein energy malnutrition, nutritional anaemias (particularly iron deficiency), riboflavine deficiency and vitamin C deficiency. The most important cause of this malnutrition is poor dietary intake and intake of unbalanced diet. Therefore, any formulation of prescription of medicinal remedies must be combined or even preceded by advice on dietary improvement to balance the diet of the consumer.

There are preparations that have been modified to eliminate a particular constituent from food or are nutrient mixtures formulated as substitutes for the food, for patients, who either cannot tolerate or cannot metabolize certain common constituents of food.

PHENYLKETONURIA

Phenylketonuria which results from the inability to metabolize phenylalanine, is required to restrict its dietary intake to a small amount sufficient for tissue building and repair. Aspartame contributes to phenylalanine intake and should be avoided.

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COELIAC DISEASE

Celiac disease, which results from an intolerance of gluten, is managed by completely eliminating gluten from the diet.

Recipes for Treatment of Severe PEM:

WHO has suggested the following three recipes :

- (1) Starter Recipes (a) :

Dried skimmed milk (g)	25
Sugar (g)	100
Vegetable oil (g)	30
Electrolyte mineral solution (ml)	20
Water to make	1000 ml
Contains 75 Kcal and 0.9 g protein per	100 ml
 - (2) Catch Up (b) :

Dried skimmed milk (g)	80
Sugar (g)	50
Vegetable oil (ml)	60
Electrolyte mineral solution (ml)	20
Water to make	1000 ml
Provides 100 Kcal and 2.9 protein per	100 ml
 - (3) Catch Up (c) :

Dried skimmed milk (g)	90
Sugar (g)	65
Vegetable oil	85
Electrolyte mineral solution (ml)	27
Water to make	1000 ml
Provides 135 kcal and 3.3 g protein per	100 ml
- (a) Comparable starter formulas can be made from 35 g whole dried milk, 100 g sugar, 20 g oil, 20 ml of electrolyte/mineral solution and water up to 1000 ml.
- (b) Comparable catch up formulas can be made from 110 g of dried whole milk, 50g sugar, 30 g oil, 20ml of electrolyte/mineral solution and water to 1000ml.

OR

880 ml of fresh cows milk, 75 g sugar, 20 ml oil and 20 ml electrolyte mineral solution and water up to 1000ml.

- (c) For use in special circumstances in case of low weight gain or possible inadequate feeding

RECIPE FOR ELECTROLYTE/ MINERAL SOLUTION :

Potassium Chloride	224 g	24 mmol
Tripotassium Citrate	81	2 mmol
Magnesium Chloride	76	3 mmol

Zinc Acetate	8.2	300 µmol
Copper sulphate	1.4	45 µmol
Water make up to		2500 ml

16.2.2 MINERALS

16.2.2.1 IRON

Oral iron

Iron salts should be given by mouth unless there are good reasons for using another route. Ferrous salts show only marginal differences between one another in efficiency of absorption of iron. Haemoglobin regeneration rate is little affected by the type of salt used provided sufficient iron is given, and in most patients the speed of response is not critical. Choice of preparation is thus usually decided by the incidence of side-effects and cost. The oral dose of elemental iron for iron-deficiency anaemia should be 100 to 200mg daily. It is customary to give this as dried ferrous sulfate, 200 mg (: 65mg elemental iron) three times daily; for prophylaxis of iron deficiency anaemia, a dose of ferrous sulfate 200 mg once or twice daily may be effective. For treatment of iron-deficiency anaemia in children and for prophylaxis of iron-deficiency anaemia in babies of low birth weight, see BNF for Children.

Therapeutic response The haemoglobin concentration should rise by about 100–200 mg/100mL (1–2 g/litre) per day or 2 g/100mL (20 g/litre) over 3–4 weeks. When the haemoglobin is in the reference range, treatment should be continued for a further 3 months to replenish the iron stores. Epithelial tissue changes such as atrophic glossitis and koilonychia are usually improved, but the response is often slow.

Side-effects Gastro-intestinal irritation can occur with iron salts. Nausea and epigastric pain are dose-related, but the relationship between dose and altered bowel habit (constipation or diarrhoea) is less clear. Oral iron, particularly modified-release preparations, can exacerbate diarrhoea in patients with inflammatory bowel disease; care is also

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needed in patients with intestinal strictures and diverticular disease.

Iron preparations taken orally can be constipating, particularly in older patients and occasionally lead to faecal impaction. If side-effects occur, the dose may be reduced; alternatively, another iron salt may be used, but an improvement in tolerance may simply be a result of a lower content of elemental iron. The incidence of side-effects due to ferrous sulfate is no greater than with other iron salts when compared on the basis of equivalent amounts of elemental iron.

Iron preparations are a common cause of accidental overdose in children. For the treatment of iron overdose,

Parenteral iron

Iron can be administered parenterally as iron dextran, iron sucrose, ferric carboxymaltose, iron isomaltoside 1000, or ferumoxytol. Parenteral iron is generally reserved for use when oral therapy is unsuccessful because the patient cannot tolerate oral iron, or does not take it reliably, or if there is continuing blood loss, or in malabsorption. Parenteral iron may also have a role in the management of chemotherapy-induced anaemia, when given with erythropoietins, in specific patient groups.

(See also section 15.1.1)

16.2.2.2 CALCIUM & CALCIUM SUPPLEMENTS

- 16.2.2.2 HYPERCALCAEMIA
- 16.2.2.3 MAGNESIUM
- 16.2.2.4 PHOSPHATE SUPPLEMENTS AND PHOSPHATE BINDING AGENTS
- 16.2.2.5 FLOURIDE (See Dental Practitioner's formulary)
- 16.2.2.6 IODINE
- 16.2.2.7 ZINC

16.2.2.1 CALCIUM & CALCIUM SUPPLEMENTS

Dietary intake of calcium is generally yet deficiency signs are not very overt.

Dietary requirement varies with age and physiological status is relatively greater in childhood and pregnancy and lactation due to increased demand and in old age due to impaired absorption. In osteoporosis, a calcium intake double the recommended amount reduces the bone loss.

CALCIUM SALTS

Indications : deficient dietary intake as in childhood, rickets, pregnancy and lactation, in old age due to impaired absorption, osteomalacia, osteoporosis, hypocalcaemic tetany, neonatal tetany, systolic cardiac arrest

Contraindications: conditions associated with hypercalcaemia and hypercalcuria

Cautions: renal impairment, sarcoidosis. Concurrent administration with thiazide diuretics may increase the risk of hypercalcaemia

Side-effects: mild gastrointestinal disturbances, bradycardia, arrhythmia and irritation after injection

Dose: by mouth up to 29 ml calcium daily in divided doses as calcium gluconate, lactate or pentothenate. By very slow injection IV of calcium gluconate 1-2 g (2.25-4.5 mmol of Ca⁺⁺⁺); CHILD half the adult dose by slow IV route

CALCIUM CARBONATE

Proprietary Preparations

- A-Cal (Acme)**, Tab., 250 mg, Tk. 1.00/Tab.; Tab., 500 mg, Tk. 3.50/Tab.
- Acical (ACI)**, Tab., 500mg, Tk. 4/Tab.
- Ambeecal (Ambee)**, Tab., 500 mg, Tk. 2.01/Tab
- Aristocal (Beximco)**, Tab., 500 mg, Tk. 4.00/Tab.;
- Bonec (Orion)**, Tab., 500 mg, Tk. 3.51/Tab.
- Boni (Delta)**, Tab., 500 mg, Tk. 3.00/Tab.
- Cal (Pacific)**, Tab., 250 mg, Tk. 1.50/Tab.; Tab., 500 mg, Tk. 2.63/Tab; 500 mg, Tk. 4.00/Tab.; 250 mg, Tk. 3.00/Tab.
- Calbon (Aristo)**, Tab., 500 mg, Tk. 3.50/Tab.
- Calcarb (Alco)**, Tab., 500 mg, Tk. 4.00/Tab.
- Calcibost (Sharif)**, Tab., 500 mg, Tk. 3.00/Tab.
- Calcicar (Incepta)**, Tab., 500 mg, Tk. 2.50/Tab.
- Calcid (Opsonin)**, Tab., 400 mg, Tk. 1.51/Tab.
- Calcimak (Maks)**, Tab., 500mg, Tk. 2.50/Tab.

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Calcin (*Renata*), Tab., 500 mg, Tk. 3.50/Tab.
Calciton (*Chemist*), Tab. 500 mg, Tk. 2/Tab.
Calcium (*Albion*), Tab., 250 mg, Tk.2/Tab.; 500 mg, Tk. 2.00/Tab.
Calcium-A (*Ad-din*), Tab., 500 mg, Tk. 2.50/Tab.
Caldical (*Ziska*), Tab., 500 mg, Tk. 2.50/Tab.
Caldil (*Drug Int.l*), Tab.,500 mg, Tk.3.00/Tab.
Calfor (*Asiatic*), Tab. 500 mg, Tk.2.50/Tab.
Calmet (*Somatec*), Tab. 500 mg, Tk. 2.01/Tab.
Caltonic (*Globex*),Tab. 500 mg, Tk. 4.00/Tab.
Cal-Up (*Sonear*), 500 mg, Tk. 3.00/Tab.
Carben (*Benham*), Tab. 500 mg, Tk. 3.50/Tab.
Carbocal (*Globe*), Tab., 500 mg, Tk. 2.20/Tab.
Casalt (*Kemiko*), Tab. , 500 mg, Tk. 4.00/Tab.
Cenet (*Central*), Tab. 500 mg, Tk. 1.60/Tab.
Costin (*General*),Tab.,500 mg, Tk. 2.01/Tab.
Gravite (*Bios*),Tab., 500 mg, Tk. 2.40/Tab.
Ipical (*Ibn Sina*), Tab.,500 mg, Tk. 3.50/Tab.
Jasocal (*Jayson*), Tab., 250 mg, Tk. 1.50/Tab., 500mg, Tk. 2.01/Tab.
Kidcal (*Acme*), Chewable Tab., 250 mg, Tk. 1.50/Tab.
Med-Cal (*Medimet*), Tab., 500 mg, Tk.2.00/Tab.
Miracal (*Navana*), Tab., 500 mg, Tk. 4.00/Tab.;Tab., 250 mg, Tk. 2.00/Tab.
Monocal (*Concord*),Tab.,500 mg, Tk. 4.00/Tab.
Mycal (*Organic*),Tab.,500 mg, Tk. 3.00/Tab.
Neocal (*White Horse*), Tab. , 500 mg, Tk. 2.50/Tab.
Oracal (*Amico*),Tab. 500 mg, Tk. 2/Tab.
Orthocal (*Biopharma*), Tab. 500 mg, Tk. 4.00/Tab.
Oscal (*Unimed*),Tab. 500 mg, Tk. 3.50/Tab.
Ostacid (*Rangs*), Tab., 500 mg, Tk. 3.50/Tab.
Ostocal (*Eskayef*), Tab. 500 mg, Tk.4.00/Tab.
Ostocal JR (*Eskayef*), Tab, 250 mg, Tk. 2.00/Tab.; 250 mg, Tk. 3.00/Tab.
Ostogen (*Opsonin*), Tab.,500 mg, Tk. 2.45/Tab.
Ostogen JR (*Opsonin*), Tab.250 mg, Tk. 1.51/Tab.
Protebon (*Beacon*), Tab.500 mg, Tk. 2/Tab.
Rocal (*Healthcare*), Tab.500 mg, Tk. 4/Tab.
Sandocal (*Novartis*),Tab,500 mg, Tk. 5/Tab.
Sycal (*MST*), Tab., 500 mg, TK. 2.50/Tab.
Tumy (*Eskayef*), Tab, 240 mg, Tk. 1.50/Tab.
Xcid (*Square*), Tab. 400 mg , Tk. 2.01/Tab.
Xtracal (*Pharmasia*), Tab.,500 mg, Tk. 4/Tab.

CALCIUM GLUCONATE^[ED]

Proprietary Preparations

Calcium ambee (*Ambee*), Inj. 500mg/5 ml, Tk. 6.22/5 ml Amp.

Calcium-Jayson (*Jayson*), Inj., 10%, Tk. 9.74/10 ml Amp.; Tk. 9.15/5 ml Amp.
G-Calcium Gluconate (*Gonoshasthaya*), Inj., 10%, Tk. 9.16/5 ml Amp.

CALCIUM LACTATE

Proprietary Preparations

Calcitate (*Ambee*), Tab. 300 mg, Tk. 0.29/Tab.
Calson (*Hudson*), Tab. 300 mg, Tk. 0.29/Tab.
Calcate (*Gaco*), Tab., 300 mg, Tk.0.70/Tab.
G-CALCIUM LACTATE (*Gonoshasthaya*), Tab., 300 mg, Tk. 0.40/Tab.
Calac (*Opsonin*), Tab., 300 mg, Tk.0.23/Tab.

CALCIUM OROTATE

Proprietary Preparations

Calorate (*Beximco*), Tab., 400 mg, Tk. 8.00/Tab.; 740 mg, Tk. 10.00/Tab.
Ortical (*Opsonin*), Tab., 400 mg, Tk. 6.02/Tab.

CALCIUM PENTOTHENATE

Proprietary Preparations

Calci (*Opsonin*), Inj. 100mg, Tk.3.50/amp
Calcinate (*Gaco*), Inj. 100mg, Tk.3.50/amp
Pantoston (*Jayson*), Inj. 100mg, Tk.3.85/amp

CALCIUM AND VITAMIN C

Indications: increased demand for calcium and vitamin C e.g pregnancy, lactation, period of rapid growth, old age, infectious disease, convalescence; treatment for calcium and vitamin C deficiency; adjuvant in colds and influenza

Contraindications: hypersensitivity to drug, hypercalciuria, sever renal failure

Cautions: Impaired renal function; reduce dosage or discontinue therapy if necessary

Side-effects: mild gastrointestinal disturbance

Dose: ADULT 1 tablet daily; CHILD; half tablet daily

Proprietary Preparations

Acical-C (*ACI*), Tab. Tk. 11.00/Tab.
C-4 (*Alco*), Tab. , Tk. 8.00/Tab.
CaC-1000 (*Novartis*), Effervescent Tab., Tk.15.00/Tab.

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Calbo-C (*Square*), Tab., Tk. 7.86/Tab.
Cavic-C (*Incepta*), Tab., Tk. 7.90/Tab.
Ostocal (*Easkayef*) Tab., Tk. 8.00/Tab.
Ostogen C (*Opsonin*) Tab., Tk. 6.88/Tab.
Ultracal-C (*Popular*), Tab., Tk. 10.54/Tab.

CALCIUM WITH VITAMIN D₃

Indications: Calcium is necessary for many normal functions of body, especially bone formation and maintenance. Vitamin D is important for the absorption of calcium from the stomach and for the functioning of calcium in the body. Calcium and vitamin D combination is used to prevent or to treat a calcium deficiency.

Proprietary Preparations

A-Cal D (*Acme*), Tab., 500 mg + 200 IU, Tk. 5.00/Tab.
Acical-D (*ACI*), Tab., 500 mg + 200 IU, Tk. 5.00/Tab.
Adcal D (*Amulet*), Tab., 500 mg + 200 IU, Tk. 4.00/Tab.
Ambeecal-D (*Ambee*), 500 mg + 200 IU, Tk. 3.31/Tab
Apocal D (*Apex*), Tab., 500 mg + 200 IU, Tk. 4.00/Tab.
Aristocal D (*Beximcoi*), Tab., 500 mg + 200 IU, Tk. 5.00/Tab.
Beucal D (*RAK*), Tab., 500 mg + 200 IU, Tk. 5.00/Tab.
Boni D (*Delta*), Tab., 500 mg + 200 IU, Tk. 4.00/Tab.
Cadmin (*General*), Tab., 500 mg + 200 IU, Tk. 3.31/Tab.
Cadolin (*Jayson*), Tab., 500 mg + 200 IU, Tk. 5.00/Tab.
Cal D (*Pacific*), Tab., 500 mg + 200 IU, Tk. 3.76/Tab.
Calbo-D (*Square*), Tab., 500 mg + 200 IU, Tk. 5.00/Tab.
Calbon-D (*Aristo*), Tab., 500 mg + 200 IU, Tk. 5.00/Tab.
Calboral-D (*Square*), Tab., 500 mg + 200 IU, Tk. 8.00/Tab.
Calci-D (*Rephco*), Tab., 500 mg + 200 IU, Tk. 2.00/Tab.
Calcibo-D (*Astra*), Tablet, 500 mg + 200 IU, Tk. 4.00/Tab.
Calcibost-D (*Sharif*), Tab., 500 mg + 200 IU, Tk. 4.00/Tab.
Calci-D plus (*Rephco*), Tab., 500 mg + 400 IU, Tk. 4.30/Tab.
Calcimak-D (*Maks*), Tab., 500 mg + 200 IU, Tk. 4.00/Tab.
Calcin-D (*Renata*), Tab., 500 mg + 200 IU, Tk. 5.00/Tab.

Calcium Forte (*Albion*), Tab., 500 mg + 200 IU, Tk.3.30/Tab.
Calcium-D (*Ad-din*), Tab., 500 mg + 200 IU, Tk. 3.30/Tab.
Caldical-D (*Ziska*), Tab., 500 mg + 200 IU, Tk.4.00/Tab.
Caldil Plus (*Drug Int.*), Tab., 500 mg + 200 IU, Tk. 4.00/Tab.
Caldivit (*G.S.K*), Tab., 500 mg + 200 IU, Tk. 3.52/Tab.
Caldolin (*Chemist*), Tab., 500 mg + 200 IU, Tk. 5.00/Tab.
Calfor D (*Asiatic*), Tab., 500 mg + 200 IU, Tk. 4.00/Tab.
Calmet D (*Somatec*), Tab., 500 mg + 200 IU, Tk. 3.28/Tab.
Calmi-D (*Alco*), Tab., 500 mg + 200 IU, Tk. 5.00/Tab.
Caltonic-D (*Globex*), Tab., 500 mg + 200 IU, Tk. 5.00/Tab.
Calvimax (*Incepta*), Tab., 500 mg + 200 IU, Tk. 4.00/Tab.
Carben -D (*Benham*), Tab., 500 mg + 200 IU, Tk. 4.00/Tab.
Carbocal-D (*Globe*), Tab., 500 mg + 200 IU, Tk. 5.00/Tab.
Casalt-D (*Kemiko*), Tab., 500 mg + 200 IU, Tk. 5.00/Tab.
Coralcal-D (*Radiant*), Tab., 500 mg + 200 IU, Tk. 10.00/Tab.
DOS (*Central*), Tab., 500 mg + 200 IU, Tk. 4.00/Tab.
Ipical-M (*Ibn Sina*), Tab., 500 mg + 200 IU, Tk. 5.00/Tab.
Labcal D (*Labaid*), Tab., 500 mg + 200 IU, Tk. 7.00/Tab.
Miracal-D (*Navana*), Tab., 500 mg + 200 IU, Tk. 5.00/Tab.
Monocal D (*Concord*), Tab., 500 mg + 200 IU, Tk. 5.00/Tab.
Mycal-D (*Organic*), Tab., 500 mg + 200 IU, Tk. 4.00/Tab.
Novacal-D (*Leon*), Tab., 500 mg + 200 IU, Tk. 4.00/Tab.
Nutribon (*Veritas*), Tab., 500 mg + 200 IU, Tk. 6.00/Tab.
Oracal-D T (*Amico*), Tab., 500 mg + 200 IU, Tk. 5.00/Tab.
Orthocal-D (*Biopharma*), Tab., 500 mg + 200 IU, Tk. 5.00/Tab.
Oscal-D (*Unimed*), Tab., 500 mg + 200 IU, Tk. 4.00/Tab.; 500 mg + 400 IU, Tk. 5.00/Tab.
Ostacid-D (*Rangs*), Tab., 500 mg + 200 IU, Tk. 4.00/Tab.
Ostium-D (*APC*), Tab., 500 mg + 200 IU, Tk. 3.50/Tab.
Ostocal D (*Eskayef*), Tab, 500 mg + 200 IU, Tk. 5.00/Tab.
Ostocal DX (*Eskayef*), Tab, 500 mg + 400 IU, Tk. 8.00/Tab.
Ostogen D (*Opsonin*), Tab., 600 mg + 400 IU, Tk. 4.51/Tab.; 500 mg + 200 IU, Tk. 3.76/Tab.

Protebon D (*Beacon*), Tab., 500 mg + 200 IU, Tk. 5.00/Tab.
Rocal-D (*Healthcare*), Tab., 500 mg + 200 IU, Tk. 6.00/Tab.
Rocal- D Vita (*Healthcare*), Tab., 600 mg + 400 IU, Tk. 15.00/Tab.
Sandocal D (*Novartis*), Tab., 500 mg + 200 IU, Tk. 7.00/Tab.
Starcal D (*Nipro JMI*), Tab., 500 mg + 200 IU, Tk. 6.00/Tab. ; 500 mg + 400 IU, Tk. 8.00/Tab.
Sycal-D (*MST*), Tab., 500 mg + 200 IU, TK. 4.00/Tab.
Ultracal-D (*Popular*), Tab., 500 mg + 200 IU, Tk. 4.02/Tab.
Xtracal-D (*Pharmasia*), Tab., 500 mg + 200 IU, Tk. 4.00/Tab.
Calcium+vitaminC+vitaminD
Cavic-C Plus (*Incepta*), Tab., Tk. 8.00/Tab.
Ostogen C Plus (*Opsonin*) Tab., Tk. 7.064/Tab

CALCIUM + MINERALS

Indications: prevention and treatment of osteoporosis; nutritional supplement; pregnancy and lactation; deficiency state of calcium and vitamin D

Contraindications, **Side-effect,**
Cautions: see under calcium and vitamin C

Dose: 2 tablets per day, preferably 1 tablet in the morning and 1 tablets in the evening

Proprietary Preparations

Acical-M (*ACI*), Tab., Tk. 5.02/Tab.
Apocal DM (*Apex*), Tab., Tk. 4.00/Tab.
Aristocal M (*Beximco*), Tab., 500 mg, Tk. 5.5/Tab.;
Boni M (*Delta*), Tab., Tk. 4.00/Tab. .
Bontoni (*Globex*), Tab., Tk. 5.00/Tab.
Cadmin Plus (*General*), Tab., Tk. 4.02/Tab.
Cal D Plus (*Pacific*), Tab., Tk. 6.02/Tab.
Calbon M (*Aristo*), Tab., Tk. 5.00/Tab.; Tk. 5.00/Tab.
Calbon Plus (*Aristo*), Tab., Tk. 5.50/Tab.
Calboplex (*Square*), Tab., Tk. 5.00/Tab.
Calcin-M (*Renata*), Tab., Tk. 5.00/Tab.
Calcium Forte Plus (*Albion*), Tab., Tk. 3.50/Tab.
Calcium- M (*APC*), Tab., Tk. 4.00/Tab.
Calcium-C Forte (*Albion*), Tab., Tk. 8.00/Tab.
Calcium-C Plus (*Albion*), Effervescent Tab., Tk. 7.86/Tab.
Calmi-M (*Alco*), Tab., Tk. 5.50/Tab.
Calvimax Plus (*Incepta*), Tab., Tk. 5.00/Tab.
Miracal-M (*Navana*), Tab., Tk. 5.35/Tab.
Oracal-M (*Amico*), Tab., Tk. 4.00/Tab.
OSCAL-M (*Unimed*), Tab., Tk. 5.00/Tab.
Ostocal-M (*Easkayef*) Tab., Tk. 5.00/Tab.

Protebon M (*Beacon*), Tab., Tk. 5.00/Tab.
Rocal-M (*Healthcare*), Tab., Tk. 7.00/Tab.
Xtracal-M (*Pharmasia*), Tab., Tk. 3.52/Tab.

16.2.2.2 HYPERCALCAEMIA

Treatment of acute severe hypercalcaemia is needed when calcium level is 3.0 mmol/l loop diuretics can be given which enhances calcium reabsorption, bisphosphonates or plicamycin can be given in acute cases. Because of its toxicity plicamycin is not the drug of choice for the treatment of hypercalcaemia. (See also Section 5.6)

16.2.2.3 MAGNESIUM

Magnesium is the second most plentiful cation of intracellular fluid and is involved in a wide range of activities. It is an essential constituent of many enzyme systems, particularly involved in energy generation and plays important role in neurochemical transmission and muscular excitability.

Indications: to prevent convulsion in patients with pre-eclampsia, eclampsia, tetanus and acute uremia

Contraindications: heart block or myocardial damage

Interactions: see Appendix-2

Side-effects: excessive administration of magnesium results in hypermagnesaemia manifested by nausea, vomiting, flushing of the skin, thirst, hypotension, drowsiness, confusion, loss of tendon reflexes, respiratory depression, cardiac arrest

Dose: seizure prophylaxis in pre-eclampsia and eclampsia: a loading dose of 4 g or 16 mmol (100 ml) over up to 20 minutes followed by a maintenance dose of 2 g or 8 mmol (50 ml) per hour. Recurrence of seizure may require and additional I.V. bolus of 2-4 g or 8-16 mmol (50-100 ml). For seizure prophylaxis, treatment should continue during labour and for at least 24 hours after delivery

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Proprietary Preparations

G-Mag Sulph (*Gonoshasthaya*), Inj.49.3%
2.47g/5ml,

Nlepsin (*Beximco*), I.V. Infusion, Mag.sulph
4%+Nacl 0.45%+Dextrose 5%,Tk.70.8/100ml

16.2.2.4 PHOSPHATE SUPPLEMENTS AND PHOSPHATE BINDING AGENTS

Phosphate supplements to be given in addition to vitamin D in a small number of patients who have been suffering from hypophosphataemic Vitamin D resistant rickets. Diarrhoea is the common problem during the treatment with potassium phosphate supplements and the dose should be reduced at that time. Phosphate infusion is occasionally needed in the debilitated patients taking IV nutrition deficient in potassium phosphate supplements and in severe diabetic ketoacidosis.

Cautions: essential to monitor closely plasma concentration of phosphate and other electrolytes

Phosphate binding agents: Aluminum containing and calcium containing antacids are used as phosphate binding agents in the management of hyperphosphataemia complicating renal failure

16.2.2.5 FLOURIDE

(See *Dental Practitioner's Formulary*)

16.2.2.6 IODINE

Endemic Goiter due to iodine deficiency is widespread in Bangladesh. The commonly affected groups are adolescent girls, school age children, and pregnant and lactating mothers. This is mainly due to the low Iodine content of food and water. The recommended adult intake is about 150 microgram. An intake over 2000 IU is considered excessive and may cause toxicity in individual cases. Excessive consumption may cause iodine-induced hyperthyroidism.

PROPHYLAXIS

Iodination of salt: To provide 150 µg/day which requires iodination of salt with potassium iodate at the rate of 15 parts per million. To provide for storage and cooking losses, Bangladesh program for control of goiter put iodine at 15 parts per million.

Proprietary Preparation

I-Cap (*Drug Intl*), Cap. 200mg

16.2.2.7 ZINC

In recent years, subclinical zinc deficiency causing growth retardation in children has been recognized. Supplemental studies have provided evidence of accelerated growth in children. Whole grain cereals are good sources of zinc but most of the zinc are present in bran and germ and lost during milling. Legumes are also good sources. Requirement is about 15 microgram.

ZINC SALTS ^[ED]

Indications: see notes above

Side effect: abdominal pain, dyspepsia

Proprietary Preparations

Baby Zinc (*Acme*), Tab., 20 mg, Tk.
1.76/Tab.

Bimuty (*Pacific*), Tab., 20 mg, Tk.
1.50/Tab.;DS Syrup, 10 mg/5 ml, Tk.
22.41/100 ml

Biozinc (*Ibn Sina*), Syrup, 10 mg/5 ml, Tk.
35.00/100 ml

B-Zn (*Benham*), Syrup, 10 mg/5 ml, Tk.
35.00/100 ml

C-Zinc (*Central*), Syrup, 10 mg/5 ml, Tk.
30.00/100 ml

Dispazinc (*ACI*), Tab., 20 mg, Tk. 1.76/Tab.

Dz-20 (*RAK*), Syrup, 20 mg/5 ml, Tk.
50.00/100 ml

G-Zinc (*Gonoshasthaya*), Syrup, 10 mg/5
ml, Tk. 24.00/100 ml;Syrup, 10 mg/5 ml, Tk.
24.00/100 ml;Tab., 20 mg, Tk. 1.00/Tab.

Kidzin (*Sharif*), Syrup, 10 mg/5 ml, Tk.
35.00/100 ml

Leozinc (*Leon*), Syrup, 10 mg/5 ml, Tk.
32.00/100 ml

Mazic (*Renata*), Tab., 20 mg, Tk.
1.50/Tab.;DS Syrup, 20 mg/5 ml, Tk.

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55.00/100 ml; Syrup, 4 mg/5 ml, Tk. 38.00/100 ml; Syrup, 10 mg/5 ml, Tk. 35.00/100 ml
Nid (*Opsonin*), Tab., 20 mg, Tk. 1.14/Tab.; Syrup 10 mg/5 ml, Tk. 26.32/100 ml
Nipozin (*Nipro JMI*), Syrup, 10 mg/5 ml, Tk. 35.00/100 ml
Oral-Z (*ACI*), Tab., 20 mg, Tk. 1.51/Tab.; Syrup, 10 mg/5 ml, Tk. 26.10/100 ml
Oralzin (*Aristo*), Syrup, 10 mg/5 ml, Tk. 30.00/100 ml
Orazinc (*Navana*), Tab., 20 mg, Tk. 1.51/Tab.; Syrup, 10 mg/5 ml, Tk. 20.08/50 ml; Tk. 30.11/100 ml
Orazinc-B (*Navana*), Syrup, 10 mg/5 ml, Tk. 30.11/100 ml
Orazinc-B (*Navana*), Syrup, 10 mg/5 ml, Tk. 50.19/100 ml
Orgazinc (*Organic*), Syrup, 10 mg/5 ml, Tk. 35.00/100 ml
Pep (*Orion*), Syrup, 4.05 mg/5 ml, Tk. 33.00/100 ml
Pep-2 (*Orion*), Syrup, 10 mg/5 ml, Tk. 35.00/100 ml; Tk. 60.00/200 ml; 20 mg/5 ml, Tk. 55.00/100 ml; Tab., 20 mg, Tk. 1.51/Tab.
Soluzinc (*Popular*), Tab., 10 mg/5 ml, Tk. 30.11/100 ml
Zinc (*Square*), Tab., 20 mg, Tk. 2.01/Tab.
Zinc (*Asiatic*), Syrup, 10 mg/5 ml, Tk. 28.00/100 ml
Zinc Sulphate (*APC*), Syrup, 10 mg/5 ml, Tk. 30.00/100 ml
Zinc-200 (*Asiatic*), Syrup, 10 mg/5 ml, Tk. 30.00/100 ml
Tiny-Z (*Pharmasia*), Syrup, 10 mg/5 ml, Tk. 30.00/100 ml
Xinc (*Eskayef*), Syrup, 10 mg/5 ml, Tk. 35.00/100 ml; Tab, 20 mg, Tk. 1.50/Tab.
Zeal (*Jayson*), Syrup, 10 mg/5 ml, Tk. 30.00/100 ml
Zedex DS (*Beximco*), Syrup, 10 mg/5 ml, Tk. 30.00/100 ml
Zep (*Alco*), Syrup, 10 mg/5 ml, Tk. 30.00/100 ml
Zep Junior (*Alco*), Syrup, 10 mg/5 ml, Tk. 27.00/100 ml
Zesup (*Square*), Syrup, 10 mg/5 ml, Tk. 35.00/100 ml; Syrup, 20 mg/5 ml, Tk. 50.20/100 ml
Zico (*General*), Syrup, 10 mg/5 ml, Tk. 26.10/100 ml
Ziflu (*Incepta*), Syrup, 10 mg/5 ml, Tk. 30.00/100 ml
Zinc Sulphate (*Albion*), Syrup, 10 mg/5 ml, Tk. 30.00/100 ml
Zincare (*Jayson*), Tab., 20 mg, Tk. 2.00/Tab.
Zinc-DT (*Alco*), Tab., 20 mg, Tk. 1.75/Tab.
Zincol (*Somatec*), Syrup, 10 mg/5 ml, Tk. 30.00/100 ml
Zinga (*Biopharma*), Tab., 10 mg/5 ml, Tk. 2.01/Tab.; Syrup, 10 mg/5 ml, Tk. 35.00/100 ml
Zink-B (*Bios*), Syrup, 10 mg/5 ml, Tk. 25.50/100 ml

Zipol Plus (*Apex*), Syrup, 20 mg/5 ml, Tk. 45.00/100 ml
Zipol (*Apex*), Syrup, 10 mg/5 ml, Tk. 30.00/100 ml
Zis DS (*Acme*), Syrup, 10 mg/5 ml, Tk. 38.00/100 ml
Zismo (*Kemiko*), Syrup, 10 mg/5 ml, Tk. 35.00/100 ml
Zn (*Amico*), Syrup, 10 mg/5 ml, Tk. 35.00/100 ml; Syrup, 20 mg/5 ml, Tk. 50.00/100 ml
Znkid (*Delta*), Syrup, 10 mg/5 ml, Tk. 30.00/100 ml
ZT (*Beacon*), Tab., 20 mg, Tk. 1.50/Tab.

16.2.3 VITAMIN PREPARATIONS

- 16.2.3.1 VITAMIN A
 - 16.2.3.2 VITAMIN B COMPLEX
 - 16.2.3.3 VITAMIN C
 - 16.2.3.4 VITAMINS D
 - 16.2.3.5 VITAMIN E
 - 16.2.3.6 VITAMIN K
 - 16.2.3.7 MULTIVIT AND MINERAL PREPARATIONS
 - 16.2.3.8 ANTIOXIDANT VITAMIN PREPARATION.
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16.2.3 VITAMIN PREPARATIONS

Vitamin A deficiency is widespread particularly among the pre school children and pregnant and lactating mothers. About 30,000 children go blind each year due to Vitamin A deficiency. Most of these deficiencies could be eradicated through increased consumption of commonly available pro-vitamin A rich foods such as papaya, yellow quash, carrots, ripe mango and particularly green and coloured vegetables (coloured within inside). For prophylaxis it is advised to give 200,000 I.U. of vitamin A every 6 months to all children 1-6 months that are at risk and to all infants 6-11 months, 100,000 particularly along with the vaccination of measles and polio. For lactating mothers, 200,000 I.U. orally at delivery or during the first 8 weeks postpartum if breast-feeding to raise the level of vitamin A in the breast milk to protect the breast-fed infants; or first 6 weeks if not breast-feeding to protect the mother.

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Because of the epidemiological evidence of involvement of vitamin A and carotene in the prevention of cancer vitamin A has been incorporated in special anti-oxidant preparations, which are widely used in Bangladesh. The available evidences are still controversial and inconclusive and may not justify the cost in its use. Bangladeshi physicians should carefully scrutinize these evidences before suggesting them for use. Consumption of high doses of vitamin A during pregnancy has been reported to cause birth defects. Supplements of vitamin A should not be taken without the advice of a doctor.

Toxicity from consumption of pre-formed vitamin A (not carotinoids) can occur with chronic consumption of doses of 10 times higher than the recommended dietary allowances. Dose dependent toxicity include headache, vomiting, diplopia, dryness of the mucus membrane, desquamation, bone and joint pain, liver damage and coma.

16.2.3.1 VITAMIN A

Indications: Vitamin A deficiency states, such as night blindness, impaired dark adaptation, follicular hyperkeratosis of the skin, Bitot's spot and keratomalacia in the eye

Cautions: hypervitaminosis A can occur in infants and children given massive doses for long periods. Poisoning can occur if massive prophylactic dose is repeated by mistake and can be life threatening. Avoid use in early pregnancy

Side-effects: overdose can cause rough skin, dry hair, enlarged liver, raised ESR, raised serum calcium and serum alkaline phosphatase concentrations

Dose: for treatment of xerophthalmia, CHILD under 1 year, immediately 100,000 IU; next day 100,000 IU; 2-4 weeks later 100,000 IU

For CHILD over 1 year, 200,000 IU immediately; next day 200,000 IU; 2-4 weeks later 200,000 IU.

In severely protein energy malnutrition :

Monthly until PEM resolves under 1 year, 100,000 IU; and 200,000 IU when the child is over a year

Proprietary Preparations

A-Forte (*Globe*), Cap. 50,000 IU; Tk.1.90/cap;

A-Vit (*Globe*),Cap 1,00,000 IU,Tk. 2.83/Cap, 2,00,000,IU Tk./Cap Tk.4.04/Cap

Ovit-A (*Opsolin*) Cap 50,00 IU,Tk. 1.69/Cap, 2,00,000,IU Tk./Cap Tk.5.56/Cap

Ratinol Forte (*Drug Intl*), Cap. 50,000 IU; Tk.2.00/Cap

16.2.3.2 VITAMIN B COMPLEX

Deficiency of certain vitamin of B-group is very common in Bangladesh. There is widespread prevalence of clinical signs of riboflavin deficiency. Sub-clinical deficiency of other B-group vitamin remain unquantified but likely to be very common. Folic acid deficiency is very common amongst pregnant women. Vitamin B₁ deficiency may not be common due consumption of parboiled rice. Pyridoxine deficiency is rare but may occur during isoniazide therapy and is characterised by peripheral neuritis.

THIAMINE B₁ ^[ED]

THIAMINE HYDROCHLORIDE

Indications: beriberi; neuritis (such as in diabetes, poisoning etc.), polyneuritis after infectious diseases, mental disorders associated with alcoholism, Wernickes' syndrome, and anorexia nervosa

Dose: ADULT : daily requirements 3-6 mg; neuritis 25-100 mg by IM injection daily followed by 10-15 mg orally daily for a few months. In acute deficiency, 100-200 mg daily by IM or IV daily followed by 100-200 mg orally. Neuralgia 50-150 mg by injection every alternate days. Anorexia same as Neuritis
CHILD : 5-20 mg orally and parenterally

Proprietary Preparations

A-B1 (*Acme*), Tab., 10 mg, Tk. 0.74/Tab.

Beovit (*Square*), Tab. , 100 mg, Tk. 0.74/Tab.

Berin (*GSK*), Tab. , 10 mg, Tk. 2.66/Tab.

B-One (*Alco*), Tab. , 10 mg, Tk. 0.74/Tab.

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G-Vitamin B1 (*Gonoshasthaya*), Tab. , 10 mg, Tk.0.63 /Tab
Thianomin (*Rephco*), Inj., 25 mg/ml, Tk. 2.60/1 ml Amp.
Thiason (*Jayson*), Inj., 100 mg/ml , Tk. 3.55/1 ml Amp.;, Tk. 16.24/10 ml Amp.
Thiosina (*Ibn Sina*), Tab. , 10 mg, Tk. 0.74/Tab.
Tone (*Orion*), Tab. , 10 mg, Tk. 0.73/Tab.
Vita-1 (*Pacific*), Tab., 100 mg, Tk. 0.55/Tab.

RIBOFLAVINE B₂ [ED]

Indications: angular stomatitis, cheilosis, glossitis, seborrhoeic dermatitis, photophobia, anaemia and neuropathy

Dose: ADULT and CHILD 5-10 mg daily

Proprietary Preparations

G-Vitamin B2 (*Gonoshasthaya*), Tab, 5 mg, Tk. 0.18/Tab.
Riboflavin (*Amico*), Tab., 5 mg, Tk. 0.13/Tab.
Ribomin (*Ad-din*), Tab. 5 mg, Tk. 0.23/Tab.
Ribosina (*Ibn Sina*), Tab., 5 mg, Tk. 0.23/Tab.
Riboson (*Jayson*), Tab., 5 mg, Tk. 0.30/Tab.
Rivin (*Supreme*), Tab., 5 mg, Tk. 0.30/Tab.

NICOTINIC ACID (B₃)

Indications: prevention and treatment of pellagra, as vasodilator in peripheral vascular disease, Vincent's infection, hypercholesterolaemia and hypertriglyceridemia

Contraindications: pregnancy, breast-feeding

Side-effects: flushing, dizziness, palpitations, pruritus, nausea, vomiting, rarely impaired liver function and rashes.

Cautions: diabetes mellitus, gout, liver disease and peptic ulcer

Dose: 100-200 mg daily

Proprietary Preparation

Nicoson (*Jayson*), Tab., 500mg; 50mg

PYRIDOXINE (B₆) [ED]

Indications: peripheral neuritis, isoniazid induced peripheral neuritis, premenstrual syndrome, pregnancy, radiation sickness, idiopathic sideroblastic anaemia, B₆-deficiency

anaemia, other deficiency states and convulsions in children

Contraindication: in patients receiving levodopa

Cautions: drug interaction with levodopa but does not occur if dopa decarboxylase inhibitor is also given

Dose: ADULTS and deficiency states, 20-25 mg up to three times daily. Isoniazid neuropathy, prophylaxis 10 mg daily
Idiopathic sideroblastic anaemia, 100-400 mg in divided doses
Premenstrual syndrome, 50-100 mg daily
CHILD: Convulsion 20-100 mg daily.

Proprietary Preparations

Pyrol (*Jayson*), Tab. , 25 mg, Tk. 0.50/Tab.
G-Vitamin B6 (*Gonoshasthaya*), Tab. , 25 mg, Tk. 0.25/Tab.

CYNOCOBALAMIN B₁₂

(see section 15.1.2)

Indications: pernicious anaemia and other B₁₂ responsive macrolytic anaemias; prophylaxis in total gastrectomy or total ileal resection, malabsorption syndrome, coeliac disease, tropical sprue etc

Contraindications: leber's disease, tobacco amblyopia (use hydroxocobalamin)

Dose: ADULT: 250-1000 microgram IM on alternate days for 1-2 weeks (or for 10 times) then 250 microgram weekly until blood count is normal. Maintenance, 1000 microgram every monthly

CHILD: initially as for adult, subsequent dosage according to haematological response (for detail see manufacturers' literature)

Proprietary Preparation

(see section 15.1.2)

MECOBALAMIN

Indications: diabetic and alcoholic neuropathy; drug induced neuropathy; lumbago; entrapment neuropathy,

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intercostals neuralgia and other neuropathies). Megaloblastic anemia due to vitamin due B₁₂ deficiency (injection only)

Cautions: the methylcobal Tablet should not be used for months.If there is no response at all after its use for a certain period of time. Methylcobal injection should be discontinued if symptoms of hypersensitivity, such as eruption occur; infrequently pain and induration at the site of injection and in rare cases headache, sweating or fever may occur

Dose: by *mouth* 500 microgram three times daily.The dose should be justed according to the age of patient and the severity of symptoms

Injection 500 microgram administered intramuscularly or intravenously three times a week in *peripheral neuropathies*.

In *megaloblastic anemia* the usual adult dose is 500 microgram administered intramuscularly or intravenously three times a week. After about 2months of administration, dose should be changed to 500 microgram every one to three months as maintaince therapy

Proprietary Preparations

Colamin (*Rangs*), Tab., 0.5mg, Tk. 4.00/Tab.

Maclon (*White Horse*), Tab. , 0.5 mg, Tk. 4.00/Tab.

Mb (*Acme*), Tab., 500 microgram, Tk. 4.01/Tab.; Inj., 500 microgram / ml, Tk. 30.11/Amp

Mecobal (*General*), Tab. , 500 microgram, Tk. 4.02/Tab.;Inj., 500 microgram / ml, Tk. 30.00/Amp.

Mecol (*Aristo*), Tab. , 0.5mg, Tk. 4.00/Tab.

Mecolagin (*Incepta*), Tab. , 500 microgram, Tk. 4.00/Tab. ;Inj., 500 microgram / ml, Tk. 30.00/Amp.

Mecolin (*Drug Int*), Tab. , 500 microgram, Tk. 4.00/Tab.

Mecopen (*Eskayef*), Tab, 500 microgram, Tk. 4.00/Tab.

Methicol (*Square*), Tab. , 500 microgram, Tk. 4.01/Tab.; Inj., 500 microgram / ml, Tk. 30.11/Amp.

Nervex(*Orion*), Tab. , 500 microgram, Tk. 4.02/Tab.

Nerviton(*Opsonin*), Tab., 500 microgram, Tk. 3.02/Tab.;Inj., 500 microgram / ml, Tk. 22.64/Amp.

Neural (*Healthcare*), Tab., 0.5 mg, Tk. 4.25/Tab.

Pedial (*Globe*), Tab., 0.5 mg, Tk. 4.00/Tab

Phyton (*ACI*), Inj., 5mg/ml, Tk. 30.11/Amp. ; Tab. , 0.5mg , Tk. 4.02/Tab.

Remylin (*Ibn Sina*), Tab., 500 microgram, Tk. 4.50/Tab.

VITAMIN B-COMPLEX PREPARATIONS

Indications: B-complex deficiency states during pregnancy, lactation, prolonged antibiotic therapy, convalescence

Dose: prophylectic 1-2 cap. daily Other preparations - see under individual drugs

VITAMIN B-COMPLEX ^[ED]

Proprietary Preparations

3Bion (*RAK*), Tab., Tk. 5.00/Tab.

Aduvit (*Pacific*), Cap., Tk. 0.39/Cap. Syrup, Tk. 27.82/200 ml; Tk. 15.04/100 ml

Aristoplex (*Beximco*), Syrup, Tk. 25.59/100 ml; Tk. 42.77/200 ml

Aristovit B (*Beximco*), Tab. , Tk. 0.52/Tab.;

Asibion (*Asiatic*) Tab. , Tk. 4.00/Tab.

Beconex (*Renata*), Syrup, Tk. 20.85/100 ml; Tk. 38.03/200 ml

Benvit -B (*Benham*), Tab. , Tk. 0.51/Tab.

Big B (*Amico*), Tab. , Tk. 4.00/Tab.

Complavit (*G.S.K*), Syrup, Tk. 18.40/100 ml

Genaplex (*General*), Syrup, Tk. 20.75/100 ml; Tk. 37.75/200 ml;

G-Vitamin B Complex (*Gonoshasthaya*) Tab. Tk. 0.45/Tab; Syrup, Tk.18.00/100 ml; Tk.36.00/200 ml

Inj., Tk. 10.00/2 ml Inj. ; Tab., Tk. 0.44/Tab.; Cap., , Tk. 1.00/Cap

Kvit-N (*Kemiko*), Tab., Tk. 4.50/Tab.

Miovit (*Somatec*), Tab. , Tk. 4.01/Tab.

Nerbo (*Sharif*), Tab. , Tk. 4.00/Tab

Nervin (*Jayson*), Inj., Tk. 10.00/2 ml Amp.

Nerviplex (*Jayson*), Inj., Tk. 25.10/3 ml Amp.; Tab., Tk. 4.01/Tab.

Neucos-B (*Radiant*), Tab. , Tk. 11.00/Tab.

Neuralgin (*Ibn Sina*), Inj., Tk. 260.00/Amp.; Tab., Tk. 5.00/Tab.

Neuro-B (*Square*), Inj., Tk. 25.10/Amp.; Tab. Tk. 5.00/Tab

Neurobest (*Renata*), Inj., Tk. 30.00/Amp. ; Tab. Tk. 5.00/Tab.

Neurocare (*Beximco*), Tab. , Tk. 5.00/Tab.

Neuvital (*Unimed*), Tab. , Tk. 5.00/Tab.

Nugesic (*Orion Pharma*), Inj, Tk. 25.00/Amp. ; Tab. , Tk. 4.02/Tab.

Opsovit (*Opsonin*), Tab., Tk. 0.33/Tab.;Syrup, Tk. 19.24/100 ml; Tk. 32.16/200 ml;Cap., Tk. 0.32/Cap.

Orgabion, (*Organic*), Tab. , Tk. 4.10/Tab.

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Plexamin-B (*Maks*), Syrup, Tk. 20.84/100 ml; Tk. 38.03/200 ml
Polyvit-B (*Albion*), Cap. , Tk. 0.57/Cap. ; Syrup, Tk. 20.00/100 ml; Tk. 38.60/200ml
Renovit (*Healthcare*), Tab., Tk. 5.00/Tab. ; Inj., Tk. 140.00/Vial
Solbion (*Eskayef*), Inj, Tk. 25.00/Amp. ; Tab, Tk. 5.00/Tab.
Tri-B (*White Horse*), Tab. , Tk. 5.00/Tab.
Vitabion (*Incepta*), Inj., Tk. 25.00/Amp.; Tab., Tk. 4.00/Tab.
Vitagrow (*Incepta*), Syrup, Tk. 80.00/100 ml
Vitamin B-Complex (*Popular*), Tab. , Tk. 0.44/Tab.
Vitcod (*Alco*), Syrup, Tk. 75.00/100 ml; Tk. 140.00/200 ml
V-Plex (*Acme*), Syrup Tk. 35.54/100ml; Tk.62.00/200 ml Tab., Tk. 0.44/Tab; Cap., Tk. 0.56/Cap.
Zovia Kids (*Opsonin*), Syrup, Tk. 60.38/100 ml; Tk. 109.43/200

16.2.3.3 VITAMIN C

Vitamin C therapy is essential in scurvy. Prescribers sometimes prescribe Vitamin C in colds and in injuries for rapid wound healing; but the available incidences are not conclusive and may not rationalize its use.

ASCORBIC ACID^[ED]

Indications: prevention and treatment of scurvy

Dose: prophylactic, 25-75 mg daily; therapeutic, not less than 250 mg daily in divided doses

Proprietary Preparations

Ascobex (*Beximco*), Tab., 250 mg, Tk. 1.32/Tab.
Ascorbic (*Apex*), Tab., 250 mg, Tk. 1.30/Tab.
Ascoston (*Jayson*), Tab., 250 mg, Tk. 1.32/Tab.; Syrup, 100 mg/5 ml, Tk. 33.34/100 ml; Inj., 500 mg/5 ml, Tk. 5.99/Amp.
C-bon (*Ambee*), Tab., 250 mg, Tk.1.3 / Tab
Cecon (*Acme*), Tab., 250 mg, Tk. 1.32/Tab.
Cegram (*Incepta*), Tab., 1000 mg, Tk. 10.00/Tab.
Ceemet (*Medimet*), Tab., 250mg, Tk.1.20/Tab.
Ceevit (*Square*), Tab., 250 mg, Tk. 1.32/Tab.; Effervescent Tab., 1000 mg, Tk. 10.04/Tab.
Cevalin (*Biopharma*), Tab., 250 mg, Tk. 1.31/Tab.
Cevion (*Healthcare*), Tab., 1000 mg, Tk. 8.18/Tab.

Chewce (*Navana*), Syrup, 100 mg/5 ml, Tk. 33.34/100 ml; Tab., 250 mg, Tk. 1.31/Tab.
Citamin (*Supreme*), Tab., 250 mg, Tk. 1.30/Tab.
C-On (*Rephco*), Tab., 250 mg, Tk. 0.70/Tab.; Inj., 500 mg/5 ml, Tk. 4.75/Amp.; Sachet, 250 microgram/250ml, Tk. 5.00/Sachet
G-Vitamin (*Gonoshasthaya*), Tab., 250 mg, Tk. 1.30/Tab.
Hi-C (*Eskayef*), Syrup, 100 mg/5 ml, Tk. 33.22/100 ml
Kvit-C (*Kemiko*), Tab., 250 mg, Tk. 1.30/Tab.
Lemovit-C (*Ziska*), Tab., 500mg, Tk. 1.31/Tab.
Livit-C (*Orion*), Syrup, 100 mg/5 ml, Tk. 33.34/100 ml
Nutrivit-C (*ACI*), Paed. drop, 100 mg/ml, Tk 30.11/15 ml; Tab., 250 mg, Tk. 1.32/Tab.; Syrup, 100 mg/5 ml, Tk. 33.35/100 ml; Tab., 1000 mg, Tk. 12.00/Tab.
Rapid C (*Popular*), Tab., 1000 mg, Tk. 10.04/Tab.; Syrup, 100 mg/5 ml, Tk. 33.35/100 ml
Suvic (*Amico*), Tab., 250 mg, Tk. 0.75/Tab.
Vasco (*Opsonin*), Syrup, 100 mg/5 ml, Tk. 25.08/100 ml
Vc (*Aristo*), Tab., 250 mg, Tk. 1.30/Tab.
Veesina, (*Ibn Sina*), Tab., 250 mg, Tk. 1.32/Tab.
Vita-C (*Central*), Tab., 250 mg, Tk. 1.30/Tab.
Vitamin-C (*Albion*), Syrup, 100 mg/5 ml, Tk. 33.22/100 ml; Tab., 125 mg, Tk. 0.89/Tab.; Tab., 1000 mg, Tk. 10.00/Tab.

16.2.3.4 VITAMIN D

The term Vitamin D is used for a range of compounds, which possesses the property of curing and preventing rickets. They include ergocalciferol, Vitamin D₂ obtained by irradiating the plant sterol and Cholecalciferol (vitamin D₃) the major form in nature.

The exposure of skin in sunlight converts provitamin D (7-dehydrocholesterol) to previtamin D₃ in the skin.

Rickets due to vitamin D deficiency is likely to be uncommon in Bangladesh because of natural exposure of children to sunlight in Bangladesh. However, there are recent reports of prevalence of rickets from some districts of Chittagong. The cause of which has not yet been determined definitely.

Vitamin D is particularly toxic and is not excreted in urine and should be prescribed only when there is definite

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indication. The proprietary infant milk formulas should be carefully checked so that not more than 200 IU of Vitamin D is consumed by formula fed infants daily. Infants fed on breast milk should be exposed to sunlight regularly.

Toxic symptoms include anorexia, loss of weight, nausea, headache, depression and irritability.

VITAMIN-D PREPARATIONS

Ergocalciferol (Calciferol or Vitamin D₂).
Cholecalciferol (Vitamin D₃).
Alfacalceferol (1 α -hydroxycholecalciferol).
Calcitriol (1, 25, dihydroxy cholecalciferol).
Dihydroxycholecalciferol.

ERGOCALCIFEROL (D₂) / CHOLECALCIFEROL (D₃) [E^D]

Indications: simple Vitamin D deficiency states, such as rickets, osteomalacia, osteoporosis, abnormal calcium and phosphorus metabolism, intestinal malabsorption or liver diseases and renal osteodystrophy; hypocalcaemia of hypoparathyroidism; as adjunct to treatment of lupus vulgaris and tubercular adenopathies.

Contraindications: renal dysfunction; hypercalcaemia, metastatic calcification

Side-effects: symptoms of overdose include anorexia, lassitude, nausea, vomiting, diarrhoea, weight loss, polyuria, sweating, headache, thirst, vertigo and raised concentrations of calcium and phosphate in plasma and urine

Dose: ADULT and CHILD: Simple Vitamin D deficiency, 400 IU (10microgram) daily; deficiency caused by intestinal malabsorption or chronic liver disease, upto 40,000 IU (1 mg) daily. Renal osteodystrophy, upto 200,000 IU (5 mg) daily. Rickets and osteomalacia 1000-5000 IU daily

Oily solution of cholecalciferol 200,000 IU/ml ampoule : injectable IM or drinkable.

In Rickets for prevention : 200,000 I.U. or 1 ampoule every 4 months, which may be, increased to 400,000 IU i.e. 2 ampoules. In pregnancy, 1 ampoule at 6 months. Prevention should be started early and continue to the 5th year of life.

In Rickets- Curative: 1 ampoule every 2 weeks for one month and then 1 ampoule every 4 months or 600,000 IU i.e. 3 ampoules renewed some months later, as per the severity of the case.

Hypocalcaemia caused by tetany : Same as for preventing Rickets.

Osteoporosis and Osteomalacia: 200,000 IU i.e. 1 ampoule every 15 days for 3 months.

Renal Osteodystrophy, 200,000 IU i.e. 1 ampoule or more daily or as advised by the physician.

Proprietary Preparations

Calciferol (*Renata*), Inj., 2 Lac IU, Tk.120/Amp.

Colical (*Opsonin*), Inj., 2 Lac IU, Tk. 90.23/Amp.

Deon-3 (*Rephco*), Inj., 2 Lac IU, Tk. 90/Amp.

K-Vit D (*Kemiko*), Inj., 2 Lac IU, Tk.90/Amp.

Oticlor (*Incepta*), Cap., 500 mg, Tk.

40.00/Cap.; Syrup, Tk. 75.00/15 ml; Inj., 2 Lac IU, Tk. 90/Amp.

ALFACALCIDOL

(1 α -hydroxycholecalciferol)

Alfacalcidol or 1 α -hydroxycholecalciferol is the active form of vitamin-D₃, which is formed in the kidney tissues by hydroxylation of D₃.

Indications: requiring vitamin-D therapy in patients with severe renal impairment i.e. renal osteodystrophy (vitamin-D requires hydroxylation by the kidney to its active form i.e. 1 α -hydroxycholecalciferol, or 1,25 dihydroxycholecalciferol so, in severe renal impairment it is prescribed); postmenopausal osteoporosis

Contraindications; Side-effects & Cautions: see under *ergocalciferol*.

Dose: renal osteodystrophy - ADULT, initially 0.25 microgram daily or on alternative days, increased if necessary in steps of 0.25 microgram at intervals of

2-4 weeks; usual dose 0.5–1 microgram daily; CHILD, not established

Established postmenopausal osteoporosis—0.25 microgram twice daily (monitor plasma calcium and creatinine level, if possible)

Proprietary Preparations

Bon One Tab. 0.5 microgram⁽¹⁾ (*Teijin*), Tab., 0.5 microgram, Tk. 9.35/Tab

One Alpha ⁽¹⁾ (*Leo*), Cap., 0.25microgram, Tk. 8.65/Tab.

CALCITRIOL **(1,25 - dihydroxycholecalciferol)**

Indications: *see under Alfacalcidol.*

Cautions; Containdications & Side-effects: *see under Ergocalciferol.*

Dose: hypocalcaemia in dialysis patients with chronic renal failure, by intravenous injection (or injection through catheter) after haemodialysis, initially 500 nanograms (approx. 10 nanograms/kg) 3 times a week, increased if necessary in steps of 250-500 nanograms at intervals of 2-4 weeks; usual dose 0.5-3 micrograms 3 times a week; CHILD not established

Dose : Renal osteodystrophy, ADULT, initially 250 nanograms daily or on alternate days, increased if necessary in steps of 250 nanograms at intervals of 2-4 weeks; usual dose 0.5-1 micrograms daily; CHILD not established.

Established postmenopausal osteoporosis, 250 nanograms twice daily (monitor plasma calcium and creatinine).

Proprietary Preparations

Calcitrol (*Square*), cap, 0.25 microgram, Tk. 10.00/Cap.

Caloren (*ACI*), Inj., 1 microgram/ml, Tk. 155.58/Amp.

Caltrol (*Pacific*), Cap., 0.25 microgram, Tk. 7.52/Cap.

Colitrol (*Incepta*), Cap., Tk. 10.00/Cap.; Inj., 1 microgram/ml, Tk. 155.00/Amp.

Encatrol (*Globe*), Soft Cap., 0.25 microgram, Tk. 10.00/Tab.

Improcal (*Opsonin*), Cap. 0.25 microgram,,Tk. 6.18/Cap.;

Liquical (*Beacon*), Cap., 0.25 microgram, Tk. 10.00/Cap.

Lucent (*Renata*), Cap., 0.25 microgram, Tk. 10.00/Cap.

Ostriol(*Nipro JMI*), cap, 0.25 microgram, Tk. 10.00/Cap.

Promocal (*Navana*), Inj., 1 microgram/ml, Tk. 155.00/Amp

Rocaltrol (*Radiant*), Cap., 0.25 microgram, Tk. 20.00/Cap.

VITAMIN A & D PREPARATIONS

Proprietary Preparations

Cod Liver Oil

CodCap (*Incepta*), Cap., 0.30 ml, Tk. 2/Cap.

Codliv (*Pacific*), Cap., 0.30 ml, Tk. 1.50/Cap,

Codvit (*Opsonin*), Cap., 0.30 ml, Tk.

1.50/Cap.

Multiseas (*General*), Cap., 0.30 ml, Tk.

3.00/Cap.

Olicod (*Square*), cap, 0.30 ml, Tk. 2.01/Cap.

16.2.3.5 VITAMIN E

The requirement of Vitamin E has not been definitely established in man. There is now substantial evidence that supplementation of Vitamin E reduces the incidence of coronary heart disease in doses of 200-400 mg. Deficiency of Vitamin E in Bangladesh has not been reported. Recently a possible public health requirement has been suggested as 40-60 mg daily; an increase of about 3-4 folds from the old recommended allowance.

ALPHA TOCOPHERYL ACETATE

Indications : Vitamin E deficiency in malabsorption syndrome, sprue, and neuromuscular abnormalities due to very low Vitamin E concentration as found in young children with congenital cholestasis. As an adjunct to specific hormone therapy in sterility, habitual or imminent abortion; intermittent claudication, premature infants

Dose : ADULT 3-15 mg daily, CHILD 1-10 mg/kg, 100-200 mg/daily

Proprietary Preparations

Alfa-E (*Aristo*), Tab., 200 mg, Tk. 5.00/Tab.

Biovit-E (*Biopharma*), Tab., Tk. 5.00/Tab.

E-Cap (*Drug Intl*), Soft Cap., 200 mg, Tk.

4.00/Cap.; 400 mg, Tk. 6.00/Cap.

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E-Fill (*General*), Cap., 200 mg, Tk. 4.02/Cap.; 400 mg, Tk. 6.03/Cap.
Efynal (*Healthcare*), Tab., 200 mg, Tk. 6.50/Tab.
E-Soft (*Pacific*), Cap., 200 mg, Tk. 3.01/Cap.; 400 mg, Tk. 4.51/Cap.
E-Tab (*Acme*), Tab., 400 mg, Tk. 3.26/Tab.
Evit (*Square*), Tab., 200 mg, Tk. 3.34/Tab.; Licap, 200 mg, Tk. 4.01/Cap.; 400 mg, Tk. 6.02/Cap.
Formula E (*Beximco*), Tab., 200 mg, Tk. 3.82/Tab.
Inovit E (*Incepta*), Cap., 200 mg, Tk. 4.00/Cap.; 400 mg, Tk. 6.00/Cap.
Lifil-E (*Acme*), Cap., 200 mg, Tk. 4.00/Cap.; 400 mg, Tk. 6.00/Cap.
Liqu-E (*Beacon*), Cap., 200 mg, Tk. 4.00/Cap.; 400 mg, Tk. 6.00/Cap.
Nutrivit-E (*ACI*), Tab., 200 mg, Tk. 3.81/Tab.
Ovit-E (*Opsonin*), Cap., 200 mg, Tk. 3.01/Cap.; 400 mg, Tk. 4.51/Cap.
Polyvit (*Albion*), Tab., 200 mg, Tk. 4.00/Tab.
Tocomin (*Amnico*), Tab., 200 mg, Tk. 3.00/Tab.
Vanila E (*Eskayef*), Tab, 200 mg, Tk. 3.80/Tab.
Vegecap-E (*Nipro JMI*), Cap., 200 mg, Tk. 5.00/Cap.; 400 mg, Tk. 7.00/

Vitamin E + Vitamin C

Vital E+C (*Unimed*), Chewable Tab., Tk. 4/Tab
E-Cap Plus (*Drug Int.*), Soft Cap. , Tk. 4/Cap.
Protector (*Opsonin*), Tab., Tk. 5.27/Tab.

16.2.3.6 VITAMIN K

Vitamin K is necessary for the production of blood clotting factors and proteins needed for the normal calcification of bones.

Because Vitamin K is fat soluble, patients with malabsorption, especially in biliary obstruction or hepatic disease may become deficient. For oral administration to prevent Vitamin K deficiency in malabsorption syndrome a water soluble preparation Menadiol sodium phosphate may be used in does about 10 ml daily. Vitamin K is used for prophylaxis against haemorrhagic disease of the newborn. Fears about the safety of parenteral administration of Vitamin K appear unfounded.

Oral coumarin anticoagulants act by interfering with vitamin K metabolism in the hepatic cells and their effects can be antagonized by giving vitamin K.

Phytomenadione is natural vitamin K.

VITAMIN-K^[ED]

Indications: hypoprothrombanaemia; prophylaxis and treatment of haemorrhagic diseases of the newborn.

Cautions: anaphylactic reaction may occur with parenteral administration

Contraindications: synthetic analogues of vitamin K should be avoided in newborn because of the risk of kernicterus

Dose: ADULT, orally 10-20 mg, max. 40 mg in 24 hours. CHILD & NEONATES, 1 mg, over 3 months, 5-10 mg

By injection, ADULT, 10-20 mg IM, or slow IV, max. 40 mg in 24 hours. CHILD & NEONATES 1 mg IM; over 3 months 5-10 mg IM

Proprietary Preparation

Konakion[®] (*Roche*), Inj. 2mg/0.2ml, Tk.68.26/vial

Babykion (*Chemist*), Inj. 0.2 ml; Tk. 20/0.2 ml

16.2.3.7 MULTIVITAMIN AND MULTIVITAMIN WITH MINERAL PREPARATIONS

In view of the prevalence of multiple vitamin and mineral deficiencies together it is sometimes impossible to diagnose cases of specific deficiencies. It may be worthwhile to treat such cases with formulation containing multiple vitamins or with combined multivitamin and minerals. .

Indication: it is used as dietary supplement

MULTIVITAMINS

Indications: multivitamin deficiencies in infants and children as in malabsorption syndrome and other gastrointestinal diseases; growth retardation and during antibiotic therapy

Dose: usual dosage, 10-15 drops once or twice daily

Proprietary Preparations

Biovit PDD (*Biopharma*), Paed drops, Tk. 15.06/15 ml
Micovit (*Amico*), Paed drops, Tk. 15/15 ml
Multisina (*Ibn Sina*), Paed Drops, Tk. 20/15ml
Nutrivit-MV (*ACI*), Paed Drops, Tk.16.01/15 ml
Tynisol (*Beximco*), Drops, Tk. 24/15 ml
Vita M (*Opsonin*), Paed drops, Tk. 16.54/15 ml
V-Plex (*Acme*), Paed Drops, Tk. 22/15 ml

MULTIVITAMIN + MULTIMINERALS**Proprietary Preparations**

Activit Gold (*Delta*), Tab., Tk. 6.00/Tab.
Activit Silver (*Delta*), Tab., Tk. 6.00/Tab.
Apevit- M (*APC*), Tab., Tk. 1.00/Tab.
Aristo Gold (*Aristo*), Tab., Tk. 7.00/Tab.
Aristo Kid (*Aristo*), Syrup, Tk. 86.00/100 ml; Tk. 152.00/200 ml
Aristo Mom (*Aristo*), Tab., Tk. 3.00/Tab.
Aristovit M (*Beximco*), Tab., Tk. 2.00/Tab.
Aristovit X (*Beximco*), Tab., Tk. 4.00/Tab.
Asitrum Gold (*Asiatic*), Tab., Tk. 6.00/Tab.
Asitrum Silver (*Asiatic*), Tab., Tk. 6.00/Tab.
Atoz Premium (*Radiant*), Tab., Tk. 12.00/Tab.
Atoz Senior (*Radiant*), Tab., Tk. 12.00/Tab.
Aztrum Gold (*Apex*), Tab., Tk. 6.00/Tab.
Benvit - M (*Benham*), Tab., Tk. 1.80/Tab.
Bextram (*Beximco*), Tab., Tk. 5.00/Tab.
Bextram Gold (*Beximco*), Tab., Tk. 7.00/Tab.
Bextram Silver (*Beximco*), Tab., Tk. 7.00/Tab.
Bextram KIDZ (*Beximco*), Syrup, Tk.80/100 ml
Bextram Teen HM (*Beximco*), Tab., Tk. 6/Tab.
Bextram Teen HR (*Beximco*), Tab., Tk. 6/Tab.
Biovit Gold (*Biopharma*), Tab., Tk. 7/Tab.
Biovit Silver (*Biopharma*), Tab., Tk.6.02/Tab.
Biovit-M (*Biopharma*), Tab., Tk. 1.80/Tab.
Central Gold (*Central*), Tab., Tk. 6.50/Tab.
Century Forte (*Unimed*), Tab., Tk. 6.00/Tab.
Century Select (*Unimed*), Tab., Tk. 6.00/Tab.
Cytaplex M (*Central*), Tab., Tk. 1.50/Tab.
Envit-M (*Ibn Sina*), Tab., Tk. 1.50/Tab.
Equate (*Asiatic*), Tab., Tk. 1.00/Tab.
Evagren (*Incepta*), Tab., Tk. 4.00/Tab.
Filwel Gold (*Square*), Tab., Tk. 6.02/Tab.
Filwel Silver (*Square*), Tab., Tk. 6.02/Tab.
Flavit-M (*Amico*), Tab., Tk. 1.50/Tab.
Goldage (*Orion*), Tab., Tk. 6.02/Tab.
Goldpac (*Pacific*), Tab., Tk. 6.52/Tab.
Hygea Gold (*Somatec*), Tab., Tk. 6.02/Tab.
I Care (*Pacific*), Tab., Tk. 7.52/Tab.
Kidovit (*Amico*), Syrup, Tk. 65.00/100 ml
Kvit Gold (*Kemiko*), Tab., Tk. 6.00/Tab.
Kvit-M (*Kemiko*), Tab., Tk. 1.50/Tab.
Life Gold (*Alco*), Tab., Tk. 6.00/Tab.
Life Silver (*Alco*), Tab., Tk. 6.00/Tab.
Livwel (*Square*), Syrup, Tk. 160.60/200 ml; Tk. 90.34/100 ml
Multivit Plus (*Square*), Tab., Tk. 1.80/Tab.
Natal (*Opsonin*), Tab., Tk. 2.26/Tab.
Newage (*Orion*), Tab., Tk. 5.02/Tab.

Nipro Gold (*Nipro JMI*), Tab., Tk. 6.00/Tab.
Norad Plus (*Pacific*), Cap., Tk.3.76/Tab.
Nox (*Alco*), Tab., Tk. 2.53/Tab.
Nutrum 50+ (*Acme*), Tab., Tk. 6.02/Tab.
Nutrum Bone (*Acme*), Tab., Tk. 4.01/Tab.
Nutrum Gold (*Acme*), Tab., Tk. 6.02/Tab.
Nutrum Junior (*Acme*), Syrup, Tk. 85.32/100 ml
Nutrum Super (*Acme*), Tab., Tk. 4.01/Tab.
Opsovit Mm (*Opsonin*), Tab., Tk. 1.14/Tab.
Orioplex-M (*Orion*), Tab., Tk. 1.51/Tab.
Ostium-Gold (*APC*), Tab., Tk. 6.00/Tab.
Oxidex (*Albion*), Tab., Tk. 2.53/ Tab.
Polyvit Plus A to Z Gold (*Albion*), Syrup, Tk. 85.00/100 ml ; Tab., Tk. 6.00/Tab.
Revigor (*ACI*), Tab., Tk. 5.02/Tab.
Revital 30 (*ACI*), Tab., Tk. 6.02/Tab.
Revital32 (*ACI*), Tab., Tk. 6.02/Tab.
S-32 Gold (*Sharif*), Tab., Tk. 6.00/Tab.
Santox (*Healthcare*), Tab., Tk. 4.00/Tab.
Silvage (*Orion*), Tab., Tk. 6.02/Tab.
Sina Gold (*Ibn Sina*), Tab., Tk. 6.50/Tab.
Solvit-M (*Eskayef*), Tab, Tk. 1.80/Tab.
Supravit (*Drug Intl*), Soft Cap., Tk. 2.00/Cap.
Supravit-M (*Drug Int.*), Soft Cap., Tk. 3.50/Cap.
Synergy (*Amico*), Tab., Tk. 4.00/Tab.
Univit Plus (*Aristo*), Tab., Tk. 1.50/Tab.
Vitace M (*Aristo*), Tab., Tk. 4.00/Tab.
Vitachild (*Popular*), Tab., Tk. 75.28/100 ml; Tk.140.53/200 ml
Vitaforce S (*Biopharma*), Tab., Tk. 4.02/Tab.
Vitagrow (*Incepta*), Syrup, Tk. 80/100 ml
Vitalgin (*Ibn Sina*), Syrup, Tk. 175/200ml; Tk.85/100 ml
Vitrum Gold (*Eskayef*), Tab, Tk. 6.00/Tab.
Vitrum Silver (*Eskayef*), Tab, Tk. 6.00/Tab.
VM Gold (*Organic*), Tab., Tk. 6.00/Tab.
V-Plex Plus (*Acme*), Tab., Tk. 0.44/Tab.
Xvit (*Beacon*), Cap., Tk. 3.50/Cap.
Zovia Teen B (*Opsonin*), Tab., Tk. 4.51/Tab.
Zovia Teen G (*Opsonin*), Tab., Tk. 4.51/Tab.

MULTIVITAMIN WITH COD-LIVER OIL

A special preparation of multivitamin comprising vitamin A, D, B₂, B₆, C, E, nicotinamide and codliver oil.

Proprietary Preparations

Aquavit (*Somatec*), Syrup, Tk. 80.30/100 ml; Tk. 150.00/200 ml
Asitrum Cod (*Asiatic*), Syrup, Tk. 80/100 ml
CNV (*Delta*), Syrup, Tk. 80.00/100 ml
Cod Plus (*Apex*), Syrup, Tk. 80/100 ml; Tk.145/200 ml
Codomix (*Jayson*), Syrup, Tk. 80.00/100 ml
Codvita (*Amico*), Syrup, Tk. 80.00/100 ml
Filwel Kids (*Square*), Syrup, Tk.145.54/200 ml ;Tk. 80.30/100 ml
Gold Kid (*Orion*), Syrup, Tk. 80.30/100 ml
Hepta Seas (*ACI*), Syrup, Tk. 80.30/100 ml

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Junivit (*Ibn Sina*), Syrup, Tk. 90.00/100 ml
Kiddi (*Renata*), Syrup, Tk. 40.15/50 ml; Tk. 140.53/200ml; Tk. 80.31/100 ml
Kvit seas (*Kemiko*), Syrup, Tk. 145.00/200 ml; Tk. 80.00/100 ml
Mixavit (*Eskayef*), Syrup, Tk. 80.00/100 ml
Multi Seas (*General*), Syrup, Tk. 80.30/100 ml; Tk. 145.54/200 ml
Multicod (*Pacific*), Syrup, Tk. 75.19/100 ml
Newseas (*Sharif*), Syrup, Tk. 80/100 ml
Nine Seas (*Aristo*), Syrup, Tk. 80/100 ml; Tk.150/200 ml
Pediavit (*Unimed*), Syrup, Tk. 80/100 ml
Polyvit Kids (*Albion*), Syrup, Tk. 80/100 ml
Revam (*Navana*), Syrup, Tk. 45.17/50 ml; Tk. 80.30/100 ml
Seasvita (*Organic*), Syrup, Tk. 80/100 ml; Tk. 145/200 ml
Simcod (*Pharmasia*), Syrup, Tk. 80/100 ml; Tk. 145/200 ml
Supracod (*Drug Int.*), Syrup, Tk. 80.00/100 ml
Vitalex Cod (*Supreme*), Syrup, Tk. 80/100 ml

PRENATAL MULTIVITAMIN AND MULTIMINERAL

Indications: improving the nutritional status of throughout the pregnancy and in postnatal period for both lactating and non-lactating mother; increase the nutritional status of women prior to conception

Side-effects: allergic sensitization has been reported following oral administration of folic acid

Cautions: folic acid in doses above 0.1mg daily may obscure pernicious anemia in that hematological remission can occur while neurological manifestation remain progressive. Accidental over dose of iron containing products is a leading cause of fatal poisoning in children under

Dose: one daily.

Proprietary Preparations

Biovit PN (*Biopharma*), Tab., Tk. 5.02/Tab
Nutrum PN (*Acme*), Tab. Tk.5/Tab
Nutrum PN (*Acme*), Tab., Tk. 5.01/Tab.
Placent-M (*Navana*), Tab., Tk. 1.51/Tab.
Precare (*Incepta*), Tab. Tk.5/Tab
Supravit-PN (*Drug Intl*), Soft Cap., Tk. 5/Cap.
Supravit-PN (*Drug Intl*), Soft Cap., Tk.5/Tcap

16.2.3.8 ANTIOXIDANT VITAMIN PREPARATIONS

β- CAROTENE + VITAMIN C + VITAMIN E:

Beta-carotene, vitamin C & vitamin E are antioxidant vitamins. It is found that their presence in foods help fight & protect the cell against harmful cell damage.

Indications: as antioxidant vitamins to combat degenerative process of ageing; prevent old age diseases, inflammatory rheumatic diseases, inflammatory rheumatic diseases, malignancy & pre-cancerous conditions, lung functional problems & immunological problems. Prophylactic use of vitamin E and vitamin C may prevent certain degenerative diseases

Contraindications; Side-effects & Cautions: see under respective vitamins individually

Dose: 1 tablet or capsule daily, or as prescribed by the physician
Beta-carotene 6 mg + Vitamin C 200 mg + Vitamin E 50 mg.

Proprietary Preparations

Active Plus (*White Horse*), Tab., Tk. 2.50/Tab.
Antox (*Acme*), Tab., Tk. 2.54/Tab
Bec (*Opsonin*), Tab., Tk. 1.7/Tab.
Carocet (*Beximco*), Tab. Tk. 2.54 /Tab
Ceb (*Rephco*), Tab., Tk. 4.00/Tab.
Cebeta (*Amulet*), Tab., Tk. 2.53/Tab
Norad (*Pacific*), Tab., Tk. 3.01/Tab; Cap., Tk. 3.01/Cap.
Oxet (*Amico*), Tab., Tk. 2.50/Tab.
Perex (*Central*), Tab., Tk. 2.50/Tab
Race (*Ibn Sina*), Tab., Tk. 2.50/Tab.
Rex (*Square*), Tab., Tk. 2.54/Tab.
Rexovit (*Maks*), Tab., Tk. 2.50/Tab
Tanox (*Drug Intl*), Tab. Tk. 3.00 /Tab
Tasti (*ACI*), Tab., Tk. 2.50/Tab.
Vitace (*Aristo*), Tab., Tk. 3.00/Tab.
Vitaforce (*Biopharma*), Tab., Tk. 2.54/Tab
Vitamin C+Vitamin E + Zinc + Copper + Lutein.
Azocol (*Incepta*), Cap., Tk. 10.00/Cap.
Eyevi (*Square*), Cap., Tk. 8.04/Cap.
I-Gold (*Aristo*), Cap., Tk. 10.00/Cap.
Kvit-I (*Kemiko*), Cap., Tk. 10.00/Cap.
Lutin Plus (*General*), Cap., Tk. 10.00/Cap.
Nutrum Eye (*Acme*), Cap., Tk. 8.00/Cap.
Ocuvit (*Asiatic*), Cap., Tk. 10.00/Cap.
Optagol (*Ibn Sina*), Cap., Tk. 10.00/Cap.
Optavit (*Popular*), Tab., Tk. 10.00/Cap.
Tanox-Plus (*Drug Intl*), Tab. Tk. 4 /Tab.

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