

INTRAVENOUS & INJECTABLE SUPPLEMENTS:

Vitamin B1: Thiamine –

An essential water-soluble nutrient that helps convert food into energy, supporting brain, nerve, and heart function. Thiamine is required to convert the elements of food into chemical energy by assisting the enzymes involved in breaking down sugars and amino acids.

- People at increased risk of insufficiency or deficiency:
 - Diets low in legumes, wholegrains and/or animal proteins.
 - Chronic excessive alcohol intake.
 - Older/elderly adults.
 - Chronic users of the anti-convulsant medication such as phenytoin.
 - Unresolved chronic hyperglycemia. (uncontrolled diabetes)
 - Bariatric surgery patients.

Vitamin B2: Riboflavin –

A water-soluble vitamin essential for energy production, cellular function, and fat metabolism. It is required for the maintenance of normal iron levels. Riboflavin is required to convert the elements of food into chemical energy. It is also a vital component for cellular detoxification in the body. Riboflavin can result in bright yellow urine, following administration both orally or intravenously.

- Riboflavin is required for the synthesis or bioactivation of the following;
 - Vitamin B3
 - Vitamin B6
 - Vitamin B12
 - Folate
- People at increased risk of insufficiency or deficiency:
 - Chronic, excessive alcohol intake.
 - Decreased dietary intake of vitamin B2.
 - Vegans who are not eating wholefoods, especially those performing high amounts of physical activity.
 - People with inflamed bowel disease may have negatively affected absorption of vitamin B2.

Vitamin B3: Niacin –

Niacin is a water-soluble vitamin and is the precursor to the enzyme nicotinamide adenine dinucleotide (NAD), which has over 400 direct or indirect roles currently known within the human body. It is required in the process of creating chemical energy from food. It's important for the production of cholesterol. Steroid hormones and bile acids. It is also essential for the recycling of antioxidants required for detoxification.

- People at increased risk of insufficiency or deficiency:
 - Those with poor dietary intake of vitamin B3 and or tryptophan.
 - Vegans who consume low amounts of legumes or seeds.
 - People with malabsorption syndromes to certain medications.
 - People with chronic alcoholism.
 - Vitamin B2 or B6 deficiency may contribute to lower levels of niacin and its cofactors.
 - People with cancer.
 - People with defective tryptophan absorption. (Hartnup's disease)

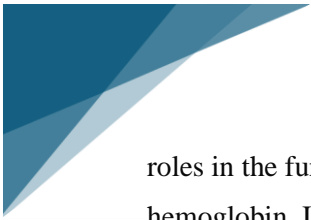
Vitamin B5: Pantothenic Acid –

A water-soluble essential nutrient crucial for breaking down fats, carbohydrates, and proteins into energy. It is required to generate chemical energy from food. It is needed for the production of essential fats, cholesterol, steroid hormones, chemical messengers, vitamin A & D. It also helps the liver detoxify against certain drugs and toxins.

- People at increased risk of insufficiency or deficiency:
 - Poor or low nutrient diets, such as those rich in processed foods & low wholefoods.
 - Individuals with certain types of dysbiosis of the microbiome.

Vitamin B6: Pyroxidine: -

A water-soluble vitamin essential for protein metabolism, red blood cell formation, and nervous/immune system health. It is an essential vitamin and cannot be synthesized by the body. Pyroxidine plays vital



roles in the function of hundreds of chemical reactions that occur in the body. It is needed to create hemoglobin. It also has a vital role in the synthesis of amino acids and the processing of fatty acids. It supports the releaser of glucose from stored sugar, glycogen, as well as gluconeogenesis, the process of forming glucose from non-carbohydrate sources.

- People at increased risk of insufficiency or deficiency:
 - People with poor dietary intake/absorption.
 - Those with excessive alcohol intake.
 - People with malabsorption issues, such as inflammatory bowel disease.
 - Malignancy.
 - People taking CERTAIN medications.

Vitamin B12: Cobalamin –

A water-soluble essential nutrient crucial for nerve tissue health, brain function, red blood cell formation, and DNA synthesis. Cobalamin has the most complex structure of all the vitamins. It is essential for making vital compounds and chemical energy production. It also maintains cellular identify while supporting DNA synthesis and repair. It assists in red blood cell production and the preservation of the protective layer that insulates the nerve cells.

- People at increased risk of insufficiency of deficiency:
 - Vegans & Vegetarians.
 - People with low intake of red meat.
 - Elderly.
 - Drug Users.
 - People with salivary gland pathology.
 - Gastric considerations:
 - Gastrectomy.
 - Bariatric Surgery.
 - Peptic Ulcer Disease.
 - Chronic pancreatitis.
 - Prolonged use of antibiotics.
 - People with malabsorption syndromes.

- People who have had ileal resection. (Chron's or coeliac surgeries)
- People with chronic alcoholism.
- People on Metformin and other medications.

Magnesium –


Is an essential mineral. It is a cofactor for more than 300 enzymes, providing chemical energy to fuel the body. Magnesium is required for several steps in the synthesis. (DNA, RNA, proteins, carbohydrates and lipids.) It is essential for the synthesis of glutathione, a principal antioxidant of the body. Magnesium plays a structural role within bone, cell membranes and chromosomes. Essential for electrical nerve conduction, muscle, contraction & relaxation and cardiac electrical activity. It also acts a smooth muscle relaxer. It also helps to maintain calcium equilibrium, and is important for wound healing.

- People at increased risk of Insufficiency or Deficiency:
 - People with poor dietary intake.
 - Type 1 & 2 diabetics.
 - People with chronic excessive alcohol use.
 - Elderly people.
 - People who use protein pump inhibitors for an extended period.
 - People who use thiazide diuretics at high doses for extended periods.

Vitamin C: Ascorbic Acid –

Vitamin C (ascorbic acid) is an essential vitamin that cannot be synthesized by the human body. Ascorbic acid is the primary antioxidant. It can protect proteins, lipids, carbohydrates, DNA and RNA from free radicals & oxidative stress. Vitamin C is neutralization of free radical toxins and reactive oxygen species. It allows for the synthesis of collagen, carnitine and epinephrine. It supports cell differentiation and enhances the intestinal absorption of non-heme iron.

- People at increased risk of Insufficiency or Deficiency:
 - Smokers and passive smokers.
 - People with malabsorption syndromes.
 - People with low dietary consumption of Vitamin C.

- 
- Diets low in fruits and vegetables and high in processed foods.
 - Vitamin C is a heat sensitive nutrient and level can deplete with some cooking techniques.
 - Patients with cancer.
 - People having renal dialysis.

Zinc –

Zinc is a trace element, essential for life. It is thought that more than 3000 human proteins contain zinc binding sites helping to support normal growth and development, immune function, vision, reproduction, neurotransmission and intestinal ion transport. Zinc also helps with cellular defense against oxidative stress, plus detoxification of heavy metals.

- People at Increased risk of Insufficiency or Deficiency:
 - People with poor dietary intake of zinc. Vegans and vegetarians are at risk.
 - People with chronic, excessive alcohol intake.
 - People who have sickle cell anemia.
 - People with inflammatory bowel disease.
 - People with prolonged or recurrent diarrhea.
 - Lactating/nursing mothers are at risk for deficiency.
 - Individuals taking thiazide diuretics.
 - People with renal disease.
 - Older adults are at risk.

Selenium –

Selenium is a trace element utilized by the human body. It's an important component of at least 25 different proteins. It helps protect against oxidative stress. It makes inactive thyroid hormone, thyroxine (T4) to form the biologically active thyroid hormone, triiodothyronine (T3), it is essential for thyroid health.

- People at Increased Risk of Insufficiency or Deficiency:
 - Vegans and Vegetarians not consuming nuts and seeds may be more at risk.

- Individuals following bariatric surgery.
- People with severe inflammatory bowel conditions, such as Chron's disease or ulcerative colitis.
- People who are HIV positive.
- Individuals with low triiodothyronine (T3) may benefit from increase in dietary or supplemental selenium.

Glutathione –

Glutathione is the body's primary "master antioxidant" and detoxifier, a tripeptide (glycine, cysteine, glutamic acid) produced in the liver. High concentrations of glutathione can be found in the cells of the liver, lungs and kidneys. It is a major antioxidant in the cells of the body which directly neutralizes a broad range of toxins, both exogenous and endogenous, and heavy metals. Mitochondria glutathione plays a key role in regulating apoptosis. It has the ability to recycle vitamins C and E, it is also required in many stages of the immune response.

- People at Increased Risk of Insufficiency or Deficiency:
 - People with low dietary intakes of cysteine and glycine.
 - People with exposure to chronic excessive stress.
 - People with excessive and chronic exposure to heavy metals, chemicals, UV radiation, pollutants, pesticides, drugs, mold and other xenobiotic harmful substances.

N-acetyl Cysteine (NAC) –

Cysteine is required to make glutathione. It directly detoxifies certain reactive oxygen and nitrogen species. NAC is effective in causing the mucus to be less viscous and elastic. It helps by blocking activity, NAC decreases the release of inflammatory cytokines, which can reduce inflammation.

- People at Increase Risk of Insufficiently or Deficiency:
 - People with low intake of the following nutrients:
 - Folate
 - Vitamin B6
 - Vitamin B12

- Methionine

Coenzyme Q10 (Ubiquinone) –

Coenzyme Q10 is found in almost all cellular and mitochondrial membranes. Both vitamin B5 and B6 are required for the biosynthesis of COQ10. It is required for the conversion of carbohydrates and fats to chemical energy. COQ10 is an effective fat-soluble antioxidant that protects cell membranes and lipoproteins from oxidations. COQ10 regenerates other antioxidants like a-tocopherol (form of vitamin E) and vitamin C.

- People at Increased Risk of Insufficiency or Deficiency:
 - COQ10 has been found to decline with age.
 - Patients on statin therapy may be at increased risk of lower COQ10 levels.
 - Patients with deficiencies in vitamin B5 or B6 may be at increased risk of reduced COQ10.
 - Diet deficiencies from (meat, poultry, fish, olive oil, nuts and seeds).

Alpha Lipoic Acid (ALA) –

Alpha lipoic acid is a naturally occurring compound that can be synthesized by humans. It is an essential cofactor for mitochondrial complexes, to help produce ATP. Plays a role in major components of DNA. ALA helps to activate several antioxidants, including coenzyme Q10, vitamin C and glutathione. Available research suggests that treatment with ALA may help reduce the symptoms of diabetic peripheral neuropathy. It also may regulate other signaling pathways involved in metabolism, stress responses, proliferation and cell survival.

- People at increased Risk or Insufficiency or Deficiency:
 - Poor, low nutrient diets, such as those rich in processed foods and low in whole foods.



Biotin –

Biotin is a water-soluble vitamin. Humans get biotin from food, and it can be synthesized in the intestine by the microbiome. Biotin is essential for fatty acid metabolism. It is highly active in the liver, heart and pancreatic tissues. Biotin is a cofactor responsible for gluconeogenesis. Biotin is required for the breakdown of the branched chain amino acid, leucine, fuel for the citric acid to produce energy.

- People at Increased Risk or Insufficiency or Deficiency:
 - Those consuming raw egg white for many weeks or more.
 - People with chronic excessive alcohol intake.
 - People with no HCL production, such as those with partial gastrectomy.
 - People with dysbiosis of microbiome.
 - Smokers.
 - Individuals taking anticonvulsants medications.

