**Question 1**

Which deficiency causes diarrhoea, dermatitis and dementia?

Your answer was not correct

A Niacin (B3)

B Vitamin B1

C Riboflavin (B2)

D Pyridoxine (B6)

Explanation A

Remember: Niacin cause 4 “D”s. The fourth D is death.

Extra: Niacin is also known as Vitamin B3 and nicotinic acid. Niacin deficiency is known as Pellagra A deficiency causes the 4 D’s=Diarrhoea, Dermatitis, Dementia, Death. Other features include Casal’s Necklace on the lower neck, hyperpigmentation, skin thickening and inflammation of tongue and mouth.

**Question 2**

A deficiency in which of the following can cause heart failure?

A Zinc

B vitamin D

C Thiamine

D Pyridoxine

Explanation C

Thiamine (vitamin B1) deficiency gives rise to three distinctive syndromes. A polyneuropathy (dry beriberi), a cardiovascular syndrome (wet beriberi) and Wernicke-Korsakoff syndrome. Wet beriberi is associated with vasodilatation, leading to more rapid arterio-venous (AV) shunting of blood, high output cardiac failure and eventually peripheral oedema

**Question 3**

Which of the following is not associated with B12 deficiency?

A Subacute degeneration of the spinal cord

B Autoimmune gastritis

C Microcytic anaemia

D Crohn's disease

Explanation C

B12 is absorbed in the terminal ileum of the small intestine. Crohn’s disease often affects this part of the intestine causing a lack of B12 absorption. Autoimmune gastritis leads to a deficiency in intrinsic factor which is important for the absorption of B12. This results in pernicious anaemia. Vitamin B12 deficiency causes a subacute combined degeneration of the posterior spinal tracts

**Question 4**

Smoking is related to all the following carcinomas, with the exception of?

A Laryngeal

B Lung

C Oesophageal

D Endometrial

Explanation D

Carcinomas caused by smoking include: Trachea, lung, bronchus, larynx, lip, oral cavity, pharynx, oesophagus, bladder, urinary tract, cervix, pancreas and stomach

Note: Cigarette smoking was found to be significantly associated with a reduced risk of endometrial cancer, especially among postmenopausal women.

**Question 5**

Which body cell is the most sensitive to radiation injury?

A Cerebral cells

B Ovarian cells

C Gastric mucosal cells

D Haematopoietic stem cells

Explanation D

In general tissue/cells with the greatest proliferation capability show the highest sensitivity. In terms of sensitivity for the cell types in this question the order from highest sensitivity to lowest is;

 - Lymphohaematopoietic

 - Ovarian

 - Gastric mucosal

 - Cerebral

Effects of total body ionizing radiation

Main site if injury

1-2Sv: lymphocytes, granulocytes

2-10Sv: bone marrow

10-20Sv: small bowel

>50Sv: brain

Estimated Threshold doses for acute radiation effects on specific organs:

(Doses in Sv)

Testes 0.15

0.5 Sv: Bone Marrow

0.5 Sv: Skin (reversible effects)

1-2 Sv: Ovary

2.5-6Sv: Skin (temporary hair loss)

3-5 Sv: Testis (Permanent sterility) 3.5 Sv

5 Sv: Lens of eye

**Question 6**

Which of the following is not increased by cigarette smoking?

A Oesophageal cancer

B Chronic liver disease

C Pancreatic cancer

D Spontaneous abortion

Explanation D

Smoking increases the risk of cancer, ischaemic heart disease, cardiac arrest, cerebrovascular disease, arteriosclerosis and chronic respiratory disease.

Currenly smoking has a clear dose-response effect on spontaneous abortion. Prior smoking has not shown to be a significant predictor for future miscarriages.

**Question 7**

In pure iron deficiency anaemia, which of the following options occurs?

A Decreased transferrin saturation

B Decreased total iron-binding capacity (TIBC)

C Increased ferritin

D Decreased platelet count

Explanation A

In a pure iron deficiency, the total iron binding capacity is high and the serum ferritin is low. There is decreased transferin saturation. There is no effect on the platelets. Iron deficiency is the most common nutritional deficiency in the world. Iron is absorbed in the duodenum and has an increased absorption in the presence of vitamin C. Iron excess can cause pulmonary fibrosis

**Question 8**

Regarding electrical injuries, which of the following statements is correct?

A All body compartments conduct electricity

B Lightning does not cause thermal injury

C Voltage rather than amperage is the most important factor in electrical injury

D Death is usually associated with extensive burns

Explanation A

Death resulting from electrical injuries is not always associated with extensive burns. Amperage is very important in the aetiology of injury from electrocution. Lightening can cause thermal injury. All tissues of the body are conductors of electricity but they have differing degrees of resistance. Dry skin is not a good conductor of electricity.

**Question 9**

Which of the following options is correct regarding electrical injuries?

A Massive skin burns may cause death

B Amperage is not important

C Dry skin is a good electrical conductor

D All body tissues conduct equally

Explanation A

Death resulting from electrical injuries is not always associated with extensive burns. Amperage is very important in the aetiology of injury from electrocution. Lightening can cause thermal injury. All tissues of the body are conductors of electricity but they have differing degrees of resistance. Dry skin is not a good conductor of electricity.

**Question 10**

Which of the following may be caused by thiamine deficiency?

A Glossitis

B High output cardiac failure

C Rickets

D Anaemia

Explanation B

Wet beriberi will cause high output cardiac failure. The heart may be mildly affected or be massively dilated resulting in a 4 chamber dilitation. The walls become thin and dilated and a mural thrombus may be generated.

Ricketts is associated with Vit D deficiency Glossitis is associated with Vit B2 (riboflavin) and B6 (pyridoxine) deficiency. Anaemia is associated with B12 (megaloblastic anaemia), B6 (sideroblastic), folate (megaloblastic), and iron (microcytic) deficiency

**Question 11**

Which of the following is not a cause of megaloblastic anaemia?

A Epstein-Barr virus (EBV) infection

B Folate deficiency

C Neoplasms

D Pregnancy

Explanation A

Megaloblastic anaemias are caused by a vitamin B12 deficiency, folic acid deficiency, or due to unresponsiveness to vitamin B12, or folic acid therapy. Pregnancy, hyperthyroidism and disseminated cancer all have an increased requirement for B12

EBV may be associated with acute haemolytic anaemia

**Question 12**

Which of the following options occurs In iron deficiency?

A Decreased total iron binding capacity (TIBC)

B Decreased transferrin saturation

C Macrocytic anaemia

D Increased serum ferritin

Explanation B

In iron deficiency anaemia, there is typically a microcytic, hypochromic anaemia, with decreased serum iron, decreased transferrin saturation, decreased serum ferritin, and increased total iron binding capacity. Both the haemoglobin and haematocrit are low and there is a modest poikilocytosis. Remember that the MCV and the MCHC is also low in iron deficiency anaemia

**Question 13**

Heroin overdose can cause all of the following, with the exception of?

A Acute myocardial infarction due to vasospasm

B Pulmonary oedema

C Miosis

D Coma

Explanation A

Heroin is not a sympathetic stimulant and therefore does not cause vasospasm of the coronary arteries

Heroin is a type of opioid. Opiate overdose presents with triad of - CNS depression, Respiratory depression, Miosis. Pulmonary oedema associated with opiate overdose occurs almost exclusively with heroin, occurring in upto 10% of patients.

**Question 14**

Which of the following body tissues is most susceptible to radiation damage?

A Lymphohaematopoietic system

B Brain

C Lungs

D Gastrointestinal tract

Explanation A

Lymphohaematopoietic tissue/cells display the highest sensitivity to radiation. tissues/cells with the greatest proliferation capability show the highest sensitivity. Gastrointestinal tissue is less sensitive followed by brain

**Question 15**

Which of the following is an anti-oxidant?

A vitamin B12

B vitamin E

C vitamin B6

D vitamin K

Explanation B

Vitamin E is a major antioxidant. Vitamin K is a cofactor in hepatic carboxylation of procoagulants (factor 2, 7, 9 and 10, proteins C and S) Vitamin B12 is required for normal folate metabolism and DNA synthesis Vitamin B6 (pyridoxine) coenzyme in many intermediary reactions. Vitamins A and C are also antioxidants

**Question 16**

Regarding Iron, which of the following statements is false?

A Most is absorbed in the duodenum

B Most is found in myoglobin

C Transferrin is usually 33% saturated

D Absorption is increased by vitamin C

Explanation B

Most iron is found in haemoglobin. 80% of functional iron is found in Hb; myoglobin and iron containing enzymes such as catalase and the cytochromes contain the rest. Almost all iron absorption occurs in the duodenum in the ferrous (Fe2+) form. Transferrin saturation ranges: men 20-50% and women 15-50%. Vit C enhances iron absorption

**Question 17**

Common neurological sequelae of lead poisoning in children include all EXCEPT?

A Brain damage

B Low intellectual capacity

C Peripheral neuropathies

D Behavioural changes

Explanation C

Children absorb more than 50%of ingested lead (adults <15%). The higher intestinal absorption and the more permeable blood brain barrier create a high susceptibility to brain damage. Subclinical lead poisoning (<10ug/dl) leads to low intellectual capacity, behaviour changes, poor organisation skill and hyperactivity. High levels of lead poisoning lead to encephalopathy and brain damage even death. Peripheral neuropathies predominate in adults and not in children

Extra: old editions of the TB repot that peripheral nerve demyelination occurs predominately adults

**Question 18**

Regarding protein energy malnutrition (PEM), which of the following statements is CORRECT?

A Kwashiorkor is due to loss of the visceral protein compartment stores

B PEM only occurs in children

C Marasmus results in a fatty liver

D A person with a BMI of <20kg/m2 is considered malnourished

Explanation A

In developing countries PEM occurs in children (up to 25% of children). In developed countries the elderly and debilitated patients in nursing homes and hospitals are affected. A body mass index of <16kg/m2 is considered malnutrition. An easier way to remember is that a child with a weight of <80% of normal is malnourished. PEM presents in malnourished children as marasmus and kwashiorkor. Marasmus-the somatic protein compartment (skeletal muscles) is affected and Kwashiorkor, the visceral compartment (liver). Marasmus occurs when the weight falls <60% of normal. Somatic protein compartment is lost, this is protective as the visceral compartment is more important for survival is maintained. Therefore serum albumin levels are normal or only slightly depleted. Lipolysis also occurs-to obtain fuel. The patient is emaciated. Immune and vitamin deficiencies and anaemia occurs.

Kwashiorkor occurs when the protein deprivation is greater than the reduction in calorie intake. Basically children weaned too early and then fed an exclusive carbohydrate diet. Severe depletion of the visceral compartment occurs resulting in hypoalbuminaemia giving rise to dependant oedema. Loss of weight is masked by the increased fluid retention. There is relative sparing of muscle mass and subcutaneous fat. A fatty liver occurs. Skin changes include area of hypopigmentation and desquamation.

**Question 19**

Pernicious anaemia can be caused which of the following conditions?

A Crohn's disease

B Autoimmune gastritis

C Fish tape worm infestations

D Right hemicolectomy

Explanation B

Pernicious anaemia- vitamin B12 deficiency- is a specific form of megaloblastic anaemia caused by autoimmune gastritis and an attendant failure of intrinsic factor production, resulting in failure to absorb vitamin B12. Vitamin B12 deficiency is associated with disorders other than pernicious anaemia. Most of these impair absorption of the vitamin. E.g. malabsorption states, diffuse intestinal disease (lymphoma, systemic sclerosis), ileal resection (including as part of a right hemicolectomy), ileitis (Crohn’s disease), competitive parasitic uptake, fish tapeworm infestation, and bacterial overgrowth in blind loops and diverticula of bowel. Increased demand for B12 can also result in a deficiency.