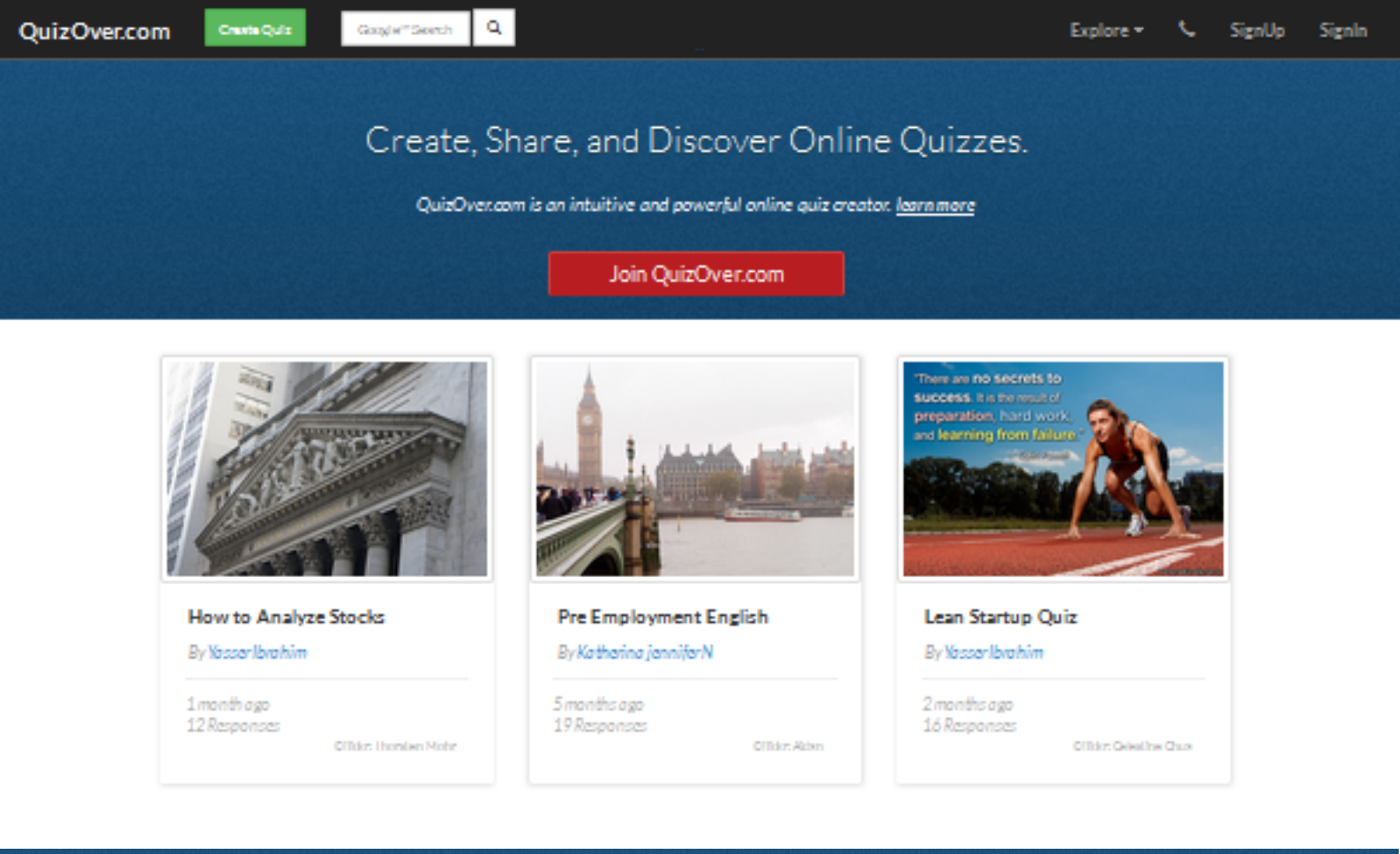
Nutrition and Chronic Disease- Test 2

Author: Madison Christian



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4. Chapter: Nutrition and Chronic Disease- Test 2

1. Nutrition and Chronic Disease- Test 2 Questions

4.1.1. Normal Anatomy and Physiology of the Endocrine System

• Classifi...

Author: Madison Christian

Normal Anatomy and Physiology of the Endocrine System

• Classification of Hormones

– Functions of major hormones

- • Reproduction and sexual differentiation (from sex organs)
  - • Growth and development (e.g. from pituitary)
  - • Energy homeostasis (e.g. pancreas)
  - • Regulation of metabolism (e.g. thyroid hormone)

4.1.2. Normal Anatomy and Physiology of the Endocrine System

• Classifi...

Author: Madison Christian

Normal Anatomy and Physiology of the Endocrine System

• Classification of Hormones

– Format

- • Protein/peptides (major form)
  - • Amines (rare, derivatives of tyrosine)
  - • Steroids (sex hormones, derived from cholesterol)

4.1.3. Normal Anatomy and Physiology of the Endocrine System

• Endocrin...

Author: Madison Christian

Normal Anatomy and Physiology of the Endocrine System

• Endocrine Function

– Pituitary Gland

- • Base of the brain
  • Anterior and posterior pituitary
  – Six hormones from anterior pituitary control the secretion of other hormones
  – Vasopressin and oxytocin: synthesized from hypothalamus. Stored at and secreted from posterior pituitary
  – Hormones are NOT secreted all the time

4.1.4. Other Endocrine Disorders

• Pituitary Disorders

– Pituitary T...

Author: Madison Christian

Other Endocrine Disorders

• Pituitary Disorders

– Pituitary Tumors

- – Cushing’s Syndrome: hypercortisolism.

  Increased endogenous production from

  adrenal glands or use of synthetic steroids.

Check the answer of this question online at QuizOver.com:
Question: Other Endocrine Disorders Pituitary Madison Christian Nutrition Quest

4.1.5. Parts of Thyroid gland

Author: Madison Christian

Parts of Thyroid gland

- Right lobe, Trachea, Isthmus, and Left Lobe.

4.1.6. Normal Anatomy and Physiology of the Endocrine System

• Endocrin...

Author: Madison Christian

Normal Anatomy and Physiology of the Endocrine System

• Endocrine Function

– Thyroid Gland

- • Located in neck
  • Controls metabolic rate
  • 2 iodine-containing hormones
  – Thyroxine – T4, less active form, produced in thyroid gland
  – Triiodothyronine – T3- more active (T4->?T3 is an enzymatic reaction taken place in anterior pituitary, liver and kidney; deiodinase is a selenium-containing enzyme).

4.1.7. Disorder

• Hypothyroidism

– Definition

Author: Madison Christian

Disorder

• Hypothyroidism

– Definition

- • Decreased production and secretion of thyroid hormones and most common pathologic hormone deficiency
  • Cretinism – congenital; dwarfism and metal retardation in children
  • Adult: goiter

  Iodine deficiency

Check the answer of this question online at QuizOver.com:
Question: Disorder Hypothyroidism Definit Madison Christian Nutrition and Quest

4.1.8. Disorder

• Hypothyroidism

– Pathophysiology

Author: Madison Christian

Disorder

• Hypothyroidism

– Pathophysiology

- • Reduced production of T4/increased TSH
  - • Hyperplasia and hypertrophy of gland (stimulated by TSH)

4.1.9. Disorder

• Hypothyroidism

– Clinical manifestations

Author: Madison Christian

Disorder

• Hypothyroidism

– Clinical manifestations

- • Subtle or no symptoms
  - • Reduction in metabolic activity

4.1.10. Other Endocrine Disorders

• Hyperthyroidism

– Definition

Author: Madison Christian

Other Endocrine Disorders

• Hyperthyroidism

– Definition

- • Excessive secretion of thyroid hormones

Check the answer of this question online at QuizOver.com:
Question: Other Endocrine Disorders Hyperthyroidism Madison Christian Nutrition

4.1.11. Other Endocrine Disorders

– Epidemiology and Etiology

Author: Madison Christian

Other Endocrine Disorders

– Epidemiology and Etiology

- • Relatively rare in children
  - • Graves’ disease- most common cause

Check the answer of this question online at QuizOver.com:
Question: Other Endocrine Disorders Epidemiology Madison Christian Nutrition

4.1.12. Other Endocrine Disorders

– Pathophysiology

Author: Madison Christian

Other Endocrine Disorders

– Pathophysiology

- • Autoimmune disease- antibody TSI targets TSH receptors on thyroid cells-> stimulate growth of thyroid gland and secretion of thyroid hormone

4.1.13. Graves' Disease is associated with

Author: Madison Christian

Graves' Disease is associated with

- Bulging eyes

Check the answer of this question online at QuizOver.com:
Question: Graves' Disease is associated Madison Christian Nutrition and Quest

4.1.14. Normal Anatomy and Physiology of the Endocrine System

• Endocrin...

Author: Madison Christian

Normal Anatomy and Physiology of the Endocrine System

• Endocrine Function

– Endocrine Pancreas

- • Hormones that regulate energy metabolism and fuel homeostasis
  • Islets
  – Alpha cells – glucagon- most cells- glucose breakdown
  – Beta cells – insulin – most cells –glucose uptake
  – Delta cells – somatostatin – digestive system –decrease nutrient absorption and digestion
  – F cell – pancreatic polypeptide – pancreas – inhibit appetite

4.1.15. Introduction to Energy Metabolism

• Why control energy supply to...

Author: Madison Christian

Introduction to Energy Metabolism

• Why control energy supply to a constant rate is important?

- We don’t eat all the time. We find a way to store glucose after we eat a meal to supply us energy when we are not eating.

4.1.16. What is the body’s primary direct energy source?

Author: Madison Christian

What is the body’s primary direct energy source?

- Glucose

Check the answer of this question online at QuizOver.com:
Question: What is the body s primary direct energy Madison Christian Nutrition

4.1.17. What are the storage forms of energy?

Where? Which one is the pr...

Author: Madison Christian

What are the storage forms of energy?

Where? Which one is the primary form of energy reservoir?

- We store glucose in the form of chemical or glucagon
  Liver but also can store glucagon in the muscle. Major difference in liver it is readily available and that enzyme is only in the liver to be readily released. That enzyme is not in the muscle.
  Liver, how fast it is released depends on where glucagon is located.

4.1.18. How long it takes for a typical meal to be absorbed?

Author: Madison Christian

How long it takes for a typical meal to be absorbed?

- 2 hours
  The amount of glucagon our liver can store is limited which is why we must eat multiple times throughout the day. If we eat too much the excess glucose can not be stored for use. There is a limited amount that can be stored as glucagon. There is a limited amount of storage. The amount of storage in amount is enough for a few hours after eating.

4.1.19. Endocrine Control of EnergyMetabolism

Author: Madison Christian

Endocrine Control of EnergyMetabolism

- • Fed state- major metabolic pathways (Fig 17-6).
  • Pancreatic hormones manage and control fuel homeostasis
  – Insulin & glucagon regulate blood glucose
  – Cortisol, GH, and epinephrine: increase? blood glucose, but their secretion is NOT related to eating (Table 17.2)

Check the answer of this question online at QuizOver.com:
Question: Endocrine Control of EnergyMetabolism Madison Christian Nutrition

4.1.20. Normal Anatomy and Physiology of the Endocrine System

• Endocrin...

Author: Madison Christian

Normal Anatomy and Physiology of the Endocrine System

• Endocrine Control of Energy Metabolism

– Insulin

- • A peptide hormone (Figure 17.8)
  • Half-life: 5 min!!!
  • Promote CHO, protein, & fat storage; suppress mobilization of stores; an anabolic hormone (Table 17.2)
  • CHO metabolism– Transport of blood glucose into the cells when levels are high
  – Most cells depend on insulin for glucose uptake except for brain, liver and working muscles

4.1.21. Normal Anatomy and Physiology of the Endocrine System

• Endocrin...

Author: Madison Christian

Normal Anatomy and Physiology of the Endocrine System

• Endocrine Control of Energy Metabolism

– Insulin

- • GLUT-4: Insulin-dependent glucose transporter-4
  – In skeletal and cardiac muscle and in the adipocytes.
  • Fat metabolism
  – Storage as TG via GLUT-4 in the liver and adipocytes
  • Protein metabolism
  – Active transport of amino acids from blood mainly to muscle, as well as to other tissue
  – Promotes protein synthesis and tissue growth

4.1.22. Figure 17.9 Step 1, 2,3,and 4.
1.In response to a rise in blood gl...

Author: Madison Christian

Figure 17.9 Step 1, 2,3,and 4.

1.In response to a rise in blood glucose, the pancreas releases more insulin into the blood.

2. Insulin binds to a membrane- bound receptor.

3? 4?

- 3. The binding of insulin to its receptor signals glucose transporters to move from the cytoplasm to the cell membrane.
  4. Glucose transporters enable glucose to move from the extracellular space into the cytoplasm.

Check the answer of this question online at QuizOver.com:
Question: Figure 17.9 Step 1 2 3 and 4. 1.In response Madison Nutrition Quest

4.1.23. Normal Anatomy and Physiology of the Endocrine System

• Endocrin...

Author: Madison Christian

Normal Anatomy and Physiology of the Endocrine System

• Endocrine Control of Energy Metabolism

– Glucagon

- • Secreted from ? cells when glucose levels fall
  • the opposite effect of insulin occurs
  • Breakdown of the stored glycogen
  • Gluconeogenesis (AA->glucose)
  • Lipolysis: additional FA as fuels
  ....Glucagon promotes catabolism and provides energy by acting on glucose, proteins AND lipids!

4.1.24. Pathophysiology of the Endocrine Disorders

• Most common causes ...

Author: Madison Christian

Pathophysiology of the Endocrine Disorders

• Most common causes of endocrine dysfunction

- – Secretion: Hyposecretion or hypersecretion of hormones
  - • Primary or secondary: thyroid hormone as an example
  - – Response: Hyporesponsiveness of target organs.
  - • insulin

4.1.25. Diabetes Mellitus

Author: Madison Christian

Diabetes Mellitus

- • Most common of all endocrine disorders
  • 8% of population; 1/4 undiagnosed
  • Defects in insulin production (Type 1), action (Type 2), or both (late stage Type 2)
  • All forms of diabetes show hyperglycemia--glucose intolerance
  • Chronic hyperglycemia correlates with failure of eyes, kidneys, nerves, heart, blood vessels

Check the answer of this question online at QuizOver.com:
Question: Diabetes Mellitus Madison Christian Nutrition and Chronic Disease

4.1.26. Diabetes Mellitus

• Type 1 Diabetes Mellitus

– Epidemiology

Author: Madison Christian

Diabetes Mellitus

• Type 1 Diabetes Mellitus

– Epidemiology

• • 5-10% of diagnosed cases

4.1.27. Diabetes Mellitus Etiology

Author: Madison Christian

Diabetes Mellitus Etiology

- • Immune mediated – cellular-mediated autoimmune destruction of ?-cells
  ?-cell destruction: Infants/children—fast; adults--gradual
  – Autoantibodies against insulin
  – Ketoacidosis: 1st sign of T1DM in children and adolescents; increased ketones in the blood
  – Antigens: virus (coxsackie virus, rubella virus), cow’s milk proteins
  • Idiopathic

4.1.28. Diabetes Mellitus

• Type 1 Diabetes Mellitus

– Pathophysiolog...

Author: Madison Christian

Diabetes Mellitus

• Type 1 Diabetes Mellitus

– Pathophysiology and Clinical Manifestations

- • Inability of cells to use glucose for energy due to insulin deficiency
  – Hyperglycemia->? excess glucose in urine (glycosuria)-> frequent urination->? polydipsia (thirst mechanism stimulated)
  – Cell starve->? Polyphagia (hunger mechanism stimulated)

4.1.29. Diabetes Mellitus

• Type 1 Diabetes Mellitus

– Pathophysiolog...

Author: Madison Christian

Diabetes Mellitus

• Type 1 Diabetes Mellitus

– Pathophysiology and Clinical manifestations

- Stating from blockage of glucose entry into cells• Hormones in favor of lipid for energy increase-increase ?Lipolysis and decrease ? TG synthesis (in adipocytes)-> increased blood FA-> ? FA transformed to ketones (in the liver)->? ketones to blood stream
  » pH falls (7.3->6.8) » Ketonuria
  » Metabolic acidosis/ ketoacidosis
  » Kussmaul respirations: rapid, deep, labored
  increase ?protein degradation-> increased amino acids in the blood-> increased ?gluconeogenesis->? hyperglycemia

4.1.30. Diabetes Mellitus

• Type 1 Diabetes Mellitus

– Pathophysiolog...

Author: Madison Christian

Diabetes Mellitus

• Type 1 Diabetes Mellitus

– Pathophysiology and Clinical Manifestations

- • Hypovolemia
  • Potassium, sodium, magnesium, phosphorus lost
  • Increased Hematocrit (% RBC in whole blood)
  • Weight loss (protein degradation, muscle wasting)

  Deep, labored breathing (due to ketoacidosis)

4.1.31. Diabetes Mellitus

• Type 1 Diabetes Mellitus

– Diagnosis
• O...

Author: Madison Christian

Diabetes Mellitus

• Type 1 Diabetes Mellitus

– Diagnosis

• Oral glucose tolerance test (OGTT)

- – Fasting O/N, water okay
  – Collect blood->? drink 75 g glucose (100 g for pregnant women) in 250 mL volume->
  ? collect blood 2 h later.

4.1.32. • Type 1 Diabetes Mellitus

– Diagnosis

• Autoantibodies

Author: Madison Christian

• Type 1 Diabetes Mellitus

– Diagnosis

• Autoantibodies

- – Diabetes related autoantibodies:
  - » Glutamic acid decarboxylase autoantibodies (GADA)
  - » Islet cell autoantibodies (ICA)
  - » Insulin autoantibodies (IAA)

Check the answer of this question online at QuizOver.com:
Question: Type 1 Diabetes Mellitus Diagnosis Madison Christian Nutrition and

4.1.33. • Type 1 Diabetes Mellitus

– Diagnosis
C-peptide:

Author: Madison Christian

• Type 1 Diabetes Mellitus

– Diagnosis

C-peptide:

- an indicator of insulin production

4.1.34. Diabetes Mellitus

• Type 2 Diabetes Mellitus

– Epidemiology

Author: Madison Christian

Diabetes Mellitus

• Type 2 Diabetes Mellitus

– Epidemiology

- • 90-95% of diagnosed cases
  - • Adults, elderly, races (next slide)

4.1.35. Diabetes Mellitus

• Type 2 Diabetes Mellitus

– Etiology

Author: Madison Christian

Diabetes Mellitus

• Type 2 Diabetes Mellitus

– Etiology

- • Heredity – autosomal dominant (those < the age of 25)
  • Obesity – central body adiposity– Correlated with insulin resistance
  • Physical inactivity– Exercise can enhanc “whole-body” insulin sensitivity
  • High or low birth weight– A case of developmental original of chronic disease; epigenetics
  • Poor placental growth
  – Food insecurity during pregnancy

4.1.36. Diabetes Mellitus

• Type 2 Diabetes Mellitus

– Pathophysiology

Author: Madison Christian

Diabetes Mellitus

• Type 2 Diabetes Mellitus

– Pathophysiology

- • Insulin resistance
  • Insulin production in the pancreas is increased
  • Pancreas stops producing insulin
  • Insulin deficiency
  • Glucose intolerance
  • Fasting hyperglycemia develops (from gluconeogenesis in the liver)

4.1.37. How do our body generate glucose when glucose is deficient?

Author: Madison Christian

How do our body generate glucose when glucose is deficient?

- • Glycogenolysis
- • Gluconeogenesis
- • Insulin inhibits both

Check the answer of this question online at QuizOver.com:
Question: How do our body generate glucose when Madison Christian Nutrition

4.1.38. Diabetes Mellitus

• Type 2 DM

– Physical Activity

Author: Madison Christian

Diabetes Mellitus

• Type 2 DM

– Physical Activity

- • Enhances blood glucose uptake and improves insulin sensitivity
  • Enhances weight loss efforts
  • 30-45 min. 3-5 days/week, no more than 2 consecutive days of rest

4.1.39. Diabetes Mellitus

• Gestational Diabetes Mellitus (GDM)

– Epi...

Author: Madison Christian

Diabetes Mellitus

• Gestational Diabetes Mellitus (GDM)

– Epidemiology

- • Glucose intolerance occurs during pregnancy – 7% of pregnancy.
  20-50% chance of developing diebetes in the next 5-10 years.
  • Who's at risk?
  – BMI >30
  – Personal/family history

4.1.40. Diabetes Mellitus

• GDM

– Etiology

Author: Madison Christian

Diabetes Mellitus

• GDM

– Etiology

• • 2nd and 3rd trimesters of pregnancy

4.1.41. Diabetes Mellitus
GDM
– Pathophysiology

Author: Madison Christian

Diabetes Mellitus

GDM

– Pathophysiology

- • Pathophysiology similar to T2DM
  • GDM affects fetus- induces fetal hyperglycemia-hyperinsulinemia & macrosomia (large infants)

4.1.42. Hypoglycemia

• Hypoglycemia

– Definition

Author: Madison Christian

Hypoglycemia

• Hypoglycemia

– Definition

- • Abnormally low blood glucose level
  - • < 70 mg/dL; impairment of brain function

4.1.43. • Hypoglycemia

– Etiology

Author: Madison Christian

• Hypoglycemia

– Etiology

- • Fasting hypoglycemia
  – excess insulin (insulin-like substance) from alcohol or drugs

  • Postprandial (reactive) hypoglycemia-
  – Too much insulin or oral med

Check the answer of this question online at QuizOver.com:
Question: Hypoglycemia Etiology Madison Christian Nutrition and Chronic Quest

4.1.44. The Hematological System

Author: Madison Christian

The Hematological System

- • Blood and blood vessels, bone marrow, spleen, and other tissues
  • Blood Composition (Fig 19.1)
  • Composition of blood used as diagnostic tool for disease presence, severity, or risk

4.1.45. The Hematological System

• Blood Composition

– Blood Components

Author: Madison Christian

The Hematological System

• Blood Composition

– Blood Components

- • Red blood cells (RBCs)
  - • White blood cells (WBCs)
  - • Platelets
  - • Transport nutrients and waste

4.1.46. Components of blood

Author: Madison Christian

Components of blood

- Plasma=55% of whole blood
  "Buffy coat"<1%(Platelets and white blood cells(leukocytes))
  Red blood cells=45% of whole blood
  Packed cell volume, or hematocrit

4.1.47. Anatomy and Physiology of the Hematological System

• The Cells o...

Author: Madison Christian

Anatomy and Physiology of the Hematological System

• The Cells of the Hematological System

– Erythrocytes (RBCs)

- • Largest % of blood cells
  • Iron, B vitamins and vitamin E are critically tied to hematopoiesis
  • Made from undifferentiated cells – stem cells in bone marrow
  • High content in PUFA—RBCs are flexible in shape; vitamin E protects against PUFA oxidation.
  • No nucleus

4.1.48. Anatomy and Physiology of the Hematological System

• The Cells o...

Author: Madison Christian

Anatomy and Physiology of the Hematological System

• The Cells of the Hematological System

– WBCs

- • 1% total volume
  • also produced in bone marrow
  • Involved in inflammation, immunity
  – Macrophage (monocyte)
  – Lymphocytes (B-cells, T-cells)

4.1.49. Anatomy and Physiology of the Hematological System

• The Cells o...

Author: Madison Christian

Anatomy and Physiology of the Hematological System

• The Cells of the Hematological System

– Platelets (thrombocytes)

- • Less than 1% cell volume
  • Recycled and degraded rapidly
  • If activated by cytokines, they aggregate and form clot at site of injury
  – Cytokines:
  » small proteins
  » play regulatory roles similar to hormones, but they are NOT hormones. Why?

4.1.50. Anatomy and Physiology of the Hematological System

• The Develop...

Author: Madison Christian

Anatomy and Physiology of the Hematological System

• The Development of the Hematological

Cells

- – All blood components are generated from stem cells in bone marrow and differentiated into various cell types
  • Hematopoiesis declines as we age
  – Another key regulator of erythropoiesis: kidneys

4.1.51. Review Figure 19.3

Author: Madison Christian

Review Figure 19.3

- 1. The kidneys detect reduced 02 carrying capacity of the blood.
  2. When less O2 is delivered to the kidneys they secrete the hormone erythropoietin into the blood.
  3. Erythropoietin stimulates erythropoiesis (erythrocyte production) by the bone marrow.
  4. The additional circulating erythrocytes increases the O2 carrying capacity of the blood.
  5. The increases O2 carrying capacity relieves the initial stimulus that triggered erythropoietin secretion.

Check the answer of this question online at QuizOver.com:
Question: Review Figure 19.3 Madison Christian Nutrition and Chronic Disease

4.1.52. Anatomy and Physiology of the Hematological System

• The Develop...

Author: Madison Christian

Anatomy and Physiology of the Hematological System

• The Development of the Hematological Cell

– Hemoglobin

- • 4 unit metalloprotein containing iron at center of each heme unit
  alpha ? globin chains: iron-containing subunits of hemoglobin
  • A heme group in each of the 4 subunits
  • Porphyrin: a chemical structure that enables hemes to carry oxygen

4.1.53. Anatomy and Physiology of the Hematological System

• The Develop...

Author: Madison Christian

Anatomy and Physiology of the Hematological System

• The Development of the Hematological Cell

– Abnormalities

- • Thalassemia (abnormal ? or ? chain), sickle cell anemia (specific point mutation in B chain)
  • Porphyria: genetic disorder, genes involved in
  porphyrin synthesis are mutated
  • Sideroblastic anemia: inefficient oxygen transport by heme->? body compensate for more heme and RBC production-> too much Fe!

4.1.54. Anatomy and Physiology of the Hematological System

• Recycle RBC

Author: Madison Christian

Anatomy and Physiology of the Hematological System

• Recycle RBC

- – Aged RBC engulfed by macrophages and the hemoglobin is recycled.
  – Iron recycled and stored in liver complexed to ferritin or utilized
  – Heme unit is degraded to bilirubin, excreted in bile and urine
  • Excessive bilirubin-- jaundice

4.1.55. Homeostatic Control of the Hematological Cell

• Blood clotting

Author: Madison Christian

Homeostatic Control of the Hematological Cell

• Blood clotting

- – Warfarin (“blood thinning” effect) is a common nd effective drug for treatment of myocardial infarction or other CVD with blood clotting
  – Warfarin inhibits ability of vitamin K and calcium to activate clotting proteins
  – Why stop taking warfarin for those MI and CVD patients in need of surgery?

4.1.56. Nutritional Anemia Declines in carrying O2:

Author: Madison Christian

Nutritional Anemia Declines in carrying O2:

- • Deficiency in size or number of red bloodcells (erythrocytes) or amount of hemoglobin they contain

4.1.57. Iron Deficiency Anemia

• Major micronutrient deficiency

synd...

Author: Madison Christian

Iron Deficiency Anemia

• Major micronutrient deficiency

syndrome in the US and worldwide

- – Primarily infants, children
  – Women during reproductive years
  Solution: iron supplementation, enrichment of flour and grain products, iron fortification of cereals
  • iron bioavailability: heme (15-35%) vs non-heme iron (much lower).

4.1.58. Nutritional Anemias

• Microcytic Anemia (small RBCs): Iron Defic...

Author: Madison Christian

Nutritional Anemias

• Microcytic Anemia (small RBCs): Iron Deficiency Anemia

– Definition

- • Characterized by the production of small (microcytic) erythrocytes-> less circulating hemoglobin
  • Represents the end point of a long period of iron deprivation

4.1.59. Nutritional Anemias

• Microcytic Anemia (small RBCs): Iron Defic...

Author: Madison Christian

Nutritional Anemias

• Microcytic Anemia (small RBCs): Iron Deficiency Anemia

– Epidemiology

- • Most common nutritional anemia

4.1.60. Nutritional Anemias

• Microcytic Anemia: Iron deficiency anemia

...

Author: Madison Christian

Nutritional Anemias

• Microcytic Anemia: Iron deficiency anemia

– Etiology

- • Mineral excesses (Zn, Cu, Mn) affect bioavailability of Fe. How?
  – Common mineral transporters» Metallothionine: Zn/Fe» Ceruloplasmin: Cu/Fe
  » Transferrin: Fe/Mn
  • Iron chelators: phytic acid
  • How to improve iron bioavailability? – Avoid Fe-containing foods with iron chelators or mineral imbalance
  – Non-heme Fe + vitamin C

4.1.61. Select Indices of Hematological Function

Hematocrit

Author: Madison Christian

Select Indices of Hematological Function

Hematocrit

- Males 40-54%
  Females 37-47%

4.1.62. Food sources of iron

Author: Madison Christian

Food sources of iron

- Heme Iron Source Clams- 3 ounces- 14 mg, Steak- 4 ounces-4mg,Poultry-3 ounces-1mg
  *highly bio-available
  Non-Heme Iron Sources: Fortifies cereal- 1 cup-9mg, Spinach-1 cup-6mg, Kidney beans-1 cup-5mg, Tortilla-1 item-2mg, Baked potato with- 1 item-2mg.

4.1.63. Nutritional Anemias

• Megaloblastic Anemia

– Definition

Author: Madison Christian

Nutritional Anemias

• Megaloblastic Anemia

– Definition

- • A form of anemia characterized by the presence of large, immature, abnormal red blood cell precursors in the bone marrow
  • often attributable to folic acid or vitamin B12 deficiency
  – Folate and B12 are essential for DNA synthesis

4.1.64. Nutritional Anemias

• Megaloblastic Anemia

– Epidemiology

Author: Madison Christian

Nutritional Anemias

• Megaloblastic Anemia

– Epidemiology

• • Pernicious anemia: one form of megaloblastic anemia

4.1.65. Nutritional Anemias

• Megaloblastic Anemia

– Etiology: a link...

Author: Madison Christian

Nutritional Anemias

• Megaloblastic Anemia

– Etiology: a link between stomach problem and anemia

- • Also known as pernicious anemia
  • Atrophic gastritis: chronic inflammation of gastric mucosa
  • Gastrectomy and bariatric surgery
  • Decreased intrinsic factor (IF): a protein synthesized by gastric cells to bind B12 and improve its absorption.

4.1.66. Nutritional Anemias

• Megaloblastic Anemia

– Pathophysiology:

Author: Madison Christian

Nutritional Anemias

• Megaloblastic Anemia

– Pathophysiology:

- B12 and folate are necessary for RBC maturation
  • CYANOCOBALAMIN (B12)
  – Pharmaceutical use for megaloblastic anemia. Our body convert cyanocobalamin into active B12.
  Folate
  – Essential for DNA synthesis

Check the answer of this question online at QuizOver.com:
Question: Nutritional Anemias Megaloblastic Anemia Madison Christian Nutrition

4.1.67. Folate and B12

Megaloblastic Anemia

Author: Madison Christian

Folate and B12

Megaloblastic Anemia

- Review Slide 29

Check the answer of this question online at QuizOver.com:
Question: Folate and B12 Megaloblastic Anemia Madison Christian Nutrition Quest

4.1.68. Hemochromatosis

• Definition

Author: Madison Christian

Hemochromatosis

• Definition

- – Regulatory mechanisms for iron are inoperative; resulting in build up of iron and pro-oxidant iron damage of cells

  – Hereditary

Check the answer of this question online at QuizOver.com:
Question: Hemochromatosis Definit Madison Christian Nutrition and Chronic Quest

4.1.69. Hemochromatosis

Epidemiology:

Author: Madison Christian

Hemochromatosis

Epidemiology:

- Caucasian, 1/200; Non-Hispanic white, 10% are heterozygous.

4.1.70. Hemochromatosis

• Etiology

Author: Madison Christian

Hemochromatosis

• Etiology

- – Genetic predisposition for mutations
  – Alterations in iron absorption, removal, mobilization, synthesis

4.1.71. Hereditary Hemochromatosis

Author: Madison Christian

Hereditary Hemochromatosis

- • A human autosomal, recessive disorder
  • Cause: excessive iron accumulation due to mutations in genes involved in iron absorption
  • Symptoms: liver cirrhosis, cancer, diabetes and heart failure.

4.1.72. Hemoglobinopathies: Non-Nutritional Anemias

– Structural (sickle...

Author: Madison Christian

Hemoglobinopathies: Non-Nutritional Anemias

– Structural (sickle cell anemia)

- ?-chain point mutation

4.1.73. Hemoglobinopathies: Non-Nutritional Anemias

– Thalassemias

Author: Madison Christian

Hemoglobinopathies: Non-Nutritional Anemias

– Thalassemias

- • Thalassemic hemoglobin variants

4.1.74. Hemoglobinopathies: Non-Nutritional Anemias

– Aplastic anemia

Author: Madison Christian

Hemoglobinopathies: Non-Nutritional Anemias

– Aplastic anemia

- • Fanconi’s anemia – inherited, marrow failure

4.1.75. Hemoglobinopathies: Non-Nutritional Anemias

– Other Rare Anemias

Author: Madison Christian

Hemoglobinopathies: Non-Nutritional Anemias

– Other Rare Anemias

- • Blackfan-Diamond anemia
  • Schwachmann’s syndrome
  – Both syndromes are characterized by bone marrow failure

4.1.76. Nutritional Anemias

Macrocytic

Author: Madison Christian

Nutritional Anemias

Macrocytic

- Deficiencies in B vitamins such as cyanocobalamin, folate, thiamin, pyridoxine

4.1.77. Nutritional Anemias Microcytic

Author: Madison Christian

Nutritional Anemias Microcytic

- Deficiencies in or too little protein, iron, ascorbate, vitamin A, pyridoxine, copper, manganese.

  Toxicities in or Too much copper, zinc, lead, cadmium, and other heavy metals.

4.1.78. Nutritional Anemias

Hemolytic

Author: Madison Christian

Nutritional Anemias

Hemolytic

- Vitamin E deficiency or toxicity

Check the answer of this question online at QuizOver.com:
Question: Nutritional Anemias Hemolytic Madison Christian Nutrition and Quest

4.1.79. Food Sourced of Vitamin b12

Author: Madison Christian

Food Sourced of Vitamin b12

- Beef liver-1 ounce-32, Clams-1 ounce-16,Oysters-1 ounce-14, Brewer's yeast- 2T-3, Lobster-3 ounces-3,Pot roast-3 ounces-3, Yogurt-1 cup-1.

4.1.80. Food Sources of Folate

Author: Madison Christian

Food Sources of Folate

- Asparagus-1 cup-263 ug, Spinach(cooked)-1cup-262 ug, Cooked peas or lentils-1/2 cup-180 ug, Romaine lettuce-1.5 cups-115 ug, tortilla-1 item- 90 ug.