Chapter 17 Endocrine and Hematologic Emergencies

Endocrine System
- A complex message and control system.
- Glands secrete _______________________ .
- Hormones are chemical messengers.
- System maintains _______________________ .

Diabetes (1 of 2)
- Diabetes affects the body’s ability to use _______________________ (sugar) for fuel.
- Occurs in about 7% of the population
- Complications include blindness, cardiovascular disease, and _______________________ failure.

Diabetes (2 of 2)
- As an EMT, you need to know signs and symptoms of blood glucose that is:
  - High (_______________________ )
  - Low (_______________________ )
- Central problem in diabetes is lack, or ineffective action, of insulin.

Defining Diabetes (1 of 2)
- Diabetes mellitus
  - Metabolic disorder in which the body cannot _______________________ glucose
  - Usually due to a lack of _______________________ .
- Glucose
  - One of the basic sugars in the body
  - Along with oxygen, it is a primary fuel for _______________________ metabolism

Defining Diabetes (2 of 2)
- Insulin
  - Hormone produced by the _______________________ 
  - Enables glucose to enter the cells
  - Without insulin, cells starve
- Hormone
  - Chemical substance produced by a _______________________ 
  - Has special regulatory effects on other body organs and tissues

Type I Diabetes
- Insulin-dependent diabetes (IDDM)
- Patient does not produce any _______________________ 
- Insulin injected daily
- Onset usually in _______________________ 

Type II Diabetes
- Non-insulin-dependent diabetes (NIDDM)
• Patient produces _______________ amounts of insulin
• Usually appears later in life
• Disease may be controlled by _______________ or oral hypoglycemics

9 ❑ Severity of Diabetes
• Severity of diabetic complications depends on patient’s average blood glucose level and when diabetes began.
• _______________ increases the risk of diabetes.
• Diabetes _______________ every other medical condition and injuries

10 ❑ Role of Glucose and Insulin
• Glucose is the major source of _______________ for the body.
• Constant supply of glucose needed for the brain.
• Insulin acts as the _______________ for glucose to enter cells.
• Normal glucose (blood sugar) is _________ to ___________mg/dL.

11 ❑ Insulin

12 ❑ Classic Symptoms of Uncontrolled Diabetes (3 Ps)
• Polyuria: frequent, plentiful _______________.
• Polydipsia: frequent drinking to satisfy continuous thirst
• Polyphagia: excessive _______________.

13 ❑ Energy Sources
• The body uses glucose as a principal _______________ source
• When glucose is not available, the body turns to other sources
  • _______________ is most abundant.
  • Using fat for energy results in buildup of ketones and fatty acids in blood and tissue.

14 ❑ Hyperglycemia
• Lack of insulin causes glucose to build-up in blood in extremely high levels.
• Kidneys excrete glucose.
• This requires a large amount of _______________.
• Without glucose, body uses fat for fuel.
• _______________ are formed.
• Ketones can produce diabetic _______________.

15 ❑ Hypoglycemia
• Blood glucose is _______________ normal.
• Untreated, results in unresponsiveness and hypoglycemic crisis
• Signs and symptoms of hyperglycemia and hypoglycemia are _______________.

16 ❑ Hyperglycemic Emergencies

17 ❑ Diabetic Ketoacidosis (DKA) (1 of 2)
• _______________ in insulin levels.
• Most common in type 1 diabetes
• Glucose cannot enter cells.
• Glucose accumulates in the blood.
• Body PH _______________________
• Polyuria
• _______________________

18 [Diabetic Ketoacidosis (DKA) (2 of 2)]
• Osmotic _______________________
• Dehydration
• Shock
• Cells metabolize fat, produce _______________________ as waste
• Retention of _______________________ by kidneys which leads to cardiac arrhythmias

19 [Hyperosmolar Hyperglycemic Nonketotic Coma (HHNC)]
• More often caused by type 2 diabetes
• Slower, more _______________________ onset than DKA
• No sweet-smelling breath
• Other S/S same as DKA
• Excessive urination results in _______________________.

20 [Hyperglycemic Crisis (Diabetic Coma) (1 of 3)]
• A state of unconsciousness resulting from:
• Ketoacidosis
• _______________________
• Dehydration
• Excess _______________________ glucose

21 [Hyperglycemic Crisis (Diabetic Coma) (2 of 3)]
• Can occur in diabetic patients:
• Not under medical treatment
• Who have taken _______________________ insulin
• Who have markedly overeaten
• Under stress due to infection, illness, _______________________ , fatigue, or alcohol

22 [Hyperglycemic Crisis (Diabetic Coma) (3 of 3)]
• If untreated, can result in _______________________
• Treatment may take hours in a well-controlled hospital setting.
• Suspect for all _______________________ patients of unknown etiology

23 [Diabetic Coma]

24 [S/S of DKA]
• Air hunger (_______________________ Respirations)
• Dehydration
• Sweet, fruity breath odor
• Rapid, weak pulse
• Normal or slightly low blood pressure
• Varying degrees of unresponsiveness
• ________________ onset--over several hours or days
• Skin is ________________

Management of DKA
• High Con ________________
• Obtain blood glucose level if authorized
• ________________

Hypoglycemic Emergencies
Insulin Shock (Hypoglycemic Crisis)
Three causes of Insulin Shock
• ________________ overdose
  • taking insulin but not ________________ adequately
  • over ________________
• Decreased blood sugar
• Brain is deprived of sugar

S/S of Insulin Shock
• Normal or rapid breathing
• Pale, moist skin
  • ________________
  • Dizziness, headache
  • Rapid pulse
  • Normal or slightly elevated ________________

Care for Insulin Shock
• Oxygen
• Obtain sugar level if authorized
• Give ________________ if conscious (Instant Glucose)
• Contact ALS backup if unconscious or severe altered LOC
• Rapid Transport
  • True ________________

Diabetic Conditions
Diabetes and Alcohol Abuse
• Patients may appear ________________.
  • Suspect hypoglycemia with any altered mental status.
  • Be alert to the similarity in symptoms of acute alcohol ________________ and diabetic emergencies.
• Diabetics may drink alcohol and become intoxicated

Emergency Medical Care (1 of 2)
Ask a patient with known diabetes:
• Do you take insulin or any pills to lower blood sugar?
• Have you taken your usual dose of insulin (or pills) today?
• Have you _______________________ normally today?
• Have you had any _______________________ , unusual amount of activity, or stress today?

34 Emergency Medical Care (2 of 2)
• Perform initial assessment.
• Obtain baseline vital signs and SAMPLE history.
• Check for emergency medical identification _______________________ .
• Always do a full, careful assessment.
• Ask patient or family about last _______________________ or insulin dose.
• DO NOT administer anything by mouth to an _______________________ patient.

35 DKA vs. Insulin Shock
• Pt eaten but has not taken insulin?
  • - _______________________ 
• Pt taken insulin and has exercised profusely?
  • - _______________________ 
• Pt accidentally took two doses of insulin?
  • - _______________________ 
• Pt has been sick and vomiting lately and has been taking insulin?
  • - _______________________ 

36 DKA vs. Insulin Shock
• Pt has taken insulin and has been eating normally?
  • - _______________________ 
• Pt has not been eating and has not taken insulin?
  • - _______________________ 
• When in doubt, GIVE _______________________ !!

37 Administering Glucose (1 of 4)
• Names:
  • _______________________ 
  • Insta-Glucose
• Dose equals ___________ grams (one tube)
• Glucose should not be given to a diabetic patient with a decreased level of consciousness.

38 Administering Glucose (2 of 4)
• DO NOT give glucose to a patient with the inability to _______________________ or unconscious.
• Give between _______________________ and gums

39 Administering Glucose (3 of 4)
• Make sure the tube is intact and has not ____________________.
• Squeeze a generous amount onto a ____________________ stick.

40 Administering Glucose (4 of 4)
• Open the patient’s mouth.
• Place the bite stick on the ____________________ membranes between the cheek and the gum with the gel side next to the cheek.
• __________________ if needed

41 Complications of Diabetes
• Heart disease
• __________________ disturbances
• Renal failure
• Stroke
• Ulcers
• Infections of the feet and toes
• __________________
• Altered __________________ status

42 Seizures
• Consider hypoglycemia as the cause.
• Use appropriate BLS measures for airway management.
• Obtain __________________ glucose level if authorized.
• Call for ALS backup for IV administration of glucose
• Provide prompt ____________________.

43 Geriatric Needs
• Patient may have __________________ diabetes.
• Certain symptoms suggest poorly controlled or uncontrolled diabetes.
  • Nonhealing wounds
  • Blindness
  • __________________ failure
• Obtain a SAMPLE history.
• Check blood glucose level if authorized

44 Blood Glucose Monitors
• Test __________________
• Normal range 80-120 mg/dL
• __________________
• There are numerous different glucometers. You must become familiar with the one used on your service.

45 Hematologic Emergencies
• __________________ is the study and prevention of blood-related diseases.
• Blood is “the __________________ of life.”
  • Understanding it helps understand disorders.
46 Blood
- Made up of cells and ________________.
- Red blood cells contain hemoglobin, which carries oxygen to the tissues.
- White blood cells “clean” the body.
- ________________ are essential for clot formation.
- Plasma transports blood cells.

47 Sickle Cell Disease (1 of 3)
- ________________ disorder, affects red blood cells
- Predominant in African Americans and persons of Mediterranean descent
- Red blood cells are ________________ or oblong shaped, contain hemoglobin S, are poor oxygen carriers, and live for only 16 days.

48 Sickle Cell Disease (2 of 3)
- May cause ________________; swelling or rupture of blood vessels or spleen; and death
- Four main types of sickle cell crises:
  - Vaso-occlusive crisis
  - ________________ crisis
  - Hemolytic crisis
  - ________________ sequestration crisis

49 Sickle Cell Disease (3 of 3)
- Vaso-occlusive crisis
  - Blood flow to organs is ________________
- Aplastic crisis
  - Worsening of baseline anemia
- Hemolytic crisis
  - Acute, accelerated ________________ in hemoglobin level
- Splenic sequestration crisis
  - Acute enlargement of ________________

50 Complications of Sickle Cell Disease
- Cerebral vascular attack
- Gallstones
- ________________
- Avascular necrosis
- Splenic infections
- ________________ tolerance

51 Clotting Disorders
- ________________
- ________________

52 Thrombophilia
- Tendency to develop blood ________________
• Blood-thinning medications used to treat
• Not common in pediatric patients
• Risk factors:
  • Recent _______________________, impaired mobility, congestive heart failure, cancer, respiratory failure, infectious diseases, over 40 years of age, being overweight/ obesity, smoking, oral ________________________ use

53 Hemophilia (1 of 2)
• _______________________; impaired ability to form blood clots
• Predominant in ________________________ (1 per 5,000–10,000)
• Hemophilia A most common
• Hemophilia B second most common

54 Hemophilia (1 of 2)
• Signs and symptoms:
  • Spontaneous, acute, chronic ________________________
  • ________________________ bleeding (major cause of death)
• During assessment, seriously consider injury/illness that can cause bleeding.

55 Emergency Medical Care for Hematologic Disorders
• Mainly supportive and ________________________
• Patients with inadequate breathing or altered mental status:
  • Administer high-flow O2 at 12 to 15 L/min.
  • Place in a position of comfort.
  • Transport ________________________ to hospital.