Chapter 14 Cardiovascular Emergencies

Cardiovascular Emergencies

- Cardiovascular disease has been leading killer of Americans since ____________.
- Accounts for 1 of every 2.8 deaths
  - 2,551 per day
  - Almost _____________ people per minute!

Prevention

- EMS can help reduce deaths by:
- Encouraging healthy life-style
- ________________access
- More CPR training of laypeople
- ________________access to defibrillation devices
- Recognizing need for ___________________ life support (ALS)

Physiology of the Circulatory System (1 of 2)

- Pulse:
  - The wave of blood through the arteries formed when the left ventricle ________________
  - Can be felt where an artery passes near the skin surface and over a ____________________

Physiology of the Circulatory System (2 of 2)

- Blood pressure:
  - Amount of force exerted against walls of arteries
    - ________________: Left ventricle contracts
    - ________________: Left ventricle relaxes
- Perfusion:
  - Circulation of blood within an organ or tissue
  - If inadequate, the patient goes into ___________________

Pulse Points

- ____________________
  - Femoral
  - Brachial
  - ____________________
  - Posterior Tibial
  - ____________________Pedis

Components

- 1. ___________________ (pump)
2. _______________________(pipes)
3. _______________________(fluid)

8 The Heart
• Muscular organ
• _______________________-the heart muscle
• Lies directly behind the sternum
• Has ___________ chambers
• -Left and right _______________________ (upper chambers)
• -Left and right _______________________ (lower chambers)
• Septum--divides left and right sides

9 The Heart
• Has it’s own _______________________supply
• Has it’s own _______________________system
• The heart is divided into 2 types of circulation:
  • 1. _________________Circulation
  • 2. _________________Circulation

10 Pulmonary Circulation
• Circulation to and from _______________________
• _______________________side of heart
• Unoxgenated blood enters the right atrium from the superior vena cava
• Enters the right ventricle through a valve
• Pumped through pulmonary arteries to lungs
• Receives oxygen from _______________________and leaves waste products and carbon dioxide

11 Systemic Circulation
• Circulation to and from _______________________
• _______________________side of heart
• Oxygenated blood enters left atria through pulmonary vein
• Enters left ventricle through a valve
• Pumped to aorta and the body
• Delivers oxygen to cells and removes _______________________

12 Cardiovascular Structure and Function

13 Blood Flow Through the Heart
• 1. Vena Cava
• 2. Right Atrium
• 3. Tricuspid valve
• 4. Right ________________________
• 5. Pulmonic Valve
6. Pulmonary Artery
7. ________________

14 Blood Flow Through the Heart
15 Electrical System of the Heart
16 Coronary Arteries
17 Blood Vessels
   - ________________-Carries blood away from the heart (usually oxygenated)
   - Arteries branch into arterioles and then into capillaries
   - ________________-Carries blood toward the heart (usually unoxygenated)
   - Veins branch into venules and then into ________________

18 Blood Vessels
   - Capillaries--Very thin vessels where the actual gas exchanges occurs
     - oxygen and ________________delivered to cells
     - carbon dioxide and waste picked up
   - Forms capillary ________________

19 Blood Components
   - ________________
     - sticky yellowish
     - carries blood cells and nutrients
     - ________________(red blood cells)
     - contain iron
     - gives blood it’s color
     - carries ________________

20 Blood Components
   - ________________(white blood cells)
     - fights infection
   - ________________
     - clot formation
     - usually clots in 4 to 6 minutes

21 Cardiac Compromise
   - Chest pain results from ________________
   - Ischemic heart disease involves decreased blood flow to the heart.
   - If blood flow is not restored, the tissue ________________

22 Coronary Artery Disease (CAD)
   - ________________
Atherosclerosis
• Materials build up inside blood _______________________.
• This decreases or obstructs blood flow.
• ______________________ factors place a person at risk.

Arteriosclerosis
• Coronary artery wall becomes hard and stiff due to ______________________ deposits
  • “Hardening of the Arteries”
• Causes coronary arteries to lose their elastic nature
• ______________________ blood flow
• Causes ______________________

Major Risk Factors of Coronary Artery Disease
• Uncontrollable
  • Age
  • Sex
  • Race
• ______________________

Minor Risk Factors of Coronary Artery Disease
• ______________________
  • Inactivity
  • ______________________
  • Personality

Coronary Artery Disease

Angina Pectoris
• Pain in chest that occurs when the heart does not receive enough oxygen
• Typically ______________________ or squeezing pain
• Rarely lasts longer than ___________-______________ minutes
• Can be difficult to differentiate from heart ______________________

Angina Pectoris
• Signs/Symptoms
  • 1. Squeezing/crushing chest ______________________
  • 2. Pain may ______________________ to shoulders, arms, neck, jaw, upper back, or upper abdomen
  • 3. Pain may be in area of ______________________ only
  • 4. Possible shortness of breath (SOB)
31 Angina Pectoris
• 5. Pain associated with the “3 E’s”
  • - _____________________
  • - Eating
  • - _____________________
• 6. Pain seldom lasts for more than 10-15 minutes
• 7. Pain normally relieved by:
  • - rest
  • - _____________________

32 Angina Pectoris
• Following an angina attack, there is NO residual
  ______________________ to the myocardium

33 Angina Pectoris
• Two Forms of Angina
  • 1. ________________________Angina
    • - Pain ________________________ in duration and frequency
    • - Pain relieved by predictable amounts of rest and nitroglycerin
  • 2. ________________________Angina
    • - Change occurs in usual patterns
    • - 30% go on to infarct within 3 months

34 Treatment of Angina Pectoris
• Treat all first time angina and unstable angina as a myocardial
  ________________________.
• When in doubt, manage ________________________ chest pain as a
  myocardial infarction

35 Acute Myocardial Infarction
• Acute Myocardial Infarction (AMI)-- ________________________ Attack
  • ________________________ of the myocardium due to inability of diseased
    coronary arteries to allow adequate perfusion
• Once myocardium tissue dies, it will not ________________________

36 Myocardial Infarction
• Incidence
  • MI is the ________________________ cause of death in the US
• 1 to 1.5 million Americans will have a MI this year. Of these, about
  600,000 will die.
• 350,000 will die in the first __________________ hours after symptoms begin,
  without ever reaching the hospital!!

37 Acute Myocardial Infarction (AMI)
• Pain signals __________________ of cells.
• Opening the coronary artery within the first hour can __________________ damage.
• Immediate __________________ is essential.

38 Pain of AMI
• Chest Pain is “____________________ sign” of an AMI
• Occurs in 85% of AMIs
• May or may not be caused by __________________________
• Does not resolve in a few minutes
• Can last from 30 minutes to several hours
• May not be relieved by rest or ________________________

39 Pain of AMI
• May be crushing, squeezing, tight, heavy
• May radiate to neck, ______________________, shoulders, arm, upper back, or even abdomen
• May occur in areas of radiation only
• May vary in intensity, unaffected by swallowing, coughing, deep breathing, or ______________________
• 15% have “silent AMI”

40 Signs/Symptoms of AMI
• Chest pain
• Shortness of breath (SOB)
• Weakness, dizziness, fainting
• Nausea, ________________________
• Pallor, diaphoresis (sweating)
• Feeling of impending ______________________
• Pulmonary ______________________

41 Signs/Symptoms of AMI
• Changes in pulse, BP, or respirations are __________________________diagnostic of an AMI
• Early recognition is ______________________
• 50% of deaths occur in first __________ hours. But the average person waits 3 hours before seeking help

42 Sudden Death
• 40% of AMI patients do not reach the hospital.
• Death is due to ________________________ (irregular heart rhythm)
• Heart may be ________________________

43 Arrhythmias
- Ventricular _________________

### Arrhythmias
- _________________ Tachycardia
- _________________ Fibrillation
- _________________

### Treatment of Cardiac Chest Pain (1 of 3)
1. _________________ Pt, High concentration of oxygen
2. Give _________________
3. Reassure/calm patient
4. Obtain brief history and perform physical exam
5. Give _________________

### Treatment of Cardiac Chest Pain (2 of 3)
6. If patient has history of angina with changes in pattern, _________________ immediately.
7. Transport in semi-sitting position if BP is normal, supine if BP is low.
8. Do NOT allow patient to _________________ to ambulance.
9. Don’t use lights and _________________ if patient is awake, alert, and breathing without distress.

### Treatment of Cardiac Chest Pain (3 of 3)
10. Monitor vital signs every _____________ minutes
11. Request ALS Backup
- -90% of deaths occur from _________________.
- -Arrhythmias can be treated with early drug therapy.
12. _________________ examine for pedal edema and listen to lung sounds

### Cardiogenic Shock
- Heart lacks power to force _________________ through the circulatory system.
- Onset may be immediate or not apparent for 24 hours after AMI.
- Failure of the _________________ and circulatory system
- Low BP
- _________________ : Irregular heart beats

### Congestive Heart Failure
- Congestive Heart Failure (CHF)--Inability of the heart to _________________ blood out as fast as it enters.
- Can be left-sided or right-sided
- Usually begins with _________________ -sided failure.
50 Congestive Heart Failure
- Causes of CHF
  - Coronary Artery Disease (______________)
  - MI
  - Valvular heart disease

51 Congestive Heart Failure
- Pathophysiology
  - __________ ventricle fails
  - Blood backs up into _________________
  - _________________ increases in capillary beds
  - Fluids forced out of capillary beds into the alveoli causing pulmonary edema; fluid in the lungs

52 Congestive Heart Failure
- Signs/Symptoms
  - Dyspnea on _________________
  - Paroxysmal nocturnal dyspnea
  - _________________ -dyspnea lying down
  - _________________ -rapid pulse rate (>100 bpm)

53 Congestive Heart Failure
- Signs/Symptoms (Cont.)
  - _________________ -rapid breathing
  - Noisy, labored breathing
  - _________________ , wheezing
  - Pink, frothy _________________

54 Congestive Heart Failure
- Right sided failure most commonly caused by _________________ sided failure.
  - Blood backs up into systemic circulation
  - _________________ neck veins
  - -fluid in abdominal cavity
  - -_______________ edema-fluid in feet and ankles

55 Congestive Heart Failure
- Treatment
  - Sit patient up with _________________ down
  - Hi concentration of oxygen
  - Assist _________________ as needed
  - Monitor vital signs every 5 to 10 minutes
• Request _______________________ backup

56 Hypertensive Emergencies (1 of 2)
• Systolic pressure greater than ____________ mm Hg
• Common symptoms include altered mental status and pulmonary edema.
• If untreated, can lead to _______________________ or dissecting aortic aneurysm.
• Common symptoms
  • Sudden, severe _______________________
  • Strong, bounding _______________________
  • Ringing in the ears

57 Hypertensive Emergencies (2 of 2)
• Common symptoms
  • Nausea and vomiting
  • _______________________
  • Warm skin (dry or moist)
  • _______________________
• Normally, there is no pre-hospital care for hypertension at the EMT-B level
• Rapid transport, contact _______________________ backup

58 Aortic Aneurysm
• Aortic aneurysm is _______________________ in the wall of the aorta.
• Susceptible to _______________________
• Dissecting aneurysm occurs when inner layers of aorta become separated
• Primary cause: uncontrolled _______________________

59 S/S of Aortic Aneurysm
• Very _______________________ chest pain
• Comes on full force
• Different blood pressures between _______________________
• May complain of _______________________ pain
• Transport patients quickly and safely.

60 Physical Findings of Cardiac Compromise
• Pulse rate increases and may be _______________________ .
• Blood pressure may be _______________________ or falling.
• Respirations are usually normal.
• General appearance
  • Frightened
  • _______________________, vomiting, cold sweat

61 Approach to the Patient with Chest Pain (1 of 2)
• _______________________ the patient and perform initial assessment.
• Administer _______________________.
• Measure and record vital signs.
• Place the patient in a position of _______________________.

62 Approach to the Patient with Chest Pain (2 of 2)
• Obtain history and physical exam.
• _______________________ about the chest pain
• Assist with administration of prescribed nitroglycerin.
• _______________________ promptly.
• Report to medical control en route.

63 Heart Surgeries
• Coronary artery bypass ________________________ (CABG)
• Angioplasty
• Cardiac _______________________

64 Internal Cardiac Pacemakers
• Maintains a regular heart ________________________ and rate
• Do not place _______________________ patches over pacemaker.

65 Automatic Implantable Cardiac Defibrillators
• Monitor heart ________________________ and deliver shocks as needed.
• Low _______________________ will not affect rescuers.