Ch. 7 Review

- Medications may be administered through nine routes: intravenous, intramuscular, or subcutaneous injection; orally; sublingually; intraosseously; transcutaneously; by inhalation; and by rectum.
- In all but the intravenous injection route, the medication is absorbed into the bloodstream through various body tissues. These routes of administration often determine the speed with which the medication takes effect.
- Medications come in seven forms: tablets and capsules, solutions and suspensions, metered-dose inhalers, topical medications, transdermal medications, gels, and gases.
- The administration of any medication requires approval by medical control, through direct orders given online or standing orders that are part of the local protocols.
- Once an order from medical control has been obtained, follow the steps in administering medications: Verify the patient, verify the proper medication, verify the dose, verify the route, and verify the time. Once the medication has been administered, reassess vital signs and document the patient’s history, assessment, treatment, and response findings.
- Three medications are typically carried on the EMS unit: oxygen, oral glucose, and activated charcoal. Two medicines have recently been added to the list by some states and services: aspirin and epinephrine.
- There are three additional medications that you may help the patient self-administer: metered-dose inhaler medications, nitroglycerin, and epinephrine. Remember, though, that the medications may differ depending on local protocol.
- Knowing what medications a patient takes may be the only way you can determine what chronic or underlying conditions your patient may have.

Ch. 12 Review

- Trauma emergencies are injuries that are the result of physical forces applied to the body. Medical emergencies require EMS attention because of illnesses or conditions not caused by an outside force.
- The assessment of a medical patient is similar to the assessment of a trauma patient but with a different focus. Whereas a trauma assessment focuses on physical injuries, most of which are visible through a physical examination, medical patient assessment is usually more focused on symptoms and depends more on establishing an accurate medical history.
- Many medical patients may not appear to be seriously ill at first glance.
- For conscious medical patients, obtaining a thorough patient history can be one of the most beneficial aspects of the patient assessment. Try to determine the nature of the illness by asking questions about the patient’s chief complaint.
- Conscious medical patients seldom need a full-body scan, but all should get a focused examination based on their chief complaint. On the other hand, you should always perform a full-body scan on unconscious patients; this head-to-toe assessment may give you clues to help identify the problem.
- Most medical emergencies require a level of treatment beyond what is available in the prehospital setting. Also, the treatments depend on an accurate diagnosis of the exact medical condition; therefore, advanced testing in the hospital may be required.
- If the patient is not in critical condition, you should gather as much information as possible from the scene so that you can transmit that information to the physician at the emergency department.
- Many medical emergency patients do not have immediate life-threatening conditions. If a life-threatening condition exists, transportation should include the use of lights and sirens, but if that is not the case, careful consideration should be given to nonemergency transport.
• Modes of transport ultimately come in one of two categories: ground or air.
• Many medical patients will benefit from being transported to a specific hospital capable of handling their particular condition.
• Because it is often impossible to tell which patients have infectious diseases, you should avoid direct contact with the blood and body fluids of all patients.
• If you think you may have been exposed to an infectious disease, see your physician (or your employer’s designated physician) immediately.
• Six infectious diseases of special concern are:
  – HIV infection
  – Hepatitis B
  – Meningitis
  – Tuberculosis
  – SARS
  – H1N1
• Infection control should be an important part of your daily routine. Be sure to follow the proper steps when dealing with potential exposure situations.

Ch. 13 Review

• Dyspnea is a common complaint that may be caused by numerous medical problems, including infections of the upper or lower airways, acute pulmonary edema, chronic obstructive pulmonary disease, spontaneous pneumothorax, asthma, allergic reactions, pleural effusion, mechanical obstruction of the airway, pulmonary embolism, and hyperventilation.
• Each of these lung disorders has the ability to interfere with the exchange of oxygen and carbon dioxide that takes place during respiration. This interference may be in the form of damage to the alveoli, separation of the alveoli from the pulmonary vessels by fluid or infection, obstruction of the air passages, or air or excess fluid in the pleural space.
• Patients with long-standing lung diseases often have chronically high levels of blood carbon dioxide; in some cases, giving too much oxygen to them may depress or stop respirations. However, judicious use of oxygen is always an important priority in patients with dyspnea.
• Patients often develop breathing difficulty and/or hypoxia with the following medical conditions: upper or lower airway infection, acute pulmonary edema, chronic obstructive pulmonary disease, hay fever, asthma, anaphylaxis, spontaneous pneumothorax, and pleural effusion.
• Infectious diseases associated with dyspnea include epiglottitis, bronchitis, tuberculosis, pneumonia, and pertussis.
• Lung and breath sounds are some of the most important vital signs you should assess when treating a patient in respiratory distress.
• Signs and symptoms of breathing difficulty include unusual breath sounds (wheezing, stridor, rales, and rhonchi); nasal flaring; pursed-lip breathing; cyanosis; inability to talk; use of accessory muscles to breathe; and sitting in the tripod position, which allows the diaphragm the most room to function.
• Interventions for respiratory problems may include the following:
  – Oxygen via a nonrebreathing mask at 15 L/min, positive-pressure ventilations using a bag-mask device, pocket mask, or a flow-restricted oxygen-powered ventilation device
  – Airway management techniques such as use of an oropharyngeal airway, a nasopharyngeal airway, suctioning, or airway positioning
  – Positioning the patient in a high Fowler’s position or a position of comfort to facilitate breathing
Assistance with respiratory medications found in a prescribed MDI or a small-volume nebulizer. (Consult medical control to assist with its use, or follow standing orders if the orders allow for this.)

- Remember, a patient who is breathing rapidly may not be getting enough oxygen as a result of respiratory distress from a variety of problems, including pneumonia or a pulmonary embolism; trying to “blow off” more carbon dioxide to compensate for acidosis caused by a poison, a severe infection, or a high level of blood glucose; or having a stress reaction.
- In every case, prompt recognition of the problem, administration of oxygen, and prompt transport are essential.

Ch. 14 Review

- The heart is divided down the middle into two sides, right and left, each with an upper chamber called the atrium and a lower chamber called the ventricle.
- The heart valve that keeps blood moving through the circulatory system in the proper direction is the aortic valve, which lies between the left ventricle and the aorta, the body’s main artery.
- The heart’s electrical system controls heart rate and helps the atria and ventricles work together to pump the blood.
- During periods of exertion or stress, the myocardium requires more oxygen. The oxygen is supplied by dilation of the coronary arteries, which increases blood flow.
- Common places to feel for a pulse include the carotid, femoral, brachial, radial, posterior tibial, and dorsalis pedis arteries.
- Low blood flow to the heart is usually caused by coronary artery atherosclerosis, a disease in which cholesterol plaques build up inside blood vessels, eventually occluding them.
- Occasionally, a brittle plaque in an artery will crack, causing a blood clot to form. Heart tissue downstream suffers from a lack of oxygen and, within 30 minutes, will begin to die. This condition is called an acute myocardial infarction (AMI), or heart attack.
- Heart tissues that are not getting enough oxygen but are not yet dying can cause pain called angina. The pain of an AMI is different from the pain of angina in that it can come at any time, not just with exertion; it lasts up to several hours, rather than just a few moments; and it is not relieved by rest or nitroglycerin.
- In addition to crushing chest pain, signs of AMI include sudden onset of weakness, nausea, and sweating; sudden arrhythmia; pulmonary edema; and even sudden death.
- Heart attacks can have three serious consequences. One is sudden death, usually the result of cardiac arrest caused by abnormal heart rhythms called arrhythmias. These include tachycardia, bradycardia, ventricular tachycardia, and, most commonly, ventricular fibrillation.
- The second consequence is cardiogenic shock. Symptoms include restlessness; anxiety; pale, clammy skin; pulse rate higher than normal; and blood pressure lower than normal. Patients with these symptoms should receive oxygen, assisted ventilations as needed, and immediate transport.
- The third consequence of AMI is congestive heart failure, in which damaged heart muscle can no longer contract effectively enough to pump blood through the system. The lungs become congested with fluid, breathing becomes difficult, the heart rate increases, and the left ventricle enlarges.
- Signs include swollen ankles from dependent edema, high blood pressure, rapid heart rate and respirations, rales (crackles), and, sometimes, the pink sputum and dyspnea of pulmonary edema.
- Treat a patient with congestive heart failure as you would a patient with chest pain. Monitor the patient’s vital signs. Give the patient oxygen via nonrebreathing face mask. Allow the patient to remain sitting up.
When treating patients with chest pain, obtain a SAMPLE history, following the OPQRST mnemonic to assess the pain; measure and record vital signs; ensure the patient is in a comfortable position, usually semireclining or half sitting up; administer prescribed nitroglycerin and oxygen; and transport the patient, reporting to medical control as you do.

If a patient is not responsive, you may perform the following, depending on the patient’s age, weight, and your local protocol:
- Unresponsive adult or child older than 8 years and weighing at least 55 lb, perform automated external defibrillation
- Unresponsive child younger than 8 years who weighs less than 55 lb, perform automated external defibrillation with special pediatric pads, if protocol allows
- Unresponsive infant, begin CPR

The AED requires the operator to apply the pads, power on the unit, follow the AED prompts, and press the shock button as indicated. The computer inside the AED recognizes rhythms that require shocking and will not mislead you.

The three most common errors in using certain AEDs are failure to keep a charged battery in the machine; applying the AED to a patient who is moving, squirming, or being transported; and applying the AED to a responsive patient with a rapid heart rate.

Do not touch the patient while the AED is analyzing the heart rhythm or delivering shocks.

Effective CPR and early defibrillation with an AED are critical interventions to the survival of a patient in cardiac arrest. If you witnessed the patient’s cardiac arrest, begin CPR and apply the AED as soon as it is available. If the patient’s cardiac arrest was unwitnessed, perform 5 cycles (approximately 2 minutes) of CPR, and then apply the AED.

If an advanced life support (ALS) service is responding to the scene, stay where you are and continue CPR and defibrillation as needed. If ALS is not responding, you should begin transport if the patient regains a pulse, if you have delivered 6 to 9 shocks, or if the AED gives three consecutive messages (separated by 2 minutes of CPR) that no shock is advised. Follow your local protocols regarding when it is appropriate to transport the patient.

If an unconscious patient has a pulse but the pulse is lost during transport, you must stop the vehicle, reanalyze the rhythm, and defibrillate again or begin CPR, as appropriate.

The chain of survival, which is the sequence of events that must happen for a patient with cardiac arrest to have the best chance of survival, includes recognition of early warning signs and immediate activation of EMS, immediate CPR by bystanders, early defibrillation, and early advanced care. Seconds count at every stage.

Ch. 15 Review

The cerebrum, the largest part of the brain, is divided into right and left hemispheres, each controlling the opposite side of the body.

Different parts of the brain control different functions. The front part of the cerebrum controls emotion and thought; the middle part controls touch and movement; and the back part of the cerebrum is involved with vision. In most people, speech is controlled on the left side of the brain, near the middle of the cerebrum.

Many different disorders can cause brain or other neurologic symptoms. As a general rule, if the problem is primarily in the brain, only part of the brain will be affected. If the problem is in the heart or lungs, the whole brain will be affected.

Stroke is a significant brain disorder because it is common and potentially treatable.

Seizures and altered mental status are also common, and you must learn to recognize the signs and symptoms of each condition.

Other causes of neurologic dysfunction include coma, infections, and tumors.

Strokes occur when part of the blood flow to the brain is suddenly cut off; within minutes, brain cells begin to die.
• Signs and symptoms of stroke include receptive and/or expressive aphasia, slurred speech (dysarthria), muscle weakness or numbness on one side of the body, facial droop, and sometimes high blood pressure.
• You should always perform at least three neurologic tests on patients you suspect of having a stroke: testing speech, facial movement, and arm movement.
• In a transient ischemic attack (TIA), normal body processes break up the blood clot, restoring blood flow and ending symptoms in less than 24 hours. However, patients experiencing a TIA are at high risk for a completed stroke.
• Because current treatments for stroke must be administered within 1 to 3 hours (and preferably within 2 hours) of the onset of symptoms to be most effective, you should provide prompt transport.
• Always notify the hospital as soon as possible that you are bringing in a patient with a possible stroke, so that staff there can prepare to test and treat the patient without delay.
• Seizures are characterized by unconsciousness and generalized twitching of all or part of the body.
• There are types of seizures that you should learn to recognize: generalized, partial, and status epilepticus.
• Most seizures last between 3 and 5 minutes and are followed by a postictal state in which the patient may be unresponsive, have labored breathing, have hemiparesis, and may have been incontinent.
• It is important for you to recognize the signs and symptoms of seizures so that you can provide the emergency department staff with information as you transport the patient.
• Altered mental status is a common neurologic problem that you will encounter as an EMT. Signs and symptoms vary widely, as do the causes for this condition.
• Among the most common causes of altered mental status are hypoglycemia, intoxication, drug overdose, and poisoning.
• As you assess a patient with an altered mental status, do not always assume intoxication; hypoglycemia is just as likely a cause. Prompt transport with close monitoring of vital signs en route is indicated.

Assessment in Action

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