CHAPTER 1

Introduction to Emergency Medical Care
Slide 9  The Long and Winding Road of Ambulance Service Video
Topics

The Emergency Medical Services System
Components of the EMS System
Research
Special Issues
The Emergency Medical Services System
How It Began

- 1790s
  - Napoleonic Wars

- Civil War

- World War I
  - Volunteer ambulance corps

- Korea/Vietnam
  - MASH-type units and helicopter transport from battlefield

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How It Began

- Nonmilitary ambulance services began operating in early 1900s in U.S.
- Operated by hospitals, fire departments, or funeral homes
- No requirements or standards for equipment, crew training, or ambulance design
EMS Today

- 1966
  - Department of Transportation charged with developing EMS standards
- 1970
  - Founding of the National Registry of EMTs (NREMT)

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EMS Today

• 1973
  ▪ National Emergency Medical Service Systems Act (NEMSSA) passed by Congress
The Long and Winding Road of Ambulance Service Video

Click on the screenshot to view a video on the topic of the history of EMS.

Back to Directory
NHTSA Standards for EMS Systems

1. Regulation and policy
   - Each state establishes laws, policies, and regulations.

2. Resource management
   - Centralized coordination of emergency treatment and transport resources.

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NHTSA Standards for EMS Systems

3. Human resources and training
   - Assure EMS personnel are trained and certified to minimum standards

4. Transportation
   - Provide safe, reliable transportation

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5. Facilities
   ▪ Transport to closest appropriate facility

6. Communications
   ▪ Universal system access number (911), dispatch-to-ambulance, ambulance-to-ambulance, ambulance-to-hospital, hospital-to-hospital communications

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NHTSA Standards for EMS Systems

7. Public information and education
   ▪ Educate public about role of EMS, access to EMS, participate in injury prevention programs

8. Medical direction
   ▪ Medical Director is accountable for EMS personnel within system

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NHTSA Standards for EMS Systems

9. Trauma systems
   ▪ Develop trauma triage, transport, and treatment protocols

10. Evaluation
   ▪ Establish program for evaluating and improving effectiveness (QI, QA, TQM)
Components of the EMS System
Components of the EMS System

- Emergency Medical Dispatchers
- EMS responders
- Emergency Department/Hospital
  - Doctors, nurses, allied health personnel
- Specialty centers

continued on next slide
Components of the EMS System

- Other specialized care facilities
  - Trauma centers
  - Burn centers
  - Pediatric centers
  - Cardiac centers
  - Stroke centers
Components of the EMS System

Emergency department staff

Photo: © Edward T. Dickinson, MD
Think About It

• What medical services are available in your community?
• How important is it that EMS personnel know the capabilities of community medical facilities?
• What are the possible consequences of transporting a patient to a facility not equipped to handle the problem?
Accessing the EMS System

The chain of human resources making up the EMS system.

*Emergency Department staff photo: © Edward T. Dickinson, MD*
Accessing the EMS System

- 911 telephone access
  - Available in most communities
- Enhanced 911
  - Provides caller number and location for landline phones
Accessing the EMS System

- **Emergency medical dispatchers**
  - Can provide instructions to callers on how to provide emergency care until EMS personnel arrive
  - EMD certification required in some jurisdictions
Accessing the EMS System

Emergency medical dispatchers

Photo: © Edward T. Dickinson, MD
Critical Decision Making

- Critical decision making is a very important concept in EMS.
- Information must be gathered, patients assessed, and determination made on treatment and transport options.
- Decisions often time-critical
Examples of Critical Decisions

• Is it better to take patient to closest hospital or to one farther away but more appropriate for the condition?
• Is patient stable enough for further evaluation on scene, or should patient be transported immediately?
• Will this treatment make patient better or worse?
Levels of EMS Training

- Emergency Medical Responder (previously called first responder)
- Emergency Medical Technician (previously called EMT-Basic)
- Advanced Emergency Medical Technician (previously called EMT-Intermediate)
- Paramedic (previously called EMT-Paramedic)
Roles and Responsibilities of EMTs

- Personal safety
- Safety of crew, patient, and bystanders
- Patient assessment
- Patient care
- Lifting and moving
- Transport
- Transfer of care
- Patient advocacy
Think About It

• How would it impact an older adult patient if they were transported to the hospital without glasses, hearing aid, or dentures?
• On a routine call, would taking the time to gather these items have a negative effect on the patient's care?
• How about assuring the home is secure and locked before leaving?

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Think About It

• Could the concept of patient advocacy also extend to the community (fall prevention programs for elderly, poisoning awareness, pool and water safety programs for children)?
Physical Traits of a Good EMT

• Ability to lift and carry equipment and patients up to 125 pounds
• Good eyesight (distance and reading)
• Awareness of any problems with color vision
• Good communication skills (oral and written)
Personal Traits of a Good EMT

- Pleasant
- Sincere
- Cooperative
- Resourceful

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Personal Traits of a Good EMT

A professional appearance inspires confidence.
Personal Traits of a Good EMT

- Self-starter
- Emotionally stable
- Able to lead
- Neat and clean
- Of good moral character and respectful of others

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Personal Traits of a Good EMT

- In control of personal habits
- Controlled in conversation and able to communicate properly
- Able to listen to others
- Nonjudgmental and fair
Education

• Maintain up-to-date knowledge and skills
• Refresher courses
• Continuing education courses
• Conferences, seminars, and lectures
Many EMS/rescue operations adopt new procedures and equipment on the basis of research providing evidence that they are effective.
Think About It

- How will you refresh your knowledge and stay current once you are out of the classroom?
- What qualities would you like to see in an EMT who is caring for you? How can you come closer to being this kind of EMT?
Where Will You Become a Provider?

- Ambulance services
- Fire departments
- Rural/wilderness teams
- Urban/industrial settings
- Volunteering
Where Will You Become a Provider?

There is a wide variety of career opportunities for EMTs, including work in rural/wilderness settings.

*Photo © Edward T. Dickinson, MD*
National Registry of Emergency Medical Technicians

- Registration for EMRs, EMTs, AEMTs, and paramedics who successfully complete NREMT examinations
- May help in reciprocity (transferring to another state or region)
- Beneficial when applying for employment
Quality Improvement

• Continuous self-review with the purpose of identifying aspects of the system that require improvement
• Develop plans to correct deficiencies and improve performance

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Quality Improvement

• Everyone in organization has a role.
  ▪ Preparing carefully written documentation
  ▪ Becoming involved in the quality process
  ▪ Obtaining feedback from patients and hospital staff
  ▪ Maintaining your equipment
  ▪ Continuing your education
Medical Direction

• All patient care performed under direction of Medical Director
  ▪ Ultimate responsibility for patient care
  ▪ Oversees training
  ▪ Develops treatment protocols
  ▪ Issues off-line medical direction (standing orders)
  ▪ Provides on-line medical direction
EMS Role in Public Health

- Injury prevention for geriatric patients
- Injury prevention for youth
- Public vaccination programs
- Disease surveillance
Research
Research

- Focus on improving patient outcomes and through evidence-based techniques
- Evidence-based process
  - Forming a hypothesis
  - Reviewing literature
  - Evaluating the evidence
  - Adopting the practice if evidence supports it
The Basics of EMS Research

• Not all research is created equal.
• Rely on the scientific method.
• Exacting and comprehensive studies are both difficult and time consuming.
• Obtain an objective opinion.
The Basics of EMS Research

• Methods of reducing bias
  ▪ Prospective versus retrospective
  ▪ Randomization
  ▪ Control groups
  ▪ Study group similarity

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The Basics of EMS Research

• Types of medical research
  ▪ Case studies/case reports
  ▪ Cohort/concurrent control/case-control studies
  ▪ Randomized controlled trials (RCTs)
  ▪ Systematic review
  ▪ Meta-analysis

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The Basics of EMS Research

• "Level of Evidence" designation by American Heart Association
  ▪ Level of Evidence 1
  ▪ Level of Evidence 2
  ▪ Level of Evidence 3
  ▪ Level of Evidence 4
  ▪ Level of Evidence 5
The Basics of EMS Research

• Questions to ask when evaluating a study
  ▪ Assists in identifying bias of flaws in methodology

• Questions to ask before participating in a study
  ▪ Assists in understanding the study and providing needed information
Questions to Ask Before Participating in EMS Research

• What is the title of the study?
• Who are the principal investigator and primary contact?
• What is the research question or hypothesis?
• What are the study's inclusion criteria?
• What are the study's exclusion criteria?
Questions to Ask Before Participating in EMS Research

- What EMS data is needed?
- How will informed consent be handled?
- If a treatment is going to be randomized, how will that happen?
- What samples will need to be collected?
- What are the potential benefits to the patient?

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Questions to Ask Before Participating in EMS Research

- What are the potential risks to the patient?
- What institutional review board has approved the study?
- Has the EMS agency's Medical Director approved the study?
- Has the EMS agency's administration approved the study?
Special Issues
Special Issues

• Throughout the course we will discuss:
  ▪ Local issues
  ▪ Administrative matters
    • Course description
    • Class meeting times
    • Requirements for certification as an EMT

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Special Issues

- The Americans with Disabilities Act (ADA) has set strict guidelines preserving the rights of Americans with disabilities.
Chapter Review
Chapter Review

- The EMS system has been developed to provide prehospital as well as hospital emergency care.
- The EMS system includes 911 or another emergency access system, dispatchers, EMTs, hospital emergency department, physicians, nurses, physician's assistants, and other health professionals.
The EMT's responsibilities include safety; patient assessment and care; lifting, moving, and transporting patients; transfer of care; and patient advocacy.
Chapter Review

• An EMT must have certain personal and physical traits to ensure the ability to do the job.

• Education (including refresher training and continuing education), quality improvement procedures, and medical direction are all essential to maintaining high standards of EMS care.
Remember

- EMS dates back to Napoleonic times.
- There is a chain of human resources involved in EMS.
  - Critical decisions are made by each member of the chain.

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Remember

• There are certain personal and physical traits that help you to be a successful EMS provider.

• An EMS provider should actively pursue opportunities to improve personal knowledge and abilities as well as the unit's overall quality.
Questions to Consider

• What innovation was introduced in the Korean and Vietnam wars that is now common in many EMS systems?
• What are the four levels of EMS providers?
• Requesting orders from a physician by radio is an example of what kind of medical control?
Critical Thinking

• Your patient is hesitant to go to the hospital because she is worried about her dog. What can you do to assist in this situation? What part of your role as an EMT is this an example of?
CHAPTER 2

The Well-Being of the EMT
Multimedia Directory

Slide 26  AIDS: Etiology and Pathophysiology Video
Topics

Well-Being
Personal Protection
Diseases of Concern
Emotion and Stress
Scene Safety
Well-Being
Importance of Well-Being

• Keeping yourself prepared for demands and risks of EMT is very important.
• If you are unable to function for any reason, patients may not get needed care.
Maintaining Well-Being

- Maintaining solid personal relationships
- Exercise
- Sleep
- Eating right
- Limiting alcohol and caffeine intake
- Seeing your physician regularly and keeping up to date on vaccines
Personal Protection
Standard Precautions

- Standard Precautions include steps to protect self from pathogens.
- Scene size-up and protocols provide information on which precautions to take.

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Standard Precautions

• The Occupational Safety and Health Administration (OSHA) has issued strict guidelines about precautions against exposure to bloodborne pathogens.
• Refer to local protocols for wearing personal protective equipment.
• When in doubt, wear it.
Always wear personal protective equipment to prevent exposure to contagious diseases.
Personal Protective Equipment

- Protective gloves
  - Always have vinyl or other nonlatex gloves readily available.
  - Gloves should be changed between patients.
Personal Protective Equipment

Pull at top of glove #1 and pull glove #1 inside out.

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Personal Protective Equipment

- Hand cleaning
  - Hand washing
  - Alcohol-based hand cleaners
    - Considered effective by the Centers for Disease Control (CDC)
    - Alcohol-based hand sanitizers can be used if soap and water are not available.
Careful, methodical hand washing is effective in reducing exposure to contagious diseases.
Personal Protective Equipment

Alcohol-based hand cleaners are effective and often available when soap and water are not.
Personal Protective Equipment

• Eye and face protection
  ▪ Eye protection prevents splashing, spattering, or spraying fluids from entering the body.
  ▪ Should provide a guard from the front and the sides
Personal Protective Equipment

Wear a NIOSH-approved respirator when you suspect a patient may have tuberculosis.
Personal Protective Equipment

• Masks
  ▪ In cases where there will be blood or fluid splatter, wear a surgical-type mask.
  ▪ In cases where tuberculosis is suspected, wear an N-95 or high-efficiency particulate air (HEPA) respirator approved by the National Institute for Occupation Safety and Health (NIOSH).
Personal Protective Equipment

Wear a protective mask and face shield when suctioning a patient.
Personal Protective Equipment

• Gowns
  - May also wear gown to protect clothing and bare skin from spilled or splashed fluids
Diseases of Concern
Hepatitis B and C

- Infection that causes inflammation of the liver
- Can live on surfaces in dried blood for several days
- Hepatitis B (HBV) deadly; killed hundreds of health care workers each year before vaccine available
- Hepatitis C (no vaccine yet) poses same risk.
Tuberculosis (TB)

- Infects lungs
- Highly contagious
- Airborne
AIDS

• HIV
  ▪ Attacks immune system, leaving patient unable to fight off infection

• AIDS
  ▪ Set of conditions that results when the immune system has been attacked by HIV

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AIDS

- Lower risk for health care workers than hepatitis or TB
- Contact with blood usual route of infection
AIDS: Etiology and Pathophysiology Video

Click on the screenshot to view a video on the subject of AIDS.

Back to Directory
Emerging Conditions and Diseases

- Ebola
  - People in the U.S. infected in 2014
  - Hemorrhagic fever
  - High rate of deaths and lack of definitive treatment

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Emerging Conditions and Diseases

- Severe Acute Respiratory Syndrome (SARS)
  - Spread through respiratory droplets
- Middle Eastern Respiratory Syndrome (MERS)
  - Found primarily on the Arabian Peninsula

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Emerging Conditions and Diseases

- **Avian flu**
  - Found in poultry; can affect humans
  - Not easily transmissible from human to human

- **Influenza**
  - Around for hundreds of years
  - 1918 pandemic killed between 30 and 50 million people around the world
Infection Control and the Law

- EMS personnel, other health care workers are at high risk of coming in contact with infectious diseases.
- Guidelines for workplace safety developed by OSHA and other federal, state, and local agencies.
Occupational Exposure to Bloodborne Pathogens

• The OSHA standard on bloodborne pathogens requires infection control be joint responsibility of employer and employee.

• EMS agencies provide training, protective equipment, and vaccinations to employees.

• Employees participate in infection exposure control plan.

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Occupational Exposure to Bloodborne Pathogens

- Infection exposure control plan
- Adequate education and training
- Hepatitis B vaccination
- Personal protective equipment
- Methods of control
- Housekeeping
- Labeling
- Postexposure evaluation and follow-up
Ryan White CARE Act

• Allows EMS providers to find out if they have been exposed to potentially life-threatening diseases while providing patient care
• Designated officer gathers facts about potential exposures.

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Ryan White CARE Act

• Two notification systems
  ▪ Airborne disease exposure
  ▪ Bloodborne or other infectious disease exposure

• Once notified of an exposure, employer will refer you to a health care professional for evaluation and follow-up.
Tuberculosis Compliance Mandate

- OSHA's respiratory standard
  - Selection and use of respirators
- Caring for or transporting a patient with suspected TB
  - Wear a NIOSH-approved N-95 or HEPA mask when you are:
    - Caring for patients suspected of having TB
Tuberculosis Compliance Mandate

- Caring for or transporting a patient with suspected TB
  - Wear a NIOSH-approved N-95 or HEPA mask when you are:
    - Transporting an individual from such a setting in a closed vehicle
    - Performing high-risk procedures such as endotracheal suctioning and intubation
Immunizations

- Immunizations for hepatitis B, other infectious diseases should be available through EMS agency.
- Regular TB testing may also be required.
- Local system protocols vary.
Emotion and Stress
Physiologic Aspects of Stress

- Stress inevitable in the EMS profession.
- Recognizing signs of stress and developing strategies to deal with stress are very important to the EMS career.
Physiologic Aspects of Stress

- First stage
  - Alarm reaction (fight-or-flight)
- Second stage
  - Stage of resistance (coping)
- Third stage
  - Exhaustion (loss of ability to resist or adapt to the stressor)
Types of Stress Reactions

- May occur as the result of a critical incident
  - Any situation that triggers a strong emotional response
Acute Stress Reaction

- Often linked to catastrophe
- Occurs in EMTs and patients
- Signs and symptoms develop soon after incident.
- Physical, cognitive, emotional, and behavioral symptoms
- Normal reactions to extraordinary situation
- May require professional intervention
Delayed Stress Reaction

- Posttraumatic stress disorder (PTSD)
- Signs and symptoms not evident until long after incident.
- Delay makes dealing with reaction much harder.
  - Patient may not recognize what is causing problem.
- Requires intervention by mental health professional
Cumulative Stress Reaction

- Results from years of sustained low-level stressors
- Early signs
  - Vague anxiety
  - Emotional exhaustion

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Cumulative Stress Reaction

- Progresses to physical complaints, loss of emotional control, irritability, depression
- May present as severe withdrawal or suicidal thoughts requiring long-term psychological intervention
Causes of Stress

- Multiple-casualty incidents (MCI)
- Calls involving infants or children
- Severe injuries
- Abuse and neglect
- Death of a coworker
Signs and Symptoms of Stress

• Eustress
  ▪ Positive form of stress that helps people work under pressure and respond effectively

• Distress
  ▪ Negative stress causing immediate and long-term problems with health and well-being

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Signs and Symptoms of Stress

- Irritability
- Inability to concentrate
- Changes in daily activities
- Anxiety
- Indecisiveness
- Guilt
- Isolation
- Loss of interest in work
Think About It

- If your partner is beginning to show signs of stress, what should you do?
- What possible risk could there be to your partner, you, or a patient if stress is left unresolved?
- Do you have an obligation to act to help your partner?
Dealing with Stress

• Lifestyle changes
  ▪ Develop more healthful and positive dietary habits
  ▪ Exercise
  ▪ Devote time to relaxing
  ▪ Change shift or location for lighter call volume, different call types, more family time

continued on next slide
Dealing with Stress

• Critical incident stress management
  ▪ Comprehensive system
  ▪ Includes education and resources to prevent stress
  ▪ Ways to deal with stress appropriately when it occurs

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Dealing with Stress

• Critical incident stress management
  ▪ Critical incident stress debriefing (CISD)
    • Designed to help responders "defuse" after incident
    • Team of trained peer counselors and mental health professionals meet with rescuers and health care providers involved in major incident twenty-four to seventy-two hours after incident
    • Helps responders deal with stress

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Dealing with Stress

• Understanding reactions to death and dying
  ▪ Do not usually see dead people except at funeral
  ▪ Do not normally see person die
  ▪ Often most difficult part of job
  ▪ Dealing with family may be more difficult

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Dealing with Stress

• Understanding reactions to death and dying
  ▪ Emotional stages
    • Denial or "Not me."
    • Anger or "Why me?"
    • Bargaining or "OK, but first let me..."
    • Depression or "OK, but I haven't..."
    • Acceptance or "OK, I'm not afraid."

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Dealing with Stress

• Understanding reactions to death and dying
  ▪ Recognize the patient's needs.
  ▪ Be tolerant of angry reactions from the patient or family members.
  ▪ Listen empathetically.
  ▪ Do not falsely reassure.
  ▪ Offer as much comfort as you realistically can.
Scene Safety
Scene Safety

- EMS not usually a dangerous profession
- Being aware of potential dangers is always a priority.
- Determining scene safety will be the most important decision on any call.
Hazardous Material Incidents

- Primary rule is to maintain a safe distance from the source of the hazardous material.
- Placards
  - Ensure that your emergency vehicle is equipped with binoculars.
  - Correspond with coded colors and identification numbers that are listed in the *Emergency Response Guidebook*

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Hazardous Material Incidents

• Roles
  ▪ Recognize potential problems.
  ▪ Take actions for personal safety and the safety of others.
  ▪ Notify a trained hazardous material response team.

• Do not treat patients until after they have undergone decontamination.
Terrorist Incidents

- May be small or large in scale
- May include chemical agents, biochemical agents, radiation, and/or explosive devices
Rescue Operations

• Rescuing or disentangling victims from fires, auto collisions, explosions, electrocutions, and more

• Evaluate each situation and ensure that appropriate assistance is requested early in the call.
  - Never perform acts that you are not properly trained to do.
Placards with coded colors and identification numbers must be used on vehicles and containers to identify hazardous materials.
Violence

• Plan
  ▪ Wear safe clothing
  ▪ Prepare your equipment so it is not cumbersome
  ▪ Carry a portable radio whenever possible
  ▪ Decide on safety roles

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Violence

As a safety precaution, do not stand directly in front of a door when knocking or ringing the bell.
Violence

• Observe
  ▪ Survey scene on approach.
  ▪ Do not announce arrival.
    • Turn off lights and siren.
  ▪ Drive few feet past residence so you can see front and sides.

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Violence

- Observe
  - Violence
  - Crime scenes
  - Alcohol or drug use
  - Weapons
  - Family members
  - Bystanders
  - Perpetrators
  - Pets
React to Danger

- Three Rs
  - Retreat
  - Radio
  - Reevaluate
    - Do not reenter a scene until it has been secured by police.
Response to Danger: Observe

Never enter a scene that is potentially violent until the police have secured it and told you it is safe.

*AP Photo/The Sacramento Bee, Randy Pench*
React to Danger

- Flee.
- Get rid of any cumbersome equipment.
- Take cover and conceal yourself.
React to Danger

Concealing yourself is placing your body behind an object that can hide you from view.
Chapter Review
Chapter Review

• Your well-being is an important concept. This chapter has provided several ways to protect and maintain it.

• You should never take safety or Standard Precautions lightly. Each is an important decision you will make at least once at each scene you respond to—always.

continued on next slide
Chapter Review

- Protect yourself from violence and scene hazards at all costs.
- Protect yourself from disease. Do not be paranoid about catching a disease, but take appropriate precautions.
Chapter Review

- Stress may be an immediate reaction from a particular call or cumulative from a combination of life and EMS. Both are bad for you. Seek help if you need to.
Chapter Review

• You will see death and reaction to death. Each is very personal to those involved. The stages of death are denial, anger, bargaining, depression, and acceptance.

• Treat people who are under stress fairly and compassionately, even if it is difficult to do so.
Remember

• Scenes are dynamic and can change in an instant.
• Assessment of scene safety is an ongoing process.
• Don't be so focused on the patient that you lose perception of what is happening around you.
Questions to Consider

• What precautions must I take if I am dealing with a patient who has an open wound?
• What can I do to help deal with stress?
• A patient who refuses to believe she has a terminal disease is in what stage of dealing with it?
Critical Thinking

• You are called to an unknown emergency at a tavern. As you approach the scene, you see a man lying supine in the parking lot, apparently bleeding profusely. Two other men are scuffling, and one seems to have a gun. What actions must you take?
CHAPTER 3

Lifting and Moving Patients
Multimedia Directory

Slide 60 Prehospital Lifting of Patients Video
Topics

Protecting Yourself: Body Mechanics
Protecting Your Patient: Emergency, Urgent, and Non-Urgent Moves
Protecting Yourself: Body Mechanics
Protecting Yourself: Body Mechanics

• The proper use of your body to prevent injury and to facilitate lifting and moving

continued on next slide
Protecting Yourself: Body Mechanics

• Consider the following before lifting any patient:
  ▪ The object
    • Its weight and whether it would require additional help to lift
  ▪ Your limitations
  ▪ Communication
    • Make a plan and communicate it with your partner.

continued on next slide
Protecting Yourself: Body Mechanics

• Rules for lifting
  ▪ Position your feet properly.
  ▪ Use your legs.
  ▪ Never turn or twist.
  ▪ Do not compensate when lifting with one hand.

continued on next slide
Protecting Yourself: 
Body Mechanics

- Rules for lifting
  - Keep weight as close as possible to your body.
  - Use a stair chair when carrying patient on stairs whenever possible.
Rules for Lifting

Moving a stair chair down steps.
Power Lift and Power Grip
Protecting Yourself: Body Mechanics

• When reaching:
  ▪ Keep back in a locked-in position.
  ▪ Avoid twisting while reaching.
  ▪ Avoid reaching more than twenty inches in front of body.
  ▪ Avoid prolonged reaching when strenuous effort is required.
Protecting Yourself: Body Mechanics

- When pushing or pulling:
  - Push, rather than pull, whenever possible.
  - Keep back locked in.
  - Keep line of pull through center of body.
  - Keep weight close to body.
Protecting Yourself: Body Mechanics

• When pushing or pulling:
  ▪ If the weight is below your waist, push or pull from kneeling position.
  ▪ Avoid pushing or pulling overhead.
  ▪ Keep your elbows bent and arms close to your sides.
Protecting Your Patient: Emergency, Urgent, and Non-Urgent Moves
Emergency Moves

• Situations
  ▪ The scene is hazardous.
  ▪ Care of life-threatening conditions requires repositioning.
  ▪ You must reach other patients.
Emergency Moves

CLOTHES DRAG
Emergency Moves

INCLINE DRAG. Always head first.
Emergency Moves

FIREFIGHTER'S DRAG. Place patient on his back and tie his hands together. Straddle him, crouch, and pass your head through his trussed arms. Raise your body and crawl on your hands and knees. Keep the patient's head as low as possible.
BLANKET DRAG. Gather half of the blanket material up against the patient's side. Roll him toward your knees, place the blanket under him, and gently roll him onto the blanket. During the drag, keep the patient's head as low as possible.
One Rescuer Assist
Emergency Moves

TWO-RESCUER ASSIST. Place the patient's arms around the shoulders of both rescuers. They each grip a hand, place their free arms around the patient's waist, and help him walk to safety.
Urgent Moves

• Situations
  ▪ The required treatment can be performed only if the patient is moved.
  ▪ Factors at the scene cause patient decline.

continued on next slide
Urgent Moves

• Moving a patient onto a long spine board
  ▪ Used if immediate threat to life and suspicion of spine injury
  ▪ Patient supine, log-roll onto side
  ▪ Place spine board next to body; log-roll onto board.

continued on next slide
Urgent Moves

• Moving a patient onto a long spine board
  ▪ Lift onto stretcher.
  ▪ Secure to stretcher; load into ambulance.

continued on next slide
Urgent Moves

• Rapid extrication
  ▪ Used when taking time to immobilize the patient with short backboard or vest before moving patient may cause a deadly delay
  ▪ Stabilize spine manually as patient is moved onto a long spine board.
Non-Urgent Moves

- Patient stable
- No immediate life threat
- Patient can be assessed, treated, and moved in normal way.
- Take all required precautions not to aggravate existing conditions.
Patient-Carrying Devices

- Stretcher or any other device designed to carry the patient safely to the ambulance and/or to the hospital

- Wheeled stretchers
  - Power stretchers
  - Manual stretchers
  - Bariatric stretchers
    - Some rated to carry patients weighing 800 pounds or more
A wheeled stretcher is carried on every ambulance.
Patient-Carrying Devices

Power stretcher. © Ferno—Washington, Inc.
Many EMS services are now equipped with specially constructed stretchers and loading equipment for obese patients.
Patient-Carrying Devices

- Stair chairs
  - Useful where stretchers cannot be easily maneuvered
- Spine board
  - Short
    - Primarily for removing patients from vehicles when neck or spine injury is suspected
  - Long
Patient-Carrying Devices

Stair chair.
Patient-Carrying Devices

Short spine board.
Patient-Carrying Devices

Long spine boards.
Patient-Carrying Devices

- Other types of stretchers
  - Portable stretcher
  - Scoop stretcher
  - Basket stretcher
  - Flexible stretcher
  - Vacuum mattress
Patient Immobilizing Devices

Vest-Type Extrication Device
Patient-Carrying Devices

Scoop (orthopedic) stretcher. © Ferno—Washington, Inc.
Patient-Carrying Devices

Basket stretcher.
© Ferno—Washington, Inc.
Patient-Carrying Devices

Flexible stretcher. © Ferno—Washington, Inc.
Patient-Carrying Devices

A vacuum mattress may be used to transport a patient.
Patient-Carrying Devices

When the patient is placed on the device and air is withdrawn, the mattress becomes rigid and conforming, automatically padding voids.
Think About It

• How do you choose the appropriate patient-carrying device?
Moving Patients onto Carrying Devices

• Patient with suspected spine injury
  ▪ Immobilize head, neck, and spine before move.
  ▪ Perform manual stabilization.
  ▪ Place a rigid cervical collar.
  ▪ Maintain manual stabilization until the patient is immobilized to spine board.
Moving Patients onto Carrying Devices

- Patient with no suspected spine injury
  - Extremity lift
    - Used to carry patient to stretcher or stair chair
    - Can be used to lift patient from ground or from sitting position

continued on next slide
Moving Patients With No Suspected Spinal Injury

Extremity Carry
Moving Patients onto Carrying Devices

- Patient with no suspected spine injury
  - Direct ground lift
    - Lifting from ground to stretcher
Direct Ground Lift: 1. The stretcher is set in its lowest position and placed on the opposite side of the patient. The EMTs face the patient, drop to one knee, and if possible, place the patient's arms on his chest. The head-end EMT cradles the patient's head and neck by sliding one arm under the neck to grasp the shoulder, moving the other arm under the patient's back. The foot-end EMT slides one arm under the patient's knees and the other arm under the patient above the buttocks.

**Note:** If a third rescuer is available, he should place both arms under the patient's waist while the other two slide their arms up to the mid-back or down to the buttocks, as appropriate.
Direct Ground Lift: 2. On signal, the EMTs lift the patient to their knees.
Direct Ground Lift: 3. On signal, the EMTs stand and carry the patient to the stretcher, drop to one knee, and roll forward to place him onto the mattress.
Moving Patients onto Carrying Devices

- Patient with no suspected spine injury
  - Draw-sheet method
  - Direct carry method
Draw-Sheet Method: 1. Loosen the bottom sheet of the bed and roll it from both sides toward the patient. Place the stretcher, rails lowered, parallel to the bed and touching the side of the bed. EMTs use their bodies and feet to lock the stretcher against the bed.
Draw-Sheet Method: 2. EMTs pull on the draw sheet to move the patient to the side of the bed. Both use one hand to support the patient while they reach under him to grasp the draw sheet. Then they simultaneously draw the patient onto the stretcher.
Recovery Position

A patient in the recovery position.
Patient Positioning

- Positioning for shock
  - Place patients believed to be in shock in supine position
  - Do not lower head
  - Do not raise legs
Transferring the Patient to a Hospital Stretcher

• When you arrive at the hospital, you will move the patient from the ambulance stretcher to the hospital stretcher.
  • Modified draw-sheet method
1. Position the raised ambulance cot next to the hospital stretcher. Hospital personnel then adjust the stretcher (raise or lower the head) to receive the patient.
2. You and the hospital personnel gather the sheet on either side of the patient and pull it taut to transfer the patient securely.
3. Holding the gathered sheet at support points near the patient's shoulders, mid-torso, hips, and knees, you and the hospital personnel slide the patient in one motion onto the hospital stretcher.
4. Make sure the patient is centered on the stretcher and the stretcher rails are raised before turning him over to the emergency department staff.
Prehospital Lifting of Patients Video

Click on the screenshot to view a video on the subject of prehospital lifting of patients.

Back to Directory
Chapter Review
Chapter Review

• The process of lifting and moving patients is a task that requires planning, proper equipment, and careful attention to body mechanics to prevent injury to your patient and to yourself.
The most important rule in lifting is to lift with your legs, not your back. Keep your feet shoulder-width apart and keep your knees bent. Rules for lifting are for patients as well as equipment.

Emergency moves are those that may aggravate spine injuries and, therefore, are reserved for life-threatening situations.
Urgent moves are used when the patient must be moved quickly but there is time to provide quick, temporary consideration toward preventing or aggravating spinal injury.
Chapter Review

• Non-urgent moves are normal ways of moving a patient to a stretcher after performing a complete on-scene assessment and completing any needed spinal stabilization and immobilization.

• Positioning the patient for transport should take into account the patient's comfort, medical needs, and safety.

continued on next slide
Chapter Review

• Remember the importance of correct lifting and moving techniques on every call. Protect your patient and protect yourself from injury to maintain a long and positive EMS experience.
Remember

- Proper lifting technique is important wellness strategy.
- Biomechanics and rules of lifting help prevent injuries associated with lifting.
- Many different patient-carrying devices exist. Choose the correct device based upon particular patient and needs of particular movement.

continued on next slide
Remember

- Use proper technique to move patients onto patient-carrying devices and position them for transport based upon their condition.
Questions to Consider

• Why are body mechanics so important when lifting and moving patients?
• Why is using the appropriate patient-carrying device an important consideration?
• When would an emergency move be necessary?
• In what ways can proper positioning help a patient's condition?
Critical Thinking

- You arrive at a vehicle crash and find an elderly driver slumped over the wheel. Upon examination you determine the patient is in respiratory arrest, but not trapped in the vehicle. Which move would be appropriate for this patient?
CHAPTER 4

Medical/Legal and Ethical Issues
Slide 7  Legal Issues in Healthcare Video
Topics

• **Scope of Practice**
• **Patient Consent and Refusal**
• **Other Legal Issues**
Scope of Practice
Scope of Practice

• Regulations and ethical considerations that defines the scope, or extent and limits of an EMT's job
• May include skills and procedures
• Determined by national, state, local laws, statutes, and protocols
Standard of Care

- Care that would be expected from an EMT with similar training when caring for a patient in a similar situation
- Meeting standard of care reduces risk of legal action
- Scope of practice
  - What you can do
- Standard of care
  - How you should do it
Legal Issues in Health Care Video

Click on the screenshot to view a video on the topic of legal issues in health care.

Back to Directory
Patient Consent and Refusal
Consent

- Permission from patient to assess, treat, and transport
- Expressed consent
  - Must be informed
- Implied consent
  - Assumed consent
  - Follow local laws and protocols.

continued on next slide
Consent

• Children and mentally incompetent adults
  ▪ Minors not legally permitted to provide consent or refusal for treatment
  ▪ Obtain from parent or legal guardian
  ▪ Possible exceptions (check local law)
    • *In loco parentis*
    • Emancipated minors

continued on next slide
Consent

- Children and mentally incompetent adults
  - Possible exceptions (check local law)
    - Life-threatening illness or injury
    - Minors who have children
    - Minors serving in armed forces

continued on next slide
Consent

• Children and mentally incompetent adults
  ▪ Adult patients incapable of informed decisions about care
  • State and local laws and protocols permit transport of such patients under implied consent

continued on next slide
Consent

- Involuntary transportation
  - Patient considered threat to himself or others
  - Court order
  - Usually requires decision by mental health professional or police officer
  - If patient restrained, must not risk legal liability
When a Patient Refuses Care

• Patient may refuse care or transport under the following circumstances:
  ▪ Patient must be legally able to consent.
  ▪ Patient must be awake and oriented.
  ▪ Patient must be fully informed.
  ▪ Patient will be asked to sign a "release" form.

• Despite all precautions, EMT may still be held liable.

continued on next slide
When a Patient Refuses Care

• Take all possible actions to persuade the patient to accept care and transport.
  ▪ Spend time speaking with the patient.
  ▪ Listen carefully to try to determine why the patient is refusing care.
  ▪ Inform the patient of the consequences of not going to the hospital.

continued on next slide
When a Patient Refuses Care

• Take all possible actions to persuade the patient to accept care and transport.
  - Consult medical direction.
  - Ask the patient if it is all right if you call a family member—or advise the patient that you would like to call a family member.

continued on next slide
When a Patient Refuses Care

• Take all possible actions to persuade the patient to accept care and transport.
  ▪ Call law enforcement personnel if necessary.
Think About It

• What are the risks of beginning treatment and/or transport without getting consent from the patient?
• What if the patient refuses to sign the refusal of care form?
When a Patient Refuses Care

• Subjecting the patient to unwanted care and transport has actually been viewed in court as assault or battery.
• Have witnesses to refusal.
• Inform patient that if they change their mind, they can call back.
When a Patient Refuses Care

• If possible, have friend or relative remain with patient.
• Document attempts thoroughly.
Do Not Resuscitate Orders and Physician Orders for Life-Sustaining Treatment

- Legal document expressing patient's wishes if patient unable to speak for self
- Do not resuscitate order (DNR)
  - May be part of an advance directive
  - May be part of a Physician Order for Life-Sustaining Treatment (POLST)
- Should also be familiar with living wills and health care proxies
Other Legal Issues
Negligence

• Something that should have been done was not done, or was done incorrectly

• Must prove:
  ▪ EMT had duty to act
  ▪ Breach of duty
    • EMT failed to provide standard of care expected or failed to act

continued on next slide
Negligence

• Must prove:
  ▪ Proximate causation
    • Patient suffered harm because of EMT action or inaction
• Negligent EMTs may be required to pay damages.

continued on next slide
Negligence

- *Res ipsa loquitur* (the thing speaks for itself)
  - Legal concept important in negligence cases
Duty to Act

• Obligation to provide care to a patient
• Duty to act is not always clear.
  ▪ Off duty
  ▪ On duty but out of jurisdiction
• Follow local laws and protocols.
• Follow own conscience.

continued on next slide
Duty to Act

• Abandonment
  - Once care is initiated, it may not be discontinued until transferred to medical personnel of equal or greater training.
  - Failure to do so may constitute abandonment.
Good Samaritan Laws

- Grant immunity from liability if rescuer acts in good faith within level of training
- Rarely apply to on-duty personnel
- May not cover EMTs in some situations
- Do not protect persons from gross negligence or violations of law
Think About It

- You arrive on the scene of a patient in cardiac arrest. The family says she has a DNR, but don't know where it is. How should you handle this?
- You are off duty and arrive on the scene of a vehicle crash. Police and EMS have not yet arrived. Are you legally obligated to stop and render aid?
Confidentiality

• Information on patient's history, condition, treatment considered confidential

continued on next slide
Confidentiality

- Privacy Rule of the Health Insurance Portability and Accountability Act (HIPAA)
  - Information shared with other health care personnel as part of patient's continuing care
  - Otherwise must be obtained through subpoena
Medical Identification Devices

Example of a medical identification device (front and back).
Special Situations

• Medical identification devices
  ▪ For particular medical conditions
  ▪ Necklace, bracelet, or card
  ▪ Conditions include:
    • Heart conditions
    • Allergies
    • Diabetes
    • Epilepsy

continued on next slide
Special Situations

• Organ donors
  ▪ Completed legal document allowing donation of organs and tissues in event of death
  ▪ May be identified by family members, donor card, driver's license
  ▪ Receiving hospital and/or medical direction should be advised per protocol
Special Situations

• Safe haven laws
  ▪ Allow person to drop off an infant or child at any fire, police, or EMS station
  ▪ States have different guidelines for ages of children included
  ▪ Protect children who may otherwise be abandoned or harmed by parents unwilling or unable to care for them
Crime Scenes

• Location where crime was committed or anywhere evidence may be found
• Once police have made scene safe, EMT's priority is patient care.
• Know what evidence is.
• Take steps to preserve evidence.
Crime Scenes

- Examples of evidence
  - Condition of the scene
  - The patient
  - Fingerprints and footprints
  - Microscopic evidence
Crime Scenes

• Preservation of evidence
  ▪ Remember what you touch
  ▪ Minimize your impact on the scene
  ▪ Work with the police
Special Reporting Requirements

- Child, elderly, or domestic abuse
- Violence (gunshot wounds or stabbings)
- Sexual assault
- Situations where restraint may be necessary

continued on next slide
Special Reporting Requirements

- Intoxicated person with injuries
- Mentally incompetent people with injuries
- Check local laws and protocols.
Chapter Review
Medical, legal, and ethical issues are a part of every EMS call.
Chapter Review

- Consent may be expressed or implied. If a patient who is awake and oriented and has the capacity to fully understand his situation refuses care or transport, you should make every effort to persuade him, but you cannot force him to accept care or go to the hospital.

continued on next slide
Chapter Review

• Negligence is failing to act properly when you have a duty to act. As an EMT, you have a duty to act whenever you are dispatched on a call. You may have a legal or moral duty to act even when off duty or outside your jurisdiction.

continued on next slide
Abandonment is leaving a patient after you have initiated care and before you have transferred the patient to a person with equal or higher training.
• Confidentiality is the obligation not to reveal personal information you obtain about a patient except to other health care professionals involved in the patient's care, under court order, or when the patient signs a release.
Chapter Review

• As an EMT, you may be sued or held legally liable on any of these issues. However, EMTs are rarely held liable when they have acted within their scope of practice and according to the standard of care and have carefully documented the details of the call.

continued on next slide
Chapter Review

• At a crime scene, care of the patient takes precedence over preservation of evidence; however, you should make every effort not to disturb the scene unnecessarily and to report your actions and observations to the police.

continued on next slide
Remember

- EMTs must use good judgment and decision-making skills when dealing with patient consent and refusal.
- Avoiding negligence implies using good judgment; critical thinking is an essential component for avoiding liability.

continued on next slide
Remember

- EMTs hold responsibility for patients' protected health information; exercising care when dealing with this information is a legal and ethical obligation.
Questions to Consider

• Define scope of practice, negligence, duty to act, abandonment, and confidentiality.
• What steps must you take when a patient refuses care or transportation?
• What types of evidence may be found at a crime scene? How should you act to preserve evidence?
Critical Thinking

• You respond to a motor vehicle crash and find a seriously injured patient. He has no pulse and you are about to begin CPR when someone says, "Don't do that! He's got cancer and a DNR!" No one has the DNR at the scene. Do you start CPR and transport the patient?
CHAPTER 5

Medical Terminology
Multimedia Directory

Slide 13  Medical Term Components Video
Slide 14  Terms Involved With Medical Specialties Video
Topics

- Medical Terminology
- The Language of Anatomy and Physiology
- Anatomic Terms
Medical Terminology
The Components of Medical Terms

• Compounds are made up of two or more words
  ▪ Smallpox

continued on next slide
The Components of Medical Terms

• Words made from parts
  ▪ Roots
    • *Therm* meaning "heat"
  ▪ Roots with combining form
    • *Therm-o* + meter = *thermometer*
  ▪ Prefixes
    • *Dys*-pnea, *tachy*-pnea
  ▪ Suffixes
    • *Arthr-itis*, *hemophil-iac*
Word Component Example

tachy (fast) → cardia (heart) → tachycardia (fast heart rate)

continued on next slide
Word Component Example

hemo (blood) → thorax (chest) → hemothorax (blood in chest cavity)

continued on next slide
Word Component Example

Cardiologist: An example of root and suffixes.

- **CARDIO-**  
  *the heart*

- **-LOGY**  
  *study of*

- **-IST**  
  *one who specializes in*
• Acronym
  ▪ Abbreviation made up of initials that can be pronounced as a word
    • CPAP (*SEE*-pap)
      • Continuous positive airway pressure
Abbreviations and Acronyms

- Abbreviation
  - Letters or symbols used in place of words or phrases
    - DNR
      - Do Not Resuscitate
When and When Not to Use Medical Terms

• Do not use when speaking to patients or family members.
• Occasionally complex terms used in messages can cause confusion even among trained health care professionals.
• If there is potential for ambiguity, do not be reluctant to return to simple terms.
Medical Term Components Video

Click on the screenshot to view a video on the topic medical term components.

Back to Directory
Terms Involved with Medical Specialties Video

Click on the screenshot to view a video on the topic of terms involved with medical specialties.

Back to Directory
The Language of Anatomy and Physiology
Anatomy and Physiology

• Anatomy
  ▪ Study of body structure

• Physiology
  ▪ Study of body function
Anatomic Terms
Directional Terms

• Anatomic position
  ▪ Facing forward
  ▪ Hands at sides
  ▪ Palms facing forward

• Divide body into planes

• Midline
  ▪ Medial is closer to the midline.
  ▪ Lateral is farther from the midline.

continued on next slide
Directional Terms

- **Bilateral**
  - "Both sides"
- **Unilateral**
  - One side
- **Mid-axillary line**

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Directional Terms

- Anterior (ventral)
  - Front
- Posterior (dorsal)
  - Back
- Superior
  - Vertical, above
- Inferior
  - Vertical, below
Directional Terms

- **Proximal**
  - Closer to torso

- **Distal**
  - Farther from torso

- **Palmar**
  - Refers to the palm of the hand

- **Plantar**
  - Refers to the sole of the foot
Directional Terms

Body regions and anatomic position.
Directional Terms

Directional terms.
Directional Terms

• Mid-clavicular line
  ▪ Divides chest into regions
  ▪ Since there are two clavicles, there are two mid-clavicular lines.
Directional Terms

The planes of the body.
Directional Terms

- Abdominal quadrants
  - Horizontal and vertical lines through navel
  - Right upper quadrant (RUQ)
  - Left upper quadrant (LUQ)
  - Right lower quadrant (RLQ)
  - Left lower quadrant (LLQ)

continued on next slide
Directional Terms

Abdominal quadrants.
Positional Terms

- **Supine**
  - Patient lying on back
- **Prone**
  - Patient lying on front
- **Recovery**
  - Patient lying on side
  - Preferred for any unconscious nontrauma patient
Positional Terms

Anatomic positions: Supine
Positional Terms

Anatomic positions: Prone
Positional Terms

Anatomic positions: Lateral recumbent (recovery)
Positional Terms

Semi-Fowler position.
Positional Terms

• Fowler
  ▪ Patient seated straight up
  ▪ Semi-Fowler
    • Leaning back in a semi-sitting position
Chapter Review
Chapter Review

- Medicine has a language of its own. As an EMT, you will frequently communicate with medical professionals who speak this language.
- Medical terms generally consist of a root with a prefix and/or suffix.

*continued on next slide*
Remember

• Medical terminology is the language of health care. Roots, prefixes, and suffixes can lend clues to the meaning of many terms.
• Understanding anatomy and physiology is like reviewing the owner's manual for the body.
• Anatomical terminology brings precision and accuracy to descriptions.
Questions to Consider

• Is my use of medical terms accurate and descriptive?
• Can I identify critical organs and structures that reside in an area where a patient has a complaint or traumatic injury?
Critical Thinking

• You respond to a teenage boy who has taken a hard fall from his dirt bike. He has a deep gash on the outside of his left arm halfway between shoulder and elbow and another on the inside of his right arm just above the wrist. His left leg is bent at a funny angle about halfway between hip and knee.

continued on next slide
Critical Thinking

When you cut away his pants leg, you see a bone sticking out of a wound on the front side. How will you describe your patient's injuries over the radio to the hospital staff?
Topics

• Locating Body Organs and Structures
• Body Systems
Locating Body Organs and Structures
Locating Body Organs and Structures

• Visualizing
• Topography
Body Systems
Musculoskeletal System

• Three main functions
  ▪ Gives the body shape
  ▪ Protects vital internal organs
  ▪ Provides for body movement
Musculoskeletal System

• Skeleton
  - Consists of skull and spine, ribs and sternum, shoulders and upper extremities, and pelvis and lower extremities
Musculoskeletal System

• **Skull**
  - Bony structure of the head
  - Function to enclose, protect brain
  - Cranium
    - Top, back, and sides
  - Face
    - Front of the skull

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Musculoskeletal System

• Skull
  ▪ Connects to facial bones
    • Mandible
    • Maxillae
    • Nasal bones
    • Orbits
    • Zygomatic arches

continued on next slide
Skull

The skull consists of the cranium and face.
Musculoskeletal System

- Spinal column
  - Thirty-three vertebrae
  - Essential for movement, sensation, and vital functions
- Thorax
  - Contains the heart, lungs, and major blood vessels
  - The thorax protects the heart, lungs, and major blood vessels
Spinal Column

The divisions of the spine.

- Cervical 1-7
- Thoracic 1-12
- Lumbar 1-5
- Sacrum
- Coccyx
Musculoskeletal System

- Pelvis
  - Ilium
  - Ischium
  - Pubis
  - Hip joint
    - Acetabulum
    - Ball at proximal end of femur

continued on next slide
Musculoskeletal System

- Lower extremities
  - Femur
  - Patella
  - Tibia
  - Fibula
  - Ankle
    - Lateral malleolus
    - Medial malleolus

continued on next slide
Musculoskeletal System

• Lower extremities
  ▪ Foot
    • Metatarsals
    • Calcaneus
      • Heel
    • Phalanges
      • Toe bones

continued on next slide
Musculoskeletal System

• Upper extremities
  ▪ Clavicle
  ▪ Scapula
  ▪ Acromion process
    • Acromioclavicular joint
  ▪ Humerus
  ▪ Radius
  ▪ Ulna

continued on next slide
Musculoskeletal System

• Upper extremities
  ▪ Wrist
    • Carpals
  ▪ Hand
    • Metacarpals
    • Phalanges are finger bones.
Skeletal System

The skeleton.
Musculoskeletal System

• Joints
  ▪ Formed when bones connect to other bones
  ▪ Two types of joints
    • Ball-and-socket
    • Hinge
Musculoskeletal System

• Muscles
  ▪ Voluntary (skeletal)
  ▪ Involuntary (smooth)
  ▪ Cardiac
    • Automaticity
      • Heart has ability to generate and conduct own electrical impulses
Muscle

Three types of muscle.
Respiratory System

- Brings in oxygen via inhalation
- Excretes carbon dioxide via exhalation

continued on next slide
Respiratory Anatomy

• Air enters body through the mouth and nose.
• It moves through the oropharynx and the nasopharynx.
  ▪ The pharynx includes both areas.
• Air moves toward the lungs.
• Epiglottis
  ▪ Closes over glottis

continued on next slide
Respiratory Anatomy

- **Larynx**
  - Voice box containing vocal cords
  - Cricord cartilage forms lower portion.
- **Trachea**
- **Lungs**
  - Bronchi
  - Alveoli
- **Diaphragm**
Respiratory System

The respiratory system.
Respiratory Physiology

• Inhalation (active process)
  ▪ Diaphragm and intercostal muscles contract; diaphragm moves downward and ribs move upward and outward.
  ▪ Negative pressure pulls air into lungs.

continued on next slide
Respiratory Physiology

- Exhalation (passive process)
  - Diaphragm and intercostal muscles relax.
  - Positive pressure pushes air out of lungs.
  
  *continued on next slide*
Respiratory Physiology

• Ventilation
  ▪ Movement of gases to and from alveoli

• Respiration
  ▪ Exchange of gases between cells and bloodstream

continued on next slide
Respiratory Physiology

- Oxygenated blood is carried from the lungs to heart, then is pumped to rest of the body.
- At the cellular level, oxygen (O$_2$) is exchanged with cells for waste carbon dioxide (CO$_2$).
- Deoxygenated blood returns to the heart, then to lungs to exchange waste CO$_2$ for O$_2$. 
Respiratory Physiology

- Child has smaller nose and mouth.
- In child, more space is taken up by tongue.
- Child’s trachea is narrower.
- Cricoid cartilage is less rigid and less developed.
- Airway structures are more easily obstructed.

Comparison of child and adult respiratory anatomies.
Cardiovascular System

- Heart
- Blood
- Blood vessels
Anatomy of the Heart

• Four chambers
  ▪ Two atria (upper areas)
  ▪ Two ventricles (lower areas)

• Pathway of blood through heart
  ▪ Right atrium
  ▪ Right ventricle
  ▪ Left atrium
  ▪ Left ventricle
Anatomy of the Heart

The path of blood flow through the heart.
Cardiac Conduction System

The cardiac conduction system.

1. Sinoatrial node (pacemaker)
2. Atrioventricular node
3. Atrioventricular bundle (Bundle of His)
4. Bundle branches
5. Purkinje fibers

Superior vena cava
Aorta
Left atrium
Purkinje fibers
Interventricular septum
Circulation of the Blood

- Important arteries to know:
  - Coronary arteries
  - Aorta
  - Pulmonary artery
  - Carotid artery
  - Femoral artery

continued on next slide
Circulation of the Blood

- Important arteries to know:
  - Brachial artery
  - Radial artery
  - Posterior tibial artery
  - Dorsalis pedis artery
Circulation of the Blood

From the heart, oxygen-rich blood is carried out into the body by arteries. The arteries gradually branch into smaller arteries called arterioles. The arterioles gradually branch into tiny vessels called capillaries.

In the capillaries, the blood gives up oxygen and nutrients, which move through the thin walls of the capillaries into the body’s cells. At the same time, carbon dioxide and other wastes move in the opposite direction, from the cells and through the capillary walls, to be picked up by the blood.

On its return journey to the heart, the oxygen-poor blood, now carrying carbon dioxide and other wastes, flows from the capillaries into small veins called venules which gradually merge into larger veins.

Arteries, capillaries, and veins.
Composition of the Blood

- **Plasma**
  - More than half the volume of the blood

- **Red blood cells**
  - RBCs, erythrocytes, red corpuscles

- **White blood cells**
  - WBCs, leukocytes, white corpuscles

- **Platelets**
  - Help with clotting
Pulse

- Pressure wave of blood flowing down an artery when the left ventricle contracts
- Can be felt by compressing an artery over a bone

continued on next slide
Pulse

- Peripheral (outer parts of body) pulse
  - Radial
  - Brachial
  - Posterior tibial
  - Dorsalis pedis
- Central (core of body) pulse
  - Carotid
  - Femoral

continued on next slide
Pulse

- Central (core of body) pulse
  - Pulses near the center part of the body
  - Carotid and femoral pulses can be felt even when peripheral pulses are too weak to be felt.
Blood Pressure

• Force blood exerts against the walls of blood vessels

• Systolic (upper reading)
  ▪ Arterial pressure when left ventricle contracts

• Diastolic (lower reading)
  ▪ Pressure when left ventricle refills
Perfusion

• Adequate circulation of blood and exchange of oxygen and waste products
• Hypoperfusion (shock)
  ▪ When flow becomes inadequate
Think About It

- How is the function of the respiratory system related to the function of the circulatory system?
Life Support Chain

- Interaction of respiratory system and cardiopulmonary system
- Perfusion
  - Cells oxygenated
  - Carbon dioxide removed
Lymphatic System

• Functions
  ▪ Capture fluid
  ▪ Maintain balance of fluid

continued on next slide
Lymphatic System

• Lymphoid organs
  ▪ Adenoids
  ▪ Tonsils
  ▪ Spleen
  ▪ Thymus
  ▪ Nodes

continued on next slide
Lymphatic System

• Avoid taking blood pressure on the side of a woman's body where a mastectomy has been performed.
Nervous System

The nervous system.
Nervous System

- Central nervous system
  - Brain
  - Spinal cord
- Peripheral nervous system
  - Sensory nerves
  - Motor nerves
- Autonomic nervous system
  - Involuntary motor functions
Digestive System

- Provides the mechanisms by which food travels through the body and is digested
- Consists of:
  - Stomach
  - Small intestine
  - Large intestine

continued on next slide
Digestive System

- Accessory organs
  - Liver
  - Gallbladder
  - Pancreas
  - Spleen
  - Appendix
Integumentary System

- Functions
  - Protection
  - Water balance
  - Temperature regulation
  - Excretion
  - Shock (impact) absorption

continued on next slide
Integumentary System

- Layers
  - Epidermis
  - Dermis
  - Subcutaneous
Integumentary System

The layers of the skin.
Endocrine System

• Produces hormones that regulate many body activities and functions
• Pancreas
• Adrenal glands
  ▪ Secrete epinephrine
Endocrine System

The endocrine system.
Renal System

- Urinary system
- Helps the body regulate fluid levels, filter chemicals, and adjust body pH
- Kidneys
  - Principal organs
- Bladder
  - Fluid reservoir for urine
Renal System

The renal/urinary system.
Renal System

- Ureters
  - Transport urine to bladder from kidneys
- Urethra
  - Excretes urine from the bladder to external environment
Reproductive System

• Female reproductive system
  ▪ Ovaries
  ▪ Uterus
  ▪ Vagina
Female Reproductive System

The female reproductive system.
Reproductive System

• Male reproductive system
  ▪ Testes
  ▪ Penis
Male Reproductive System

The male reproductive system.
Chapter Review
• As an EMT, your knowledge of the anatomy, or structure, and the functions, or physiology, of the body will be important in allowing you to assess your patient and communicate your findings with other EMS personnel and hospital staff accurately and efficiently.
Chapter Review

- Major body systems with which you should be familiar:
  - Musculoskeletal system
  - Respiratory system
  - Cardiovascular system
  - Nervous system
  - Digestive system

continued on next slide
Chapter Review

- Major body systems with which you should be familiar:
  - Integumentary system
  - Endocrine system
  - Renal system
  - Reproductive systems (male and female)
Remember

- Cellular metabolism requires a constant supply of oxygen and glucose; absence of either component disrupts normal metabolism.
- Cardiopulmonary system combines the functions of respiratory and cardiovascular systems to provide oxygen at the cellular level.

continued on next slide
Remember

- Shock occurs when the cardiopulmonary system fails and cells become hypoperfused.
- The body is composed primarily of water, and this fluid is distributed throughout the body systems.
Questions to Consider

• When evaluating a patient with a cardiac problem, consider the impact on the respiratory system. When evaluating a patient with a respiratory problem, consider the impact on the cardiovascular system. What impacts do problems in these systems have on each other?

continued on next slide
Questions to Consider

• Shock must be recognized immediately. What is the pathophysiology of shock?
Critical Thinking

• You are treating a patient who was recently released from the intensive care unit with a massive infection (sepsis). This has impaired the patient's ability to regulate the size of the blood vessels.
Critical Thinking

• How might this affect the patient's ability to compensate for any additional illnesses? What steps should you take to help this patient compensate?
CHAPTER 7

Ventilation, Perfusion, and Shock: Understanding Pathophysiology
Multimedia Directory

Slide 15  Cell Structure Video
Slide 47  Transport of Carbon Dioxide Animation
Topics

- The Cell
- The Cardiopulmonary System
- Shock
- Pathophysiology of Other Systems
Introduction to Pathophysiology

- Study of how disease processes affect function of body
- Understanding helps you recognize changes patient is going through due to illness or injury
The Cell
The Cell

- Cell membrane protects and selectively allows water and other substances in and out of the cell.
- Mitochondria convert glucose and other nutrients into adenosine triphosphate (ATP).
  - Fuel for cell functions
  - Without ATP, many of the cell's specialized structures cannot function.
The cell.
Water and the Cell

- Cells need the correct balance of water inside and outside.
  - Too little water
    - Cell dehydrated and dies
  - Too much water
    - Basic cellular function interrupted
- Water also affects levels of electrolytes.
  - Impacts electrical functions
Think About It

- Draw an analogy between cell metabolism and how a refinery turns crude oil into gasoline for use in automobiles.
Glucose and the Cell

- Building block for energy
- Supply of insulin must match the body's glucose requirement.
Oxygen and the Cell

• Aerobic metabolism
  ▪ Cellular functions using oxygen

• Anaerobic metabolism
  ▪ Cellular functions not using oxygen
    • Creates much less energy and much more waste
    • Body becomes acidic, impairing many body functions.
Aerobic metabolism. Glucose broken down in the presence of oxygen produces a large amount of energy (ATP).
Oxygen and the Cell

Anaerobic metabolism. Glucose broken down without the presence of oxygen produces acidic by-products and only a small amount of energy (ATP).
The Vulnerability of Cells, Organs, and Organ Systems

- Many diseases alter the permeability of membrane.
- Ineffective cell membrane can allow substances into the cell that should not be there.
- These substances can interfere with the regulation of water.
Cell Structure Video

Click on the screenshot to view a video on the topic of cell structure.

Back to Directory
The Cardiopulmonary System
The Cardiopulmonary System

- Respiratory and cardiovascular systems work together.
  - Bring oxygen into body
  - Distribute to cells
  - Remove waste products
- Any breakdown can result in system failure.
The bronchial tree. Each mainstem bronchus enters a lung then branches into smaller and smaller bronchi, ending in the smallest bronchioles.
(A) Each bronchiole terminates in a tiny air pocket called an alveolar sac. (B) The alveoli are encased by networks of capillaries; oxygen and carbon dioxide are exchanged between the air in the alveoli and the blood in the capillaries.
The Airway

- Must have an open (patent) airway for system to function
- Upper airway obstructions are common.
  - Caused by foreign bodies, infection, or trauma
The Lungs

- Part of lower airway
- Tidal volume
  - Volume of air moving in and out during each breath cycle
- Tidal volume \times \text{respiratory rate} = \text{minute volume}
  - Amount of air moved in and out of lungs in one minute

continued on next slide
The Lungs

- Any change in tidal volume or respiratory rate reduces minute volume.
- Respiratory dysfunction occurs any time something interferes with minute volume.
Respiratory Dysfunction

- Disruption of respiratory control
  - Respirations controlled in brain by the medulla oblongata
  - Any event impacting function of the medulla oblongata can affect minute volume
    - Infection, drugs, toxins, trauma

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Respiratory Dysfunction

• Disruption of pressure
  ▪ If wall of thorax is compromised (punctures, rib fractures), ability to inhale and exhale is impacted and minute volume is reduced.
  ▪ Air or blood accumulating in chest (pleural space) also compromises respiration.

continued on next slide
Respiratory Dysfunction

- Disruption of lung tissue
  - Trauma or medical problems can compromise the ability of alveoli to exchange gases.
  - Less oxygen gets in; less carbon dioxide gets out.
  - Can result in low oxygen levels (hypoxia) and high carbon dioxide levels (hypercapnia)
Respiratory Compensation

- Body attempts to compensate for gas exchange deficits.
- Chemoreceptors detect changing oxygen and carbon dioxide levels.
- Brain stimulates respiratory system to increase rate and/or tidal volume.
The Blood

- Four parts
  - Plasma (liquid)
  - Red blood cells
    - Contain oxygen-carrying hemoglobin
  - White blood cells
    - Fight infection
  - Platelets
    - Form clots

continued on next slide
The Blood

• Plasma oncotic pressure
  ▪ Proteins in plasma attract water away from are around cells and pulls it into bloodstream.

• Hydrostatic pressure
  ▪ Water pushed back out of blood vessels towards cells.

• Problems with these proteins can cause an imbalance.
Blood Dysfunction

- Without enough blood, oxygen and carbon dioxide cannot be properly moved around.
  - Bleeding
  - Dehydration
  - Anemia
  - Liver failure
The Blood Vessels

The network of arteries, veins, and capillaries.
The Blood Vessels

- Take oxygenated blood from lungs via heart to capillaries
- Where gas exchange takes place
  - Between cells and capillaries
- Return blood to lungs via heart for gas exchange
  - Between capillaries and alveoli

continued on next slide
The Blood Vessels

• Need adequate pressure to make cycle work
• Pressure controlled by changing diameter of blood vessels
• Stretch receptors monitor pressure.
• Pressure can be increased or decreased depending on situation.
Blood Vessel Dysfunction

• Loss of Tone
  ▪ Vessels lose ability to constrict and dilate.
  ▪ Pressure drops
  ▪ Causes
    • Trauma
    • Infection
    • Allergic reaction
Blood Vessel Dysfunction

(A) Normal vessel

(B) Dilated vessel with reduced blood volume

Dilated blood vessel.
Blood Vessel Dysfunction

- Excessive permeability
  - Capillaries leak fluid out their walls.
  - Caused by severe infection (sepsis), high altitude, and certain diseases
Blood Vessel Dysfunction

Increased permeability allows too much fluid to escape through capillary walls.
Blood Vessel Dysfunction

- Hypertension
  - Systemic vascular resistance (SVR)
  - Pressure inside vessels
  - Various conditions lead to abnormal constriction of vessels, leading to dangerously high pressures (hypertension).
  - Major risk factor in stroke and heart disease
The Heart

- Pump with average stroke volume (output) of about 70 mL blood per contraction

continued on next slide
The Heart

- Stroke volume is based on:
  - Preload
    - Amount of blood returning to heart
  - Contractility
    - How hard heart squeezes
  - Afterload
    - Pressure the heart has to pump against to force blood out into the system
Cardiac Output

- Stroke volume $\times$ beats per minute = cardiac output
- Slowing heart rate or decreasing stroke volume reduces cardiac output.
- Very fast heart rates reduce cardiac output.
  - Inadequate time for heart to refill between contractions
Heart Dysfunction

- Mechanical problems
  - Physical trauma
  - Squeezing forces
  - Cell death (heart attack)
- Electrical problems
  - Damage to heart's ability to regulate rate
The Cardiopulmonary System: Putting It All Together

• Entire cardiopulmonary system must work together to maintain life.
• Must be a balance between ventilation (V) and perfusion (Q) for system to work properly
  ▪ V/Q match
• Any breakdown in system impacts ratio causing possible life-threatening situation.
Shock
Shock

• Perfusion
  ▪ Regular delivery of oxygen and nutrients to cells and removal of waste products

• Hypoperfusion
  ▪ Breakdown in system
    • Can result in death of patient
Four Categories of Shock

- Hypovolemic
- Distributive
- Cardiogenic
- Obstructive
Recognizing Compensation

• When problems arise, body attempts to compensate.
• Signs of compensated shock
  ▪ Slight mental status changes
  ▪ Increased heart rate
  ▪ Increased respiratory rate
  ▪ Delayed capillary refill time
  ▪ Pale, cool, clammy skin
  ▪ Sweating
Transport of Carbon Dioxide Animation

Click on the screenshot to view an animation on the subject of the transport of carbon dioxide.

Back to Directory
Pathophysiology of Other Systems
Fluid Balance

• Body is 60 percent water.
  - Intracellular (70 percent)
  - Intravascular (5 percent)
  - Interstitial (25 percent)
Fluid Balance

Water comprises approximately 60 percent of body weight. The water is distributed into three spaces: intracellular, intravascular, and interstitial.
Fluid Balance

- Brain and kidneys regulate thirst and elimination of excess fluid
- Blood plasma proteins pull fluid into the bloodstream
- Cell membrane and capillary permeability regulate flow in and out
Disruptions of Fluid Balance

- Fluid loss (dehydration)
  - Decrease in total water volume
- Poor fluid distribution
  - Water not getting to where it needs to go
  - Edema
    - Too much water in some parts of the body
The Nervous System

• Brain and spinal cord are well-protected by skull and spine.
  ▪ Covered by several protective layers (meninges) and a layer of shock-absorbing fluid (cerebrospinal fluid)
  ▪ Still subject to damage from trauma or disease
Nervous System Dysfunction

- Trauma
  - Motor-vehicle crashes
  - Falls
  - Diving accidents

continued on next slide
Nervous System Dysfunction

- Medical dysfunction
  - Strokes
  - Infection (meningitis, encephalitis)
  - Disease (Lou Gehrig disease, MS)
  - Low blood sugar (hypoglycemia)
The Endocrine System

- Glands secrete hormones.
- Hormones send chemical messages to the body to control body functions.

continued on next slide
The Endocrine System

- Major organs of system
  - Brain
  - Kidneys
  - Pancreas
  - Pituitary gland
  - Thyroid gland
  - Adrenal glands
Endocrine System Dysfunction

- Organ or gland problems
- Present at birth or result of illness
- Too many hormones
  - Graves' disease (too much thyroid hormone)
  - Problems with heart rate and temperature regulation
- Not enough hormones
  - Diabetes
The Digestive System

• Allows food, water, and other nutrients to enter the body

• Major organs of system
  ▪ Esophagus
  ▪ Stomach
  ▪ Intestines
Digestive Dysfunction

- Impacts hydration levels and nutrient transfer
- Gastrointestinal bleeding
  - Can be slow
    - Chronic bleeding
  - Can be massive, with rectal bleeding and/or vomiting blood

continued on next slide
Digestive Dysfunction

• Vomiting and diarrhea
  ▪ Most common disorders
  ▪ Variety of causes
  ▪ May result in malnutrition and dehydration
The Immune System

• Responsible for fighting infection
• Responds to specific body invaders by identifying them, marking them, and destroying them
Hypersensitivity (Allergic Reaction)

- Allergic reaction to certain food, drugs, other substances
- Result of exaggerated immune response
- Chemicals affect more than just invader.

continued on next slide
Hypersensitivity (Allergic Reaction)

- Produces edema
- Results in a rapid drop in blood pressure
- Can be life threatening
Chapter Review
Chapter Review

• Pathophysiology allows us to understand how negative forces impact the normal function of the body.

• Pathophysiology helps us understand how common disorders cause changes in the body.

continued on next slide
Chapter Review

• Understanding how the body compensates for insults sheds light on the signs and symptoms we may see during assessment.

• Understanding what compensation looks like helps us rapidly identify potentially life-threatening problems.
Remember

- Cellular metabolism requires a constant supply of oxygen and glucose. Absence of either component disrupts normal metabolism.
- Cardiopulmonary system combines the functions of respiratory and cardiovascular systems to provide oxygen at the cellular level.

continued on next slide
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You are treating a patient who was recently released from the intensive care unit with a massive infection (sepsis). This has impaired the patient's ability to regulate the size of the blood vessels.

continued on next slide
Critical Thinking

- How might this affect the patient's ability to compensate for any additional illnesses? What steps should you take to help this patient compensate?
CHAPTER 8

Life Span Development
Topics

- Infancy (Birth to 1 Year)
- Toddler Phase (12–36 Months)
- Preschool Age (3–5 Years)
- School Age (6–12 Years)
- Adolescence (13–18 Years)
- Early Adulthood (19–40 Years)
- Middle Adulthood (41–60 Years)
- Late Adulthood (61 Years and Older)
Infancy (Birth to 1 Year)
Infancy (Birth to 1 Year)

A newborn infant.
Infancy (Birth to 1 Year)

- Physiological
  - 3.0–3.5 kg (6.6–7.7 lbs) at birth
  - Weight doubles by six months; triples by twelve months.
  - Head 25 percent of total body weight
  - Airway narrow; easily obstructed
  - Nose and diaphragm used for breathing

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Infancy (Birth to 1 Year)

• Physiological
  - Antibodies passed from mother to child in pregnancy
  - Antibodies also passed through breastfeeding

continued on next slide
Infancy (Birth to 1 Year)

- Physiological
  - Moro reflex (startle)
    - Throws arms out, spreads fingers, grabs with fingers and arms
  - Palmar reflex
    - Grasps objects placed in palm
  - Rooting reflex (hunger)
    - Turns toward side of head touched

continued on next slide
Infancy (Birth to 1 Year)

- Physiological
  - Sucking reflex
    - Sucks when lips are stroked
  - Sleep patterns
    - Begin to regulate after two to four months
    - Then sleeps through night
  - Extremities grow from a combination of growth plates and epiphyseal plates.

continued on next slide
Infancy (Birth to 1 Year)

• Physiological
  ▪ Fontanelles not fused at birth
    • Posterior fontanelle closes in two or three months.
    • Anterior fontanelle closes between nine and eighteen months.

continued on next slide
Infancy (Birth to 1 Year)

- Physiological
  - Sunken fontanelles indicate dehydration.
  - Bulging fontanelles indicate increased pressure inside skull.
Infancy (Birth to 1 Year)

- Psychosocial
  - Bonding
  - Trust versus mistrust
  - Scaffolding
  - Temperament
Toddler Phase (12–36 Months)
Toddler Phase (12–36 Months)

A year-old infant.
Toddler Phase (12–36 Months)

- Physiological
  - Pulmonary system
  - Nervous system
  - Musculoskeletal system
  - Immune system
  - Teeth
Toddler Phase (12–36 Months)

• Psychosocial
  ▪ Begins to understand cause and effect
  ▪ Develops separation anxiety
  ▪ Begins to develop "magic thinking," imagination, and engages in play-acting
Toddler Phase (12–36 Months)

A toddler.
Preschool Age (3–5 Years)
Preschool Age (3–5 Years)

A preschooler. © Daniel Limmer
Preschool Age (3–5 Years)

- **Physiological**
  - Body systems continue to develop.

- **Psychosocial**
  - Developing interactive and social skills
School Age (6–12 Years)
School Age (6–12 Years)

School-age children. © Shutterstock.com
School Age (6–12 Years)

- Physiological
  - Loss of primary teeth
- Psychosocial
  - Less general supervision
  - Developing decision-making skills
  - More awareness of self-esteem
  - Values opinions of peers (positive or negative)
Adolescence (13–18 Years)
Adolescence (13–18 Years)

An adolescent.
Adolescence (13–18 Years)

• Physiological
  ▪ Rapid two- to three-year growth spurt
  ▪ Sexual maturity
Adolescence (13–18 Years)

- Psychosocial
  - Strives for independence
  - Concern about body image and peer pressure
  - May be prone to self-destructive behaviors
  - Developing personal code of ethics
Think About It

- Adolescents are often injured because of risk taking.
  - May be resistant to disclose what happened
  - Must be encouraged to explain circumstances surrounding an incident
Early Adulthood (19–40 Years)
Early Adulthood (19–40 Years)

A young adult.
© Shutterstock.com
Early Adulthood (19–40 Years)

- **Physiological**
  - Lifelong habits formed
  - Reaches peak physical condition
- **Psychosocial**
  - Job and family stress
  - Marriage, childbirth, and child rearing
  - Accidents leading cause of death
Middle Adulthood (41–60 Years)
Middle Adulthood (41–60 Years)

A middle-aged adult. © Royalty Free/Masterfile
Middle Adulthood (41–60 Years)

- **Physiological**
  - May need vision correction
  - Cancer, heart disease often develop.
  - Weight control more difficult
- **Psychosocial**
  - Empty-nest syndrome
  - Caring for elderly parents
Late Adulthood (61 Years and Older)
Late Adulthood (61 Years and Older)

An older adult.
© Shutterstock.com
Late Adulthood (61 Years and Older)

• Physiological
  ▪ Body systems less efficient

• Psychosocial
  ▪ Living environment
  ▪ Self-worth
  ▪ Financial burdens
  ▪ Death and dying
Chapter Review
Chapter Review

• Understanding the basic physiological and psychosocial development for each age group will assist you in communicating with and assessing patients of various ages.
Chapter Review

- Physiological differences between the ages will affect your care. Examples include differences in the respiratory systems of younger patients and the effect of preexisting medical conditions of older patients.

continued on next slide
• Infants and young children have less developed and smaller respiratory structures, which can make respiratory conditions worse.
Chapter Review

• Your ability to communicate with younger patients will depend on their stage of development. This can range from fear of strangers to separation anxiety from parents and embarrassment during adolescence. Older patients may have issues with denial or depression over medical conditions.
Remember

- Infants present massive bursts of anatomical and psychosocial development in the first year of life.
- Although preschoolers begin to develop independence and reason, in many ways they still resemble the psychosocial development of toddlers.

continued on next slide
Remember

- School-age children often are independent and logical, but that may crumble with illness or injury.
- Adolescents are reaching physiological maturity, but they often face difficult psychosocial challenges.

continued on next slide
Remember

• Early, middle, and late adults vary greatly in terms of physiological development and conditioning; they also face psychosocial challenges unique to adulthood.
Questions to Consider

• How do I approach a patient most effectively based on developmental characteristics?
• Does the age of my patient pose any assessment or care challenges based on physiologic development?
Critical Thinking

• You are called for abdominal pain in a 16-year-old girl. She is with friends at the park. She seems hesitant to answer any of your questions. What characteristic of adolescent development is most likely the cause of this? How could you overcome it?