Learning Objectives

• Identify roles of the emergency medical services (EMS) community in injury prevention.
• Describe the epidemiology of trauma in the United States.
• Define injury.

Learning Objectives

• Describe Haddon’s matrix and the injury triangle.
• Relate how alterations in the epidemiological triangle can influence injury and disease patterns.

Injury Epidemiology

• Unintentional injuries are the leading cause of death in ages 1–44
  – Fifth leading cause overall
  – Result in more years of life lost before age 65
  – 120,000 injury-related deaths in the United States in 2006
Injury Epidemiology

- Financial view
  - Effect of fatal and nonfatal unintentional injuries was $652.1 billion in 2006
  - Equaled $5,700 per household
  - Quality of life lost valued at $3,080.1 billion
  - Total cost: $3,732.2 billion in 2006
- 36% of emergency department visits in the United States are related to injury
  - Accounts for 41 million + visits to emergency departments in 2005

Injury Prevention Overview

- Primary injury prevention
  - Injury control strategy of preventing rather than treating injury
- Preventive strategies
  - More lives saved, less money spent
  - Identifying strategies weighs heavily on data collected
  - Success depends on teaching patients
Injury Prevention Overview

- Paramedics
  - Respected in community
  - Welcomed in homes, businesses
  - Can find injury patterns, intervene on behalf of persons at risk

Injury Concepts

- Injury definition
  - Unrelated nature of injuries hindered study of injury
- All injuries are the result of:
  - Tissue damage caused by the transfer of energy to the human body
  - Tissue damage caused by the absence of needed energy elements, such as heat or oxygen
Injury Triangle

- Factors necessary to cause disease
  - Host = victim
  - Agent = energy
  - Environment = place for agent and host to meet

Haddon’s Matrix

- “Father” of injury prevention
- Injury sequence
- Three factors of injury triangle placed in timeline
  - Pre-event
  - Event
  - Post-event

Haddon’s Matrix

- Pre-event phase
  - Period before release of injury-causing energy
  - Performance > task demands
  - Energy under control
  - Events influence likelihood of injury
  - Primary injury prevention occurs
  - Time frame: seconds to years
Haddon’s Matrix

- Event phase
  - Performance < task demands
  - Release of uncontrolled energy
  - Time frame: fraction of second to minutes
  - Events affect transmission of energy
  - Secondary injury prevention centered on reducing severity of injury occurring

Haddon’s Matrix

- Post-event phase
  - Period after injury
  - Time frame: seconds to years
  - Tertiary injury prevention occurs to lessen long-term adverse effects
  - Traditional EMS exists

3 E’s of Injury Prevention

- Education
  - Persuade high-risk groups to change risky behavior
  - Teach to adopt safety precautions
  - Active countermeasure
  - Most used approach
  - Most effective with enforcement, engineering
  - Educational programs
3 E’s of Injury Prevention

- Education: educational programs
  - Alcohol, drug prevention
  - Burn prevention
  - Drowning prevention
  - Elder safety
  - Fall prevention
  - Pedestrian, bicycle safety
  - Poison prevention
  - School safety and school-based programs
  - Sports safety
  - Suicide prevention
  - Violence prevention

- Enforcement
  - Occurs through force of law
  - Requires person to adopt behaviors to reduce risk
  - Active countermeasure
  - Success depends on compliance, ability to enforce
  - More effective than education alone

- Enforcement: strategies proven to reduce vehicle-related injuries
  - Child restraint laws
  - “Click It or Ticket” programs
  - Ignition interlock programs for repeat offenders
  - Minimum drinking age laws
  - Reducing legal blood alcohol concentrations
  - Sobriety checkpoints, DUI enforcement
  - Speed limit enforcement
  - Zero tolerance for young drivers
3 E’s of Injury Prevention

• Engineering
  – Product or environmental design
  – Provides protection or decreases likelihood of injury
  – Builds safety into product
  – Passive countermeasure
  – Most effective of 3 E’s
  – Most expensive

3 E’s of Injury Prevention

• Engineering for preventing injury to paramedics
  – Disposable equipment
  – Latex gloves
  – Needleless syringes, injection ports
  – Nonslip footwear, nonskid surfaces
  – Particulate air filters, masks
  – Personal protective equipment
  – Sharps containers

Why do you think engineering controls would be the most effective?
Lesson 3.2
Principles and Feasibility of EMS in Public Health

Learning Objectives
• Describe public health goals and activities.
• Outline the aspects of the emergency medical services system that make it a desirable resource for involvement in public health activities.

Learning Objectives
• Describe essential activities for the active participation of emergency medical services in community wellness activities.
• List situations in which paramedics may participate in injury prevention.
• Evaluate a situation to determine opportunities for injury prevention.
Public Health

• Field of medicine dealing with physical and mental health of community
• Focus more on disease prevention than disease treatment
• Important areas
  – Water supply
  – Waste disposal
  – Air pollution
  – Food safety

Public Health

• Health goals and accomplishments
  – Widespread vaccination programs
  – Clean drinking water, sewage systems
  – Infectious disease decline
  – Fluoridated water supplies
  – Reduction in tobacco product use
  – Prenatal care services

Public Health Laws, Regulations, Guidelines

• Provided by local, state, and federal government agencies
• Important roles
  – Physicians
  – Nurses
  – EMS personnel
  – Hospitals
  – Clinics
  – Public service agencies
  – Other government and nongovernment agencies
Feasibility of EMS Involvement in Public Health

- Greater than 840,669 EMS personnel in the United States
- Reflects diversity of population it serves
- Valuable human resource

Feasibility of EMS Involvement in Public Health

- EMS interface with public health and injury prevention
  - Often most medically educated persons in rural areas
  - Role models with high profiles
  - Seen as champions of customer

Feasibility of EMS Involvement in Public Health

- EMS interface with public health and injury prevention
  - Welcome in homes, schools, and other settings
  - Seen as authorities on injury prevention
  - Often first to spot situations that pose risk for illness or injury
Can you remember any program that a firefighter or paramedic taught you when you were a child? How did you feel about the firefighters and paramedics?

What advantages do prehospital providers have over hospital providers that make them ideal for community prevention activities?

Community Leadership Activities

- Require community to successfully participate
  - Protect EMS personnel from injury
- Safety policies during response, at scene, during transportation
  - Traffic safety laws
  - Public education
  - Law enforcement, fire service personnel
  - Other public service agencies
  - Personal protective equipment
  - Reduce exposure to communicable diseases, hazmat
Do you know an emergency medical services provider who was injured on the job? How did the injury occur? Can you identify any measures that could have prevented it?

Community Leadership Activities

• Provide education to EMS personnel
  – Primary and continuing education programs should include basics of primary injury prevention
  – Community leaders should help create a liaison between EMS programs, public, and private specialty groups

Community Leadership Activities

• Support and promote the collection and use of injury data
  – Create policies that promote injury documentation
  – Review and modify tools for data collection so prompt data recording is feasible and realistic
  – Data collected should contribute to local, state, and national surveillance programs
How is the data within your EMS system used (or could be used) in state, provincial, and federal injury surveillance systems?

Community Leadership Activities

- Obtain support and resources for primary injury prevention activities
  - Provide budgetary support
  - Seek financial resources
  - Initiate or attend meetings of local organizations involved

Community Leadership Activities

- Obtain support and resources for primary injury prevention activities
  - Grants from state, national, and other groups help fund initiatives
  - Funding is not always easily obtainable
  - Regardless of funding, EMS workers have duty to provide prevention initiatives where event occurred
Community Leadership Activities

- Empower individual personnel to conduct primary injury prevention activities
- Community must promote interest and involvement from EMS personnel
- Support can influence individual participation
  - Providing rotating assignments to prevention programs
  - Providing salary for off-duty injury prevention activities
  - Rewarding and/or remunerating participation for on/off-duty prevention activities

Essential Paramedic Activities

- Knowing and practicing personal injury prevention strategies
  - Appropriate use of audible, visual warning devices
  - Availability, use of law enforcement
  - Exercise, conditioning
  - Practice on-scene survival techniques
  - Proper driving techniques
  - Recognize health hazards, high-profile crime areas
  - Safety restraint use

Essential Paramedic Activities

- Knowing and practicing personal injury prevention strategies
  - Secure equipment in patient care compartment
  - Safe approach to parking at and exiting the scene
  - Safe driving
  - Stress management
  - Traffic control
  - Use of on-scene survival resources
Essential Paramedic Activities

- Knowing and practicing personal injury prevention strategies
  - Use of personal protective equipment
  - Use of proper lifting, moving techniques
  - Personal wellness
- Knowledge of
  - Illnesses, injuries common to various age groups
  - Recreational activities
  - Workplaces
  - Other community facilities

What are ways to prevent common EMS work-related injuries?

Implementation and Prevention Strategies

- Use for patient care considerations
- Recognize signs/symptoms of exposure to danger, need for outside assistance
- Document primary care and injury data
- On-scene education essential
Implementation and Prevention Strategies

• Patient care considerations
  – Identify signs/symptoms of suspected abuse, potentially abusive situations
  – Preplanning helps identify outside resources

Implementation and Prevention Strategies

• Recognition of dangerous situations
  – Personal safety is priority
  – Recognize general, specific environmental hazards
  – Safety hazards in the home
  – Inadequate housing conditions
  – Inadequate food and clothing

Implementation and Prevention Strategies

• Recognition of dangerous situations
  – Absence of protective devices
  – Hazardous materials
  – Communicable disease
  – Signs of abuse or neglect
At some point, you will probably visit an older adult family member or friend. Can you identify any potential hazards that exist in that person’s home?

Implementation and Prevention Strategies

- Recognition of the need for outside resources
  - Providers of resources and services eager to assist with development of strategies
  - Municipal organizations
  - Community organizations
  - Religious organizations

Documentation

- Precise notes crucial
- Record of events
- Helpful to other care providers
- Gathering data useful in designing injury prevention strategies
Documentation

• Primary injury data
  – Scene conditions
  – Mechanism of injury
  – Use of protective devices
  – Absence of protective devices
  – Risks at scene
  – Other factors noted by EMS agency

On-Scene Education

• Teachable moment
  – Patient, family may be open to prevention tips and strategies
  – Assess hazards in environment
  – Provide on-scene, one-on-one prevention education
  – Involves three-step process

On-Scene Education

• Teachable moment: observe the scene
  – Look for contributing factors, hazards that may have caused injury
  – Floor rugs without nonslip backing
  – Inoperable smoke detectors
On-Scene Education

- Teachable moment: gather information
  - From individuals and observers
  - What was seen?
  - Why do they think the injury occurred?
  - Has this been a common occurrence?

On-Scene Education

- Teachable moment: make assessments
  - Make decisions from information gathered
  - If situation is critical or noncritical, a teachable moment exists
  - Observations and history taking are steps to decide whether high-risk persons, high-risk behaviors, or high-risk setting exist
  - Based on assessments, create a remedy

What are some call situations that would be appropriate for the “teachable moment”? 
On-Scene Education

• Common on-scene remedies
  – Discussion
  – Discuss behavior or action with person at risk
  – Injury prevention discussions (30- to 60-second process)
  – Message must be in a patient-appropriate manner
  – Manner depends on age, education, and socioeconomic status
  – Conveyed in nonjudgmental tone of voice

On-Scene Education

• Demonstrate
  – Proper behavior as strategy
  – Replace safety cap on pill bottle, explain importance
  – Put fresh battery in smoke detector
  – Move throw rug on slippery floor to safer location
  – Draw attention to likely hazards, work to prevent future injury

On-Scene Education

• Document
  – What was seen, heard, done
  – Written histories allow follow-up, data-gathering efforts
  – Histories make easier review for EMS organization to improve injury prevention
Other Injury Prevention Roles

- Support legislative change
- Get involved in primary prevention programs

Lesson 3.3
Prevention Programs Participation

Learning Objectives

- Differentiate among primary, secondary, and tertiary health prevention activities.
- Identify resources necessary to conduct a community health assessment.
- Describe strategies to implement a successful injury prevention program.
Participation in Prevention Programs

• Effective programs first call for community health assessment
• Assessment needed before intervention can take place, before education can start

Participation in Prevention Programs

• Systemic approach to health assessment and prevention program includes:
  – Gather information, identify problem population
  – Identify prevention strategies
  – Choose best strategy
  – Develop plan
  – Implement plan
  – Evaluate, revise plan as needed
Community Health Assessment

- Paramedics have limited time and resources for prevention and wellness promotion
- Maximize time and resources by identifying target for community health education
- Overall view of health of community can yield valuable data, unexpected data

Community Health Assessment

- Assessment conducted more effectively through group effort with other health agencies
  - Population demographics
  - Morbidity statistics
  - Mortality statistics
  - Crime, fire information
  - Community resource allocation
  - Hospital data
  - Senior citizen needs
  - Education standards
  - Recreational facilities
  - Environmental conditions
  - Other factors
Community Health Assessment

- Can identify factors that relate and contribute to certain health risks
- After assessment, choose target for health education carefully, use fitting intervention
- Compare data from assessment with another population with similar demographics

Community Health Intervention

- Put plan in place that attempts to reduce risk
- Plan should attempt to improve health of community
- Levels of health prevention activities
  - Primary, secondary, tertiary

Community Health Intervention

- Primary prevention
  - Prevents problems and disease before they occur
  - Seatbelt education
  - Laws to require bike helmets
  - Vaccination programs
Community Health Intervention

• Secondary prevention
  – Find issues and promote early intervention
  – Prevent complications and/or progression of disease
  – Health screenings to detect hypertension

• Tertiary prevention
  – Correct and prevent further deterioration of disease or problem
  – Provide EMS services in community

Community Health Education

• Prevention program must serve entire target population
• Community must improve education, training for EMS and other public service agencies
• Special groups can be included in prevention programs
  – Ethnic, cultural, religious groups
  – Non-English-speaking populations
  – Learning disabled
  – Physically challenged

• Consider reading level and age of target population
  – Helps prepare educational material
  – Makes material more effective

• Before start of large-scale educational program, test program on target audience
  – Evaluates appeal of materials, ensures understanding of message
Community Health Education Promotion

• Verbal
  – Lectures
  – Informal discussions
  – Informal teaching on EMS call
  – Podcasts
  – Radio programs

Community Health Education Promotion

• Written/static visual
  – Bulletin boards, exhibits
  – Flyers, pamphlets, posters
  – Models
  – Slides, photographs

• Dynamic visual
  – Videotapes
  – Television
  – Internet resources

What method of health education is most likely to change your personal behavior? Would that same method be equally effective for a 5-year-old or a 70-year-old person?
Summary

• EMS providers are members of the community health care system and can be important resources in injury prevention
• Unintentional injuries are the fifth leading cause of death, exceeded only by heart disease, cancer, stroke, and COPD
• The United States has over than 840,000 EMS personnel who play a major role in public education

Summary

• Paramedics playing an active role in the health of a community is crucial
  – Must protect EMS worker from injury
  – Provide education to paramedics
  – Supply support and promote collection and use of injury data
  – Obtain resources for primary injury prevention activities
  – Empower paramedics to conduct primary injury prevention

Summary

• Paramedics must have a basic knowledge of personal injury prevention
  – Should know about maladies and injuries common to various age groups, recreation activities, workplaces, and other facilities in community
• Paramedics need to spot the signs and symptoms of abuse and abusive situations
  – Should notice exposure to danger
Summary

• Paramedics should identify and use outside community resources
  – Document primary injury data properly
  – Identify and properly use “teachable moments”
• Paramedics must maximize time and resources
  – Should identify targets for community health education
    • Perform community health assessment

Summary

• To identify community education goals, paramedics must understand several factors:
  (1) illness or injury is related to extent or exposure to agent;
  (2) illness or injury also is related to strength of agent;
  (3) illness or injury is linked to susceptibility of individual (host); and
  (4) illness or injury is related to biological, social, and physical environment

Summary

• Primary injury prevention involves preventing injury from occurring
  – Secondary and tertiary prevention help to prevent further problems from event that has already occurred
Summary

- Good injury prevention programs must serve the whole target population in a community
  - Take into account reading level and age
  - Mark of a successful program
  - Can provide community health education in diverse ways, such as verbal, written/static material, and dynamic visual

Questions?