EMS Subspecialty Certification Review Course

Occupational Health

2025

1

ABEM EMS Core Content

2.3.3.1	Occupational culture of safety
2.3.3.1.1	Occupational health
2.3.3.1.2	Knowledge of regulations and standards (e.g., National Fire Protection Association [NFPA] 1582, Ryan White Act, Occupational Safety and Health Administration [OSHA] requirements)
2.3.3.2	Exposure to communicable disease
2.3.3.2.1	Standard PPE precautions
2.3.3.2.2	Appropriate use of PPE for various infectious agents (contact vs. droplet vs. airborne precautions)
2.3.3.2.3	Body substance exposure
2.3.3.2.3.1	Knowledge of Centers for Disease Control and Prevention (CDC) guidelines for human immunodeficiency virus (HIV) and other blood-borne pathogens
2.3.3.2.3.2	Medical director liaison role between hospital and EMS agency
2.3.3.2.4	Post-exposure prophylaxis and testing

2

Learning Objectives

Upon the completion of this program participants will be able to

1. Identify the risk of injury and illness amongst EMS personnel relative to general working public
2. List the most common types of occupational injuries to EMS workers
3. Gain awareness of common federal regulations and standards

3

Risk of Injury and Illness

- The annual rate of on-the-job mortality for EMS workers is greater than the general working public and comparable to firefighters and police.

4

Common Occupational Injuries/Exposures

- Most Common:
  - **Mortality:**
    - Ground ambulance and helicopter crashes are common causes of mortality
  - **Injuries:**
    - Back injuries
      - Related to moving patients.
      - Sprains and strains.
    - Needle sticks
    - Exposure to blood and other body fluids
      - Exposure to sharp objects.
      - Mucous membrane exposures to eyes or mouth.

5

Standard Precautions

- CDC in late 1980s -> "standard precautions"
  - Address risk of occupational exposure to Hep B & C, HIV
  - Mandate appropriate PPE any time procedures involving blood or bodily fluids are performed, regardless of patient status
- Expanded in 1996 -> broader precautions, also aiming to decrease nosocomial infections
  - = "universal precautions"
  - Hand hygiene mandatory

6

Common Federal Regulations & Standards

OSHA 1910.1030 Bloodborne Pathogen Standard

- All employers of occupations with risk of exposure to blood or other infectious materials must establish written exposure control plan to eliminate or minimize exposure.
- All employers shall provide, at no cost to employee, **personal protective equipment** (e.g., face shields, eye protection, gloves).
- Employers shall provide means for **testing of Tuberculosis** (TB) and resources for protection against exposure or risk of infection (e.g., face masks).
- **Hep B Immunization** provided
- Later revision: mandated use of needleless systems

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7

Common Federal Regulations & Standards

Ryan White Act 1990 Extension 2009

- Part G of the Act provides a framework for Emergency Response Employees to be informed by a receiving facility (e.g., Hospital Emergency Department) that they may have been exposed to infectious disease(s).
- Each agency MUST have a designated ICO and system for rapid post-exposure notification to employees
- Healthcare facility MUST report if:
  - Emergency response employee believes an exposure has occurred
  - Emergency response employee cares for a pt w a listed infection and they were potentially infectious at the time

(Pathogen on a list + mode of transmission is present)

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It is almost certain that there will be question(s) on Ryan White Act

Each agency must have a designated Infection Control Officer and a system to notify providers

Ability to deal with issues such as post exposure prophylaxis
Each agency must have an infection control officer

System for rapid notification for exposure Originally for Aids

Must notify if:
Pathogen is on a list
Mode of transmission present

9

Common Federal Regulations & Standards

National Fire Protection Association (NFPA) 1582

- Requires fire departments designate a department physician to provide medical oversight.
- Requires fire departments establish a **comprehensive medical program** to address worker health and safety, and include reimbursement to workers for basic medical evaluations and vaccinations.

10

Common Federal Regulations & Standards

National Fire Protection Association (NFPA) 1581

- Outlines the duties of a departmental infection control officer (in accordance w Ryan White Act)
- Infection control officer responsible for:
  - Education
  - Selection and use of engineering controls and PPE
  - Cleaning of apparatus and equipment after possible exposure
  - Maintaining records

11

Common Federal Regulations & Standards

OSHA Part 1904

- Requires employers to keep records and report on work-related fatalities, injuries, and illnesses. (**5 years**)

12

Occupational Exposure

"**reasonably anticipated** skin, eye, mucous membranes, or parenteral **contact** with blood or other potentially infectious material **that may result from the performance of the employee's duties**." - OSHA

13

After an Exposure

EMS clinician should be evaluated immediately

- Document the exposure (OSHA requirement)
- Provide local care of any wound incurred
- Complete cleaning if not already done
- Coordinate source patient and EMS clinician testing
- Start PEP if indicated
- Arrange occupational health follow up

14

Hepatitis B

- Agencies must have HBV vaccination programs in place
  - Must provide vaccine for free
  - Documentation of vaccine series or declination
- The big question: do you have + titers?
  - Consider taking pics of them and saving in an album or as a contact

15

TABLE 35.3

Recommended Postexposure Prophylaxis for Exposure to Hepatitis B Virus Infection Status of Source

Vaccination and antibody response status of exposed workers*	Treatment		
	Source HBsAg† positive	Source HBsAg† negative	Source unknown or not available for testing
Unvaccinated	HBIG§ × and initiate HB vaccine series	Initiate HB vaccine series	Initiate HB vaccine series
Previously vaccinated			
Known responder**	No treatment	No treatment	No treatment
Known nonresponder††	HBIG × 1 and initiate revaccination or HBIG × 2§§	No treatment source, treat as if source were HBsAg positive	If known high risk
Antibody response unknown	Test exposed person for anti-HBs¶ 1. If adequate,** no treatment is necessary 2. If inadequate,†† administer HBIG × 1 and vaccine booster	No treatment for anti-HBs	Test exposed person 1. If adequate,¶ no treatment is necessary 2. If inadequate,¶ administer vaccine booster and recheck titer in 1–2 months

* Persons who have previously been infected with HBV are immune to reinfection and do not require postexposure prophylaxis.
† Hepatitis B surface antigen.
§ Hepatitis B immune globulin; dose is 0.06 mL/kg intramuscularly.
¶ Hepatitis B vaccine.
** A responder is a person with adequate levels of serum antibody to HBsAg (i.e., anti-HBs ≥10 mIU/mL).
†† A nonresponder is a person with inadequate response to vaccination (i.e., serum anti-HBs < 10 mIU/mL).
§§ The option of giving one dose of HBIG and reinitiating the vaccine series is preferred for nonresponders who have not completed a second 3-dose vaccine series. For persons who previously completed a second vaccine series but failed to respond, two doses of HBIG are preferred.
¶¶ Antibody to HBsAg.

Updated U.S. Public Health Service Guidelines for the management of occupational eXposures to HBV, HCV, and HIV and recommendations for postexposure prophylaxis. MMWR 29 June 200:50(RR11);1–42.

16

Hepatitis C

- 0.2% risk of virus transmission for percutaneous
- 0.0% risk of virus transmission for mucocutaneous
- No vaccine or PEP
- Close follow-up is crucial (serial testing)
  - Acute and chronic hep C can be asymptomatic
  - If EMS clinician becomes HCV+, oral antiviral is indicated

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17

HIV

- 0.3% risk of virus transmission for percutaneous
  - Ranges from 0.04% - 5% depending on if a deep injury, hollow-bore sharp, visible blood, patient's viral load
- 0.09% risk of virus transmission for mucocutaneous
- Need to know current guidelines for PEP
  - Sooner the better to initiate first dose
  - Local resistance patterns may dictate medication choice

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18

M. tuberculosis

- High index of suspicion -> N95
- On the list of mandated notifications under the Ryan White Act
- OSHA requires healthcare setting to develop a risk assessment
  - Infection control officer must compile data/review yearly
  - May no longer need annual TB testing after initial screening

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19

Recommended Immunizations

- Hepatitis B
- Influenza (yearly)
- Measles, Mumps, Rubella (MMR)
- Varicella vaccine
- TB testing based on TB risk assessment
- Tetanus, Diphtheria, Pertussis (Tdap)

NFPA 1582 gives recommendations for FD

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20

Take-Home Points

- EMS is high risk to patients and providers.
  - Mortality: ambulance or helicopter crashes
  - Back sprains/strains are the most common non-fatal injury
- Most EMS employees are required to meet basic education, training, and personal safety requirements
- Most EMS employers must adhere to basic safety standards
  - Provision of personal protective equipment and record keeping of injuries or exposures.

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21