

International EMS Registry

# EMR Study Guide



2020



## IEMSR Emergency Medical Responder Study Guide

This guide is to assist the student by highlighting the multiple areas of the EMR program. This guide is not designed to take the place of the EMR textbook and the textbook is always your foundation for detailed knowledge and performance mandates.

It is the goal of the IEMSR to have each student successfully pass the EMR program so that more certified responders can serve their community in times of need. IEMSR wishes you much success in this testing process and look forward to hearing from you in the future.

Todd Soard

IEMSR President



## IEMSR Emergency Medical Responder Study Guide

### **EMS Systems**

Emergency Medical Services (EMS) consists of services that are city, county, state or privately operated. All services operate on the needs of the local community and are free to add specific operations.

The National Highway and Traffic Administration is the leading agency in EMS and set the curriculum for EMS programs.

EMR staff is trained to handle emergency situations and assist in stabilizing the patient until advanced care arrives or can be obtained. Emergency Medical Technicians (EMTs) are trained more in-depth on patient assessment, vital signs, airway control and patient movement. They assist the Paramedic in many areas of patient care. The Paramedic is the highest level of care and is taught advanced levels of care in airway control, pharmacology, medical emergencies, and trauma care.

Each state has its own office of EMS and determines the scope of practice that will be performed in that State. Medical oversight is performed by a physician and he or she appoints assistants to assure quality improvement and protocols. Each employer has certain policies and procedures that are put into place to assure safety and quality patient care.

### **Roles, Responsibilities, and Professionalism of EMS Personnel**

Maintaining equipment and being ready to respond is vital and offers quality patient care. Safety of all on the scene should be the focus of all responders. Requesting additional resources if needed and gaining access to the patient is also the responsibilities of a Responder. Performing a patient assessment is the basis for the care that will be rendered and is vital to the patient's possibility of survival. The family is also our concern as well as other co-workers, offering needed support emotional support. Patient privacy is a must and we must maintain that trust at all times. Never leave patient reports or notes out for others to see.



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Professionalism consists of:

- Integrity
- Empathy
- Self-motivation
- Appearance and hygiene
- Self-confidence
- Knowledge of limitations
- Time management
- Communications
- Teamwork
- Respect
- Tact
- Patient advocacy
- Careful delivery of care

It is the responsibility of all responders to maintain all certifications. This would include your EMR card, CPR card, plus any other required certifications you have obtained. Remember that any legal criminal action taken against you can be cause to have you removed as a responder.

Quality improvement is a significant part of EMS. Reviewing the call and debriefing can make the responder a better patient care giver.



## Research

Research plays an important role in EMS. The research conducted allows responders to see what changes are of need and how better quality patient care can be offered. Data collection is conducted on specific aspects of the care rendered and what type of care was of need.

## Safety Precautions

A responder should always maintain one's health by having an annual physical and up-to-date vaccination. Adhering to OSHA standards, washing hands, and proper use of PPE will help keep the responder safe. PPE consist of but not limited to gloves, HEPA mask, and gown. Watching out and preventing needle sticks is a must and washing clothes that have been contaminated is important. Cleaning the vehicle protects you, co-workers, and other patients.

Stress is a part of any responder's job and needs to be seen as a normal response to the situations the responder is placed in. Warning signs are:

- Difficulty sleeping and nightmares
- Irritability with coworkers, family, and friends
- Feelings of sadness, anxiety, or guilt
- Indecisiveness
- Loss of appetite
- Loss of interest in sexual activity
- Isolation
- Loss of interest in work
- Physical symptoms
- Feelings of hopelessness
- Alcohol or drug misuse or abuse
- Inability to concentrate

Talking about these feeling and maintaining a healthy lifestyle will help you manage stress.



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Death and dying are part of a responder's job that can be the hardest part of the job. Resuscitative measures are performed on those that do not have obvious signs of definite death. If a properly executed Do Not Resuscitate (DNR) form is present, the responder may then refrain from performing heroic measures.

Response to death and dying are:

- Denial
- Anger
- Bargaining
- Depression
- Acceptance

Injury prevention consists of prevention to bloodborne and airborne exposure and maintaining a healthy lifestyle of eating right and getting enough rest. Responding to the scene safely is an extension of our patient care. Collision avoidance is of concern while responding to or from the scene. Hazards are all around us as well as hazardous materials. We must always use caution if hazardous materials are present and secure the area while a HazMat team is called.

Lifting and moving your patient involves many movements. Taking care not to injure oneself is a must while choosing the best movement option for the patient. Several moves are listed in your text book and the responder should read these over from time to time.

### **Documentation**

The patient report is a legal document that is your best legal defense. The responder documents all findings including observations made at the scene. The patient care rendered is documented noting any changes after care is rendered. If care is turned over, a copy of the responder's report is also given to the higher level of care givers. If a patient refuses care, a Patient Refusal form is signed by the patient.

Transferring a patient to other EMS personnel requires a verbal report consisting of:

- Current patient condition
- Patient's age and sex
- Chief complaint
- Brief, pertinent history of what happened



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- How you found the patient
- Major past illnesses
- Vital signs
- Pertinent findings of the physical exam
- Emergency medical care given and response to care

Team work is necessary in providing patient care and requires that we communicate between law enforcement and all responders on the scene. Never think you can do it all alone because you will fail your patient if you do.

### Therapeutic Communication

Communicating with our patient requires that we be effective in both speaking and listening. Be aware of any special needs such as hearing aids, glasses, and other aids required for our patient's everyday living needs. Being aware of our environment and privacy is vital. Use one question at a time and never give advice, talk too much, or interrupt.

### Medical Legal

Expressed consent for treatment is required upon arrival. If the patient is unable to give Expressed consent or is a minor, implied consent is assumed. Pediatric consent is given by a parent, guardian, or court. An Emancipated minor may have obtained rights by the court or military service.

Refusal of care can be expressed and a Refusal form needs to be signed. The responder states medical results that can occur if the patient refuses and advises that the patient can call for assistance again.

The Health Information Portability and Accountability Act (HIPPA) obligate responders to patient privacy. Providing patient information to other Healthcare Providers who need to know, law enforcement officers, and mandatory reporting is permitted.

Advance Directives such as a DNR provides the expressed written wishes of the patient to NOT be resuscitated. Living Wills states what the wishes of a patient are if they cannot speak for themselves.

Court cases can be a stressful for Responders. A responder would want to avoid accusations of Abandonment, Negligence, Assault, and Battery.

The Responders must preserve a crime scene to the best of their ability. Responders have a duty to care for patients and medical oversight is provided by the Medical Director. This direction can be either on-line or off-line. Mandatory reporting varies by State and is required in cases of abuse, neglect, infectious diseases or other criminal acts.



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The Responder has an ethical responsibility to do no harm, act in good faith, and have the patient's best interest in mind.

### **Anatomy and Body Functions**

The left and right side is always the patient's right or left. Anterior is the front and posterior is the back. Midline is pictured as a line down the middle of the body. Medial is toward the midline; lateral is towards or on both sides; superior is toward the head; inferior is towards the feet.

The Skeletal System consists of:

Skull  
Face  
Vertebral column (33 vertebra)  
Thorax  
Ribs  
Breastbone  
Pelvis  
Upper extremities  
Lower extremities

The Muscular System provides function to the body as well as protection.

The Respiratory System consists of:

- Nose
- Mouth/teeth
- Tongue/jaw
- Throat/pharynx
- Voice box/larynx
- Epiglottis
- Lower airway
- trachea/windpipe
- bronchi
- lungs and bronchioles
- alveoli
- Structures that support ventilation
- chest wall
- diaphragm
- intercostals muscles
- Function
- ventilation
- respiration
- alveolar/capillary gas exchange



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The Circulatory System consists of:

- I. Heart chambers
- II. Coronary arteries
- III. Blood vessels
  - A. arteries
  - B. Veins
  - C. capillaries
- IV. Blood
  - A. red blood cells
  - B. other blood cells
  - C. plasma
- V. Function
  - A. blood flow
  - B. tissue/cell gas exchange
  - C. blood clotting

Skin consists of:

- I. Structures
  - A. epidermis
  - B. dermis
  - C. subcutaneous layer
- II. Functions of the skin
  - A. protection
  - B. temperature control



## Medical Terminology

1. Cardio- Heart
2. Neuro- Spinal Nerves
3. Hyper- More or Increased
4. Hypo- Low
5. Naso- Upper Airway Nose
6. Oro- Oropharynx
7. Arterio- Vessel of the heart
8. Hemo- Blood
9. Therm- Heat
10. Vaso- Vessel
11. Tachy- Fast
12. Brady- Slow

## Pathophysiology

- I. Respiratory Compromise
  - A. Impaired Airway, Respiration, or Ventilation
    1. Airway
      - a. Movement of oxygenated air into and out of lungs is blocked
      - b. Possible causes
        - i. foreign body airway obstruction
        - ii. tongue blocks airway in unconscious patient
        - iii. blood or secretions
        - iv. swelling
        - v. trauma to the neck
    2. Respiration
      - a. Inadequate oxygen in air that is breathed in
      - b. Possible causes
        - i. low oxygen environment
        - ii. poison gases
        - iii. infection of the lungs
        - iv. illness that narrow the airway and cause wheezing
        - v. excess fluid in the lungs
        - vi. excess fluid between the lungs and blood vessels
        - vii. poor circulation
    3. Ventilation
      - a. Rate or depth of breathing is not adequate
      - b. Insufficient volume of air moved into and out of lungs
      - c. Possible causes
        - i. unconscious or altered level of consciousness
        - ii. injury to the chest
        - iii. poisoning or overdose
        - iv. diseases



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### II. Shock

#### Impaired Blood Flow to the Organs and Cells

1. Heart
  - a. Rate is too slow or very fast
  - b. Contractions are too weak
  - c. Related to heart disease, poisoning, excessive rate, or depth of artificial ventilation artificial ventilation
2. Blood vessels
  - a. Unable to constrict
  - b. Related to neck fractures with spinal cord injury, infection, or anaphylaxis
3. Blood
  - a. Decrease in the amount of blood or blood components in the blood vessels
  - b. Related to bleeding, vomiting, diarrhea, or burns

### Life Span

#### I. Infancy (Birth to 1 Year)

- A. Physiology
  1. Vital signs
    - a. Normal heart rate in newborns is between 140 and 160
    - b. Normal respiratory rate in newborns is between 40 and 60 and drops to 30-40 after first few minutes of life
    - c. Average systolic blood pressure increases from 70 mmHg at birth to 90 mmHg at 1 year
  2. Weight
    - a. Normally 3.0-3.5 kg at birth
  3. Pulmonary system
    - a. Airways are more easily obstructed
    - b. Infants are primarily nose breathers until 4 weeks
    - c. Rapid respiratory rates lead to rapid heat and fluid loss
  4. Nervous system
    - a. Strong, coordinated suck and gag
    - b. Well flexed extremities
    - c. Extremities move equally when infant is stimulated



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- II. Toddler (12 to 36 Months) and Pre-School Age (3 to 5)
  - A. Physiological
    - 1. Vital signs
      - a. Normal heart rate is between 80 and 130 beats per minute in toddlers and between 80 and 120 beats per minute in preschool-age children
      - b. Normal respiratory rate is between 20 and 30 breaths per minute in both toddlers and preschool-age children
      - c. Normal systolic blood pressure is between 70 and 100 mmHg in toddlers and between 80 and 110 mmHg in preschool-age children
      - d. Normal temperature is between 96.8 and 99.6 degrees Fahrenheit
    - 2. Nervous system
- III. School-Age Children (6 to 12)
  - A. Physiological
    - 1. Vital signs
      - a. Normal heart rate is between 70 and 110 beats per minute
      - b. Normal respiratory rate is between 20 and 30 breaths per minute
      - c. Normal systolic blood pressure is between 80 and 120 mmHg
      - d. Normal temperature is 98.6 degrees Fahrenheit
    - 2. Bodily functions
      - a. Loss of primary teeth and replacement with permanent teeth begins
- IV. Adolescence (13 to 18)
  - A. Physiological
    - 1. Normal heart rate is between 55 and 105 beats per minute
    - 2. Normal respiratory rate is between 12 and 20 breaths per minute
    - 3. Normal systolic blood pressure is between 80 and 120 mmHg



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V. Early Adulthood  
(20 to 40) A.  
Physiological

VI. Middle Adulthood  
(41 to 60)

A. Physiological

1. Normal heart rates average 70 beats per minute
2. Normal respiratory rate average 16 to 20 breaths per minute
3. Normal blood pressure average 120/80 mmHg
4. Vision and hearing become less effective
5. Cardiovascular health becomes a concern
6. Cancer strikes in this age group often
7. Weight control becomes more difficult
8. Menopause in women in late forties and early fifties

B. Psychological

1. Approach problems more as challenges than threats
2. Empty-nest syndrome
3. Often burdened by financial commitments to elderly parents as well as young adult children

VII. Late Adulthood (61  
and Older)

A. Physiological

1. Normal vital signs are dependent on the patient's physical and health status
2. Cardiovascular function changes
  - a. Circulation efficiency decreases
  - b. Tachycardia not well tolerated
  - c. Functional blood volume decreases
3. Respiratory system
  - a. Chest wall weakens
  - b. Gas exchange through alveoli is diminished
  - c. Lung capacity is diminished



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### **Public Health**

Public Health is a critical part of EMS and involves the collaboration of multiple departments. Vaccinations, health screenings and education is vital for Responders and the public at large. Education of safety such as seat belts, helmets, fire, etc are part of Public Health.

### **Pharmacology**

Medications are not generally given by EMR personnel. However, assisting a patient may be permitted. When in doubt contact Medical Control. An Epi Autoinjector Pen may be used for anaphylaxis reaction. Chemical Antidote Autoinjectors may be used in cases of chemical exposure.



## **Airway Management**

The airway consists of Nose, Mouth, Oropharynx, Epiglottis, Larynx, Trachea, Bronchi, and Lungs.

Airway obstruction can be from the tongue, food, vomit, blood, teeth or swelling due to trauma or heat. Proper assessment is necessary and is a vital aspect of patient care. Opening the Airway can be done by performing a head tilt / chin lift, jaw thrust, or modified chin lift maneuver. Suction techniques may be needed to assist in clearing the airway.

## **Respiration**

A proper open airway is vital to life and any disruption can cause a loss of life function. Shock is defined as inadequate tissue perfusion and this is possible if the cells do not receive proper oxygen. Assessing the airway consists of evaluation breathing pattern, lung sounds, and visually noting skin color changes. Oxygen delivery is important via an oxygen cylinder along with a nasal cannula or oxygen mask.

Assisting respirations can be done with a Bag-Valve Mask (BMV), pocket mask or positive pressure devices. CPR may be required if the patient is not breathing or is pulseless.



## **Scene Size-Up**

Scene size-up is assuring that the scene is safe for the responder and the public. Looking for assailants, fire, storms, and traffic can assure the safety of all. "Is the scene safe?" should not be just words but action on part of the Responder. Protecting the scene is part of public safety and wearing PPE is required when body fluids are or may be present.

## **Primary Assessment**

The Primary survey and assessment involves Airway, Breathing, and Circulation. Evaluation of these life sustaining factors are a must while treating any life threatening situations. If more effort is needed to breathe this should be noted while noting if any wheezing or gurgling is present. If the person is presenting with nasal flaring or sitting in a tripod position; this can be seen as experiencing respiratory difficulty.

Evaluating the pulse, skin color, temperature, moisture, capillary refill and mental status will provide the Responder with information concerning the stability of the patient. Treating life threats as they are found is necessary.

History taking will offer insight into the patient's condition that relates to the well being now before the Responder. Sign and Symptoms can relate to medical conditions that may be present or develop as times passes. Pediatric patients respond differently from adults as do Geriatric patients.



## **Secondary and Reassessment Assessment**

Secondary Assessment allows for more of an in-depth survey of the patient so that the Responder may focus on specific areas including vital signs. This head-to-toe approach allows you to evaluate and see other conditions that may be present but not stated by the patient.

Reassessment includes going over what you evaluated in the Secondary and now compare those findings after time has passed. This will in many cases dictate what care is now needed.

### **Medical Conditions**

An assortment of medical conditions may present and may, at times, combine. It is important to know the cause and proper treatment so that the Responder acts appropriately. All conditions require an evaluation from the Responder and transport to the hospital if needed.

Conditions to have knowledge of include, but are not limited to:

- Altered Mental Status
- Seizures
- Stroke
- Cardiac Emergencies
- Abdominal Pain
- Anaphylaxis and Allergy conditions
- Infectious Diseases
- Diabetes including Hyper and Hypo glycemia
- Behavioral conditions
- Poisoning
- Respiratory distress and recognition of airway obstruction versus a medical condition
- Renal Failure
- Gynecological Emergency
- Nosebleed
- Shock and treatment of each



## **Trauma**

Trauma care will range from minor to large situations and the Responder must act quickly since the Golden Hour is vital to the patient.

Bleeding must be noted and controlled so that the trauma patient does not lose much blood. Chest Trauma may consist of a sucking chest wound, or impaled objects that require stabilization.

Abdominal Trauma may include eviscerations to impaled objects that require stabilization.

Fractures and Dislocations can cause bleeding that may be minor or severe. Treating and stabilizing is vital in patient care.

Burns and evaluating them is crucial, as is the treatment. The Rule of 9's assist in measuring the surface area affected on the patient. Burns can be heat or chemical and require cooling while chemical requires removal of the chemical with specific methods.

Spine, Head and Neck Trauma requires maintaining a proper airway and spinal immobilization.

Pregnant patients have special needs since another patient is present. Being prepared for a birth is always top priority.

Pediatric patient's head is the largest part of the body and the neck is very short. This promotes more area for trauma and airway complications.

The elderly have needs that range from mental status issues, visual difficulties, and hearing problems. All these factors make an evaluation difficult.



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Environmental Emergencies pose a threat and the Responder must know the difference between heat exhaustion and heat stroke and how they present. Hypothermia can cause a multitude of complications and the Responder must know what these are. One complication is exposure to frostbite.

Obstetrics situations range from Vaginal bleeding to pregnancy complications. The responder must note and evaluate the situation and know how critical it may be. Delivery of a baby is exciting and does come with risk, both the Mom and the baby. Recognizing and treating them is vital. These range from normal delivery to limb presentation. Airway control after the birth is crucial and the Responder has full control of this situation and responsibility.

### **Pediatric Care**

Pediatric care involves evaluation of a patient that may not be able to speak for themselves. The Responder must make note of breathing patterns, skin tone and color, as well as any abnormalities. Being aware of seizures and caring for them is the concern of the Responder. Sudden Infant Death Syndrome (SIDS) requires assessment and following protocols in this situation. Abuse may be encountered and must be documented and reported to law enforcement.

### **Geriatrics**

The elderly may present with some minor or larger issues such as visual, hearing and sensory difficulties. Many medical conditions may be present so the Responder needs to obtain a history and a list of medication whenever possible. Elderly abuse must be documented and reported to law enforcement.

### **Ambulance Operation**

Proper driving and caring for the unit is an extension of the Responder's patient care. Keeping the unit in top shape is done by examining the inside and outside for any potential problems that would hinder transport.

### **Mass Casualty**

Mass casualty involves multiple patients and the need to call in for additional resources.



### **Air Medical**

Air medical transport involves taking the critical patient to trauma centers and time is of the essence. Air transport will be used in cases of long transport times due to distance or traffic.

### **Vehicle Extrication**

Many times a patient is trapped and needs to be cut out so that they may be treated and transported. Scene safety is foremost and stabilizing the environment around the patient is vital. This could be a car, tractor, or a silo that would move or otherwise place the Responder in danger.

### **Terrorism**

Terrorism can either be domestic or foreign. Scene safety is the Responders primary concern, protecting coworkers and the public. Maintaining a high alert to secondary attacks is top priority.