### Basics Emergency Medical Technician Course

**Schedule**

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EMT COURSE
Revised Schedule

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31 (M) Midterm.

NOVEMBER
3 (Th) Head and nervous system, Eye, Abdomen and GU systems.
7 (M) OB/GYN, Emergency childbirth, Pediatric problems, Psychiatric problems. Ch. 36
10 (Th) Heat and Cold, Burns, Aquatic problems, other environmental problems Ch. 40-44
14 (M) Poisoning, Dyspnea, Communicable disease, Alcohol and drugs, Epilepsy, Diabetes, Unconscious states. Ch. 32-35, 39, 45
17 (Th) Vehicles, Communications, ED procedures, lifting and moving patients, Heart attack and Stroke. Ch. 30-31, 48, 50
21 (M) Patient assessment, IV Therapy. Written test. Ch. 25-29

DECEMBER
1 (Th) Practical test. Review.
5 (M) Final exam-- written.
8 (Th) Final exam-- practical.

Weekend sessions:
Additional semi-technical evacuation sessions (you must attend at least one) are on Nov. 13 (Sun) and Nov. 19 (Sat).
The extrication session will be held on Nov. 12 (Sat). Meet at 0900 at Jordan Hall; bring leather gloves, raingear, and appropriate outdoor clothing including sturdy shoes.
I will let you know as soon as the water extrication session is scheduled.

NOTICE:
For the Nov. 12 session, read Chapter 47 and do the workbook section for that chapter in preparation for the session.
Mr. Keith Conover 
Emergency Medical Training Coordinator 
Blue Ridge Mountain Rescue Group, ASRC 
P.O. Box 440 
Newcomb Hall 
Charlottesville, Virginia  22903 

Dear Mr. Conover:

Your request for classroom space has been confirmed as follows:

EMT Course 
Monday and Thursday 
7 - 10:00 P.M. 
Jordan Hall 1-17 
September 12 - December 8, 1977 

EXCEPTION: November 24, 1977 (Thanksgiving) 

Since we cannot provide a cleaning crew to pick up after each class session, we request you leave the room clean for the next users. Your cooperation in this is most appreciated.

Sincerely, 

Jane A. Fitzgerald 

Jane A. Fitzgerald
The past decade has witnessed a vast change in the field of emergency medical care—emergency care now starts at the scene of an accident or sudden illness, rather than at the hospital door. A large part of this change has been due to the improved training of ambulance attendants and others involved in the delivery of emergency care in the field. One of the principal agencies involved in upgrading the training of ambulance attendants was the U.S. Department of Transportation (DOT), which first formulated standards for ambulance attendants as EMTs. Since the DOT was primarily concerned with highway safety, the EMT program was oriented primarily towards situations where EMTs were riding an ambulance and had readily available the equipment found on an ambulance (the DOT also formulated standards for ambulance equipment). The basic EMT course as outlined by DOT consists of a minimum of 81 hours of classroom, practical, and clinical training.

The course offered by the BRMRG will meet all requirements for certification of students as ambulance EMTs (EMT-As), but will include additional material relevant to wilderness and search and rescue emergency medical care. One major addition will be the material found in the American National Red Cross Advanced First Aid and Emergency Care course. Most of this additional material concerns improvised splinting and bandaging techniques which will be of great use to wilderness EMTs (EMT-Ws); all students completing the class will receive Red Cross Advanced First Aid cards. Since much of the Red Cross course is covered in the EMT lesson plans, this will only add three or four classes to the course. Techniques specific to wilderness emergency care will add another three or four classes; the total course hours will number approximately one hundred.

There are no prerequisites for the course, but a knowledge of first aid will be helpful. The class size is limited to 20 students, so membership in a search and rescue unit or rescue group will influence acceptance into the course. The cost for the course will be $25.00 per student, which will cover the cost of non-reusable supplies, handouts, supplementary texts, and certain personal equipment such as a pair of bandage scissors and a stethoscope. (Part of the fee may be waived if you already own this equipment). The principal text and its workbook must be purchased by the student and is available at University Bookstore: Emergency Care and Transportation of the Sick and Injured and workbook (second edition). This is a new edition of the "orange book"; neither the first edition of the orange book or the first edition of the "yellow book" will be adequate. For more information, contact:

Keith Conover, Course Coordinator 296-2269
## Draft Schedule (July 9, 1977)

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I will let you know as soon as the water extrication session is scheduled.

NOTICE:
For the Nov. 12 session, read Chapter 47 and do the workbook section for that chapter in preparation for the session.
1. How many valves are in the heart?
   A. Two
   B. Four
   C. Six
   D. Eight

2. The lung is covered with a smooth glistening set of membranes known as the:
   A. alveoli
   B. bronchi
   C. pericardium
   D. pleura

3. Which pair of pulses are from the same extremity?
   A. Precordial and femoral
   B. Brachial and radial
   C. Brachial and femoral
   D. Carotid and femoral

4. If a patient's blood pressure is 120/80, the 80 indicates the:
   A. systolic pressure
   B. diastolic pressure
   C. infusion pressure
   D. pulse pressure

5. When the diameter of a structure increases, it is called:
   A. aspiration
   B. constriction
   C. dilation
   D. injection

6. Constriction of the pupils may indicate:
   A. drug addiction
   B. cardiac arrest
   C. shock
   D. heat exhaustion

7. Blood pressure levels vary with age and sex. A useful rule of thumb for
   the normal systolic pressure in the male is _______ to a level of
   140-150 mm Hg.
   A. 120 plus the age of the patient
   B. 100 plus the age of the patient
   C. 80 plus the age of the patient

8. A single blood pressure reading of 120/90 is a good indication that:
   A. the patient is in shock
   B. the patient is hypertensive
   C. single readings aren't generally good indicators of anything

9. A blood pressure of 100/60 in a normal male is better than 120/100 in a
   hypertensive male.
   A. True
   B. False
10. Contraction of the heart results in ________, and peripheral resistance results in ________.  
   A. infusion pressure, diffusion pressure  
   B. diastolic pressure, systolic pressure  
   C. systolic pressure, diastolic pressure  
   D. pulse pressure, blood pressure

11. Normal diastolic pressures in a male are:
   A. 50-70 mm Hg  
   B. 65-80 mm Hg  
   C. 85-100 mm Hg

12. A small pulse pressure can result in inaudible Korotkoff sounds and therefore make detection of the blood pressure with a stethoscope impossible.
   A. True  
   B. False

13. Which of the following is not a possible cause of unequal pupils?
   A. A stroke  
   B. Head injury  
   C. Shock  
   D. A glass eye

14. The oral (oropharyngeal) airway will:
   A. act as a substitute for careful positioning of the head and jaw  
   B. frequently open the airway when other maneuvers fail  
   C. not be tolerated by a fully conscious patient and may cause vomiting in a semi-conscious patient

15. What is the most common cause of death in an unconscious victim?
   A. Shock  
   B. Pneumonia  
   C. Airway obstruction  
   D. Choking on vomit

16. The control center for breathing is located in the:
   A. frontal lobe  
   B. the medulla  
   C. spinal cord  
   D. diaphragm

17. In mouth-to-nose ventilation, the rescuer must open the victim's mouth to allow him to exhale because:
   A. the soft palate acts as a valve preventing exhalation.  
   B. the tongue falls back, obstructing the airway.  
   C. the nose is a narrower air passage than the mouth.  
   D. it allows air to escape from the stomach safely.

18. If a neck breather (laryngectomiee) victim's chest doesn't rise from the rescuer's first breath, it may be necessary to:
   A. plug the stoma while performing mouth-to-mouth ventilation.  
   B. extend the victim's neck further.  
   C. hold the victim's mouth and nose shut.  
   D. remove the metal or plastic tube from the neck opening.
19. A patient who has a crushing "stove in" chest injury accompanied by blood-shot eyes and cyanosis of the skin of the head, neck, and shoulders may have:
   A. hemothorax  
   B. subcutaneous emphysema  
   C. traumatic emphysema  
   D. pericardial tamponade

20. Injury where the lung is collapsed by blood in the pleural space is called:
   A. hemothorax  
   B. subcutaneous emphysema  
   C. traumatic asphyxia  
   D. pericardial tamponade

21. ___ occurs following a stab wound to the heart. The signs of this condition include distant heart sounds, a weak pulse with possible pulsus paradoxus, and a diminished pulse pressure.
   A. hemothorax  
   B. subcutaneous emphysema  
   C. traumatic asphyxia  
   D. pericardial tamponade

22. The presence of air in tissues under the skin, which is often due to a lung lacerated by a broken rib, is called:
   A. hemothorax  
   B. subcutaneous emphysema  
   C. traumatic asphyxia  
   D. pericardial tamponade

23. A sucking chest wound where the wound has formed a one-way valve, resulting in pressure above atmospheric pressure in the pleural space, is called:
   A. spontaneous pneumothorax  
   B. tension pneumothorax  
   C. hemothorax  
   D. subcutaneous emphysema

24. A sucking chest wound results in pneumothorax but does not impair heart function.
   A. True  
   B. False

25. Paradoxical respiration may be caused by:
   A. sucking chest wound or back (spinal cord) injury  
   B. flail chest or neck (spinal cord) injury  
   C. pneumothorax or pericardial tamponade  
   D. flail chest or traumatic asphyxia
THE FOLLOWING QUESTIONS ARE ON BASIC CARDIAC LIFE SUPPORT, WITHOUT ADJUNCTS.

26. The first time that you give breaths to a non-breathing adult you give:
   A. one long, steady breath.
   B. two quick, full breaths.
   C. one quick, full breath.
   D. four quick, full breaths.

27. After determining that a victim is unconscious, with no apparent back or neck injuries, your next step would be to:
   A. check breathing without tilting the head backwards.
   B. check the carotid pulse.
   C. open the airway and check for breathing.
   D. check the pupils of the eyes.

28. An infant's pulse is checked:
   A. at the temple.
   B. at the wrist.
   C. at the precordium (below the left nipple).
   D. on the side of the neck, near the Adam's apple.

29. Breaths are given how often to a non-breathing adult victim?
   A. once every second
   B. once every five seconds
   C. once every two seconds
   D. once every three seconds

30. Artificial respiration is given to an infant at a rate of ______ breaths per minute.
   A. 12
   B. 15
   C. 18
   D. 20

31. The victim is unconscious and not breathing. You have given him the appropriate first breaths. The next step is to:
   A. thump on his chest with your fist.
   B. check his pulse.
   C. give chest compressions.
   D. continue with mouth-to-nose respirations.

32. An adult who is sitting in a car needs CPR. What will you do?
   A. Start CPR right away, but don't move him.
   B. Start artificial respiration right away, but don't move him.
   C. Get him on a soft surface, then begin CPR.
   D. Get him on a hard surface, then begin CPR.

33. The longest pause permitted in CPR for checking the pulse is:
   A. 5 seconds.
   B. 15 seconds.
   C. 30 seconds.
   D. 60 seconds.
34. The longest pause permitted in CPR permitted for moving a patient or for intubation is:
   A. 5 seconds.
   B. 15 seconds.
   C. 30 seconds.
   D. 60 seconds.

35. The pulse is checked in an unconscious victim:
   A. right after you check for breathing.
   B. right after you give the initial breaths.
   C. before you tip the head and check for breathing.
   D. while you tip the head and check for breathing.

36. Chest compressions are given to a small child, using the:
   A. heel of one hand, with the other hand on top of it.
   B. heels of both hands, side by side.
   C. tips of two fingers.
   D. the heel of one hand.

37. A conscious victim is choking. He is coughing and attempting to breathe. He is getting some air into his lungs, and back out. You should:
   A. Allow him to continue coughing on his own without interference.
   B. Administer four abdominal thrusts.
   C. Administer four sharp blows between the shoulder blades.
   D. Perform a finger probe.

38. When performing external cardiac compression on an infant, pressure should be applied at the:
   A. center of the lower half of the breastbone.
   B. middle of the breastbone.
   C. area left of the center of the breastbone.
   D. area right of the center of the breastbone.

39. The only sign that need be present for a rescuer to assume that the victim is in cardiac arrest is:
   A. lack of respirations.
   B. lack of a carotid pulse.
   C. fixed and dilated pupils.
   D. cyanosis.

40. Chest compressions are given to an infant, using the:
   A. heel of one hand, with the other hand on top of it.
   B. heels of both hands, side by side.
   C. the tips of two fingers.
   D. heel of one hand.
1. Explain procedure to patient if appropriate.

2. Place BP cuff around upper arm with center of inflation bag over brachial artery.

3. Palpate brachial pulse at antecubital fossa (with fingers, not thumb).

4. *Count pulse over 15 seconds; \( \times 4 \) = pulse rate. Note: regular or irregular, full or thready.

5. Continue to keep fingers on pulse; count respirations over 15 seconds, \( \times 4 \) = respiratory rate. (Count over a full minute if irregular or slow) Don't let patient know you are counting respirations. Note: quality and regularity. Note patterns.

6. Place stethoscope in ears with earpieces pointing forwards; place diaphragm over pulse location. Best to hold with thumb over stethoscope head and fingers on far side of arm, or vice versa.

7. Close thumb wheel and pump cuff to 200 mm Hg. Crack open thumbwheel and let the pressure drop (about 10 mm Hg/sec.) For adults: note pressure when solid sounds are first heard (systolic) and when sounds disappear (diastolic).
For children: note pressure when sounds first appear (systolic) and when sounds suddenly become softer (diastolic).
Don't keep cuff inflated for long periods.
As soon as diastolic pressure is noted, open thumbwheel fully.

8. If no BP can be auscultated by the above method, obtain a systolic estimate as follows:
Palpate the pulse at the wrist (radial or ulnar artery) or at the elbow (brachial artery in antecubital fossa). Inflate cuff to 200 or 20 above when pulse disappears, then slowly deflate cuff until pulse reappears.
Note the pressure then open thumbwheel fully.

9. Touch face or neck with back of hand to estimate temperature.

(10) Pull down lower eyelids to check color; check pupil equality and response to light.
(11) Check alertness, orientation to time, person and place, and level of distress; obtain estimate of level of consciousness.

GIASGOW COMA SCALE

<table>
<thead>
<tr>
<th>Best</th>
<th>Motor</th>
<th>Response</th>
<th>Verbal</th>
<th>Eye</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obeys spoken command</td>
<td>Localises</td>
<td>Withdraws</td>
<td>Confused conversation</td>
<td>Spontaneous</td>
</tr>
<tr>
<td>M6</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>E4</td>
</tr>
<tr>
<td>Motor Localises</td>
<td>Abnormal flexion</td>
<td>Extensor response</td>
<td>Inappropriate words</td>
<td>To speech</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Response Withdraws</td>
<td>None</td>
<td>None</td>
<td>Incomprehensible sounds</td>
<td>To pain</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Oral Spontaneous</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
1) Which of these signs of shock is often the EMT's first warning that shock is developing?
A) Falling Blood Pressure
B) Rapid "thready" (weak) Pulse
C) Cold and Clammy Skin
D) Restlessness and Anxiety

2) Which of these is not a sign of circulatory shock?
A) Shallow, labored, rapid, possibly gasping or irregular respirations
B) Inability to remember climbing out of wrecked automobile
C) Patient has marked thirst
D) Eyes become dull or lusterless, with dilated pupils.

3) Matching (each letter will be used once in this question)

<table>
<thead>
<tr>
<th>Allergic Reaction (severe)</th>
<th>A) Respiratory Shock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe Infection</td>
<td>B) Psychogenic Shock</td>
</tr>
<tr>
<td>Usually not helped by elevating legs</td>
<td>C) Anaphylactic Shock</td>
</tr>
<tr>
<td>Fainting</td>
<td>D) Septic Shock</td>
</tr>
<tr>
<td>Starts with adequate circulation, but insufficient oxygen in blood</td>
<td>E) Cardiogenic Shock</td>
</tr>
</tbody>
</table>

4) Matching (one of letters on right will not be used in this question)

<table>
<thead>
<tr>
<th>Can be avoided or stopped by injection of Epinephrine (Adrenalin), a drug</th>
<th>A) Respiratory Shock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporary, self-cured form of shock</td>
<td>B) Psychogenic Shock</td>
</tr>
<tr>
<td>Patient may need to be transported in sitting position</td>
<td>C) Anaphylactic Shock</td>
</tr>
<tr>
<td>Might have been avoided if O₂ and/or artificial ventilation had been administered earlier</td>
<td>D) Septic Shock</td>
</tr>
<tr>
<td></td>
<td>E) Cardiogenic Shock</td>
</tr>
</tbody>
</table>

5) Matching (some letters not used, some letters used more than once)

<table>
<thead>
<tr>
<th>Contraction of the heart</th>
<th>A) Cyanosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relaxation of the heart</td>
<td>B) Sphygnomanometer</td>
</tr>
<tr>
<td>Causes blood return to the heart</td>
<td>C) Infusion</td>
</tr>
<tr>
<td>Top number as blood pressure is written</td>
<td>D) Transfusion</td>
</tr>
<tr>
<td>Bottom number as blood pressure is written</td>
<td>E) Dilation</td>
</tr>
<tr>
<td>Works like a calibrated tourniquet</td>
<td>F) Constriction</td>
</tr>
<tr>
<td>&quot;fight or flight&quot; part of autonomic nervous system- acts in emergencies</td>
<td>G) (central) venous pressure</td>
</tr>
<tr>
<td>Blue color of skin</td>
<td>H) Systole, systolic</td>
</tr>
<tr>
<td>I.V. administration of blood</td>
<td>I) Diastole, diastolic</td>
</tr>
<tr>
<td>I.V. administration of non-blood fluids</td>
<td>J) Sympathetic nervous system</td>
</tr>
<tr>
<td>Caused by I.V. needle coming out of vein</td>
<td>K) Parasympathetic nervous system</td>
</tr>
<tr>
<td>Increase in diameter</td>
<td>L) Pathetic nervous system</td>
</tr>
<tr>
<td>Decrease in diameter</td>
<td>M) Infiltration</td>
</tr>
</tbody>
</table>

Bonus Question: which letter in #5 stands for something that doesn't exist? ______
1. Virginia law requires that every ambulance engaged in emergency service must have ____ "emergency medical care attendants" (EMTs or people with Advanced First Aid cards) on board.
   A. 1
   B. 2
   C. 3
   D. 4

2. Unless a specific exception is found in the Code of Virginia, all ambulance and other emergency vehicles are bound by the same traffic rules as any other vehicle.
   A. True
   B. False

3. An ambulance may proceed through a stop sign without coming to a full stop only if flashing or alternating red lights are shown, and the ambulance is sounding a siren or other audible emergency signal.
   A. True
   B. False

4. You may assume implied consent in which of the following cases?
   A. A minor with no readily available parent
   B. A drunk who mumbles "leave me alone!" but cannot tell you where he is, what his name is, or what month it is
   C. A person who apparently overdosed on sleeping pills, and who insists he is to be left alone; but who can relate name, address, time, and place

5. A proper size oropharyngeal airway should be selected by measuring
   A. from the mouth to the center of the ear.
   B. from the mouth to the point of the jaw.
   C. from the nose to the adam's apple.
   D. from the patella to the symphysis pubis.

6. Oxygen regulators should be oiled regularly.
   A. True
   B. False

7. High flow oxygen should be given to COPD patients
   A. never.
   B. only when cyanotic.
   C. with caution, and only when needed, as the patient may suffer a respiratory arrest from high flow O₂.
   D. continuously.

8. The sympathetic nervous system is considered to be a subset of the _____ nervous system. (This is a functional, as opposed to structural, division of the nervous system.)
   A. parasympathetic
   B. "fight or flight"
   C. autonomic
   D. automatic
9. CSF is not necessary for proper function of the human body, and is easily replaced after injury.
   A. True
   B. False

10. The proper order of the meninges, from inside to outside, is
   A. arachnoid, pia, dura.
   B. pia, dura, mater.
   C. pia, arachnoid, dura.
   D. mater, fater, coccyx.

11. A condition of changed sensation (as opposed to absent sensation) is called
   A. anesthesia.
   B. paresthesia.
   C. paralysis.
   D. paresis.

12. It is possible to have injury to the bony spine without injury to the spinal cord, and without neurologic deficit.
   A. True
   B. False

13. Diaphragmatic breathing (a type of paradoxical respiration) is an indication of
   A. cervical spine injury.
   B. thoracic spine or lumbar spine injury.
   C. flail chest.
   D. an opera singer.

14. The two types of epileptic seizures are
   A. petit mal and grand mal.
   B. convulsive and silent.
   C. left hemisphere and right hemisphere.
   D. tonic and clonic.

15. The three phases of a convulsive seizure are
   A. petit mal, grand mal, and post-mal.
   B. tonic, clonic, and postictal.
   C. tonic, clonic, and multiconic.
   D. precambrian, cambrian, mesozoic.

16. Any person having a seizure should be forcibly restrained, and a padded tongue blade or similar object should always be placed in the mouth.
   A. True
   B. False

17. Seizures may be caused by high temperatures ("febrile seizures"), especially in young children, and the proper treatment for such seizures is to bring the child's temperature back down to near normal.
   A. True
   B. False
18. Since hypercapnia (high CO₂) in the brain causes reflex vasodilation and a resulting increase in ICP (intracranial pressure), anyone with a CVA (cerebrovascular accident) or head injury should be given O₂.

A. True
B. False

19. It has been shown that an area of (in most people) the left cerebral hemisphere is responsible for controlling speech and speaking, However, it has been shown recently that the equivalent area of the right cerebral hemisphere, although it cannot control speech, can understand speech. If this is true, then, it provides a reasonable way to logically solve the next question.

A person is aphasic after a CVA. It is quite possible that the person, even though perhaps appearing totally unresponsive, may be conscious and may be able to hear and understand every word said around him.

A. True
B. False

20. A person suffers a head injury as a result of an auto accident. She is "knocked out" for a few minutes, but is alert and oriented when you arrive. En route to the hospital, she complains of feeling "funny" and then becomes unconscious. You should

A. not worry.
B. transport as fast as possible, and alert the ER of the situation; any decrease in level of consciousness (LOC) after a head injury is a probable sign of a neurosurgical emergency.
C. Maintain ABCs, and transport Code 2 (urgent, but not top priority) as she has probably sustained a concussion.
D. Stop your ambulance, institute CPR, and call for a MICU.

21. Neurogenic shock is believed to be caused by

A. reflex vasodilation of capacitance blood vessels as a result of sudden vagal (parasympathetic) stimulation resulting from grief or other emotional states.
B. beestings.
C. vasodilation of blood vessels in the lower extremities due to loss of sympathetic nervous enervation from spine injury.
D. (nobody knows what causes it.)

22. The long bones of the appendicular skeleton consist of cancellous and compact bone, and are surrounded by a membrane known as the periosteum. The long part (diaphysis) is hollow, but filled by marrow. Are these statements correct?

A. correct
B. not correct

23. The three generally recognized types of muscle are

A. skeletal (striated)(voluntary); smooth (involuntary); cardiac.
B. long; smooth; intestinal.
C. voluntary (smooth); involuntary (striated); cardiac.
D. syncytial; non-syncytial (separate); (with intercalated discs)
24. The shoulder girdle consists of
   A. the scapula, clavicle, and patella.
   B. the scapula, sphenoid, and arytenoid.
   C. the scapula and clavicle.
   D. the scalpel, clavichord, and sterno.

25. The scapula of the shoulder girdle articulates only with the head of
    the humerus, whereas the ilium articulates with the sacrum as well as
    the head of the femur.
   A. True
   B. False

26. The innominate bones, also known as the "os coxae," ilium, and pubis.
    They form a socket that is the parallel of the glenoid in the shoulder
    girdle. This socket is known as the
   A. glenoid fossa.
   B. amygdaloid fossa.
   C. acetabular fossa.
   D. submaxillary fossa.

27. The medial malleolus (bump of the ankle, internal) is formed by
   A. the end of the tibia.
   B. the end of the fibula.
   C. the end of the fibia.
   D. the talus bone.

28. The portion of the femur most susceptible to injury, especially in older
    people, is the
   A. neck.
   B. shaft.
   C. head.
   D. condyles.

29. Tendons ____________________, while ligaments ____________________.
   A. connect bones to bones; connect muscles to cartilage
   B. connect muscles to bones; connect bones at joints
   C. connect aponeuroses and ligaments; connect tendons and muscle
   D. connect; don't

30. A sprain is ____________________, but a strain is ____________________.
   A. ligamentous injury; muscle injury
   B. muscle injury; ligamentous injury
   C. tendon injury; ligamentous injury
   D. ligamentous injury; bone injury

31. Ecchymosis is
   A. ugly
   B. discoloration (bruising)
   C. swelling
   D. whiteness
Test #2 p 5

32. Fractures resulting from degenerative disease processes are known as
   A. fatigue fractures.
   B. autonomic fractures.
   C. pathologic fractures.
   D. greenstick fractures.

33. Incomplete fractures, only found in young children, are _____ fractures.
   A. fatigue
   B. autonomic
   C. pathologic
   D. greenstick

34. Fractures resulting from many stresses in the same area are known as _____ fractures.
   A. fatigue
   B. autonomic
   C. pathologic
   D. greenstick

35. Air splints should be inflated by pump if possible.
   A. True
   B. False

36. Which of the following is an appropriate splinting method for a fractured clavicle?
   A. air splint
   B. padded board splint(s)
   C. traction splint
   D. sling and swathe

37. An appropriate method for splinting a fractured tibia:
   A. air splint
   B. padded board splint(s)
   C. traction splint
   D. sling and swathe

38. An appropriate method for splinting a femur shaft fracture:
   A. air splint
   B. padded board splint(s)
   C. traction splint
   D. sling and swathe

39. Tight wrapping (e.g. Ace bandages) should be placed over a dislocated elbow, so as to reduce swelling.
   A. True
   B. False

40. Protruding bone ends should always be carefully cleaned before splinting.
   A. True
   B. False
41. A dressing is _________.
   A. used to cover a bandage
   B. sterile if possible
   C. used mostly to absorb blood; need not be sterile
   D. used on salad

42. Impaled objects should always be left in place, except when
   A. in the chest (sucking chest wound).
   B. in the eye.
   C. in the face or cheek.
   D. causing problems with airway maintenance.

43. Eye irrigation fluid must be sterile.
   A. True
   B. False

44. Lacerated eyelids may be treated with gentle direct pressure, except when
   A. there is foreign material in the eye or lacerations to the globe.
   B. (no exceptions).
   C. there is a skull fracture.
   D. there are chemical burns to the eyes.

45. Which of the following is located in the upper left abdominal quadrant?
   A. liver
   B. stomach
   C. appendix (vermiform)
   D. sigmoid colon

46. Which of the following is located in the upper right abdominal quadrant?
   A. liver
   B. stomach
   C. appendix (vermiform)
   D. sigmoid colon

47. Rupture of solid abdominal organs tends to cause _______, while rupture of hollow organs tends to cause ________.
   A. peritonitis, septicemia
   B. bleeding and shock, peritonitis
   C. bleeding, septicemia
   D. peritonitis, convulsions

48. Should dry cotton applicators ("Q-tips") be used to remove foreign objects from the cornea? From the sclera?
   A. no; yes
   B. yes; no
   C. yes; yes
   D. no; no
49. Heat burns to the eyelids should be treated by
   A. moist dressings
   B. dry, opaque (dark) dressings
   C. flushing with water or saline for 20 minutes
   D. ointment

50. Light burns of the eyes ("snowblindness") should be treated by
   A. moist dressings
   B. dry, opaque dressings
   C. flushing with water or saline for 20 minutes
   D. ointment

51. Alkalai burns to the eyes should be treated by
   A. moist dressings
   B. dry, opaque dressings
   C. flushing with water or saline for 20 minutes
   D. ointment

52. The ___________ lie outside the peritoneal (abdominal) cavity proper, although they are often considered "abdominal" organs.
   A. large intestine and appendix
   B. kidneys
   C. liver and gallbladder
   D. cerebrum and cerebellum

53. The _______ intestine primarily absorbs food, and the _______ intestine primarily absorbs water.
   A. large, small
   B. small, large
   C. small, small
   D. large, large

54. The pancreas contains ductless glands that secrete _______ and ducted glands that secrete _______.
   A. insulin, bile
   B. bile, insulin
   C. insulin, digestive enzymes
   D. digestive enzymes, adrenalin

55. Cholecystitis is a disease which has a classic symptom of pain after ingesting fatty or greasy foods. It is a disease of the
   A. urinary bladder.
   B. gallbladder.
   C. intestines.
   D. kidneys.

56. The __________ connects the kidney and the urinary bladder, and the ________ connects the urinary bladder to the outside.
   A. ureter; urethra
   B. ureter; vas deferens
   C. urethra; vas deferens
   D. ureter; epididymis
57. The shape of the eye is maintained by the
   A. aqueous humor.
   B. vitreous humor.
   C. lateral recti muscles.
   D. good humor.

58. The lining of the eyelids (a membrane) is known as the
   A. conjunctiva.
   B. conjugal.
   C. sclera.
   D. cornea.

60. The iris is a muscle.
   A. True
   B. False

61. This test is a pain.
   A. True
   B. Too true
1. SECONDARY SURVEY (use separate checklist)

2. CPR (use separate checklist)

3. SPECIFIC INJURIES I
   A. Avulsed eye
      1. Information given: (from 1° and 2° surveys) No other injuries.
         - Secure patient's hands, explaining why.
         - Place dressing around eye, but not touching eye
         - Moisten eye with sterile saline.
         - Cup placed over eye.
         - Cup secured with roller gauze.
         - Uninjured eye covered; explain why.
   B. Skull fracture
      1. Information given: unconscious, questionable airway status, no other apparent injuries.
         - Maintains careful watch on airway.
         - Stabilizes neck with traction and cervical collar.
         - Patient turned to traumatic coma position, little or no neck movement.
         - Open wound covered with sterile dressing properly.
         - Triangular bandage or roller gauze properly applied.
         - Student explains that patient should be backboarded prior to transport.

4. SPECIFIC INJURIES II
   A. Humerus fracture
      1. Information given: only injury is closed midshaft humerus fx. (circ.+ enervation OK)
         - Humerus is splinted to padded board splint.
         - Sling applied to wrist (but not elbow).
         - Wide swathe applied.
         - Circulation and enervation checked after splinting.
   B. Knee fracture
      1. Information given: only injury is closed knee fx; pt. refuses to allow knee to be straightened, due to pain. Circulation and enervation are OK.
         - Two medium-length board splints are padded, and positioned on either side of leg posterior to knee.
         - Cravats or roller gauze used so as to prevent leg from both flexion and extension.
         - Circulation and enervation assessed post splinting.

5. SHORT BACKBOARDING (separate checklist)

6. TRACTION SPLINTING (separate checklist)
BLUE RIDGE MOUNTAIN RESCUE GROUP
EMT SURVEYS
CHECKLIST

PRIMARY SURVEY

1. Assure Patent Airway (open or clear airway as necessary; use separate checklist for airway obstruction procedures, if appropriate)

2. Assure Presence and Adequacy of Breathing (as appropriate; seal sucking chest wound; splint flail chest; possibly reduce tension hemorthorax; administer O₂ or positive pressure ventilation if indicated)

3. Assure Adequate Circulation Palpate carotid pulse and observe quickly for signs of severe shock; survey quickly for severe bleeding. (institute external cardiac compression if no carotid pulse; give O₂ and keep from chilling for shock; control severe bleeding using proper sequence of pressure, elevation, pressure on supplying artery, and tourniquet (PEST), putting TK and time on forehead for tourniquet)

SECONDARY SURVEY

1. Gather Subjective Information
   a. Chief complaint
   b. Rescue and incident circumstances
   c. Background of problem if appropriate
   d. Patient's age
   e. Previous medical history
   f. Current medications
   g. Allergies

2. Get Vital Signs
   a. Alertness and obvious distress
   b. Orientation to time, person, and place
   c. State of consciousness (note as conscious and oriented, conscious and disoriented, responsive to verbal stimulus, responsive to pain, unresponsive to pain)
   d. Pulse (15 sec, count x 4; note rate, regularity, and quality)
   e. Respiration (count and note as with pulse; pt. should be unaware you are taking a respiration count)
   f. Blood pressure (take full BP if possible; if not, make palpable systolic estimate and note as such)

   (additional items often considered as vital signs covered below)

3. Do Physical Exam
   a. Scalp--wetness, bumps, tenderness, wounds
   b. Ears--CSF or blood
   c. Face--injuries, paralysis
   d. Conjunctiva--color
   e. Pupils--equality and reactivity to light (PERL)
   f. Mouth--possible obstructions or injuries, smell
   g. Cervical spine--pain, tenderness, deformity
   h. Neck--medic alert tag, stoma, trachea position
   i. Shoulders and clavicles--evidence of fracture or dislocation
   j. Arms--
      feel bilaterally for tenderness and deformity
      check sensory enervation (do check with no stimulus)
      check radial pulses
      check finger movement
      check strength
      check arm motions
k. Chest--
   equal expansion and air entry
   anterior-posterior and lateral compression for pain
   obvious penetration or injury

l. Abdomen--
   obvious penetration or injury
   tenderness to light touch
   guarding and rebound tenderness

m. Lumbar spine--tenderness or deformity

n. Pelvis--compression pain
   i. pressure inwards on anterior superior iliac crests
   ii. pressure outwards on iliac crests
   iii. pressure on symphisis pubis

o. Legs--same checks as with arms

p. Back--lacerations, exit wounds, flank tenderness

4. Make Assessment
a. Tentative diagnoses

5. Make Treatment Plan
a. On-scene treatment

b. Continuing evaluation plans

c. Additional medical assistance requested

d. Transportation mode, position, and urgency

Notes:
1. Order is not crucial, except that primary survey must be quickly completed, and all items should be covered.
2. Primary survey may be nothing more than talking with patient briefly.
3. Identify self as to name and EMT status.
4. This checklist is primarily for teaching purposes.

Evaluation:
✓ done
☐ not appropriate, so not done
○ omitted improperly
× done improperly

student_____________ date__________ Instructor_____________
THOMAS HALF-RING TRACTION SPLINT APPLICATION
FOR FRACTURED FEMUR.

1. IF PATIENT IS IN SEVERE PAIN, APPLY MANUAL TRACTION
   AT ONCE. (IF NOT, DELAY APPLICATION OF TRACTION UNTIL
   ANKLE HITCH IS APPLIED.) DON'T REMOVE TRACTION! (EVER!)}

   CENTER
   OF CRANAT

   (TOP ANKLE HITCH)
   IN MID-POSITON

2. APPLY ANKLE HITCH AS SHOWN. PAD THE ANKLE!

3. PREPARE THE SPLINT:

   WINDING:
   CRANAT
   GIRTH-HITCHED
   IN MID-POSITION

   4 CRANATS:

   LONG SIDE LATERAL,
   SHORT SIDE MEDIAL

   (PREVENTS THE ISCHIAL TUGGROSITY)

4. PLACE THE SPLINT IN PLACE. PAD THE GROUND AND
   TIGHTEN THE STRAP

5. TUCK ENDS OF WINDLASS CRANAT THROUGH ANKLE HITCH,
   AROUND SPLINT RAILS, THEN TIE TOGETHER:

   (STILL PULLING TRACTION)

6. TIGHTEN WINDLASS (STILL SUPPORTING LEG, BUT WINDLASS
   TAKES TRACTION)

7. TIE SUPPORT CRANATS W/ KNOTS ON LATERAL SIDE, W/ LEG
   IN MIDLINE OF SPLINT (NOT SAGGING) REMOVE SUPPORT
EMT COURSE
Skills Checklist #2: Airway Obstruction and Artificial Respiration

Instructor: YOU HAVE COME ACROSS A VICTIM WITH A DEATHLIKE APPEARANCE.

1. Check for response to voice and touch.

Instructor: VICTIM IS UNRESPONSIVE.

2. Call out "HELP!"

3. Perform proper head tilt and check for breathing:
   - proper hand position
   - ear at victim's mouth, listening and feeling
   - looking at victim's chest
   - allow adequate time for check (3-5 seconds).

Instructor: VICTIM IS NOT BREATHING.

4. Attempt four quick breaths.

Instructor: VICTIM'S AIRWAY IS OBSTRUCTED.

5. Reposition head and attempt to ventilate again.

Instructor: AIRWAY IS STILL OBSTRUCTED.

6. Administer four back blows:
   - roll victim towards rescuer
   - strike sharply between shoulder blades 4 times.

7. Administer four manual thrusts:
   - turn victim's head away from rescuer
   - rescuer with shoulders in line with victim's body
   - proper hand position and thrust technique.

8. Finger probe:
   - keep head turned away
   - open mouth with cross-finger technique
   - sweep back of mouth with one or two fingers

9. Reposition head and attempt to ventilate.

Instructor: AIRWAY IS STILL OBSTRUCTED.

10. Repeat above sequence two or three times, or until successful.

Instructor: TOO MUCH TIME HAS ELAPSED; TRY THE TRIPLE AIRWAY MANEUVER.

11. Position head for triple airway maneuver:
    - fingers under points of victim's jaw
    - thumbs on victim's chin, holding mouth open
    - heels of hands maintaining head tilt

Instructor: YOU ARE GETTING AIR IN.

12. Check pulse.

Instructor: VICTIM HAS A PULSE.

13. Administer ventilations at the proper rate for one minute

(POSSIBLE VARIATIONS:
   1. Mouth-to-nose instead of mouth-to-mouth.
   2. Chest thrust instead of abdominal thrust.)

(Note that for trained EMTs, that at a point between steps 5 and 6, it would be appropriate to attempt to visualize the obstruction and remove it. Also, step 11 would be replaced by performing a cricothyroid membrane puncture.)
Instructor: YOU HAVE COME UPON A VICTIM WITH A DEATHLIKE APPEARANCE.

1. Check for response to voice and touch.

Instructor: THE VICTIM IS UNRESPONSIVE.

2. Call out "HELP!"

3. Perform proper head tilt and check for breathing.

Instructor: VICTIM IS NOT BREATHING.

4. Give four quick, full breaths:
   - proper head tilt and nose seal
   - adequate seal around mouth
   - quick breaths, without deflation in between

5. Check carotid pulse:
   - maintain head tilt with one hand on victim's forehead
   - place fingers in notch between trachea and muscle mass
   - allow adequate time for check (5-10 seconds)

Instructor: VICTIM HAS NO CAROTID PULSE.

6. Begin one-rescuer CPR:

   A. proper hand position
      - find xiphoid process
      - place two fingers of one hand on sternum above xiphoid
      - place heel of other hand on sternum next to fingers of first hand
      - place first hand on top of second
      - keep fingers off the chest wall.

   B. apply proper compressions
      - shoulders over sternum of victim
      - elbows straight
      - compress 1½-2 inches
      - smooth compressions, 50% systole, 50% diastole
      - maintain proper hand position
      - proper rate (80/minute, or 15/12 seconds) and number (15)
      - use body weight, not muscles

   C. provide proper ventilation
      - proper head tilt and nose seal
      - adequate seal around mouth
      - two quick full breaths without allowing deflation between
      - complete breaths and return to compressions within 5-6 sec.

   D. return to compressions, measure position properly.

7. Continue one-rescuer CPR for a total of 4 cycles of 15 compressions and 2 breaths.

8. Stop for 5 seconds, check for return of pulse and respirations.

Instructor: VICTIM HAS NO PULSE OR RESPIRATIONS

9. Continue with one-rescuer CPR.

Second Rescuer: "I am certified in CPR. Do you want help?"
First rescuer nods yes.

Second Rescuer: "Do you want me to take over respirations?"
First rescuer nods yes.
10. First rescuer finishes cycle of 15 compressions and 2 ventilations, then switches to a compression rate of 60/minute, counting out loud; no pauses after "five!"

Second rescuer interposes breaths after each fifth compression.

11. On instructor's signal, first rescuer calls out "SWITCH ON THREE NEXT TIME!"

Second rescuer gives next breath, then moves to side of victim opposite first rescuer. Second rescuer takes over compressions on 4.

12. First rescuer gives three compressions, then moves to victim's head, and gives breath after fifth compression.
   - breaths given properly
   - if a breath is missed, interpose one after NEXT compression, then continue as before
   - breaths are given immediately after fifth compression
   - periodically feels for carotid pulse produced by second rescuer's compressions.

Second Rescuer: "CHANGE ON THREE NEXT TIME!"

13. After next breath, first rescuer moves to side of victim opposite second rescuer and prepares to begin compressions:
   - places two fingers in proper position on sternum next to second rescuer's hands.

14. First rescuer begins compressions:
   - proper hand position
   - proper compressions
   - no pause between compressions 3 and 4
   - no pause after fifth compression.

15. After about 5 minutes of CPR since first check, first rescuer calls "Stop CPR. Check for pulse and respiration!"

Second rescuer checks pulse and respirations.

Instructor: "VICTIM HAS PULSE AND RESPIRATIONS. CEASE CPR".
1. "Collateral circulation" means that a single area is served by more than one artery. Thus an obstruction of one of the small arteries off of the main coronary arteries would not necessarily result in a myocardial infarction.
   A. True
   B. False

2. Most "Codes" or cardiac arrests are a result of an upset in the electrical activity of the heart. These electrical abnormalities or "arrhythmias" may be caused by strange electrical signals from dying areas of heart muscle.
   A. True
   B. False

3. CAD (Coronary Artery Disease) is commonly a result of a general atherosclerosis disease process.
   A. True
   B. False

4. Which of the following is not considered an indicator of high risk of heart disease?
   A. Male
   B. Quiet personality (not aggressive)
   C. Overweight
   D. Smoking

5. Angina Pectoris ("chest pain" in Latin) is a result of coronary artery insufficiency, is usually brought on by exertion, eating, exposure to cold, or strong emotional upsets, and is usually relieved by sublingual nitroglycerine tablets.
   A. True
   B. False

6. AMI (Acute Myocardial Infarction) can cause fatal arrhythmias, chest pain, and congestive heart failure (CHF), or they may be "silent", with no associated signs or symptoms (although signs and symptoms may develop after the infarction, as tissue in the infarcted area is dying).
   A. True
   B. False

7. A patient with a history of heart disease tells you he has chest pain. You observe him take two nitroglycerine tablets, and he tells you he took one before you arrived. After 10 minutes the pain is still severe. You should
   A. Give him another nitroglycerine tablet.
   B. start CPR.
   C. ask him if he has a headache, and check the label on the nitroglycerine bottle.
   D. rush him to the hospital Code 3 (urgently), start him on 100% oxygen, and ask for a Mobile ICU/CCU to meet you en route.
8. A person suspected of having sustained an AMI should be transported lying flat and with 100% oxygen, in the vast majority of cases.
   A. True  
   B. False  

9. Which of the following would lead one to suspect AMI instead of angina?
   A. relieved by nitroglycerine and rest  
   B. onset sudden and not related to exertion, exposure, eating, or emotion  
   C. crushing chest pain with radiation to the left arm, but for less than 10 minutes.  

10. A person with "thumping in his chest" and with an irregular pulse should be suspected of having this arrhythmia as a result of a MI.
    A. True  
    B. False  

11. A massive infarction of the left heart will usually lead to congestion in the lungs, whereas a failure of the right ventricle will result usually in ascites (fluid in the abdomen), edema of the legs and ankles, and possibly swelling of internal organs such as the liver.
    A. True  
    B. False  

12. Insulin shock, resulting from too much insulin or too little food (or both) is of sudden onset, looks in many ways like shock, (except for a blood pressure that is often normal), and is relieved by the administration of sugar.
    A. True  
    B. False  

13. It is permitted for EMTs to place small amounts of "instant glucose" in the mouth of an unconscious patient suspected of being in insulin shock.
    A. True  
    B. False  

14. Sugar should be given to any unconscious or semiconscious patient with diabetes, as sugar will not harm a patient in diabetic coma.
    A. True  
    B. False  

15. It is possible for a person to be a carrier of an infectious disease without showing any outward signs or symptoms of the disease.
    A. True  
    B. False
1. A burn patient must be treated properly. After stopping the burning process, airway and breathing are the next priorities. The major cause of death in victims of a fire is
   A. burn shock, resulting from edema and evaporation.
   B. breathing problems resulting from asphyxiation and pulmonary burns.
   C. cardiac arrest.

2. Jewlery, especially rings, should always be removed from burned limbs.
   A. True
   B. False

3. Painful partial thickness burns of a small area (i.e., less than 10% of the body surface) should be treated by immediate immersion in cold water, application of a soothing ointment or sulfamylon cream, application of a dry sterile dressing, and transport to a medical facility.
   A. True
   B. False

4. Large burns should be covered with dry sterile dressings, as "wet treatment" of large areas may easily cause hypothermia.
   A. True
   B. False

5. The proper treatment for decompression sickness or "the bends" is
   A. immediate recompression.
   B. massive infusions of IV fluids.
   C. treatment for shock.
   D. CPR.

6. Which of the following poisonings should be treated by inducing vomiting (assuming that contact with a Poison Control Center cannot be made)?
   A. hydroflouric acid
   B. drain cleaner (e.g., Drano or lye)
   C. Tylenol, an aspirin substitute
   D. strychnine-type rat poison

7. Anaphylaxis should be treated with ________ in an emergency.
   A. insulin
   B. sugar
   C. adrenaline (epinephrine)
   D. meat tenderizer

8. If you are faced with a victim of a snakebite of a possibly poisonous snake (copperhead or rattlesnake), you should keep the patient calm, and keep him quiet and laying down if possible. The injured limb should be dependent (below the rest of the body) and may be splinted. If signs of envenomation develop, and it is a long way to a hospital, you should
(8) A. pack the limb in ice, apply a tourniquet proximal to the injury, and transport.
B. apply a lymph constrictor and transport.
C. apply a lymph constrictor, make cruciate (cross-shaped incisions) over the fang marks, and suck or massage as much poison out as possible.
D. possibly apply a lymph constrictor, make linear incisions over the fang marks only on non-vulnerable areas (e.g. not on face or hands) and suck or massage out blood and venom.

9. Heat exhaustion
A. should be treated as a form of shock.
B. is a true medical emergency.
C. is characterized by a fruity odor on the breath, and by air-hunger (Kussmaul) respirations.
D. is characterized by severe cramps which do not respond to stretching or massage.

10. Heatstroke
A. should be treated as a form of shock.
B. is a true medical emergency.
C. is characterized by a fruity odor on the breath, and air-hunger (Kussmaul) respirations.
D. is characterized by severe cramps which do not respond to stretching or massage.

11. The term "hypothermia weather", referring to weather presenting a great risk of hypothermia to EMTs and others, means
A. temperatures near freezing, with wind and rain.
B. winter snowstorms with temperatures below -15°C.
C. neither of the above.

12. A person with frostbitten feet may walk on them, but only after they have been rewarmed.
A. True
B. False

13. A person with severe chronic hypothermia is in grave danger of going into ventricular fibrillation or other arrhythmias. Therefore, EMTs must be extremely careful not to jostle or bump such a patient.
A. True
B. False

14. When a hypothermic patient is rapidly rewarmed (e.g. by near-complete immersion in a bathtub full of hot water)
A. "afterdrop", or paradoxical cooling of the body core below its previous temperature, may develop.
B. blood from the periphery, which is cold, anoxic, and has toxic metabolic waste products, may rush back to the core and cause cardiac arrest or other arrhythmias.
C. excessive vasodilation in the periphery may cause a relative hypovolemia and shock.
D. (all of the above are true.)
15. Which of the following is not a good place to put hot packs when rewarming a hypothermia victim?
   A. neck
   B. groin
   C. thighs
   D. armpits

16. Since frostbite is usually caused by an external impairment of circulation, or brought on as a result of exhaustion, fatigue, hypothermia, or other predisposing conditions, wearing a pair of boots designed for one pair of socks with two pair of socks for warmth invites frostbite.
   A. True
   B. False

17. Which of the following is not a good reason for avoiding cotton clothes in the winter?
   A. Cotton clothing "wicks" water easily, so that if a small part is touched to water, the entire piece becomes wet. For example, a pair of cotton blue jeans will become wet in a rainstorm if even a small part is exposed to rain.
   B. Cotton is almost totally useless as insulation when wet.
   C. Cotton is not a good insulator when dry.

18. Which of the following clothing materials are most involved in cold weather search and rescue tasks? (where wetness will be probable)
   A. goose down
   B. wool
   C. cotton
   D. cotton/polyester knits

19. Rapid, hard massage is the treatment of choice for deep frostbite.
   A. True
   B. False

20. A patient has sustained partial-thickness burns over half of the front of the torso, half of the back of the torso, and one leg. The ER has asked you for an estimate of the percent of body surface area burned. Using the rule of nines, you calculate that _____ has been burned.
   A. 9%
   B. 18%
   C. 27%
   D. 36%
   E. 45%
For questions 1-7, a patient is described who needs some sort of treatment involving airway maintenance, artificial ventilation, or oxygen (O₂) administration. Fill in the blank with the letter referring to the proper treatment. There may be more than one acceptable answer for some questions, and even doctors may disagree in some cases. (But you, the EMT, will be faced with exactly these choices!)

Choices:

A) Airway Care only - start by extending neck or drawing jaw forward, patient may then be transported on his side or on his back with shoulders propped up to keep neck hyperextended. Constantly observe to make sure airway remains open!

B) Airway Care plus 24% oxygen by Vent-mask (low flow oxygen)

C) Airway Care plus 40-100% oxygen by "rebreather mask" or similar device (high flow oxygen)

D) Airway Care plus artificial ventilation (use AMBU bag with O₂ if immediately available and if you can ventilate effectively this way, otherwise rely on mouth-to-mouth or mouth-to-nose)

E) If conscious and struggling, slap back and/or give vigorous squeeze to upper abdomen. If unconscious and therefore not struggling, reach down throat with first two fingers (or "Choke Saver" instrument) and attempt to grasp foreign body; if unsuccessful try slapping or squeezing abdomen and repeat attempt at grasping foreign body. If removal of foreign body impossible, attempt to ventilate patient - sufficient air may pass around obstruction to lungs.

F) Try to calm patient - have patient breathe and rebreathe his/her expired air from small paper bag held in front of mouth and nose.
You are called to see:

1) 89 year old man has had a "stroke" and cannot talk or move his right side. He is lethargic (sleepy appearing) but conscious and appears to be breathing normally 18 times per minute. Skin color appears normal.

2) 60 year old man with "difficulty breathing" for the past hour. He has become increasingly "short of breath" the last two days and has been coughing up yellow sputum for the past three days. He says he has been chronically "short of breath" for 5 years, but never this bad. He normally coughs up white "phlegm" in the morning, and has smoked two packs of cigarettes each day for the past 40 years. Obviously, he admits having a "Smoker's cough", and says his doctor tells him he has a "Lung Problem".

3) 20 year old student hit by car fracturing both femurs, and sustaining possible internal injuries. Appears awake, but complains of sleepiness. Pulse 120, blood pressure palpable at 90, forehead sweaty.

4) 50 year old executive had sudden onset of "crushing" substernal chest pain which radiates (extends out) to his left arm 15 min. ago, and pain has not gotten any better. He is also "short of breath", is very sweaty, and feels more comfortable sitting up than lying down. On questioning, he admits to smoking one-half pack of cigarettes per day for twenty years, but never got "short of breath" before, except while chasing his dog. He denies coughing up "phlegm" each morning, and his doctor has never said anything about any "lung problems".

5) 35 year old former psychiatric patient found by family unconscious in bed with several empty pill bottles at bedside. You find patient unarousable, but with palpable carotid pulse (rate 100) and very slow shallow breathing. Patient's neck and shoulders have slight bluish gray color.
6) 16 year old girl with "difficulty breathing" beginning shortly after shouting fight with boyfriend 20 minutes ago. You find her agitated and breathing noisily 40 times per minute. There is no history of recent eating, drinking, choking, or injury. She is able to speak in excited but otherwise normal voice. She complains of numbness and discomfort in her fingers and in her chest. (Chest discomfort appears to be in a ringlike distribution around the lower part of her ribcage)

7) 70 year old man sitting near you in restaurant falls out of chair onto floor. His wife screams, "He had this funny look on his face- I asked him what was wrong and he just stared at me and then fell over!"

Patient has palpable carotid pulse and blue color of neck and shoulders.

Matching Question: place letter on right in space on left

8)  
   ___ Ambu bag without O₂ line.  
   ___ Ambu bag with O₂ line attached.  
   ___ Mouth to mouth ventilation.  
   ___ Ventimask  
   ___ "rebreather mask"  

A) 15-18%  
B) 20% (actually closer to 21%)  
C) 24% (some models 28% or 35%)  
D) up to approx 50%  
E) approx 60-80%

9) A patient with chronic bronchitis and/or emphysema must not receive high flow (over 24%) oxygen because, in some of these patients:

(note: one answer is correct- the others are imaginary and have no resemblance to the way the body functions- so forget them)

A) His respiratory center is driven only by his lack of oxygen- too much oxygen stops his breathing long enough for his excess CO₂ to narcotize him and stop his breathing forever.

B) His respiratory center is driven only by his excess of CO₂, too much oxygen depresses the reaction of his respiratory center to CO₂.

C) Such a patient is more susceptible to oxygen toxicity (oxygen poisoning).

D) He becomes addicted to the increased oxygen, and cannot re-adjust to it.
Growing weak by degrees

Cold can be the death of you—even a drop of as little as 6°

At 11 p.m. on Dec. 22, 1963 fire broke out aboard the Greek luxury liner Lakonia as it cruised the Atlantic near Madeira, and passengers and crew were forced into the water. The air temperature was over 60°, the sea almost 65° and rescue ships were in the area within a few hours. Nevertheless, 125 people died, 113 of these fatalities being attributed to hypothermia, the lowering of the body’s inner heat, perhaps no more than 6° from the normal 98.6°.

The temperature of the hands and feet can drop 40° to 50° below normal body temperature without lasting harm. But a relatively small drop in the temperature of the body core will kill you; it makes no difference whether you’re in water, the wilderness, a house out of fuel or a car out of gas.

The rule of thumb is that you can survive three weeks without food and three days or so without water, but without warmth you are lucky to last three hours. Though few people know it, the head is the most efficient portion of the body’s heating system. A man who leaves his head unprotected, even in a minor wind, may lose up to one-half of the body’s total heat production. There is an old mountaineer’s maxim: “When your feet are cold, put on your hat.”

Hypothermia is a danger even in mild temperatures, say between 30° and 50°. Indeed, the majority of cases develop in this seemingly harmless range. Being wet and in the wind at such temperatures can be fatal, for the thermal conductivity of water is 240 times that of still air.

The moment your body begins to lose heat faster than it produces it, hypothermia threatens. As heat loss continues, the temperature of the body’s inner core falls below normal. Hands and arms (the extremities most needed in order to survive) are affected first. When body temperature drops to 95°, dexterity is reduced to the point where you cannot open a jackknife or light a match.

According to recent research by the Mountain Rescue Association, the body reacts in a series of predictable ways when inner-core temperature falls. At 2.5° below normal, shivering begins, an automatic body process to create heat. It takes energy to shiver—comparable to what is expended sawing wood— and the heat loss continues. The more the core temperature drops, the less efficient the brain becomes. Although you may have a pack on your back with a sleeping bag and food in it, you may not have the sense to use them.

If the core temperature drops to 94°, you will stop shivering but every now and then will experience uncontrollable shaking. Your system, automatically getting rid of carbon dioxide and lactic acid, also releases blood sugar and a little adrenaline, giving you a surge of energy, which causes the violent shaking. This last desperate effort by the body to produce heat utilizes a tremendous amount of energy.

Wool has the peculiar virtue of drying from within, keeping the body warm even when wet. Never wear jeans when there is any possibility of exposure to cold.
Case 2: A man unaccustomed to drinking returns home, pulls into his garage, and falls asleep before he turns off the engine or leaves the car. A faulty exhaust system leaks carbon monoxide gas into the car. The wife, hearing the car running for an unusual amount of time, is alerted and calls the emergency squad. Upon your arrival you find the victim cyanotic and with slow and irregular pulse and respiration rates.

9. What is the appropriate emergency care for carbon monoxide poisoning?  
   A. Remove clothing  
   B. Flood affected area with water  
   C. Give nothing by mouth  
   D. All degrees would probably be exhibited  

11. Poisons are categorized according to the route of entry into the body. List the four ways poisons can enter the body.  
   A. Gastrointestinal tract  
   B. Respiratory tract  
   C. Intrauterine stages  
   D. Intravenous route  

12. What is the appropriate emergency care for this apparent accidental poisoning?  
   A. Give syrup of ipecac  
   B. Induce vomiting  
   C. Administer activated charcoal  
   D. Make sure to airway and breathing are patent  

13. What information should you provide the hospital during transport?  
   A. Canvassing of time and site of poisoning  
   B. Description of poisoning agent  
   C. Patient's history  
   D. All of the above  

14. This case represents what classification of poisoning by mouth?  
   A. Oral ingestion  
   B. Ingestion through the skin  
   C. Inhalation  
   D. Ingestion through the respiratory tract  

15. What symptoms would you eventually expect to be present in a person who has ingested a corrosive substance?  
   A. Red esophagus and brain damage  
   B. Metabolic acidosis  
   C. Cardiac arrhythmias  
   D. All of the above  

16. What are the two classes of corrosive substances that are ingested by mouth?  
   A. Acidic and alkaline corrosives  
   B. Contact and systemic corrosives  
   C. Acute and chronic corrosives  
   D. All of the above  

Answers are on page  

The following bibliography can be consulted by the EMT for information regarding the emergency care of poisoning.

BIBLIOGRAPHY


Commentary on Emergency Management of Poisoning

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Acute, accidental poisoning rates high among causes of death; 3,000 children die from accidental poisoning each year. Morbidity runs even higher as a result of scarred esophagus and brain damage. Among female adults, ingestion of drugs is a favorite method of attempting suicide.

The critical period for action is at the time and site of poisoning. Knowing how and when to administer syrup of ipecac is
You are invited to submit your comments and suggestions for future topics to Emergency Medical Services, Review and Evaluation, 15300 Ventura Blvd., Suite 301, Sherman Oaks, California 91403, or telephone 213/990-8393.

The following are actual cases involving emergency medical care of some summertime emergencies. They present an opportunity for self-evaluation and review. As a result of working through them, you should be able to

- Distinguish the major heat conditions and list the emergency care for each;
- Describe the emergency care for fractures and dislocations;
- Recall the causes of fresh and salt water drowning;
- Describe the emergency care for blunt trauma to the forehead.

Case 1: On a hot, humid summer day you respond to a call at a local park. A middle-aged man, apparently a jogger, has collapsed. His skin is hot to the touch and very dry. He is unconscious and breathing very shallowly.

1. What major heat condition is this man apparently suffering from?

2. What is another major heat condition?

3. Following are signs and symptoms of the two major heat conditions you should have listed above. Write the name of the heat condition that corresponds to each sign or symptom.

   A. ________ skin-flushed, hot, dry
   B. ________ skin-pale, clammy
   C. ________ profuse sweating
   D. ________ absence of sweating
   E. ________ breathing—rapid (shallow)
   F. ________ breathing—rapid (snoring)
   G. ________ mental confusion, delirium

4. For the apparent heat condition described in Case 1, what is the appropriate emergency care?

   A. ---------------
   B. ---------------
   C. ---------------

5. What is the emergency care for the other common heat condition?

   A. ______________
   B. ---------------
   C. ---------------

Case 2: You arrive at a little league baseball game and find the catcher of one team sitting on the bench, crying and in obvious pain. You notice that his left arm is "hanging funny" from the shoulder area. The youngsters informs you that he has extreme pain in the left shoulder area and cannot move his left arm when requested.

6. What is the most probable nature of this youngster's injury?

7. List the additional signs usually present with this type of injury.

   A. ---------------
   B. ---------------
   C. ---------------

8. Should you try to put this youngster's arm back in place at this time?

   Yes __
   No __

9. Should you ever attempt to correct similar injuries of this nature at the scene?

   Yes __
   No __

10. If Yes, give example, if No, why not?

11. List the emergency care for these types of injuries.

   A. ______________
   B. ______________
   C. ______________
   D. ______________
   E. ______________

Case 3: A young girl bicyclist has glanced off a moving car and is now lying in the street. The child is bleeding from her right forehead and a portion of bone can be seen protruding from the open wound.

12. What type of fracture does this child have?

13. What is the other major type of fracture?

14. What are the three major variations of this type of fracture you listed in question 13?

   A. ______________
   B. ______________
   C. ______________

15. As a general rule, air splints should be used (check all appropriate answers).

   A. ________ below the elbow
   B. ________ below the knee
   C. ________ full arm
   D. ________ full leg

16. Unless there is presence of some immediate danger, what is the key word in treating fractures of any type?

17. When splinting fractures, the splint should be applied (A) ________ and (B) ________ the adjacent joints.

Case 4: You arrive upon the scene approximately two minutes after an apparent drowning victim has gone under and been retrieved from a fresh water lake. The victim is now receiving mouth-to-mouth resuscitation from a bystander. Before taking over, you check for vital signs. No pulse can be determined.

18. What is the immediate emergency care in this situation?

19. A salt water drowning death is usually caused by

   A. ________ chemical imbalances in blood chemistry causing ventricular fibrillation
   B. ________ fluid being drawn from the blood into the lungs causing saturation
of the lung tissue

20. From the list below, number in order the manner in which you would attempt to make a water rescue—number 1 being the procedure of first choice.

A. ______ row a boat or canoe
B. ______ throw a rope or life ring
C. ______ swim out to make rescue
D. ______ reach with a long pole or branch

Case 5: Upon responding to a residential call, you learn that several children had been playing on a swing set. One child had been hit on the forehead by another child who came back on the swing. The child was knocked several feet behind the swing set by the impact and appears dizzy, confused, and very weak. There was no bleeding. Pupils reacted slowly to light.

21. You would most likely suspect
A. ______ skull fracture
B. ______ brain concussion
C. ______ both, as the signs and symptoms are almost identical

22. Emergency care for this child would include
A. _______________________
B. _______________________
C. _______________________
D. _______________________

23. With any head injury, always suspect
A. ______ the worst, inform the parents the child may die
B. ______ neck and back injury
C. ______ the best, no real emergency care is needed if there is no bleeding or other major sign of injury

Answers are on page 101.

The following bibliography can be consulted by the EMT for information regarding the emergency care of summertime emergencies.

**BIBLIOGRAPHY**


FIGURE 14-12 The velpeau.

FIGURE 14-32 Cravat of the pulse.

FIGURE 14-9 Rec. bandage.
Here is the first of a continuing series designed to aid the EMT in evaluating his knowledge of emergency care procedures. Each issue will feature review cases and exercises directed at the first level EMT—researched and developed by David A. Gallup, Ed.D., Assistant Professor of Medicine and Educational Specialist, and registered EMT, employed by the Office of Medical Education at Hahnemann Medical College and Hospital in Philadelphia, Pennsylvania. Thomas W. Bonekemper, M.D., Assistant Professor of Medicine and Coordinator of Primary Care at Hahnemann checks the cases for authenticity and appropriate emergency care; John R. Boker, Ph.D., Assistant Professor of Medicine at Hahnemann and an Educational Psychologist, is involved in writing and setting the cases up for self-review. At the end of each column, commentary will be provided by an expert in the field reviewed.

You are invited to submit your comments and suggestions for future topics to Emergency Medical Services, Review and Evaluation, 15300 Ventura Blvd., Suite 301, Sherman Oaks, California 91403, or telephone 213/990-8393.

The following are actual cases involving emergency medical care of burns. They present an opportunity for self-evaluation and review. As a result of working through them, you should be able to
- Describe the emergency care for thermal, chemical, and electrical burns.
- Use the Rule of Nines to determine the severity of a given burn.
- Differentiate between the severity of burns.

Case I: A 15-year-old male was joy riding in his parent's car, driving on the wrong side of the road, when he met an oncoming vehicle head-on. The driver of the other car was killed on impact, the youth was trapped in the wrecked car when the gasoline tank exploded. Initial examination revealed minor lacerations and abrasions as a result of the impact. No fractures were detected. Burns were sustained on the posterior aspects of the legs, thighs, buttocks, and back. The burns also involved the left lateral aspect of his chest and abdomen, left arm, forearm, and hand.

1. What emergency burn care should the E.M.T. administer once the victim has been removed from the vehicle?

2. You would expect this patient to have burns of what degree?
   A. ___ 1st degree
   B. ___ 2nd degree
   C. ___ 3rd degree
   D. ___ all degrees would probably be exhibited

3. The diagram below illustrates the area covered by the burns. Using the Rule of Nines to notify the hospital ER, what is the severity of the victim's burns?

4. During transportation to the ER the victim complains of thirst. You should
   A. ___ give the patient a drink of water
   B. ___ let the patient suck on ice cubes
   C. ___ give nothing by mouth
   Case II: An 18-month-old child has bitten through a household electrical cord. He has a third degree burn around his mouth.

5. What is the severity of this burn?

6. Electrical burns may result in paralysis of the breathing center and ventricular fibrillation. It may be necessary to initiate
   A. ___ cardioversion
   B. ___ defibrillation
   C. ___ nothing

7. An electrical burn is most often accompanied by a
   A. ___ thermal burn
   B. ___ chemical burn

8. After life support is initiated and accompanying burns extinguished, victims sustaining an electrical burn should be examined for

Case III: A 24-year-old female working as a research chemist in a large industrial plant has spilled acid on her left hand. She has started to flood her hand with copious amounts of water.

9. What is the normal emergency care for the majority of chemical burns?

10. An exception to the normal emergency care for burns is in dealing with carbolic acid. What is the emergency care you would institute for this type of acid burn? Why?

11. In dealing with powdered forms of chemicals, particularly lime, the initial emergency care procedure would be to
   A. ___ wash off, then transport immediately
   B. ___ do nothing, transport immediately
   C. ___ brush the powdered chemical off, then transport

12. What class of chemical inflicts the deepest and longest lasting burns?
   A. ___ acids
   B. ___ alkalis

13. In chemical burns affecting the eyes, what should be done before instituting any emergency care?

14. Please complete the following chart, giving the appropriate percentage of total body surface affected. Write the answer on the line beside each letter.

<table>
<thead>
<tr>
<th>Severity/degree</th>
<th>1st degree</th>
<th>2nd degree</th>
<th>3rd degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor</td>
<td>A. ___</td>
<td>B. ___</td>
<td>C. ___</td>
</tr>
<tr>
<td>Moderate</td>
<td>D. ___</td>
<td>E. ___</td>
<td>F. ___</td>
</tr>
<tr>
<td>Critical</td>
<td>G. ___</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

15. Exceptions to determining severity of burns would involve the following body areas or injuries:

Answers are on page 100

The following bibliography can be consulted by the E.M.T. for information about the emergency care of burns.
graduate review

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John R. Boker, Ph.D.
Office of Medical Education
Department of Medicine
Hahnemann Medical College and Hospital
Philadelphia, Pennsylvania

You are invited to submit your comments and suggestions for future topics to Emergency Medical Services, Review and Evaluation, 15300 Ventura Blvd., Suite 301, Sherman Oaks, California 91403, or telephone 213/990-8393.

The following are actual cases involving emergency medical care of poison cases. They present an opportunity for self-evaluation and review. As a result of working through them, you should be able to:

- List the four routes of entry into the body for poisons;
- Classify poisons that are taken orally;
- Describe the emergency care for specific types of poisoning;
- Recall the poisons that should not be vomited.

Case 1: A frantic young mother fears that her 2-year-old daughter has accidentally eaten some rat poison. Unfortunately, the toddler is too young to reliably tell what she has done. No unusual signs or symptoms are immediately present when the EMT arrives at the scene.

1. What should be the appropriate action of the EMT for this apparent accidental poisoning?
   A. ____________
   B. ____________

2. What should be done next?
   A. ____________
   B. ____________

3. What is the best method to administer the emergency care in Question 1 above?
   A. ____________
   B. ____________

4. What items should accompany the patient to the hospital?
   A. ____________
   B. ____________

5. The three general classifications of poisons that enter the body by mouth are: corrosives, irritants, and neurotoxins.
   A. True
   B. False

6. The poisoning in this case is an example of which above classification?

7. What symptoms would you expect to eventually appear in this patient if she did in fact ingest some of the rat poison?
   A. ____________
   B. ____________
   C. ____________
   D. ____________

8. There are certain poisons that should not be vomited. These poisons include: (check all that apply)
   A. __ acids (hydrochloric, sulfuric, nitric)
   B. __ alkalis (lime, potash, ammonia)
   C. __ petroleum-based products (gasoline, kerosene, oil)
   D. __ volatile liquids (lighter fluid, alcohol)

---

ANSWER KEY for Graduate Review

1. Heat stroke
2. Heat exhaustion
3. A. Heat stroke
   B. Heat exhaustion
   C. Heat exhaustion
   D. Heat stroke
   E. Heat exhaustion
   F. Heat stroke
   G. Heat stroke
4. A. Transport to medical facility
   B. Cool victim
   C. Maintain airway
5. A. Cool victim
   B. Administer cool water, salt added
   C. Treat for shock, transport
6. Dislocated shoulder
7. A. Swelling of injured area
   B. Discoloration
   C. Shortening or lengthening of extremity
8. No
9. Yes
10. Dislocation of lower jaw may be reduced if transportation will be delayed
11. A. Support injured area
    B. Immobilize area
    C. Do not attempt to straighten
    D. Treat for shock
    E. Transport to medical facility
12. Compound
13. Simple
14. A. Green stick
    B. Comminuted
    C. Impacted
15. A. Below the elbow
    B. Below the knee
16. Immobilization
17. A. Above
   B. Beyond
18. Start CPR
19. B.
20. A. 3
   B. 2
   C. 4
   D. 1
21. C
22. A. Keep victim lying quiet
   B. Head elevated and immobilized
   C. Apply cold pack to forehead
   D. Maintain airway, support with oxygen
   E. Transport carefully
23. B
CO SYMPTOMS AT A GLANCE

**MILD EXPOSURE**
- Less than 5%, usually no symptoms
- Light headaches
- Slight dyspnea (shortness of breath)
- Throbbing temples
- Fatigue
- Irritability
- Loss of appetite
- Motor performance

**CO SYMPTOMS AT A GLANCE**

**MILD EXPOSURE**
- Irritability
- Fatigue
- Loss of appetite
- Motor performance

**HEATING PADS**
- Invalids
- Infants
- Toddlers
- Children

**CONTACT BURNS**
- Toddlers
- Children
- Infants

**PLATE BURNS**
- Pots on stove or table
- Hot fluids, carried with underfoot
- Splash cows

**CONTACT BURNS**
- Test water before bathing: turn down water temperature control on water heater (125 is a reasonable compromise between safety and efficiency).
- Keep pot handles away from edges.
- Put toddlers in playpen or high chair, keep others out of kitchen "traffic lanes" at meal preparation time.

**HAZARD**
- Test water before bathing: turn down water temperature control on water heater (125 is a reasonable compromise between safety and efficiency).
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Council on Mountain Safety, says: "If we could just get the jeans off them we could save a lot of lives." Denim is relatively loose-woven. It not only allows water to penetrate but permits wind to blow away warm air that should remain trapped between body and clothing. Cotton absorbs water like a wick and quickly becomes soaking wet. If even an inch of cotton sweat shirt extends beyond the sleeve of one's rain gear, water will be drawn up until the whole sleeve is soaking.

If you find yourself without proper protection, use your wits. Lives have been saved by the knowledge that clothing may be padded with any soft, fluffy or relatively bulky material. Dry grass, moss, cattail down and milkweed have all been used as emergency insulation. Pieces of paper packed inside your clothes are also helpful.

Dry clothing and adequate shelter are the keys to survival. But it may take too much energy to collect materials and build a shelter which, in the end, may be insufficient to conserve body heat. It may be better to emulate the chipmunk, scooping out a body-size cave under a downed log where you can stay dry and insulated against the cold.

The threat of hypothermia is not confined to winter months. Even on warm summer days you must be prepared for cold wet winds. In late August of 1959 Alfred Whipple Jr., 20, and Sidney Crouch Jr., 21, became stranded on Cannon Mountain cliff, a sheer rock face near the Lafayette campgrounds in New Hampshire. Even as rescuers tried to reach them, strong winds and rain closed in. Before the lightly clad youths could be reached, their body temperatures had been so reduced by 38° driving rain that both died shortly after a rescue team found them. At a loss, authorities finally labeled the cause of death "exposure to nonfreezing cold."

Uncounted numbers of Americans are exploring the wilderness these days, in cars and trucks, on motorbikes and snowmobiles, in small private planes. Too many of them fail to realize that with such motorized transportation you can penetrate farther into the wilderness in 30 minutes (less in an airplane) than you can walk out alive.

When stranded during a storm in a car or truck, you are well advised to stay where you are. Even after the fuel tank has run dry and the heater no longer works, you will still have a wealth of resources. An automobile has seats and insulation that can be torn up and made into sleeping bags and padding. The crankcase oil and the tires will burn. Mirrors can signal aircraft. If you will use your wits and resist the temptation to panic, you can remain safe and reasonably warm until help comes.

Hypothermia can occur wherever the wind blows, but what isn't obvious is that it also can happen in the home. With inflation elderly people often cannot afford to buy simple things like fuel and nourishing food. In bad weather they can suffer hypothermia.

A Eugene, Ore. physician thinks hypothermia could explain many puzzling drownings, particularly among the young. Dr. Latham Flanagan Jr. says, "You hear of a lot of cases where kids, known to be good swimmers, suddenly stop swimming and sink out of sight. Most cases seem to happen around Memorial Day or the Fourth of July. We think the reason is that the water is still very cold at that time. The swimmer's body temperature drops 6° to 8°, his mind slows down and he becomes irrational. He can't remember where he is going or why."

Lieu. Commander A. B. Ford of the U.S. Coast Guard Office of Boating Safety says, "I am of the opinion that hypothermia plays a greater role in boating fatalities than would be apparent by the casualty reports, because in most cases drowning is the listed cause. Most cases seem to happen around Memorial Day or the Fourth of July. We think the reason is that the water is still very cold at that time. The swimmer's body temperature drops 6° to 8°, his mind slows down and he becomes irrational. He can't remember where he is going or why."

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Hypothermia warning signs include intense shivering, poor coordination, stumbling, thickness of speech and loss of memory. Even mild symptoms demand immediate, drastic treatment. The best procedure is to submerge the victim in a tub of hot water and, if he is conscious, to force him to drink quarts of warm, heavily sugared liquids or beef broth. In the field, if symptoms of advanced hypothermia are evident, the victim should not be moved from the spot until treatment has been given.

If symptoms are mild, get the victim into the best available shelter. Replace wet clothing with dry and put as much insulation as you can between him and the ground. Try to keep him awake while administering liquids. If there are no dry clothes to put on him, strip him and place him in a sleeping bag with another person (also stripped). If you have a double bag, put the victim between two warm people. Skin-to-skin contact is an effective field treatment.

Recent findings suggest that loss of life from immersion hypothermia could be avoided if knowledge of its hazards were more widespread. In a boating accident put on warm clothing, if possible, as well as a life-jacket (experiments show that damp clothing can provide considerable thermal insulation when submerged) and, once clear of the craft, float unless land is close enough to reach by swimming. Many of those who swam unnecessarily after leaving the Lakonia exhausted themselves, accelerating the fall in their body temperature.

Hypothermia is deadly because it is so subtle. We have all shivered at some time, with no discernible harm, because shelter and warmth were nearby or we had plenty of energy reserves to produce heat for a long time. What one rarely remembers about hypothermia is its effect on the mind.

In April 1968, bush pilot Robert Gaut­thier was discovered alive in the arctic wilderness of Canada's Northwest Territories, 58 days after his light plane had gonedown. The 39-year-old Gautthier had been overlooked in the intensive search that had followed his disappearance on Feb. 2. Although he was 50 pounds lighter and his feet were frostbitten, he was in good condition. He told rescuers he had made a normal landing after his plane ran out of fuel. He had hardly ten­...
EMERGENCY MEDICAL REPORT

IDENTIFICATION OF SCENE: Agency

Patient
Name ____________________ Age _____ Sex M F
Phone ____________________ City ____________________
Relative's
Name ____________________ Phone ____________________
Type of Emergency (Auto accident?)

PATIENT ID
DATE: / /

SUBJECTIVE (Background) (Note: Code letters - Pr = Problem / Ba = Background)

<table>
<thead>
<tr>
<th>General</th>
<th>Trauma</th>
<th>Cardiac</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pr.</td>
<td>Pr.</td>
<td>Pr.</td>
</tr>
</tbody>
</table>

Past Health: □ Heart Disease □ Emphysema □ Diabetes □ Seizures □ Hypertension
Allergies: □ Penicillin

Medications: □ Digitalis □ Water pills □ Insulin □ Blood pressure pills □ Dilantin □ Nerve pills

OBJECTIVE (Exam)

Neck Trachea: □ Stoma present
C-Spine: □ Point Tenderness? □ No
Chest Movement: □ Symmetric □ Flail
Compression: □ Pain □ No Pain
Air Entry: □ Equal □ Unequal
Abdomen—Obvious injury

Low Back □ Point Tenderness? □ No
Pelvis □ Compression Pain? □ No
Extremities—

Vitals

<table>
<thead>
<tr>
<th>Time</th>
<th>BP</th>
<th>Pulse</th>
<th>Respiration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Skin □ Moist? □ Dry? □ Bruised?
□ % _______ degree Burn

Head □ Scalp Bleeding (□ Spurting?)
□ R/L Ear Blood or drainage

Pupils □ Small? □ Large? □ =
□ Unequal — R > L or L > R

Mouth □ Clear of obstruction

ASSESSMENT (Conclusion/Diagnosis/Impression)
Suspected Problem:
Priority Threatened: □ AIRWAY □ BREATHING □ CIRCULATION □ CNS □ OTHER

PLAN
Breathing Needs: □ Positive pressure— □ Mouth to Mouth □ Mouth to Mask
□ Demand Valve □ Bag Mask □ CPR
□ Oxygen— □ 24% □ 28% □ 32% □ 40% □ 100% □ ______ Liter Flow
Circulation Needs: □ Leg Elevation □ Shock Trousers
Bleeding Control— □ Direct Pressure □ Elevation □ Pressure Point □ Tourniquet (Time Segun ______)
Splint ____________________ Positioning □ (Back) □ (Knee) □ (Sitting) □ (Side)

TO ____________________ Hospital/Code ______ / Arrival ___ am/pm X

EMT-1
Dear EMT Student;

We're glad to have you here in the E.R. In order to make your in-hospital training most valuable, we have listed objectives you should complete while here. It is hoped that each objective will be performed AT LEAST 8 times in your 10 hours here. We highly encourage you to seek out these objectives. You will be assigned to work with one nurse although you are welcome to work with others any time you see something that might interest you. Please feel free to ask any questions.

The nurse with whom you complete an objective will evaluate and initial in the appropriate box on your training sheet.

**EXAMPLE**

<table>
<thead>
<tr>
<th>DATE</th>
<th>VITAL SIGNS</th>
<th>evaluation/initials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B/P, palpated</td>
<td>T  S  O</td>
</tr>
<tr>
<td></td>
<td>B/P, auscultated</td>
<td>S  S  S</td>
</tr>
</tbody>
</table>

O = observed and understood  
T = still needs guidance, unsuccessful attempt  
S = successful
<table>
<thead>
<tr>
<th>VITAL SIGNS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>B/P, palpated</td>
<td></td>
</tr>
<tr>
<td>B/P, auscultated</td>
<td></td>
</tr>
<tr>
<td>Apical pulse</td>
<td></td>
</tr>
<tr>
<td>Radial pulse</td>
<td></td>
</tr>
<tr>
<td>Carotid Pulse</td>
<td></td>
</tr>
<tr>
<td>Femoral pulse</td>
<td></td>
</tr>
<tr>
<td>Dorsalis pedis &amp; post tibial pulses</td>
<td></td>
</tr>
<tr>
<td>Respirations</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
</tr>
</tbody>
</table>

| PATIENT ASSESSMENT                  |  |
| History                             |  |
| Systems Review                      |  |
| (head to toe)                       |  |
| Auscultate lungs                    |  |
| Abnormal findings                   |  |
| Reassurance to pt.                  |  |
| Communication                       |  |

| CONTROL OF AIRWAY                   |  |
| Head position                        |  |
| Oxygen/mask                          |  |
| Insert oral airway                   |  |
| Use of Ambu bag                      |  |
| Oral/nasal suctioning                |  |

O = observed \quad T = unsuccessful attempt \quad S = successful
<table>
<thead>
<tr>
<th>TRAINEE</th>
<th>DATE</th>
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<tbody>
<tr>
<td>NEUROLOGICAL SIGNS</td>
<td></td>
</tr>
<tr>
<td>Level of consciousness</td>
<td></td>
</tr>
<tr>
<td>Pupil check (PERL)</td>
<td></td>
</tr>
<tr>
<td>Motor Function</td>
<td></td>
</tr>
<tr>
<td>Sensory Function</td>
<td></td>
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<tr>
<td>Glasgow Coma Scale</td>
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</tr>
<tr>
<td>CIRCULATORY SUPPORT</td>
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</tr>
<tr>
<td>CPR-2 man (help or observe)</td>
<td></td>
</tr>
<tr>
<td>Control of bleeding and hemorrhage (observe)</td>
<td></td>
</tr>
<tr>
<td>LABOR AND DELIVERY (optional)</td>
<td></td>
</tr>
<tr>
<td>Taking a history</td>
<td></td>
</tr>
<tr>
<td>Timing of contractions</td>
<td></td>
</tr>
<tr>
<td>Auscultation of fetal heart tones</td>
<td></td>
</tr>
<tr>
<td>Observation of normal delivery</td>
<td></td>
</tr>
<tr>
<td>Control of post-partum hemorrhage (massaging uterus)</td>
<td></td>
</tr>
<tr>
<td>Management of newborn (observe)</td>
<td></td>
</tr>
</tbody>
</table>

O = observed  T = unsuccessful  S = Successful
**GIASGOW COMA' SCALE**

<table>
<thead>
<tr>
<th>Best Motor Response</th>
<th>Obeys</th>
<th>M6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Localises</td>
<td>5</td>
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<tr>
<td></td>
<td>Withdrews</td>
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<tr>
<td></td>
<td>Abnormal flexion</td>
<td>3</td>
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<td></td>
<td>Extensor response</td>
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<td></td>
<td>Nil</td>
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<table>
<thead>
<tr>
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AMERICAN HEART ASSOCIATION

AFFILIATE FACULTY INSTRUCTOR COURSES
FOR CARDIOPULMONARY RESUSCITATION AND
EMERGENCY CARDIAC CARE

BASIC LIFE SUPPORT
COURSE TEST

The enclosed test consists of multiple choice test questions.

On the separate answer sheet provided, circle the correct answer or answers. Do the same on the question sheet also. Many questions require more than one answer.

eg:

The heart:

a. Pumps blood around the body
b. Is situated between the spinal column and breast bone
c. Is in the abdomen
d. Continues to beat during cardiac arrest

Answers: a b c d e

Please read the questions carefully.
1. When a foreign body is obstructing the air passage and cannot be removed with fingers:
   a. Deliver firm blow over spine between shoulder blades
   b. Call for a surgeon
   c. Perform an emergency tracheotomy
   d. Keep probing in throat with fingers

2. External cardiac compression for a pulseless victim is too hazardous to perform:
   a. If the patient has numerous rib fractures and a "flail" chest
   b. If neck injury is present
   c. Following open heart surgery
   d. None of the above

3. The percentage of deaths from a heart attack before the victim reaches the hospital is:
   a. 20 - 30
   b. 40 - 50
   c. 50 - 60
   d. 70 - 80

4. In mouth-to-mouth resuscitation, tilting the head back is important because:
   a. Air cannot enter the stomach
   b. It allows the individual doing the breathing to more easily observe the victim's body and to notice when there is a pause after every fifth compression during which a breath may be interposed
   c. It extends the neck and lifts the tongue away from the back of the throat

5. Which of the following may be a patient's description of a heart attack?
   a. It was as if someone was standing on my chest
   b. Severe aching in my jaws
   c. Very great chest pain - the worst pain in my life
   d. A mild episode of indigestion
   e. My chest felt like it was on fire

6. When performing external cardiac compression on an infant:
   a. The compression rate should be 80-100 per minute
   b. Place two fingers over the lower half of the sternum
   c. Place two fingers over the middle of the sternum
   d. Interpose one ventilation between every fifth and sixth compression
   e. The compression rate and hand position is the same as for an adult
7. Hearing or feeling ribs fracture or costochondral separations during external compression:
   a. Is an indication to stop compressing as the lung may become punctured
   b. Indicates hand location should be reassessed
   c. Indicates the 60 lbs. of downward force is too much for this average adult victim
   d. Generally makes subsequent external compressions more difficult

8. Blowing a small amount of foreign matter into the lungs is less dangerous than delaying oxygenation.
   a. True
   b. False

9. The initial airway and breathing efforts fail to result in ventilation of a victim. Consider the following actions:
   1. Explore the throat for foreign objects and try again
   2. Reposition the head and neck and try again
   3. Proceed to external compression after four quick breaths if the pulse is absent
   4. Roll victim over and deliver a sharp blow between shoulder blades, re-explore the throat and try again
   5. If no ventilation can be established, do not proceed to external compression even if the victim is pulseless
   6. Do an emergency cricothyrotomy if qualified

Which is the appropriate sequence of actions to be taken?
   a. (2, 1, 6, 3)
   b. (2, 1, 4, 6)
   c. (1, 4, 3, 6)
   d. (3, 2, 1, 4)

10. What is certain when the unconscious victim's chest is seen to move up and down?
   a. He is moving air in and out of his lungs
   b. He is not breathing
   c. He is making breathing attempts but may not be getting air into his lungs

11. Which of the following is generally not considered to be a warning sign of a heart attack?
   a. Pain in the legs
   b. Squeezing feeling in the chest
   c. Numbness or aching in the arms
   d. Aching jaw
   e. Nausea, sweating, and shortness of breath
12. One of the most common mistakes made in performing mouth-to-mouth breathing is that the operator does not hyper-extend the patient's head adequately.

(a) True
(b) False

13. When switching places with partner in performing CPR:

(a) The rescuer at head moves first
(b) The rescuer at chest rests during inflations
(c) The rescuers change simultaneously to avoid interruption of rhythm
(d) The rescuer at head gives three quick breaths before moving

14. Which of these persons is likely to be a victim of airway obstruction?

(a) A stroke victim
(b) A person suffering drug intoxication
(c) A person with something in his windpipe
(d) A person with spasms of his vocal cords

15. How far down should you depress the sternum for external cardiac compression in an adult?

(a) \( \frac{1}{2} \) - 1 inch
(b) 1\( \frac{1}{2} \) - 2 inches
(c) 2 - 2\( \frac{1}{2} \) inches

16. What should you do first for the unconscious victim of illness or accident?

(a) Get him to a physician or hospital
(b) Apply effectively the ventilation and compression steps of CPR
(c) Examine him for bleeding and fractures
(d) Find out if he is breathing
(e) Open the airway

17. A precordial thump is effective because:

(a) It increases cardiac output to 60%
(b) It is less tiring than external compression
(c) It may result in creation of electrical activity sufficient to stimulate the heart
(d) It creates negative pressure in the chest causing a spontaneous inhalation

18. The chest "thump" should be performed:

(a) With the heel of the hand
(b) By striking over the left chest
(c) As part of the first step in a monitored patient with cardiac arrest
(d) As the first step in an unwitnessed arrest
(e) Starting 18 inches above the chest
Basic Life Support - Course Test

19. If you find someone who is apparently unconscious lying on the floor of his apartment, your first step is to:
   a. Run for help
   b. Feel for a pulse
   c. Position the head and check for breathing
   d. Clean out mouth
   e. Check the pupils

20. You are talking with an injured patient and suddenly he stops breathing. Consider the following actions:
   1. Check the blood pressure
   2. Open airway and feel for a carotid pulse
   3. Check the pupils
   4. Give a thump on sternum with your fist, if indicated
   5. Elevate the head of the bed
   6. Give four rapid breaths of mouth-to-mouth resuscitation
   7. Administer oxygen
   8. If pulse and breathing are not immediately restored, begin CPR

Which is the appropriate sequence of actions to be taken?
   a. (6, 2, 8, 3)
   b. (2, 4, 6, 8)
   c. (3, 6, 2, 4)
   d. (1, 8, 6, 7)
   e. (2, 3, 4, 7)

21. Sometimes mouth-to-mouth breathing is all that it takes to revive an unconscious person.
   a. True
   b. False

22. A sharp blow on the sternum in an attempt to restore the heartbeat of an unwitnessed arrest victim is a waste of time.
   a. True
   b. False

23. Infants and small children are ventilated in basically the same way as adults, except that inflations are:
   a. Faster and more forceful for children
   b. Slower and more forceful for children
   c. Faster and less forceful for children
   d. Slower and less forceful for children

24. External cardiac compressions may lead to complications. The one most common of these is:
   a. Punctured lung
   b. Laceration of the liver
   c. Fractured ribs
   d. Contusion of the heart
25. When should the ventilator deliver the major portion of the breath during two-man CPR?

- During the fifth downstroke
- During the fifth upstroke
- During the 15th upstroke
- Whenever possible

26. Choose the correct statements:

- You can usually feel a pulse at victim's neck if heart is beating
- The best way to determine if the victim's heart is beating is to check pulse
- If heart is not beating, begin CPR
- The pulse at the wrists should not be used in CPR
- If you have trouble finding a pulse, press hard

27. Always check for foreign matter in the victim's throat before starting to breathe for him.

- True
- False

28. What particular point must a rescuer remember when placing a small child in open airway position?

- The child's head should be back as far as possible
- A small child's neck is less flexible than an adult's
- Forcing the child's head back too far may result in a collapsed airway

29. How fast should you breath for a nonbreathing adult, with a strong pulse?

- 12 ventilations per minute
- 16 ventilations per minute
- 20 ventilations per minute

30. If a lone rescuer finds a nonbreathing and pulseless motor vehicle accident victim lying on his face in the road, and he suspects that the victim has a back injury, what should he do?

- Turn the victim as a unit and begin CPR
- Turn the victim's head to one side and begin CPR
- There is nothing he can do until help arrives
- Leave the victim in his present position, and do whatever he can to apply the principles of CPR

31. Artificial circulation is produced when the chest is compressed and squeezes the heart between:

- The clavicle and the scapula
- The sternum and the spine
- The clavicle and the spine
- The sternum and the xiphoid process
32. Stomach distension is a condition which often occurs during artificial ventilation. Which of the following methods should be used to alleviate this condition in a child?

a. Hold the child upright and pat his back gently
b. Exert gentle pressure on the child's epigastrium
c. Invert the child and strike sharply on the back
d. Apply heavy pressure on the child's upper abdomen

33. To perform cardiopulmonary resuscitation, a rescuer's initial effort to assure the patient's airway is open should be:

a. To listen to the chest for breathing sounds
b. To properly position the head
c. To clear foreign matter from the throat

34. If a foreign body obstruction is suspected, the victim should be turned and a sharp blow delivered between the shoulder blades before attempting removal by manual methods.

35. With a person who has drowned; one should not begin mouth-to-mouth respiration until an effort has been made to drain or suction most of the water from the lungs.

a. True
b. False

36. What ratio should a lone rescuer use when he performs CPR on an adult?

a. 5 compressions; 1 ventilation
b. 15 compressions; 1 ventilation
c. 5 compressions; 2 ventilations
d. 15 compressions; 2 ventilations

37. In order to provide CPR for a pulseless adult victim (given two rescuers):

a. Compress sternum 1½ to 2 inches
b. Give one breath after every five compressions
c. Perform 60 compressions each minute at rate of one/second
d. Pause briefly after every fifth compression to allow for one breath

38. If severe stomach distension occurs during resuscitation, it may:

a. Lead to air embolism
b. Reduce the amount of lung ventilation
c. Promote regurgitation

39. Your initial effort to obtain an airtight seal between your mouth and the face of an adult victim will usually be:

a. To pinch his nostrils and seal your mouth around his
b. To press your cheek against his nostrils and seal your mouth around his
   c. To pinch his nostrils, lift his jaw with your thumb inside his mouth, and seal your mouth around his
Basic Life Support - Course Test

40. When should you check the pulse of a victim of an unwitnessed arrest who is not breathing?
   a. Before you start breathing for him
   b. After the first four adequate breaths
   c. After the first eight to ten adequate breaths

41. What is the most common cause of airway obstruction?
   a. Tongue
   b. Denture
   c. Secretions
   d. Foreign body

42. What too frequently happens to an unconscious person when he is lying on his back with a pillow under his head?
   a. He aspirates vomitus into his airway
   b. His tongue falls back in his throat and blocks his airway

43. Under which of the following circumstances may a non-physician discontinue CPR?
   a. When the rescuer thinks the patient will not survive
   b. When the rescuer suspects that the victim may suffer permanent brain damage
   c. When the rescuer is exhausted and unable to continue
   d. When an ambulance attendant states that the victim is dead

44. If a person is having a heart attack, he will always be having trouble breathing.
   a. True
   b. False

45. Where on the adult chest would you place the heel of your hand in order to perform chest compression?
   a. Two or three fingers above the lower end of the sternum
   b. On the upper third of the sternum
   c. Where the sternum and collarbone meet
   d. On the middle of the sternum
   e. On the xiphoid process

46. With mouth-to-mouth breathing, the airway may be blocked by:
   a. Tongue
   b. Foreign body in mouth
   c. Foreign body in throat
   d. Foreign body in nose
   e. Loose false teeth

47. The concept of CPR suggests that the traditional legal definition of death (absence of breathing and circulation) may not be applicable in all cases.
   a. True
   b. False
1. The acetabular fossa (socket part of the hip joint) is made up of the union of three bones which together form the innominate bone. These are:
   A. sacrum, pubis, and ilium  
   B. pubis, ilium, and femur  
   C. ilium, ischium, and pubis  
   D. sacrum, ilium, and pubis

2. Which part of the femur is most susceptible to breakage in older people?
   A. Head  
   B. Neck  
   C. Shaft  
   D. Articular cartilage

3. Muscle attaches to bone by:
   A. tendons  
   B. nerves  
   C. cartilage  
   D. peritoneum

4. The upper jaw is called the:
   A. cranium  
   B. maxilla  
   C. mandible  
   D. innominate bone

5. The lower jaw is called the:
   A. cranium  
   B. maxilla  
   C. mandible  
   D. innominate bone

6. Ribs attach to the________ vertebrae.
   A. cervical  
   B. lumbar  
   C. thoracic  
   D. sacral

7. The part of the spine that forms part of the pelvic girdle (bony pelvis) is called the:
   A. cervical spine  
   B. lumbar spine  
   C. thoracic spine  
   D. sacral spine

8. The part of the spine involved in a broken neck is called the:
   A. cervical spine  
   B. lumbar spine  
   C. thoracic spine  
   D. sacral spine
The collarbone is called the:
A. metacarpal
B. fibula
C. radius
D. clavicle

10. The dura mater, pia mater, and arachnoid are parts of the meninges, which serve as:
A. layers of large blood vessels
B. layers of the coverings of the chest cavity
C. layers of the protective coverings of the brain and spinal cord
D. layers of the coverings of the heart

11. Motor nerves end in:
A. skin
B. muscle
C. joint
D. tendon

12. How many valves are in the heart?
A. Two
B. Four
C. Six
D. Eight

13. The lung is covered by a smooth glistening membrane called the:
A. alveoli
B. bronchi
C. pericardium
D. pleura

14. One palpates the carotid pulse in the:
A. groin
B. chest
C. neck
D. wrist

15. Which pair of pulses are from the same extremity?
A. Precordial and femoral
B. Brachial and radial
C. Brachial and femoral
D. Carotid and femoral

16. A cut through the cheek may injure the:
A. adrenal glands
B. salivary glands
C. lacrimal glands
D. prostate glands
17. What are the three types of muscle?
A. Voluntary, involuntary and sympathetic
B. Voluntary, involuntary, and autonomic
C. Voluntary, involuntary, and skeletal
D. Voluntary, involuntary, and cardiac

18. The autonomic nervous system consists of the:
A. central and peripheral nervous systems
B. sympathetic and parasympathetic nervous systems
C. motor and sensory nervous systems
D. brain and spinal cord

19. Which chamber of the heart pumps oxygenated blood to the aorta (main artery to the rest of the body)?
A. Left atrium
B. Left ventricle
C. Right atrium
D. Right ventricle

20. The colon is part of the:
A. stomach
B. small intestine
C. large intestine
D. rectum

21. Bile is stored in the:
A. duodenum
B. pancreas
C. gallbladder
D. spleen

22. ___________ makes bile and blood components, bleeds severely if lacerated, and can be lacerated if CPR is improperly performed.
A. Pancreas
B. Liver
C. Duodenum
D. Kidneys

23. The ___________ makes insulin and digestive juices. Injury to this organ causes spillage of digestive enzymes into the abdominal cavity. This organ may be injured by steering wheel impact.
A. pancreas
B. liver
C. duodenum
D. kidneys

24. The function of the ___________ is to purify the blood of waste products. Injury to this organ results in blood in the urine.
A. pancreas
B. liver
C. duodenum
D. kidneys
25. Most "stomach" ulcers actually involve the ____________.
   A. pancreas  
   B. liver  
   C. duodenum  
   D. kidneys

26. The abdominal cavity is lined by a smooth glistening layer called the ____________.
   Spillage of the intestinal contents, bile, or digestive juices causes intense inflammation of this layer.
   A. pleura  
   B. pericardium  
   C. peritoneum  
   D. meninges

27. If a patient's blood pressure is 120/80, the 80 indicates the:
   A. systolic pressure  
   B. diastolic pressure  
   C. infusion pressure  
   D. pulse pressure

28. The systolic pressure is reached (on the dial of the BP cuff) when you hear the following change while listening through the stethoscope:
   A. the first sounds of the pulse appear  
   B. the sounds of the pulse change in quality  
   C. the rate at which you hear the sounds suddenly doubles  
   D. the sounds of the pulse disappear

29. A bluish color of the skin, seen in cardiac arrest, indicates:
   A. cyanosis  
   B. ecchymosis  
   C. erythema  
   D. constriction

30. Initial examination and selection of patients and the determination of how to handle them is called:
   A. basic life support  
   B. priority care  
   C. triage  
   D. victim classification

31. When the diameter of a structure increases, it is called:
   A. aspiration  
   B. constriction  
   C. dilatation  
   D. injection

32. When the diameter of a structure decreases, it is called:
   A. aspiration  
   B. constriction  
   C. dilatation  
   D. injection
33. Contraction of the heart results in:
   A. systolic pressure
   B. diastolic pressure
   C. infusion pressure
   D. diffusion pressure

34. Blood pressure levels vary with age and sex. A useful rule of thumb for the normal systolic pressure in the male is ________ to a level of 140-150 mm Hg.
   A. 120 plus age of patient
   B. 100 plus age of patient
   C. 80 plus age of patient

35. Normal diastolic pressures in a male are:
   A. 50-70 mm Hg
   B. 65-80 mm Hg
   C. 85-100 mm Hg

36. Constricted pupils may indicate:
   A. drug addiction
   B. disease that affects the central nervous system
   C. cardiac arrest

37. Unequal size of the pupils is seen in connection with: (two answers)
   A. drug addiction
   B. cardiac arrest
   C. head injury
   D. stroke

38. The air that we inhale (breathe in) contains approximately (in addition to trace amounts of other gases, including carbon dioxide):
   A. 25% nitrogen and 75% oxygen
   B. 30% oxygen and 70% nitrogen
   C. 20% oxygen and 80% nitrogen
   D. 30% CO₂ and 70% oxygen

39. The air we exhale (breathe out) contains about:
   A. 22-25% oxygen (O₂) and 15-18% carbon dioxide (CO₂)
   B. 15-18% O₂ and 2-5% CO₂
   C. 22-25% O₂ and 2-5% CO₂
   D. 14-15% O₂ and 10-12% CO₂

40. The oral (oropharyngeal) airway will:
   A. act as a substitute for careful positioning of the patient’s head and jaw.
   B. frequently open the airway when other maneuvers fail.
   C. not be tolerated by a fully conscious patient and may cause retching and vomiting in a semi-conscious patient.
41. Which airway maneuver can be done instantly while you determine if a patient is breathing and if he has a pulse?
   A. Tilting the head backward
   B. Jaw lift maneuver
   C. Turning the patient on his side with his head to the side

42. Which airway maneuver is the most suitable for the patient with a suspected neck injury?
   A. Tilting the head backward
   B. Jaw lift maneuver
   C. Turning the patient on his side with his head to the side

43. Which airway maneuver is the safest if the patient vomits?
   A. Tilting the head backward
   B. Jaw lift maneuver
   C. Turning the patient on his side with his head to the side

44. What is the most common cause of death in the unconscious victim?
   A. Shock
   B. Pneumonia
   C. Airway obstruction
   D. Choking on vomit

45. The control center for breathing is located in:
   A. the frontal lobe
   B. the medulla
   C. the spinal cord
   D. the diaphragm

46. How many breaths per minute does one deliver to an infant during artificial ventilation?
   A. 12
   B. 15
   C. 20
   D. 60

47. How many breaths per minute does one deliver to an adult during artificial ventilation?
   A. 12
   B. 15
   C. 20
   D. 60

48. When inflating the victim's lungs (by mouth-to-mouth), you exhale into the victim's mouth until:
   A. you feel resistance
   B. you see the victim's chest rise
   C. you have exhaled completely (you and the victim are adults)
   D. you hear bubbling sounds from air moving into the stomach

49. In mouth-to-nose ventilation, the rescuer must open the victim's mouth to allow him to exhale because:
   A. the soft palate acts as a valve preventing exhalation.
   B. the tongue falls back against the airway.
   C. the nose is a narrower air passage than the mouth.
   D. it allows air to escape from the stomach safely.
50. With each expiration by the victim (during mouth-to-mouth ventilation), the rescuer should:
   A. check the victim's pupils
   B. press on the victim's stomach
   C. let go of the victim's nose
   D. watch the victim's chest fall

51. Which of the following is not a good reason to choose mouth-to-nose ventilation over mouth-to-mouth?
   A. The patient has a severe injury to the mouth region.
   B. The patient has vomitus in his mouth.
   C. An air-tight seal cannot be obtained for mouth-to-mouth ventilation.
   D. The patient has severe swelling of his tongue.

52. The correct order of structures through which air passes from the nose into the lungs is:
   A. pharynx, bronchi, trachea
   B. pharynx, trachea, bronchi
   C. trachea, pharynx, bronchi

53. The ________ is a leaf-shaped valve that normally prevents food or liquids from entering the lungs.
   A. epiglottis
   B. esophagus
   C. pharynx
   D. trachea

54. The ________ is the "throat"; both food and air normally pass through it.
   A. epiglottis
   B. esophagus
   C. pharynx
   D. trachea

55. The ________ is the tube carrying food from the throat to the stomach.
   A. epiglottis
   B. esophagus
   C. pharynx
   D. trachea

56. If a neck breather (laryngectomee) victim's chest doesn't rise from the rescuer's first breath, it may be necessary to:
   A. plug the stoma while performing mouth-to-mouth ventilation
   B. extend the victim's neck further
   C. hold the victim's mouth and nose shut
   D. remove the metal or plastic tube from the neck opening

57. If the victim's stomach bulges during mouth-to-mouth ventilation, the rescuer should:
   A. press on the victim's stomach each time the victim exhales
   B. turn the victim on his side, press on the victim's stomach, then reposition victim and continue mouth-to-mouth ventilation
   C. have an assistant hold a hand against the victim's stomach
   D. switch to back pressure-arm lift artificial ventilation
58. The primary indication for initiating cardiac compression is:
   A. respiratory arrest
   B. dilated pupils
   C. state of unconsciousness
   D. absence of palpable pulse

59. In order for CPR to be effective, the amount of pressure that must be exerted on an adult’s sternum is:
   A. 80-120 lbs
   B. 40-70 lbs
   C. 150-180 lbs
   D. 130-145 lbs

60. Why is it dangerous to leave an unconscious person lying on his back with a pillow under his head?
   A. It may be difficult to get air into his lungs.
   B. It may be difficult for blood to get to his brain.
   C. It may be difficult to tell when he regains consciousness.

61. Major irreversible changes occur in the human brain approximately _______ after cessation of respiration and functional circulation.
   A. 30-60 seconds
   B. 2-4 minutes
   C. 4-6 minutes
   D. 6-10 minutes

62. The first step in the management of the unconscious patient is to:
   A. ventilate his lungs
   B. check pulse
   C. establish an adequate airway
   D. start external cardiac compression

63. In providing basic life support to the unconscious victim, quick first for:
   A. pulse
   B. dilated pupils
   C. respiration

64. The most readily available, easiest, and surest method of emergency artificial ventilation is by:
   A. mouth-to-mouth ventilation
   B. mechanical resuscitator
   C. endotracheal intubation
   D. bag and mask

65. What is the most common cause of airway obstruction in the unconscious person?
   A. blood
   B. tongue
   C. food
   D. dentures
66. In closed chest cardiac compression, the heel of the bottom hand is centered:
   A. at the midline at the 4th intercostal space
   B. on the lower half of the sternum, excluding the last inch to inch and one-half closest to the xiphoid
   C. at the left sternal border at the 5th intercostal space
   D. on the right lower ribs without damaging the liver

67. In initiating resuscitative measures, the initial ventilatory effort should be ______ quick breaths.
   A. 4
   B. 2
   C. 8
   D. 6

68. In well performed CPR, the blood flow to the brain is at best what proportion of normal flow?
   A. 15%
   B. 1/3
   C. 1/2
   D. 60%

69. An adult victim is considered pulseless if the _______ arterial pulse cannot be felt.
   A. radial or brachial
   B. precordial (over heart) or radial
   C. carotid or femoral
   D. _______

   CPR must not be interrupted for longer than ________ except while performing endotracheal intubation or transporting a patient down stairs, in which case ________ is permitted.
   A. 5 seconds; 15 seconds
   B. 10 seconds; 20 seconds
   C. 30 seconds; 60 seconds
   D. 60 seconds; 90 seconds

71. Hyperextension of the neck should not be used as a means of establishing an open airway in which unconscious victim?
   A. Patient with known cerebrovascular disease (hardening of arteries of brain)
   B. Obese (fat) victim with short neck
   C. Automobile or diving accident victim with severe lacerations of forehead
   D. Victim with obvious blood in mouth

72. What is the ratio of compressions to ventilation in one-man CPR?
   A. 15:2
   B. 5:1
   C. 3:1
   D. 1:1

73. What is the ratio of compressions to ventilations in two-man CPR?
   A. 15:2
   B. 5:1
   C. 3:1
   D. 1:1
74. External compression of an infant's chest is accomplished by what part of the rescuer's hand during artificial circulation?

A. Heel of one hand
B. Two fingers
C. Palm of two hands
D. Heel of both hands

75. In the event the use of a precordial thump is indicated, the blow should be delivered over the mid-portion of the sternum from a height of:

A. 8-12 inches
B. 12-24 inches
C. 24-36 inches

76. Pressure cycled mechanical resuscitators (Emerson resuscitator) should not be used with closed-chest cardiac compression because:

A. an airtight seal of the mask is difficult to obtain
B. excessive ventilatory pressure may damage the lungs
C. premature cycling results in inadequate ventilation during CPR

77. The reason for a rate of 80 compressions per minute during one-man CPR is to:

A. compress the heart 80 times every minute
B. achieve approximately 60 compressions while giving 8 breaths per minute
C. achieve approximately 70 compressions while giving 10 breaths per minute

78. During CPR, when pupils that were dilated start to constrict, it is evidence that:

A. the eyes are receiving oxygenated blood
B. the brain is receiving oxygenated blood
C. the heart has resumed normal beating
D. asystole has changed to ventricular fibrillation

79. Unless chest expansion occurs, there has not been adequate filling of the victim's lungs. TRUE / FALSE

80. CPR is safe and effective only when the victim's back is resting on a soft mattress. TRUE / FALSE

81. In initiating resuscitative measures, the initial ventilatory effort should be four quick breaths, followed immediately by 2 more should artificial circulation be indicated. TRUE / FALSE

82. The precordial thump should be used on children only in the context of a witnessed arrest. TRUE / FALSE

83. If the rescuer sees that his efforts are not reviving the victim, he should discontinue CPR. TRUE / FALSE

84. To perform artificial ventilation on a child, the rescuer must pinch the nose and breathe only in the mouth. TRUE / FALSE

85. In mouth-to-nose ventilation, the victim's mouth should remain closed during exhalation. TRUE / FALSE
86. The neck of a __________ child should not be fully hyperextended during artificial ventilation. **TRUE**

87. __________ is a quivering motion of the heart without any effective blood flow.
   A. Cardiovascular collapse
   B. Ventricular fibrillation
   C. Pulmonary arrest
   D. Asystole

88. __________ means there is a weak heartbeat, but no perceptible pulse or blood pressure.
   A. Cardiovascular collapse
   B. Ventricular fibrillation
   C. Pulmonary arrest
   D. Asystole

89. __________ is equivalent to ventricular standstill, where there is no heartbeat at all.
   A. Cardiovascular collapse
   B. Ventricular fibrillation
   C. Pulmonary arrest
   D. Asystole

90. __________ means the patient has stopped breathing.
   A. Cardiovascular collapse
   B. Ventricular fibrillation
   C. Pulmonary arrest
   D. Asystole

91. __________ can be caused by a bee sting.
   A. Respiratory shock
   B. Psychogenic shock
   C. Anaphylactic shock
   D. Cardiogenic shock

92. The blood vessels of an average adult contain __________ of blood.
   A. 4 pints
   B. 4 quarts
   C. 6 quarts
   D. 10 quarts

93. Loss of **more than** __________ of blood in an adult is serious.
   A. 1/2 pint
   B. 1 pint
   C. 1 quart

94. Loss of __________ of blood in a child is serious.
   A. 1/2 pint
   B. 1 pint
   C. 1 quart
   D. 4 pints
95. Bright red blood coming in spurts is an indication of:
   A. arterial bleeding
   B. venous bleeding
   C. capillary bleeding

96. A person with a fractured shaft of the femur rarely sustaining significant blood loss and has little external evidence of bleeding. TRUE  (FALSE)

97. I.V. administration of blood is called:
   A. infusion
   B. transfusion
   C. infiltration
   D. perfusion

98. I.V. administration of non-blood fluids is called:
   A. infusion
   B. transfusion
   C. infiltration
   D. perfusion

99. During I.V. administration, fluid may accumulate in the tissue around the vein. This is called:
   A. infusion
   B. transfusion
   C. infiltration
   D. perfusion

Which of the following signs of shock is often the EMT's first warning that shock is developing?
   A. Falling blood pressure
   B. Rapid "thready" (weak) pulse
   C. Cold and clammy skin
   D. Restlessness and anxiety

101. Which of these is not a sign of circulatory shock?
   A. Shallow, labored, rapid, possibly gasping or irregular respirations
   B. Inability to remember climbing out of wrecked automobile
   C. Eyes become dull or lusterless, with dilated pupils
   D. Marked thirst

102. ________ is a severe allergic reaction.
   A. Respiratory shock
   B. Psychogenic shock
   C. Anaphylactic shock
   D. Septic shock

103. Severe infection can cause:
   A. respiratory shock
   B. psychogenic shock
   C. anaphylactic shock
   D. septic shock
104. Fainting is:

A. respiratory shock
B. psychogenic shock
C. anaphylactic shock
D. septic shock

105. __________ can be avoided or stopped by injection of epinephrine (Adrenalin).

A. Respiratory shock
B. Psychogenic shock
C. Anaphylactic shock
D. Cardiogenic shock

106. __________ is a temporary, self-cured form of shock.

A. Respiratory shock
B. Psychogenic shock
C. Anaphylactic shock
D. Neurogenic shock

107. __________ starts with adequate circulation, but insufficient oxygen in the blood.

A. Respiratory shock
B. Psychogenic shock
C. Anaphylactic shock
D. Cardiogenic shock

108. A patient with __________ does not require more fluid or elevation of his legs, and may be transported in a sitting position.

A. respiratory shock
B. psychogenic shock
C. anaphylactic shock
D. Cardiogenic shock

109. The head of the humerus usually dislocates in a __________ direction.

A. lateral (away from the middle)
B. inferior (downward)
C. anterior (forward) or posterior (backward)
D. superior (upward)

110. A typical shoulder dislocation causes the patient to hold his arm away from the body. It should be handled by:

A. gently bringing the arm down to side and strapping to body
B. bringing forearm across chest and using a sling and swathe
C. applying traction at 45° angle away from body
D. supporting the arm in its position and transporting the patient in a sitting position

111. Elderly persons with hip fractures may feel little pain and actually walk immediately after a hip fracture. TRUE FALSE

112. In a sprained or fractured ankle, the shoe should be left on and the laces should be cut. TRUE FALSE
113. When bone ends at a joint are displaced from their normal position, the injury is a:  
A. comminuted fracture  
B. sprain  
C. strain  
D. dislocation  

114. Ankle sprains are usually caused by:  
A. twisting the ankle inward  
B. twisting the ankle outward  
C. excessive downward extension of the ankle ("plantar flexion")  
D. excessive upward flexion of the ankle ("dorsiflexion")  

115. Discoloration of skin by blood often happens near a fracture site and is called:  
A. contusion  
B. ecchymosis  
C. hematoma  
D. crepitus  

116. A partial tear of a ligament is called a:  
A. comminuted fracture  
B. sprain  
C. strain  
D. dislocation  

117. A fracture occurring from repeated stresses on a bone (for example, injury to foot bones during a long march), is called a:  
A. comminuted fracture  
B. pathologic fracture  
C. fatigue fracture  
D. impacted fracture  

118. The EMT should ______________ fractures of the spine, shoulder, elbow, wrist, or knee.  

**OMIT**  
A. never attempt to straighten  
B. never use traction on  
C. always use traction on  
D. carefully pad with soft dressings  

119. Air splints are best inflated by a pump.  
A. TRUE  
B. FALSE  

120. The EMT should not straighten the angle of a dislocated joint.  
A. TRUE  
B. FALSE  

121. The nerves and blood vessels to the hand are less susceptible to injury in elbow fractures than in forearm fractures.  
A. TRUE  
B. FALSE  

122. A snug dressing should be placed over an elbow fracture to help reduce swelling.  
A. TRUE  
B. FALSE  

123. The hand should usually be splinted with fingers completely extended.  
A. TRUE  
B. FALSE
124. Which organs can commonly be lacerated or ruptured by fractured ribs or blunt injuries?

A. Liver and spleen
B. Stomach and duodenum
C. Large bowel and small bowel
D. Bladder and urethra

125. Which organs can commonly be lacerated or ruptured by fractures of the pelvis?

A. Liver and spleen
B. Stomach and duodenum
C. Large bowel and small bowel
D. Bladder and urethra

126. Laceration of hollow abdominal organs tends to cause:

A. Massive bleeding
B. Traumatic asphyxia
C. Spillage of irritating substances into abdominal cavity and intense inflammatory reaction
D. Subcutaneous emphysema

127. Evisceration means:

A. Rupture or laceration of a hollow organ
B. Presence of abdominal organs outside the abdominal cavity
C. Rupture of solid abdominal organs by improperly worn seat belt
D. Chest injury with severe shock

128. A fracture of the spine always involves damage to:

A. Bones and ligaments
B. Bones and ligaments and spinal cord
C. Spinal cord and spinal nerve roots and ligaments
D. Bones and ligaments and spinal nerve roots

129. As a result of an automobile accident, an unconscious victim is found lying face down on the road with his neck flexed. Secretions are draining freely from his mouth and his airway is unobstructed. You should:

A. Apply straight line traction to head and apply neck collar. After this, roll patient as a unit onto a backboard with the patient on his back.

B. Apply straight line traction to head and apply neck collar. Then roll patient as a unit onto backboard with the patient on his side, with a support under the head.

C. Transfer patient to backboard in the same position he is found in, without changing the position of his neck.

D. Straighten his neck with upward traction of the head with the face still to the side. Then transfer the patient to a backboard as a unit with patient remaining on his stomach.
130. The following are four types of skull fractures:
   A. linear, depressed, brain exposed, penetration
   B. linear, starburst, depressed, penetration
   C. linear, depressed, starburst, brain exposed
   D. linear, hairline, depressed, starburst

131. Brain tissue is damaged by:
   A. bruising, pressure, concussion
   B. lacerations, pressure, concussion
   C. bruising, pressure, contusion
   D. bruising, pressure, lacerations

132. A clear fluid coming from the nose or an ear of an accident victim suggests:
   A. brain damage
   B. brain contusion
   C. epidural hematoma
   D. skull fracture

133. In heat burns to the eyelids, the eyes may be covered by:
   A. vaseline
   B. close fitting dry sterile pressure dressing
   C. loose dry sterile dressing
   D. moist sterile dressing

134. Light burns to the eyes are treated by:
   A. flushing eyes 5-10 minutes with saline or water
   B. covering both eyes with loose fitting dressing
   C. taping both eyes gently shut with clear tape
   D. covering both eyes with inverted paper cups

135. The EMT may invert the upper eyelid to remove a foreign body.  TRUE  FALSE

136. The EMT may use a cotton tipped applicator against the cornea to remove a foreign body.  TRUE  FALSE

137. Penetrating injuries to the eyeball itself should be treated by:
   A. continuous irrigation of the eye with sterile saline during transport
   B. gentle hand pressure or pressure dressing, followed by transporting patient quietly on back
   C. Taping lids closed with clear tape, and then transporting patient quietly on his back.
   D. Immobilizing eye movement by loose dressings over both eyes, and then transporting patient quietly on his back.

138. Fluid for irrigating eyes must be sterile.  TRUE  FALSE

139. Lacerated eyelids may be treated by the EMT with gently direct pressure if the EMT is certain there is no foreign body in the eye.  TRUE  FALSE
140. Chemical burns of the eye by strong alkali should be flushed with water or saline (salt water) for at least:

A. 3-5 minutes  
B. 5-10 minutes  
C. 20 minutes  
D. 60 minutes

141. The part of the eye that regulates the amount of light entering the eye is called the:

A. conjunctiva  
B. cornea  
C. sclera  
D. iris

142. The _________ is a tough white tissue forming much of the outside of the eyeball.

A. conjunctiva  
B. cornea  
C. sclera  
D. iris

143. The _________ is the transparent front portion of the eye.

A. conjunctiva  
B. cornea  
C. sclera  
D. iris

144. The _________ is the viscous fluid that maintains the shape of the eyeball.

A. retina  
B. vitreous (= vitreous humor)  
C. aqueous (= aqueous humor)  
D. lacrimal humor

145. The _________ produce a lubricating substance to keep eye tissues from drying out.

A. lacrimal glands  
B. pituitary glands  
C. salivary glands  
D. endocrine glands

146. Foreign bodies in the eye are most commonly found:

A. on the cornea or under the iris  
B. under the upper lid or on the cornea  
C. under the conjunctiva or on the sclera  
D. under the lower lid or on the sclera

147. In a laceration of one eyeball, both eyes should be covered because:

A. light in the uninjured eye can damage the injured eye  
B. the open eyelids put pressure on the lacerated eye  
C. the injured eye will dry if the eyelids are open  
D. movement of the uninvolved eye causes movement of the injured eye, which can increase the damage
148. Eyes of unconscious persons should be kept closed because:
   A. the eyeballs will expand if the lids remain open
   B. the corneas will dry out and scar if the eyes remain open
   C. the constant light will damage the eyes of an unconscious patient
   D. dirt and dust are more likely to cause damage to the eyes of the unconscious patient

149. A patient who sustains a crushing "caved in" chest injury accompanied by bloodshot eyes and cyanosis of the skin of the head, neck, and shoulders may have:
   A. hemothorax
   B. subcutaneous emphysema
   C. traumatic asphyxia
   D. pericardial tamponade

150. Injury where the lung is collapsed by blood in the pleural cavity is called:
   A. hemothorax
   B. subcutaneous emphysema
   C. traumatic asphyxia
   D. pericardial tamponade

151. _______ occurs following a stab wound to the heart. The signs of this condition are very soft and faint heart tones, a weak pulse, and a blood pressure in which the systolic and diastolic pressures come closer and closer together.
   A. hemothorax
   B. subcutaneous emphysema
   C. traumatic asphyxia
   D. pericardial tamponade

152. The presence of air in tissues under the skin, which is often caused by a laceration of the lung by a fractured rib is called:
   A. spontaneous pneumothorax
   B. tension pneumothorax
   C. hemothorax
   D. subcutaneous emphysema

153. A sucking chest wound where the wound has formed a one-way valve allowing air to enter the pleural cavity (collapsing the lung), and not allowing the air to escape is called:
   A. spontaneous pneumothorax
   B. tension pneumothorax
   C. hemothorax
   D. subcutaneous emphysema

154. A form of pneumothorax that can occur without any injury whatsoever is called:
   A. spontaneous pneumothorax
   B. tension pneumothorax
   C. hemothorax
   D. subcutaneous emphysema
155. A sucking chest results in pneumothorax but does not impair heart function.
   TRUE FALSE

156. A flail chest is caused by:
   A. multiple rib fractures
   B. puncture of pericardium
   C. puncture of both lungs
   D. puncture of one lung

157. Paradoxical respiration can be caused by a:
   A. sucking chest wound or back (spinal cord) injury
   B. flail chest or neck (spinal cord) injury
   C. pneumothorax or pericardial tamponade
   D. flail chest or traumatic asphyxia

158. Chest pain that increases on deep breathing or coughing suggests:
   A. rib fractures
   B. hemotorax
   C. traumatic asphyxia
   D. pericardial tamponade

159. Injury to upper parts of the abdomen; or presence of blood or inflammation in the upper parts of the abdomen, can cause pain in the:
   A. groin
   B. mid chest
   C. shoulder
   D. mouth and throat

160. A cut vein in the neck can cause particular problems if the head and neck are elevated, because:
   A. massive bleeding usually occurs
   B. negative pressure in the veins can suck air into the circulation
   C. blood can get into the respiratory passages
   D. a blood clot may put pressure on the cervical spine

161. The bony rings of each vertebra form a continuous protective tube for the spinal cord which is called the:
   A. spinal column
   B. spinal nerve root
   C. spinal canal
   D. spinal cord

162. Ecchymosis (blood under the skin) in the lower and upper lids ("black eyes") in an accident victim suggests:
   A. brain damage
   B. facial bone fracture
   C. skull fracture
   D. patient would rather fight than switch
163. Concussion means:

A. an unconscious state due to a seizure after injury
B. an injury that may cause unconsciousness, but involves no structural
damage to the brain
C. a bruising injury to brain
D. permanent damage to the brain due to compression of the brain in a closed space

164. Burns are automatically considered critical if they are accompanied by respiratory
tract injury or fractures, or if the burned area includes the:

A. genitals, face, or ears
B. face, hands, or feet
C. genitals, face, or hands
D. genitals, hands, or feet

165. Using the "rule of nines," a burn of the entire left leg of an adult is a:

A. nine percent burn
B. fifteen percent burn
C. eighteen percent burn
D. twenty-seven percent burn

166. The area involved by a third degree burn is extremely painful to touch. TRUE FALSE

167. An acid chemical burn is worse than an alkali chemical burn. TRUE FALSE

168. Chemical burns caused by ________ should be rinsed off by alcohol first, if possible,
then rinsed with water:

A. sodium hydroxide □
B. nitric acid □
C. trichloroacetic acid
D. carbolic acid (phenol) □

169. An alkali eye burn should be treated with a twenty minute flush with a dilute
solution of vinegar. TRUE FALSE

170. If absolutely necessary, a frostbitten foot can be walked on, but only after it is
thoroughly thawed and warm. TRUE FALSE

171. The conventional treatment for a frostbitten limb is:

A. application of dry, radiant heat, with massage once color returns to the limb
B. rewarming the limb in water bath (60° and 70° F) then dry warmth
C. rapid rewarming in water bath (100° and 105°)
D. gradual rewarming in water baths of increasing temperatures

172. In hypothermia (general body cooling) the stage of apathy, sleepiness, and
listlessness is soon followed by a stage of:

A. shock
B. unconsciousness
C. convulsions
D. death
173. Trench foot is a thermal injury due to:
   A. prolonged exposure of feet to wet and cold (but not freezing) conditions
   B. a fungal infection that increases susceptibility of the foot to cold injury
   C. unnoticed freezing of toes while wearing tight footwear
   D. alternate warming and cooling of wet feet

174. A poisoning (by mouth) victim should not be made to vomit if he has ingested:
   **TWO ANSWERS**
   A. petroleum products
   B. aspirin
   C. opiates
   D. phenol

175. In surface poisoning with acids, the involved area should be washed with large quantities of __________, if possible.  
   A. soapsuds
   B. milk
   C. dilute vinegar or lemon juice
   D. any form of alcohol (gin, rubbing alcohol) followed by water

176. In surface poisoning with alcalii, the involved area should be washed with large quantities of __________, if possible.  
   A. soapsuds
   B. milk
   C. dilute vinegar or lemon juice
   D. any form of alcohol (gin, rubbing alcohol) followed by water

177. The first rule in treating the victim of inhaled poisons is to get him to fresh air or give him oxygen.  
   TRUE  FALSE

178. The EMT should administer syrup of ipecac only on orders of a physician.  
   TRUE  FALSE

179. In treating a poisonous snakebite of an extremity, constricting bands should be placed above and below the puncture sites.  
   TRUE  FALSE

180. Cutting and sucking at the site of a poisonous snakebite should not be attempted if more than half an hour has elapsed since the snakebite.  
   TRUE  FALSE

181. Fainting is temporary unconsciousness due to:
   A. reduced oxygen content of blood
   B. reduced blood supply to the brain
   C. reduced sugar (glucose) content of blood
   D. reduced carbon dioxide (CO2) content of blood

182. Most people with petit mal seizures are unconscious during their convulsions and may remain unconscious for five to ten minutes after the seizure ceases.  
   TRUE  FALSE

183. If a patient turns blue (cyanotic) during a grand mal seizure, the EMT should:
   A. assume the pulse is absent and start CPR immediately
   B. wait until violent jerking movements end, and then begin CPR during relaxation period
   C. protect the patient's tongue and head, and await for the relaxation period when breathing usually returns
   D. restrain the patient and attempt artificial ventilation when the relaxation period begins
184. Pain from a heart attack (myocardial infarction) is due to:
   A. bleeding from the vessels on the outer surface of the heart
   B. ischemia of heart muscle
   C. swelling around the heart muscle
   D. congestion of the lungs

185. The best position for a patient suffering from a heart attack or heart failure is usually:
   A. lying face down or on his side
   B. supine (lying face up)
   C. sitting
   D. standing

186. During heart failure, especially when the left ventricle fails, the following occurs:
   A. a portion of heart muscle dies
   B. fluid seeps into the air sacs of the lungs
   C. a partial occlusion of a blood vessel to the heart causes pain
   D. lack of blood flow to the brain causes unconsciousness

187. Angina pectoris is distinguished from a heart attack because it:
   A. is usually relieved by rest and lasts less than five minutes
   B. never includes pain in the left arm
   C. does not include shortness of breath
   D. does not include nausea and vomiting

188. The EMT should always give a heart patient oxygen. **TRUE** **FALSE**

189. The term "acute abdomen" indicates the presence of:
   A. hemorrhage into the abdominal cavity
   B. peritonitis, or inflammation of the lining of the abdominal cavity
   C. irritation of the diaphragm
   D. hematoma or abscess of back wall of abdomen

190. Shock is uncommon in patients with acute abdomen. **TRUE** **FALSE**

191. Disease of organs behind the abdominal cavity can result in all of the signs of disease of organs inside the abdominal cavity. **TRUE** **FALSE**

192. Asthma is caused by:
   A. loss of elasticity of the lungs
   B. spasm of bronchi
   C. inflammation of the bronchi
   D. collapse of the lung by air in the pleural cavity

193. Droplet infection from a diseased person means spreading of an infectious disease by:
   A. the spray from a cough or sneeze
   B. urine
   C. sweat
   D. fecal (bowel movement) contamination of hands
203. Which condition is caused by an overdose of insulin, or a normal dose of insulin and a failure to eat enough?

A. Apoplexy
B. Diabetic coma
C. Insulin shock (hypoglycemia)
D. Angina pectoris

204. Which condition is likely to be associated with a sweet or fruity (acetone) odor on the breath and rapid deep breathing?

A. Apoplexy
B. Diabetic coma
C. Insulin shock (hypoglycemia)
D. Angina pectoris

205. Since deeply unconscious patients cannot swallow, why is the EMT directed to put sugar in an unconscious diabetic's mouth?

A. It is a sufficient emergency to allow the risk of foreign material entering the respiratory passages, and patient may still be able to swallow some
B. If enough sugar solution is poured into the mouth, some will reach the stomach
C. Glucose (sugar) is absorbed through the lining of the mouth
D. Glucose (sugar) is absorbed through the lungs

206. "Toxemia of pregnancy," a condition that can cause convulsions in a pregnant woman, is also called:

A. abortion
B. eclampsia
C. epilepsy
D. prolapse

207. Which of these may be a sign that delivery is imminent?

A. The patient has to urinate frequently
B. The patient feels like she has to strain or move bowels
C. A gush of amnionic fluid comes from the vagina
D. Labor pains come more often than every five minutes

208. The length of labor for the mother giving birth to her first baby is usually longer than for the mother who has previously given birth. TRUE FALSE

209. What should the EMT do when there is crowning?

A. Let the mother go to the toilet
B. Have the mother cross her ankles and squeeze tightly
C. Push on the baby's head
D. Prepare for emergency childbirth

210. A "cephalic" delivery means that:

A. the baby's head is the presenting part
B. the baby is delivered through the vagina (rather than Caesarian section)
C. the perineum has torn spontaneously, rather than being surgically cut
D. the umbilical cord is initially wrapped around the baby's neck
211. If there are coils of umbilical cord looped around the baby's neck (as the head delivers) that cannot be slipped loose, the EMT should:

A. continue delivery procedure, allowing cord to stretch
B. notify hospital and transport at full speed
C. clamp cord twice, cut between clamps, and unwrap cord ends
D. pull firmly on head, delivering baby and placenta simultaneously, if necessary

212. The mother's normal blood loss after delivery includes approximately:

A. 2-3 ounces of blood when placenta delivers, then 2-3 soaked pads
B. 2-3 ounces of blood when placenta delivers, then 3-5 soaked pads
C. a half pint of blood when placenta delivers, then 3-5 soaked pads
D. a quart of blood when placenta delivers, then 3-5 soaked pads

213. If the mother hemorrhages after delivering the baby, the EMT should give oxygen, treat for shock, and:

A. hold mother's legs tightly together
B. pack vagina with sterile dressings
C. press uterus toward vagina
D. massage lower abdomen and uterus

214. The period of time from which the cervix is fully dilated until the baby is born is called the:

A. first stage of labor
B. second stage of labor
C. third stage of labor
D. effacement

215. The afterbirth is called:

A. perineum
B. bloody show
C. presenting part
D. placenta

216. The mucus and blood that come out of the vagina when labor begins is called the:

A. perineum
B. placenta
C. bloody show
D. amniotic sac

217. The lowermost part of the uterus is called the _________. It is a tubelike opening that must dilate during labor to allow the baby to enter the vagina.

A. cervix
B. vagina
C. perineum
D. womb

218. The skin area between the vagina and the anus is the:

A. perineum
B. presenting part
C. placenta
D. cervix
219. When the baby is close to birth, contractions of the muscles of the uterus (uterine contractions) occur about ____ ____ apart.
   A. 15-30 seconds   B. 2-3 minutes   C. 15-20 minutes   D. 20-30 minutes

220. In a breech delivery, the presenting part is the:
   A. umbilical cord   B. baby's head   C. baby's shoulder   D. baby's buttocks

221. When the presenting part bulges out of the vaginal opening, ________ is occurring.
   A. prolapse of the umbilical cord   B. the third stage of labor   C. crowning   D. bloody show

222. The EMT should prepare for emergency childbirth if it is the mother's first delivery and if:
   A. there is crowning   B. labor pains are coming every 2-3 minutes   C. there is a gush of amnionic fluid from the vagina   D. bloody show appears

223. The EMT should prepare for emergency childbirth if the mother has been pregnant before, and if the EMT sees crowning, or if:
   A. the mother says she has to move her bowels   B. labor pains are coming every 2-3 minutes   C. there is a gush of amnionic fluid from the vagina   D. the bloody show appears

224. There are only two cases for the EMT to put his hand in the mother's vagina. One such case is when:
   A. a shoulder delivers first   B. there is a prolapsed cord   C. there are twins   D. there is a massive tear in the perineum

225. Normal children who develop temperatures of 104-105°F may suffer:
   A. a cyanotic spell   B. a pulmonary arrest   C. a seizure (epileptic type)   D. hyperventilation syndrome
234. A near-drowning victim should have his lungs emptied of water prior to artificial ventilation if it can be done in less than three seconds.  TRUE  FALSE

235. Grappling irons should be used as a last resort to recover a possible drowning victim who is still believed to be alive.  TRUE  FALSE

236. In a near-drowning accident, CPR should be started immediately, without waiting for removal of victim from water.  TRUE  FALSE

237. The bends (caisson disease) are caused by _________ when the diver ascends.
   A. air rupturing the lungs
   B. air forcing its way into blood vessels
   C. nitrogen coming out of solution in the bloodstream
   D. air in the intestines expanding under reduced pressure

238. Some protection against cold weather is afforded by _________ on a cold weather search.
   A. smoking cigarettes
   B. not washing one's face or shaving
   C. drinking alcohol
   D. washing face with soap and water

239. Extrication may be divided into the five stages of: gaining access to the patient, giving lifesaving emergency care, _________, preparation for removal, and removal.
   A. splinting of fractures
   B. disentanglement
   C. immobilization of patient
   D. taking vital signs

240. In a disaster with multiple trapped victims, the first victims to be extricated are:
   A. lightly pinned casualties
   B. difficult but rapidly performed extrications
   C. very difficult and lengthy extrications
   D. dead bodies

241. Breathing is performed by the muscles of the chest wall and the:
   A. abdominal muscles
   B. bronchial smooth muscle
   C. diaphragm
   D. rib muscles

242. Dilation and constriction of blood vessels of the body is controlled by the:
   A. spinal cord
   B. sensory nerves
   C. autonomic nervous system
   D. breathing center

243. The "adam's apple" is the front portion of the:
   A. pharynx
   B. larynx
   C. trachea
   D. epiglottis
244. The "voice box," containing the vocal cords is the:
   A. pharynx
   B. larynx
   C. trachea
   D. epiglottis

245. Tenderness in the right upper quadrant without injury is usually caused by disease of the:
   A. stomach
   B. large intestine
   C. small intestine
   D. gallbladder

246. The xiphoid cartilage overlies the _______ and can lacerate this organ if CPR is improperly performed.
   A. stomach
   B. liver
   C. spleen
   D. gallbladder

247. The word "triage" comes from a French word meaning:
   A. emergency
   B. hospital
   C. wound
   D. choice

248. A patient who is unconscious from a drug overdose is particularly likely to vomit if an oral (oropharyngeal) airway is inserted. TRUE FALSE

249. It is better for a patient in shock to be slightly cool than to be toasty warm. TRUE FALSE

250. After a severe hemorrhage, the best way to supply more blood to the heart (if transfusion is unavailable) is to:
   A. splint fractures
   B. keep patient warm
   C. give sips of water, preferably with salt added
   D. elevate legs

251. Seat belts should be worn so that they ride:
   A. just below the umbilicus
   B. across the lower abdomen
   C. below the iliac crest of the hip bone
   D. tightly against the thigh

252. X-rays are a form of:
   A. alpha rays
   B. beta rays
   C. gamma rays
   D. delta rays
253. The proper treatment for the bends is:
   A. CPR
   B. transfusion
   C. bed rest in shock position for a week
   D. recompression

254. Peritonitis is always associated with a loss of ______ into the abdomen.
   A. blood
   B. intestinal contents
   C. body fluids
   D. white blood cells

255. An aneurism is:
   A. an episode of bleeding into the brain
   B. a swelling of a blood vessel
   C. a hole in a hollow abdominal organ
   D. a rupture of a solid abdominal organ
The ten body systems and the organs that make up each system:

- **Integumentary system**: Skin
- **Skeletal system**: Bones, Joints
- **Muscular system**: Muscles
- **Circulatory system**: Heart, Blood vessels, Lymphatic vessels, Lymph nodes, Spleen
- **Digestive system**: Mouth, Teeth, Tongue, Salivary glands, Pharynx, Esophagus, Stomach, Intestines, Appendix, Liver, Gallbladder, Pancreas
- **Respiratory system**: Nose, Pharynx, Larynx, Trachea, Bronchi, Lungs
- **Urinary system**: Kidneys, Ureters, Urinary bladder, Urethra
- **Reproductive system**: Male: Testes, Epididymis, Seminal ducts, Seminal vesicles, Ejaculatory ducts, Urethra, Prostate gland, Bulbourethral glands, Scrotum, Penis, Spermatic cord; Female: Ovaries, Uterine tubes, Uterus, Vagina, Bartholin glands, Vulva, Mammary glands
- **Endocrine system**: Pituitary gland, Thyroid gland, Parathyroid gland, Adrenal glands, Islets of Langerhans, Sex glands (ovaries, testes)
- **Nervous system**: Brain, Spinal cord, Nerves, Ganglia
<table>
<thead>
<tr>
<th>Name</th>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thorax</td>
<td></td>
<td></td>
</tr>
<tr>
<td>True ribs</td>
<td>14</td>
<td>Upper seven pairs; attached to sternum by way of costal cartilages</td>
</tr>
<tr>
<td>False ribs</td>
<td>10</td>
<td>Lower five pairs; lowest two pairs do not attach to sternum, therefore, called floating ribs; next three pairs attach to sternum by way of costal cartilage of seventh ribs</td>
</tr>
<tr>
<td>Sternum</td>
<td>1</td>
<td>Breast bone; shaped like a dagger; piece of cartilage at lower end of bone called xiphoid process</td>
</tr>
<tr>
<td>Upper extremities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clavicle</td>
<td>2</td>
<td>Collar bones; only joints between shoulder girdle and axial skeleton are those between each clavicle and sternum</td>
</tr>
<tr>
<td>Scapula</td>
<td>2</td>
<td>Shoulder bones; scapula plus clavicle forms shoulder girdle; acromion process—tip of shoulder that forms joint with clavicle; glenoid cavity—arm socket</td>
</tr>
<tr>
<td>Humerus</td>
<td>2</td>
<td>Upper arm bone</td>
</tr>
<tr>
<td>Radius</td>
<td>2</td>
<td>Bone on thumb side of lower arm</td>
</tr>
<tr>
<td>Ulna</td>
<td>2</td>
<td>Bone on little finger side of lower arm; olecranon process—projection of ulna known as the elbow or “funny bone”</td>
</tr>
<tr>
<td>Carpal bones</td>
<td>16</td>
<td>Irregular bones at upper end of hand; anatomical wrist</td>
</tr>
<tr>
<td>Metacarpals</td>
<td>10</td>
<td>Form framework of palm of hand</td>
</tr>
<tr>
<td>Phalanges</td>
<td>28</td>
<td>Finger bones; three in each finger, two in each thumb</td>
</tr>
<tr>
<td>Lower extremities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pelvic bones</td>
<td>2</td>
<td>Hip bones; ilium—upper, flaring part of pelvic bone; ischium—lower, back part; pubic bone—lower, front part; acetabulum—hip socket; symphysis pubis—joint in midline between two pubic bones; pelvic inlet—opening into true pelvis, or pelvic cavity; if pelvic inlet is misshapen or too small, infant skull cannot enter true pelvis for natural birth</td>
</tr>
<tr>
<td>Femur</td>
<td>2</td>
<td>Thigh or upper leg bones; head of femur—ball-shaped upper end of bone; fits into acetabulum</td>
</tr>
<tr>
<td>Patella</td>
<td>2</td>
<td>Kneecap</td>
</tr>
<tr>
<td>Tibia</td>
<td>2</td>
<td>Shin bone; medial malleolus—rounded projection at lower end of tibia commonly called inner ankle bone</td>
</tr>
<tr>
<td>Fibula</td>
<td>2</td>
<td>Long slender bone of lateral side of lower leg; lateral malleolus—rounded projection at lower end of fibula commonly called outer ankle bone</td>
</tr>
<tr>
<td>Tarsal bones</td>
<td>14</td>
<td>Form heel and back part of foot; anatomical ankle</td>
</tr>
<tr>
<td>Metatarsals</td>
<td>10</td>
<td>Form part of foot to which toes attach; tarsal and metatarsal bones so arranged that they form three arches in foot: the inner longitudinal arch and the outer longitudinal arch, both of which extend from front to back of foot, and transverse or metatarsal arch that extends across foot</td>
</tr>
<tr>
<td>Phalanges</td>
<td>28</td>
<td>Toe bones; three in each toe, except great toes, where there are two</td>
</tr>
</tbody>
</table>

| Total                | 206    |                                                                             |

Bones of the skeleton (Continued)
<table>
<thead>
<tr>
<th>Part moved</th>
<th>Flexors</th>
<th>Extensors</th>
<th>Adductors</th>
<th>Adductors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper arm</td>
<td>Pectoralis major</td>
<td>Latissimus dorsi</td>
<td>Deltoid</td>
<td>Pectoralis major and latissimus dorsi contracting together</td>
</tr>
<tr>
<td>Lower arm</td>
<td>Biceps brachii</td>
<td>Triceps brachii</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Thigh</td>
<td>Iliopsoas</td>
<td>Gluteus maximus</td>
<td>Gluteus medius and minimus</td>
<td>Adductor group</td>
</tr>
<tr>
<td>Lower leg</td>
<td>Hamstrings</td>
<td>Quadriceps femoris group</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Foot</td>
<td>Tibialis anterior</td>
<td>Gastrocnemius soleus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trunk</td>
<td>Iliopsoas and rectus femoris</td>
<td>Erector spinae (sacrospinalis)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Muscles grouped according to their function**

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Function</th>
<th>Insertion</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pectoralis major</td>
<td>Flexes <em>upper arm</em></td>
<td>Humerus</td>
<td>Sternum</td>
</tr>
<tr>
<td></td>
<td>Helps adduct <em>upper arm</em></td>
<td></td>
<td>Clavicle</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Upper rib cartilages</td>
</tr>
<tr>
<td>Latissimus dorsi</td>
<td>Extends <em>upper arm</em></td>
<td>Humerus</td>
<td>Vertebrae</td>
</tr>
<tr>
<td></td>
<td>Helps adduct <em>upper arm</em></td>
<td></td>
<td>Ilium</td>
</tr>
<tr>
<td>Deltoid</td>
<td>Abducts <em>upper arm</em></td>
<td>Humerus</td>
<td>Clavicle</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Scapula</td>
</tr>
<tr>
<td>Biceps brachii</td>
<td>Flexes <em>lower arm</em></td>
<td>Radius</td>
<td>Scapula</td>
</tr>
<tr>
<td>Triceps brachii</td>
<td>Extends <em>lower arm</em></td>
<td>Ulna</td>
<td>Scapula</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Humerus</td>
</tr>
<tr>
<td>Iliopsoas</td>
<td>Flexes <em>trunk</em></td>
<td>Ilium</td>
<td>Femur</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertebræ</td>
<td></td>
</tr>
<tr>
<td>Iliopsoas</td>
<td>Flexes <em>thigh</em></td>
<td>Femur</td>
<td>Ilium</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertebræ</td>
<td>Vertebræ</td>
</tr>
<tr>
<td>Gluteus maximus</td>
<td>Extends <em>thigh</em></td>
<td>Femur</td>
<td>Ilium</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sacrum</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coccyx</td>
</tr>
<tr>
<td>Gluteus medius</td>
<td>Abducts <em>thigh</em></td>
<td>Femur</td>
<td>Ilium</td>
</tr>
<tr>
<td>Gluteus minimus</td>
<td>Abducts <em>thigh</em></td>
<td>Femur</td>
<td>Ilium</td>
</tr>
<tr>
<td>Adductors</td>
<td>Adduct <em>thigh</em></td>
<td>Femur</td>
<td>Pubic bone</td>
</tr>
<tr>
<td>Hamstring group</td>
<td>Flexes <em>lower leg</em></td>
<td>Tibia</td>
<td>Ischium</td>
</tr>
<tr>
<td></td>
<td>Helps extend <em>thigh</em></td>
<td>Fibula</td>
<td>Femur</td>
</tr>
<tr>
<td>Quadriceps femoris group</td>
<td>Extends <em>lower leg</em></td>
<td>Tibia</td>
<td>Ilium</td>
</tr>
<tr>
<td>including rectus femoris</td>
<td>Helps flex <em>thigh</em></td>
<td></td>
<td>Femur</td>
</tr>
</tbody>
</table>

*The functions, origins, and insertions of muscle*
<table>
<thead>
<tr>
<th>Structure</th>
<th>Parasympathetic control</th>
<th>Sympathetic control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart muscle</td>
<td>Slower heartbeat</td>
<td>Faster heartbeat</td>
</tr>
<tr>
<td>Most blood vessels</td>
<td>None</td>
<td>Constricted</td>
</tr>
<tr>
<td>Blood vessels in skeletal muscles</td>
<td>None</td>
<td>Dilated</td>
</tr>
<tr>
<td>Digestive tract</td>
<td>Increased peristalsis and increased secretion</td>
<td>Decreased peristalsis; decreased secretion</td>
</tr>
<tr>
<td>Adrenal glands</td>
<td>Decreased epinephrine secretion</td>
<td>Increased epinephrine secretion</td>
</tr>
<tr>
<td>Sweat glands</td>
<td>None</td>
<td>Increased sweat secretion</td>
</tr>
</tbody>
</table>

The functions of the autonomic nervous system

<table>
<thead>
<tr>
<th>Cranial nerve*</th>
<th>Conducts impulses</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Olfactory</td>
<td>From nose to brain</td>
<td>Sense of smell</td>
</tr>
<tr>
<td>II. Optic</td>
<td>From eye to brain</td>
<td>Vision</td>
</tr>
<tr>
<td>III. Oculomotor</td>
<td>From brain to eye muscles</td>
<td>Eye movements</td>
</tr>
<tr>
<td>IV. Trochlear</td>
<td>From brain to external eye muscles</td>
<td>Eye movements</td>
</tr>
<tr>
<td>V. Trigeminal (or trigeminal)</td>
<td>From skin and mucous membrane of head and from teeth to brain; also from brain to chewing muscles</td>
<td>Sensations of face, scalp, and teeth; chewing movements</td>
</tr>
<tr>
<td>VI. Abducens</td>
<td>From brain to external eye muscles</td>
<td>Turning eyes outward</td>
</tr>
<tr>
<td>VII. Facial</td>
<td>From taste buds of tongue to brain</td>
<td>Sense of taste; contraction of muscles of facial expression</td>
</tr>
<tr>
<td></td>
<td>From brain to face muscles</td>
<td></td>
</tr>
<tr>
<td>VIII. Auditory (or acoustic)</td>
<td>From ear to brain</td>
<td>Hearing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sense of balance</td>
</tr>
<tr>
<td>IX. Glossopharyngeal</td>
<td>From throat and taste buds of tongue to brain; also from brain to throat muscles and salivary glands</td>
<td>Sensations of throat; taste; swallowing movements; secretion of saliva</td>
</tr>
<tr>
<td>X. Vagus</td>
<td>From throat, larynx, and organs in thoracic and abdominal cavities to brain; also from brain to muscles of throat and to organs in thoracic and abdominal cavities</td>
<td>Sensations of throat, larynx, etc.; swallowing, peristalsis, heart contractions, etc.</td>
</tr>
<tr>
<td>XI. Spinal accessory</td>
<td>From brain to certain shoulder and neck muscles</td>
<td>Shoulder movements; turning movements of head</td>
</tr>
<tr>
<td>XII. Hypoglossal</td>
<td>From brain to muscles of tongue</td>
<td>Tongue movements</td>
</tr>
</tbody>
</table>

*The first letters of the words of the following sentence are the first letters of the names of cranial nerves: "On Old Olympus' Tiny Tops A Finn and German Viewed Some Hops." Many generations of students have used this or a similar sentence to help them remember the names of cranial nerves.

The cranial nerves and their functions
Summary
Steps in taking blood pressure
1 - Snug application of compression cuff.
2 - Palpation of radial artery as compression cuff is inflated.
3 - Palpation of radial artery as cuff is deflated at 2 to 3 mm. Hg per heartbeat.
4 - Careful placement of stethoscope bell.
5 - Inflation of compression cuff above systolic pressure.
6 - Deflation of the cuff at a rate of 2 to 3 mm. Hg per heartbeat to determine systolic and diastolic blood pressure.

"Regardless of the mechanism responsible for the production of the Korotkoff sounds and the pros and cons for employing the beginning of Phase 4 or of Phase 5 to measure diastolic pressure, the auscultatory method for obtaining arterial blood pressure is the clinical method par excellence. The wise, careful, and thoughtful physician will not make serious clinical errors in diagnosis and treatment if he uses the auscultatory method properly."

Sources of Error
"Errors that can be avoided in the clinical measurement of arterial blood pressure are committed not only by undergraduate students, but also by physicians. So much of the technique for the measurement of blood pressure has been taken for granted that few physicians have given much thought to the many problems concerned with sphygmomanometry... The arterial pressure is fickle, and the ill-informed and unprepared physician is readily confused and his patient erroneously treated... Therefore, to make the reading as accurate as possible, it is important to eliminate all sources of avoidable error. The indirect method will then compare favorably with the direct method of measurement."

In general, errors in blood pressure measurement are due to the following:

A - Faulty Technique
1 - Improper positioning of the extremity. Whether the patient is sitting, standing, or supine the position of the artery in which the blood pressure is measured must be at the level of the heart. However, it is not necessary that the sphygmomanometer be at the level of the heart.

2 - Improper deflation of the compression cuff. The pressure in the cuff should be lowered at about 2 mm. Hg per heartbeat. At rates slower than this venous congestion will develop and the diastolic reading will be erroneously high. If the cuff is deflated too quickly, the column of mercury may fall 5 or 10 mm. Hg between successive Korotkoff sounds, resulting in erroneously low readings.

3 - Recording the first blood pressure. Spasm of the artery upon initial com-
Imperfection and the anxiety and apprehension of the patient can cause the first blood pressure reading to be erroneously high. After the cuff has been applied, the physician should talk quietly to the patient for a few minutes in an effort to make him relax before the blood pressure is recorded. Several measurements should be made at each examination; generally, the third value recorded is the most basal.

4 — Failure to have the mercury column vertical. It is not necessary that the mercury column be at heart level, but the mercury column must be vertical. This applies especially when measuring the blood pressure of a patient in bed since the bed often does not provide a level surface.

5 — Auscultatory gap. In some patients the Korotkoff sounds disappear as the pressure is lowered and reappear well above the diastolic pressure. This interval of silence is known as the “auscultatory gap.” Erroneously low systolic readings can be avoided by first recording the blood pressure by the palpatory method.

6 — Improper application of the cuff. If the rubber bladder bulges beyond its covering, the pressure will have to be excessively high to compress the arm effectively. If the cuff is applied too loosely, central balloonning of the rubber bladder will reduce the effective width, thus creating a narrow cuff. Both bulging and balloonning result in excessively high readings.

“The importance of a smooth and even application of the compression cuff cannot be overemphasized. The physician should develop the habit of always applying the cuff properly. Hurried and careless application will result in inaccurate blood pressure determinations. In many ways it would be better not to record the blood pressure at all than to allow an improperly recorded blood pressure to influence clinical judgment or to be entered as part of a patient’s record. The insurance and legal implications of erroneously high blood pressure values are well known.”

B — Defective Apparatus

A defective air release valve or porous rubber tubing connections make it difficult to control the inflation and deflation of the cuff. The mercury and vertical glass tube should always be clean. If an aneroid manometer is used, its accuracy must be checked regularly against a mercury manometer. The needle should indicate zero when the cuff is fully deflated. However, an accurate zero reading is not a guarantee that the aneroid manometer is accurate throughout the entire pressure range.

§ 54-276.9. Persons rendering emergency care exempt from liability.—(a) Any person who, in good faith, renders emergency care or assistance, without compensation, to any injured person at the scene of an accident, fire, or any life-threatening emergency, or en route therefrom to any hospital, medical clinic or doctor’s office, shall not be liable for any civil damages for acts or omissions resulting from the rendering of such care or assistance.

(b) Any emergency medical care attendant or technician possessing a valid certificate issued by authority of the State Board of Health who in good faith renders emergency care or assistance, without compensation, to any injured or ill person, whether at the scene of an accident, fire or any other place, or while transporting such injured or ill person to, from or between any hospital, medical facility, medical clinic, doctor’s office or other similar or related medical facility, shall not be liable for any civil damages for acts or omissions resulting from the rendering of such emergency care, treatment or assistance.

(c) Any person having attended and successfully completed a course in cardiopulmonary resuscitation, which has been approved by the Board of Health, who in good faith and without compensation renders or administers emergency cardiopulmonary resuscitation, cardiac defibrillation or other emergency life-sustaining or resuscitative treatments or procedures, which have been approved by the State Board of Health to any sick or injured person, whether at the scene of a fire, an accident or any other place, or while transporting such person to or from any hospital, clinic, doctor’s office or other medical facility, shall be deemed qualified to administer such emergency treatments and procedures; and such individual shall not be liable for acts or omissions resulting from the rendering of such emergency resuscitative treatments or procedures.

(d) Nothing contained in this section shall be construed to provide immunity from liability arising out of the operation of a motor vehicle.

(e) For the purposes of this section, the term “compensation” shall not be construed to include the salaries of police, fire or other public officials or emergency service personnel who render such emergency assistance. (1962, c. 449; 1964, c. 568; 1968, c. 796; 1972, c. 578; 1975, c. 598; 1977, c. 441.)
The Committee shall choose its own chairman and shall meet at the call of the chairman or
the State Health Commissioner.

§ 32-310.3 (c) The Board shall adopt regulations specifying sanitation standards for ambulances.
Regulations so adopted shall also require that the interior of the ambulance and the
equipment within the ambulance be sanitary and maintained in good working order
at all times.

(b) Every ambulance shall be equipped with the medical supplies and equipment
specified by the Minimal Equipment List for Ambulances as adopted by the Committee
on Trauma of the American College of Surgeons and in effect on the effective date
of this chapter, provided, however, the State Board of Health, with the approval of
the Advisory Committee on Emergency Medical Services, may require additional
equipment or supplies to be aboard ambulances or may delete items of medical equip­
ment or supplies from the required Minimal Equipment List adopted herein by reference.

(c) The Board shall cause to be inspected medical equipment and supplies required of
ambulances when it deems such inspection is necessary and shall have maintained a
record thereof. Upon a determination, based upon an inspection, that required
medical supplies or equipment fail to meet the requirements of this chapter or regula­
tions adopted pursuant hereto, the permit for the ambulance concerned shall be
suspended until such requirements are met.

Class I and Class II Vehicle Equipment

1. Each Class I vehicle shall be provided with the following items of equipment or their
equivalent:

1. Hinged half-ring lower extremity splint with webbing ankle hitch.

2. Two or more padded board splints, 4-1/2 feet by 3 inches, and two more
similar splints 3 feet by 3 inches, of a material comparable to four-ply wood,
for coaptation splinting of fracture of leg or thigh.

3. Two or more padded 15 inch x 3 inch wood splints for fracture of forearm.

4. Two back boards, one long and one short, with accessories or equivalent. An
orthopaedic type stretcher is equivalent to a long back board.

5. Adequate oxygen and masks of assorted sizes.

6. Hand operated bag-mask resuscitation kit with adult, child and infant size
masks, a unit which can be attached to oxygen supply being preferred. Recom­
mended to be used only by qualified emergency medical services attendants.

7. Simple suction apparatus with catheter.

8. Mouth-to-mouth, two-way resuscitation airways for adults and children.

9. Oropharyngeal airways (2-1/2, child, and adult sizes).

10. Mouth gags made of three tongue blades taped together and padded.

11. Universal dressing, approximately 10 inches by 36 inches, packed folded to
10 inches by 9 inches.

12. Sterile gauze pads.

13. One, 2 and 3-inch adhesive tape on cylinders.

14. Six-inch by 5 yard soft roller-type bandages.

15. Triangular bandages.

16. Safety pins, large size.

17. Shears for bandages.

18. Several pillows.

19. Two sandbags about 3 inches in length, 3 inches thick, and 12 inches in
length.

20. Four cloth hand towels.
21. One folding stretcher is recommended.

22. Two or more blankets.

23. "No Smoking" sign posted in patient compartment of the vehicle. Smoking shall not be permitted while the vehicle is in service.

24. A separate "O.B. Kit" is required with items recommended by a local physician or advisor.

25. First aid kit portable with adequate supplies (Section 5, item 5).

26. Or other item or items may be required by the Board on approval of the Advisory Committee. (32-310.3(b)).

132-310.4 (b) On and after July one, nineteen hundred seventy-two, every ambulance, except those specifically excluded from the operation of this chapter, when operated on an ambulance mission in this State shall be occupied by at least two persons, one of whom possesses a valid emergency medical care attendant's certificate issued by authority of the Board, and such individual must accompany the patient or victim in the patient or victim compartment of the ambulance. Provided, the Board may adopt regulations which exempt specific categories of ambulance service where it is felt that such exemption would not be detrimental to the health or welfare of the transported patient or victim.

(b) The Board shall adopt regulations setting forth the qualifications required for certification of such attendants. Such regulations shall be effective when approved by the Advisory Committee on Emergency Medical Services.

(c) Persons desiring certification as emergency medical care attendants shall apply to the Board using forms prescribed by the Board. Upon receipt of such application the Board shall cause the applicant to be examined and if it is determined that the applicant meets the requirements of its regulations duly adopted pursuant to this chapter, it shall issue a certificate to the applicant. Emergency medical care attendants' certificates so issued shall be valid for a period not to exceed two years and may be renewed after reexamination if the holder meets the requirements set forth in the regulations of the Board. Any certificate so issued may be suspended at any time it is determined that the holder no longer meets the qualifications prescribed for such attendants.

(d) The Board may authorize the issuance of temporary certificates with or without examination when it finds that such will be in the public interest. Temporary certificates shall be valid for a period not exceeding ninety days.
Article 6 Continued

Police cars, ambulances, etc. In Virginia the drivers of police cars, ambulances, and other State, county, and city-owned vehicles are subject to all traffic regulations unless a specific exception is made. Virginia Transit Co. v. Tidd, 194 Va. 418, 73 S. E. 2d 405 (1952); Manhattan For Hire Car Corp. v. O'Connell, 194 Va. 398, 73 S. E. 2d 410 (1952).
For statute providing exceptions for certain emergency vehicles, see § 46.1-226.

Article 7

§ 46.1-176. Duty of driver to stop, etc., in event of accident; duty of occupant; reports additional to other accident reports required by title. (a) The driver of any vehicle involved in an accident in which a person is killed or injured or in which an attended vehicle or other attended property is damaged shall immediately stop as close to the scene of the accident as possible without obstructing traffic and report forthwith to the police authority; and in addition, to the person struck and injured if such person appears to be capable of understanding and retaining the information, or to the driver or some other occupant of the vehicle collided with or to the custodian of other damaged property, his name, address, operator's or chauffeur's license number and the registration number of his vehicle. The driver shall also render reasonable assistance to any person injured in such accident, including the carrying of such injured person to a physician, surgeon or hospital for medical treatment if it is apparent that such treatment is necessary or is requested by the injured person.

(b) If the driver fails to stop and make the report required by paragraph (a) of this section, any person in the vehicle with the driver at the time of the accident who has knowledge of the accident shall report within twenty-four hours from the time of the accident to the Superintendent or, if the accident occurs in a city or town, to the chief of police of such city or town, his name, address and such other information within his knowledge as the driver must report pursuant to paragraph (a) of this section.

(c) The driver of any vehicle involved in an accident in which no person is killed or injured but in which an unattended vehicle or other unattended property is damaged shall make a reasonable effort to find the owner or custodian of such property and shall report to the owner or custodian the information which the driver must report pursuant to paragraph (a) of this section if such owner or custodian is found. If the owner or custodian of such damaged vehicle or property cannot be found, the driver shall leave a note in a conspicuous place at the scene of the accident and shall report the accident in writing within twenty-four hours to the Superintendent or, if the accident occurs in a city or town, to the chief of police of such city or town. Such note and written report shall contain the information which the driver must report pursuant to paragraph (a) of this section and such written report shall state in addition the date, time and place of the accident and the driver's estimate of the property damage.

Article 10

§ 46.1-190. Some specific instances. A person shall be guilty of reckless driving who shall:

(f) Fail to stop, when approaching from any direction, a school bus, whether publicly or privately owned, which is stopped on any highway or school driveway for the purpose of taking on or discharging children, and to remain stopped until all children are clear of the highway or school driveway and the bus is put in motion, except the driver of a vehicle upon a dual highway, when the roadways are separated by a physical barrier or barriers or
§ 46.1-199. Exceptions to speed limitations; when exemptions applicable; prosecution for recklessness; civil liability. (a) The speed limitations set forth in this chapter shall not apply to vehicles when operated with due regard for safety under the direction of the police in the chase or apprehension of violations of the law, or of persons charged with or suspected of any such violations, or in testing the accuracy of speedometers on police vehicles, or in testing the accuracy of the radio microwave or other electrical devices specified in § 46.1-198 nor to fire department vehicles when traveling in response to a fire alarm or pulmotor call, nor to ambulances when traveling in emergencies outside the corporate limits of cities and towns.

(b) These exemptions, hereinbefore granted to such a moving vehicle, shall apply only when the operator of such vehicle displays a flashing, blinking or alternating red light and sounds a siren, bell, exhaust whistle, or air horn designed to give automatically intermittent signals, as may be reasonably necessary, and, only when there is in force and effect for such vehicle standard automobile liability insurance covering injury or death to any one person in the sum of at least one hundred thousand dollars in any one accident, and subject to the limit for one person, to a limit of three hundred thousand dollars because of bodily injury to or death of two or more persons in any one accident, and to a limit of ten thousand dollars because of injury to or destruction of property of others in any one accident. Such exemptions shall not, however, protect the operator of any such vehicle from criminal prosecution for conduct constituting reckless disregard of the safety of persons and property. Nothing in this section shall be construed to release the operator of any such vehicle from civil liability for failure to use reasonable care in such operation.

Article 12

§ 46.1-225. Approach of police or fire-fighting vehicles, rescue vehicles or ambulances, violations as failure to yield right-of-way. (a) Upon the approach of any vehicle listed in paragraph (a) § 46.1-226 giving audible signal by siren, exhaust whistle, or air horn designed to give automatically intermittent signals, the driver of every other vehicle shall immediately drive the same to a position as near as possible and parallel to the right hand edge or curb, clear of any intersection of highways, and shall stop and remain in such position unless otherwise directed by a police or traffic officer until such vehicle shall have passed. This provision shall not operate to relieve the driver of any such vehicle from the duty to drive with due regard for the safety of all persons using the highway, nor shall it protect the driver of any such vehicle from the consequences of an arbitrary exercise of such right-of-way.

(b) Violation of this section shall constitute failure to yield the right-of-way. (Code 1950, § 46-241; 1958, c.541; 1960, c.570; 1966, cc.613,699; 1968, c.89.)

(a) The operator of (1) any police vehicle operated by or under the direction of a police officer in the chase or apprehension of violators of the law or persons charged with or suspected of any such violation, (2) any vehicle used for the purpose of fighting fire, including publicly owned State forest warden vehicles not to exceed two hundred in number, when traveling in response to a fire alarm or emergency call, (3) Any vehicle owned by a political subdivision of the Commonwealth for rescue purposes when traveling in response to a fire alarm or an emergency call, or (4) any ambulance or rescue or life-saving vehicle designed or utilized for the principle purposes of supplying resuscitation or emergency relief where human life is endangered, whether such vehicle is publicly owned or operated by a nonprofit corporation or association, when such vehicle is being used in the performance of public services, and when such vehicle is operated under emergency conditions, may, without subjecting himself to criminal prosecution:
(1) Proceed past red signal, light, stop sign or device indicating moving traffic shall stop if the speed and movement of the vehicle is reduced and controlled so that it can pass a signal, light or device with due regard to the safety of persons and property.

(2) Park or stand notwithstanding the provisions of this chapter.

(3) Disregard regulations governing a direction of movement of vehicles turning in specified directions so long as the operator does not endanger life or property.

(4) Pass or overtake, with due regard to the safety of persons and property, another vehicle at any intersection.

(b) These exemptions, hereinbefore granted to such a moving vehicle, shall apply only when the operator of such vehicle displays a flashing, blinking or alternating red light and sounds a siren, exhaust whistle, or air horn designed to give automatically intermittent signals, as may be reasonably necessary, and, only when there is in force and effect for such vehicle standard automobile liability insurance covering injury or death to any persons in the sum of at least one hundred thousand dollars because of bodily injury to or destruction of property of others in any one accident. Such exemptions shall not, however, protect the operator of any such vehicle from criminal prosecution for conduct constituting reckless disregard of the safety of persons and property. Nothing in this section shall be construed to release the operator of any such vehicle from civil liability for failure to use reasonable care in such operation.

Article 18A

§ 54-276.10. Physicians and others rendering medical aid to report gunshot wounds; duty of sheriff or chief of police.—Any physician or other person who renders any medical aid or treatment to any person for a wound which such physician or other person knows or has reason to believe is a wound inflicted by a firearm shall as soon as practicable report such fact, including the wounded person's name and address, if such is known, to the sheriff or chief of police of the county or city in which such treatment is rendered; provided, that if such medical aid or treatment is rendered in a hospital or similar institution, such physician or other person rendering such medical aid or treatment shall immediately notify the person in charge of such hospital or similar institution, who shall make such report forthwith.

The following opinions in reference to laws affecting Rescue Squads were given by: Mr. Thomas D. Jordan, B.A., LL.G.: Member of the Virginia Bar; Administrative Assistant, Office of Chief Medical Examiner, Commonwealth of Virginia; Associate Professor of Legal Medicine, School of Medicine, and Assistant Professor of Hospital Law, School of Hospital Administration, Health Sciences of Virginia Commonwealth University, Richmond.

Article 19

The volunteer who serves with a rescue squad has the same legal obligations, duties, and responsibilities as an ambulance operator or a member of an emergency crew who performs his services of mercy for pay. He must exercise reasonable care in driving as well as in rendering first aid.
Article 20

Legal Status of One Rendering First Aid

The question of the legal status of an individual rendering first aid is an important one. There must be a genuine emergency. First Aid must of necessity be of a temporary nature. Give as much aid as the circumstances require and transport the injured with the least practical delay to the most appropriate medical facility. When one renders first aid or gives medical assistance in the case of a genuine emergency in the absence of a qualified practitioner, the law in Virginia does not consider that person to be practicing the healing arts. The Qualified practitioner is held to a higher degree of skill and care than the layman who would render mere first aid, because, as the words imply, it is that aid which is rendered first before the arrival of a qualified practitioner. Though the practitioner may render no more assistance than might be rendered by the person furnishing first aid, the practitioner does not render first aid, because he is furnishing medical services and may not render less care or exercise a lesser degree of skill than that for which he is professionally trained and licensed to render. This statement, therefore, cloaks the rescue worker in legal armor which would protect him in most situations and give him liberty to function effectively in cases of an emergency without feeling too restricted as to what aid he might legally give.

Article 21

Consent to Treatment

Upon arrival at the scene where the services of the rescue squad has been requested, it is discovered that no emergency exists, then nothing should be done. If, in fact, there is an emergency, but the injured refuses to accept assistance, nothing should be done. Unless the person in need of immediate medical treatment is a child, a mentally-ill patient, or unconscious, he must give his consent to any treatment rendered. Unauthorized assistance is assault and battery.

Article 22

Liability for Harm

The rescue squad worker is held to exercise that degree of care and skill that other rescue squad workers would exercise under the same circumstances. If first aid is not rendered in an acceptable reasonable manner, the rescue squad worker may be liable for the resultant harm. If he fails to use reasonable care in driving the emergency vehicle and causes an accident, he may be liable not only for the damages to the other vehicle and persons injured therein, but also for any additional harm to his passenger caused by the accident or the delay encountered by the accident.

Article 23

Medical Examiner Cases

The physician—medical examiner must investigate and file a report with the local Attorney
Article 23 Continued

for the Commonwealth through the Chief Medical Examiner any death within the following classifications:

1. By violence, that is, accident, suicide, or homicide.
2. Suddenly when in apparent health.
3. When unattended by a physician (or osteopath).
4. When in prison (or jail).
5. By unusual, suspicious, or unnatural means, and
6. When the body is to be cremated.

The medical examiner upon notification of a death meeting one of these classifications, takes charge of the body, makes his investigation, and submits a report of the investigation, and submits a report of the investigation as required. A report of investigation is not required where viewing of the remains is solely for the purpose of authorizing cremation.

Visit to Scene

When the medical examiner is notified of a death within his jurisdiction, he takes charge of the body; but it is not obligatory on the medical examiner under the Virginia statute to go to the scene under any circumstances. To take charge of the body means that the body becomes subject to his sole direction. He may go the scene or order its removal.

Pronouncing Death

Since the statute requires that the medical examiner be notified only upon the death of the person, it becomes obvious that the medical examiner cannot be used for the purpose of pronouncing people dead. His jurisdiction arises only after there is no question that the patient is deceased.

In Virginia there is no statutory requirement for a physician to pronounce a patient dead though this is the recommended procedure whenever feasible. The physician last in attendance or one designated by him has only the duty to sign a death certificate. If a rescue squadsman at the place of death is satisfied that the patient is dead and he is unable to locate the attending physician, the body can be removed to a mortuary of the decedent’s family’s choice to await locating the medical attendant. If the family objects to the removal of the body, don’t remove it; and let them locate the physician or contact the funeral home of choice.

D. O. A.’s

Upon arrival of the rescue squadsman at the scene of death and finds the patient is unquestionably dead, he should ascertain as to whether the decedent was under medical attention and if he was being treated for some disease. If he was, then the physician should be notified. In the event that the physician cannot be located, the body ought to be moved either to a mortuary or to a funeral home and kept there until such time as the attending physician can be located. If it is a medical examiner’s case, of course, it is mandatory to call the medical examiner.
Removal of Dead by Rescue Squad

To use an emergency vehicle for purposes of transporting dead bodies may be considered improper utilization of such vehicle and its personnel trained in rescue functions. This is entirely a matter of local policy. Wherever the emergency crews do not remove D. O. A.'s arrangements could be made with local funeral directors to accept this duty.

Procedure for Medical Examiner Case

Notification: If there is any evidence of foul play, it is necessary for the squadsman to promptly notify the medical examiner. In the event that the medical examiner on call cannot be reached, then the next medical examiner on call should be notified. In localities where the medical examiner for the city or county cannot be reached, it is permissible to call the medical examiner for any adjacent city or county. If the local medical examiner is not available and a diligent search is made for other medical examiners and none being found, then the proper procedure is to phone the Chief Medical Examiner's office, depending in which area the case is, and permission may be obtained for the designation of a licensed physician other than the medical examiner to act in a particular case. The phone number for the Chief Medical Examiner's Office is:

Central Office: Richmond 770-3174
Tidewater Division: Norfolk 625-1306
Western Division: Roanoke 345-1031, Ext. 260

Removal: At the scene of an auto accident where one or more occupants of the auto or a pedestrian is killed, the remains may be covered and the medical examiner notified. The medical examiner in most cases will order the removal of the accident victims without coming to the scene. As a matter of local policy, the medical examiner may give a blanket authorization for the police to have accident victims removed. Otherwise, the police have no authority to order the removal of the remains under any circumstances.
Problem 1: You respond to a call from a woman—her husband may be having a heart attack. When you arrive, you find the man in no distress, with normal vital signs and he has no complaints. He is calm, but annoyed at his wife. He refuses to let you take him to the hospital. What do you do?

- Is he rational? Yes. Therefore his desires must be respected.
- Is he in immediate need of emergency care? No. But he may be in need of a diagnostic assessment.

The thing to do is explain the importance of going to the hospital to rule out acute MI. If he still refuses, write on your trip report something like: EMT’s John Smith and Mary Jones have explained to me the importance of going to the hospital for a diagnosis if I have had a heart attack. I refuse such treatment and transportation. Have the patient sign. If he won’t, make a note that he refused to sign and get a witness (perhaps the wife). It would also be a good idea to inform a physician of the situation via radio.

Problem 2: At an auto accident you find a man with alcohol on his breath suffering from a fractured left arm and abdominal pain. His BP is 90/40, pulse 140. He is yelling at you to leave him alone and go away—he does not want to go to any hospital. The police tell you to either load him up or get yourselves out. The man’s wife meekly asks you to get him to a doctor. Can you treat and transport against the patient’s will?

- Is he rational? Probably not. He may be drunk, may be dazed by the accident (concussion cannot be ruled out), and may be in decompensated shock—meaning his brain may not be fully functional.
- Is he in immediate need of emergency care? Yes.
- Is there more risk in treatment, or going without? Decompensated shock and acute MI. If he still refuses, write on your trip report something like: EMT’s John Smith and Mary Jones have explained to me the importance of going to the hospital to rule out acute MI. I refuse such treatment and transportation. Have the patient sign. If he won’t, make a note that he refused to sign and get a witness (perhaps the wife). It would also be a good idea to inform a physician of the situation via radio.

Remember the Golden Rule. Your job is to make the best medical care decision for the patient, not a legal decision for yourself.
- The wife has consented to treatment in a case where the patient may be mentally incompetent.
- Implied consent gives you the privilege to treat. If the patient is later declared to have been mentally competent, you erred on the side of life. That is what you are trained to do.

Table 1: Classification of shock

<table>
<thead>
<tr>
<th>Type</th>
<th>Problem</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypovolemia</td>
<td>Blood Loss, Plasma Loss, Water Loss</td>
<td>Bleeding ulcer, aneurysm; trauma; Burn; peritonitis; Heat stroke</td>
</tr>
</tbody>
</table>

Table II: Classification of shock

<table>
<thead>
<tr>
<th>Type</th>
<th>Problem</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiogenic</td>
<td>Poor myocardial function</td>
<td>Myocardial infarct; ventricular aneurysm</td>
</tr>
<tr>
<td></td>
<td>Poor myocardial coordination</td>
<td>Arrhythmia</td>
</tr>
<tr>
<td></td>
<td>Poor diastolic filling</td>
<td>Pericardial tamponade</td>
</tr>
<tr>
<td></td>
<td>Myocardial ischemia</td>
<td>Late hypovolemia</td>
</tr>
<tr>
<td></td>
<td>Neural or endocrine blockage decreasing cardiac reserve</td>
<td>Epidural, general anesthesia; drugs</td>
</tr>
</tbody>
</table>

Table IV: Classification of shock

<table>
<thead>
<tr>
<th>Type</th>
<th>Problem</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peripheral pooling</td>
<td>Vasomotor loss of tone</td>
<td>Syncope</td>
</tr>
<tr>
<td></td>
<td>Paralysis of resistance vessels</td>
<td>Spinal anesthesia</td>
</tr>
<tr>
<td></td>
<td>Dilatation of capacitance reservoirs</td>
<td>Endotoxemia</td>
</tr>
</tbody>
</table>

Table V: Classification of shock

<table>
<thead>
<tr>
<th>Type</th>
<th>Problem</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cellular defect</td>
<td>Failure of cellular (cytochrome) respiration</td>
<td>Cyanide poisoning</td>
</tr>
<tr>
<td></td>
<td>Interference in metabolism</td>
<td>Septic shock</td>
</tr>
<tr>
<td></td>
<td>Inadequate substrate</td>
<td>Hypoglycemia</td>
</tr>
<tr>
<td></td>
<td>• Hypoxemia</td>
<td>Insulin shock</td>
</tr>
<tr>
<td></td>
<td>• Insufficient endocrine transfer enzymes</td>
<td>CO poisoning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diabetic ketoacidosis</td>
</tr>
</tbody>
</table>
EMT COURSE
HANDOUT #3

CARRIES, COMMUNICATIONS, COMA SCALE, ANATOMY, PRIMARY AND SECONDARY SURVEYS

BACK CARRY

1. Cross the climbing rope over the victim's back.
2. Bring one inch nylon tape or two inch webbing across the back of the victim under his arms.
3. Then with the victim and rescuer together, pass the webbing over the shoulders of the rescuer.
4. Tie around the victim's legs above the knees.
5. With the webbing tied in a square knot across the stomach of the rescuer, with the ends tied off.

CLIMBING ROPE 20 INCH DIAMETER COIL
10-01 Unable to Copy—Change Location
10-02 Signal Good
10-03 Stop Transmitting
10-04 Acknowledgment
10-05 Relay
10-06 Busy—Stand by Unless Urgent
10-07 Out of Service (Location Phone No.)
10-08 In Service
10-09 Repeat
10-10 Fight
10-11 Dog Case
10-12 Stand By (Stop)
10-13 Weather and Road Report
10-14 Report of Prowler
10-15 Civil Disturbance
10-16 Domestic Trouble
10-17 Meet Complainant
10-18 Complete Assignment Quickly
10-19 Return To
10-20 Location
10-21 Call By Phone
10-22 Disregard
10-23 Arrived at Scene
10-24 Assignment Completed
10-25 Report in Person to (Meet)
10-26 Detaining Subject, expedite
10-27 Opp. Lic. Information
19-28 Registration Information
10-29 Check for Wanted
10-30 Illegal Use of Radio
10-31 Crime in Progress
10-32 Man with Gun
10-33 EMERGENCY
10-34 Riot

10-35 Major Crime Alert
10-36 Correct Time
10-37 Investigate Suspicious Vehicle
10-38 Stopping Suspicious Vehicle (Give Station Complete Description Before Stopping)
10-39 Urgent—Use Light and Siren
10-40 Silent Run—No Light or Siren
10-41 Beginning Tour of Duty
10-42 Ending Tour of Duty
10-43 Information
10-44 Request Permission to Leave Patrol
10-45 Animal Carcass In Lane at
10-46 Assist Motorist
10-47 Emergency Road Repairs Needed
10-48 Traffic Standard Needs Repairs
10-49 Traffic Light Out
10-50 Accident F, P, I
10-51 Wrecker Needed
10-52 Ambulance Needed
10-53 Road-Blocked
10-54 Livestock on Highway
10-55 Intoxicated Driver
10-56 Intoxicated Pedestrian
10-57 Hit and Run
10-58 Direct Traffic
10-59 Convoy or Escort
10-60 Squad in Vicinity
10-61 Personnel in Area
10-62 Reply to Message
10-63 Prepare to Make Written Copy
10-64 Message for Local Delivery
10-65 Net Message Assignment
10-66 Message Cancellation
10-67 Clear to Read Net Message
10-68 Dispatch Information
10-69 Message Received
10-70 Fire Alarm
10-71 Advise Nature of Fire (Size, Type, Contents)
10-72 Report Progress on Fire
10-73 Smoke Report
10-74 Negative
10-75 In Contact With
10-76 Enroute
10-77 Estimated Time of Arrival
10-78 Need Assistance
10-79 Notify Coroner
10-80 Stolen Vehicle
10-81 Reports
10-82 Reserve Lodging
10-83 Gas
10-84 If Meeting—Advise ETA
Delay Due to
10-85 Eat
10-86 Eat
10-87 Pick up Checks for Distribution
10-88 Advise Phone Number
10-89 Personal Relief
10-90 Bank Alarm
10-90A Armed Robbery
10-90B Purse Snatch
10-91 Unnecessary use of Radio
10-92
10-93 Blockade
10-94 Drag Racing
10-95 Open Door
10-96 Mental Subject
10-97 Close Door
10-98 Prison or Jail Break

CODE-10—Subject to Call
CODE-12—Cardiac Arrest
CODE-20—Unit Unit for Service
CODE-25—Return to Station
CODE-28—Police Officer Needed
CODE-30—MCCU Needed
CODE-44—Proceed With Caution
CODE-45—Call Pending
CODE-48—Station Unmanned
CODE-51—Aircraft Accident
CODE-52—Drowning/Boat Accident
CODE-53—Knifing
CODE-54—Shooting
CODE-55—Elecrocution
CODE-61—D.O.A.
CODE-60—Heart
CODE-62—Breathing Difficulty
CODE-63—Stoppage of Breathing
CODE-64—Bleeding
CODE-65—Poisoning
CODE-86—Intoxicated
CODE-96—Diabetic
CODE-97—Diabetic
CODE-100—OK to ask Questions
CODE-101—Base—KXA-255
CODE-102—Mobile—KT-6619
CODE-103—Bio Phone—KT-2583
CODE-104—Emerg. Base—KXA-256
CODE-105—TYPE-A—Routine Transportation
CODE-106—TYPE-B—Moderate Pain
CODE-107—TYPE-C—Serious

OTHER CALL SIGNS WILL BE STANDARD 10-SIGNALS
The Glasgow Coma Scale is a tool used to assess a patient's level of consciousness. It consists of three main components:

- **Eye opening**
- **Speech**
- **Motor response**

Each component is further divided into specific tests and responses, each assigned a score from 1 to 6, with 6 being the best response. The highest level of response to each command is recorded and the three categories are totaled.

### Glasgow Coma Scale

<table>
<thead>
<tr>
<th>Rescuer's Test</th>
<th>Victim's Response</th>
<th>Assigned Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye</td>
<td>Spontaneous: Opens eyes on own</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Speech: Opens eyes when asked to in a loud voice</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Pain: Opens eyes when pinched</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Pain: Does not open eyes</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Commands: Follows simple commands</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Pain: Pulls rescuer's hand away when is pinched</td>
<td>5</td>
</tr>
<tr>
<td>Best Motor</td>
<td>Response: Pulls a part of body away when is pinched</td>
<td>4</td>
</tr>
<tr>
<td>Response</td>
<td>Pain: Flexes body inappropriately to pain</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Pain: Body becomes rigid in an extended position when</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>rescuer pinches victim</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pain: Has no motor response to pinch</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Speech: Carries on a conversation correctly and tells</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>rescuer where he is, who he is, and the month and year</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Verbal Response: Seems confused or disoriented</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>(Talking) Speech: Talks so rescuer can understand</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>victim but makes no sense</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Speech: Makes sounds that rescuer can't understand</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Speech: Makes no noise</td>
<td>1</td>
</tr>
</tbody>
</table>

The highest level of response to each command is recorded and the three categories are totaled.
Figure 9-2a. Anatomical definitions important in evaluating the musculoskeletal system. (Reproduced with permission from *Trauma*. Copyright 1959 by Matthew Bender and Co., Inc.)
IDENTIFICATION Always identify when calling, answering, or signing, giving your callsign last: BASE, THIS IS TEAM DELTA... TEAM DELTA CLEAR. The station which called first should sign first. BASE will announce the time and the license callsign on each half hour while the net is in operation. In convoys, LEADER will announce the license callsign at least every 30 minutes. When no COMCTR is operating, or no mobile station has been designated LEADER, and always on CB, individual stations must use the license callsign at the beginning and end of each communication.

CALLSIGNS License Callsigns VHF FM: KU6516 -- CB: KIU9954 Tactical callsigns are issued by the CO or DO on a functional basis. The COMCTR is BASE; the lead vehicle in a convoy is LEADER; the DO is DISPATCH preceded by a Group name: BLUE RIDGE DISPATCH. Each field team uses its letter designator: TEAM ALFA, TEAM BRAVO, etc. A team specifically tasked as a relay will sign RELAY rather than TEAM: RELAY CHARLIE, RELAY DELTA, etc. Each team member signs with his function title followed by his team designator: LEADER ALFA, RESCUE ALFA, MEDIC ALFA, RADIO ALFA, DRIVER ALFA. Each subteam (or incidental radio operator) signs its parent letter designator plus a number: CHARLIE ONE, etc. Other intra-team callsigns are also by function: LEFT WING, BRAKE, etc. Staff sign by title: MISSION COORDINATOR, etc.

ITU PHONETIC ALPHABET AND NUMERAL PRONUNCIATION

| ALFA     | JULIET   | SIERRA   | 1 WUN | Numbers are spoken digit by digit except for multiples of 100 or 1000. |
| BRAVO    | KILO     | TANGO    | 2 TOO |
| CHARLIE  | LIMA     | UNIFORM  | 3 TREE |
| DELTA    | MIKE     | VICTOR   | 4 FOW-ER |
| ECHO     | NOVEMBER | WHISKEY  | 5 FT-YEV |
| FOXTROT  | OSCAR    | X-RAY    | 6 SIX |
| GOLF     | PAPA     | YANKEE   | 7 SE-VEN |
| HOTEL    | QUEBEC   | ZULU     | 8 ATE |
| INDIA    | ROMEO    |          | 9 NINER |
|          |          |          | Ø ZE-RO (not OH) |

SOME COMMONLY USED PROWORDS AND STANDARD PHRASES

THIS IS.............Precedes identification.
OVER...............It is your turn to transmit; I am listening.
GO AHEAD...........I am ready to receive your message.
ROGER..............I have satisfactorily received your message.
Does not mean yes.
AFFIRMATIVE.......Yes.
NEGATIVE...........No.
STAND BY..........Wait a moment (other stations keep out).
CLEAR.............I have no more traffic, but I will be listening.
OUT..............I am turning off my radio.
SAY AGAIN.........Repeat your previous transmission.
SAY AGAIN........I will repeat what I just said (or last transmission).
SAY AGAIN _____.Repeat the indicated specific information.

CORRECTION.......I have made an error; what follows is correct.
PREPARE TO COPY..Write this down. (Wait for GO AHEAD before sending message).
READ BACK.......For verification, read the message I just sent you.
I READ BACK.....I am reading back your message for verification.
THAT IS CORRECT..I verify that you have received or relayed my message correctly.
SPELL.............Spell out your message with phonetics.
SPEL L ..........Spell phonetically the indicated specific information.
I SPELL.........A phonetic spelling follows.
FIGURE(S)........Numerals and letters follow which do not spell words.
STATUS ONE.....Victim found; alive and well.
STATUS TWO......Victim found; alive, needs evac
STATUS THREE....Victim found; dead.

ASRC radio equipment is to be used only during missions and bona fide training operations. All other use is unauthorized. Adjustment and testing (except for brief readiness tests) may be carried out only by FCC licensed technicians authorized by the ASRC Communications Committee.
**A  AIRWAY**

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tongue obstruction</td>
<td>Hyperextend neck*</td>
</tr>
<tr>
<td></td>
<td>Jaw lift*</td>
</tr>
<tr>
<td></td>
<td>Triple airway maneuver*</td>
</tr>
<tr>
<td></td>
<td>Position</td>
</tr>
<tr>
<td></td>
<td>Modified jaw thrust [oral pharyngeal airway]</td>
</tr>
<tr>
<td></td>
<td>*not to be used when cervical spine injury is suspected.</td>
</tr>
<tr>
<td>Foreign body obstruction</td>
<td>Back blows (4)</td>
</tr>
<tr>
<td></td>
<td>Abdominal thrusts (4)</td>
</tr>
<tr>
<td></td>
<td>Finger probe</td>
</tr>
<tr>
<td></td>
<td>(long Kelley clamps or MacGill forceps)</td>
</tr>
<tr>
<td></td>
<td>(high tracheostomy = cricothyroidotomy)</td>
</tr>
<tr>
<td>Danger of aspiration</td>
<td>Position [suction]</td>
</tr>
<tr>
<td></td>
<td>(esophageal obturator airway)</td>
</tr>
<tr>
<td></td>
<td>(endotracheal intubation)</td>
</tr>
<tr>
<td>Anatomic obstruction</td>
<td>(high tracheostomy)</td>
</tr>
</tbody>
</table>

**B  BREATHING**

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apneic patient</td>
<td>Artificial respiration:</td>
</tr>
<tr>
<td></td>
<td>--mouth-to-mouth</td>
</tr>
<tr>
<td></td>
<td>--mouth-to-nose</td>
</tr>
<tr>
<td></td>
<td>--mouth-to-mouth and nose</td>
</tr>
<tr>
<td></td>
<td>--mouth-to-stoma</td>
</tr>
<tr>
<td></td>
<td>--chest pressure-arm lift</td>
</tr>
<tr>
<td></td>
<td>--mouth-to-mask</td>
</tr>
<tr>
<td></td>
<td>--bag-mask</td>
</tr>
<tr>
<td></td>
<td>--demand valve</td>
</tr>
<tr>
<td></td>
<td>--respirator</td>
</tr>
<tr>
<td>Collapsed lung/pendelluf</td>
<td>Seal</td>
</tr>
<tr>
<td></td>
<td>sucking chest wound</td>
</tr>
<tr>
<td></td>
<td>pneumo-/hemo- thorax</td>
</tr>
<tr>
<td></td>
<td>(decompression with chest tube and flutter valve or water seal drainage)</td>
</tr>
<tr>
<td></td>
<td>Position with collapsed lung down</td>
</tr>
<tr>
<td>Flail chest</td>
<td>Stabilize</td>
</tr>
<tr>
<td></td>
<td>Administer positive-pressure artificial respiration</td>
</tr>
<tr>
<td>Anoxia</td>
<td>near drowning</td>
</tr>
<tr>
<td></td>
<td>suffocation</td>
</tr>
<tr>
<td></td>
<td>CO poisoning</td>
</tr>
<tr>
<td></td>
<td>&quot;Flush out&quot; CO or CO₂ with high O₂ concentration</td>
</tr>
</tbody>
</table>

**C  CIRCULATION**

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>No effective heartbeat</td>
<td>External cardiac compression</td>
</tr>
<tr>
<td></td>
<td>(thoracotomy and internal cardiac compression)</td>
</tr>
</tbody>
</table>
(circulation contd.)

Severe external bleeding................
  direct Pressure
  Elevation
  pressure on the Supplying artery
  Tourniquet
  also:
  --pinching bleeding vessels directly
  --gause packing
  --reflection of galea

Internal bleeding......................"MAST" trousers

Traumatic hypovolemic shock..........Position
  Oral fluids*
  Oxygen
  Keep from chilling
  (IV therapy)

SECONDARY SURVEY

VITAL SIGNS
  GENERAL APPEARANCE
    -alertness (especially note if state of consciousness is deteriorating or has deteriorated)
    -orientation to time, person, place
    -degree of distress
  PULSE
  RESPIRATION
  BLOOD PRESSURE
    -systolic/diastolic
    -systolic by palpation

SUBJECTIVE EXAM
  Name
  Approx. age
  Sex
  Primary complaint
  Rescue situation
  Background of problem
  Medical history
  Medications
  Allergies

OBJECTIVE EXAM
  Scalp and skull
  Pupils and eyes
  Eyelids/fingernails
  Ears
  Mouth
  Neck: stoma, Medic Alert, tracheal deviation, cervical spine
  Chest: expansion (flail)
    - rib fractures
    - auscultate
  Abdomen: wounds
    - tenderness
    - masses
    - gaurding
  Lower spine
  Pelvis
  Legs
  Arms
  Back
Respiratory role

Fig. 1-1. Hyperventilation syndrome.

Fig. 1-2. A. Normal breathing pattern. B. Kussmaul's respiration.

Fig. 1-3. Cheyne-Stokes respiration.

Fig. 1-4. Biot's respiration.
A Guide to Medical Terminology

By Gail Walraven

Crucial to the success and growth of prehospital personnel is their ability to communicate openly and clearly with fellow members of the medical team. Historically, this requires fluency in a new language, one that is an extension of ancient Greek and Latin. Called "medical terminology," this new way of communicating removes many of the barriers between the medical community and the lay world.

Fluency in medical terms and abbreviations is not a direct requirement for actual patient treatment, but is rather a requisite for the learning process. Without the ability to quickly comprehend the meaning of medical knowledge and develop patient care skills, it is therefore a high priority to devote time to the study of medical terminology in order to facilitate future learning processes.

As foreign as this new language may appear at first, it must be remembered that, like anything new, it soon becomes second-nature if taken step by step. The organization that follows will provide the framework for this new language. However, the vast majority of the work is rote memory, and requires many hours of homework on an individual basis. Once the building blocks are committed to memory, the vocabulary can be increased at a more gradual rate.

WORD PARTS

The basis for all medical terms is a root word. This word is usually taken directly or indirectly from either Latin or Greek and retains its foreign meaning. For example, "hydro" is a Greek word meaning "water." Therefore, it can be used as the root word for many combination words meaning or referring to water:

- hydro: water
- hydrophobia: fear of water
- hydrotherapy: water treatments
- dehydrate: removal of water

Medical terms are built by selecting a root word, then attaching the modifiers, and then the prefix or suffix. When this vowel is attached, the root word is said to be in its "combining form" because it is then easier to combine with the modifiers. Medical terms require many hours of study. The following list (Table 1) identifies key root words essential for management of prehospital medical emergencies. Each of these words must, of necessity, be memorized to the point of fluency. It is suggested that a flash card system be utilized to expedite this tedious task.

In order to facilitate enunciation of the words, a vowel is frequently placed between the root word and the prefix or suffix. When this vowel is attached, the root word is said to be in its "combining form" because it is then easier to combine with the modifiers. Medical terms are first approached by identifying the root word, then the modifiers, and then translating each for an English interpretation. It is often difficult to distinguish the root word from the modifier, so there is much to be said for actual experience using the language in a clinical setting.

The next step in learning medical terminology requires many hours of independent study. The following list (Table 1) identifies key root words essential for management of prehospital medical emergencies. Each of these words must, of necessity, be memorized to the point of fluency. It is suggested that a flash card system be utilized to expedite this tedious task.

Once the list of root words is comfortably committed to memory, the learning of prefixes and suffixes can be undertaken. Use the same flash card system to memorize the meanings of these words and the foundation will have been laid.

The more you break it down, the more you build it up: your storehouse of technical vocabulary.

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Root</th>
<th>Suffix</th>
</tr>
</thead>
<tbody>
<tr>
<td>pen</td>
<td>cardi</td>
<td>ectomy</td>
</tr>
<tr>
<td>[around]</td>
<td>[heart]</td>
<td>[surgical removal of]</td>
</tr>
<tr>
<td>endo</td>
<td>cardio</td>
<td>pathy</td>
</tr>
<tr>
<td>[inner]</td>
<td>[heart]</td>
<td>[disease]</td>
</tr>
</tbody>
</table>

(continued on page 14)
Table 1

<table>
<thead>
<tr>
<th>Root Words &amp; Combining Forms</th>
<th>Pharyngo</th>
<th>Throat, pharynx</th>
<th>Extra-</th>
<th>Outside of, in addition to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algia</td>
<td>Pain</td>
<td></td>
<td>Homo-</td>
<td>Same</td>
</tr>
<tr>
<td>Algnesia</td>
<td>Sensitive to pain</td>
<td></td>
<td>Hypo-</td>
<td>Below, beneath, under</td>
</tr>
<tr>
<td>Arthrite</td>
<td>Joint</td>
<td></td>
<td>Hyper-</td>
<td>Above, increased, excessive</td>
</tr>
<tr>
<td>Brachio</td>
<td>Arm</td>
<td></td>
<td>In-</td>
<td>Within, inside, into</td>
</tr>
<tr>
<td>Broncho</td>
<td>Bronchi</td>
<td></td>
<td>Inter-</td>
<td>Between</td>
</tr>
<tr>
<td>Cardio</td>
<td>Heart</td>
<td></td>
<td>Intr-</td>
<td>Within</td>
</tr>
<tr>
<td>Cardi</td>
<td>Heart</td>
<td></td>
<td>Iso-</td>
<td>Equal</td>
</tr>
<tr>
<td>Campeo</td>
<td>Wrist</td>
<td></td>
<td>Leuko-</td>
<td>White</td>
</tr>
<tr>
<td>Cyste</td>
<td>Cell</td>
<td></td>
<td>Macro-</td>
<td>Large</td>
</tr>
<tr>
<td>Cysto</td>
<td>Cell</td>
<td></td>
<td>Mal-</td>
<td>Bad, poor</td>
</tr>
<tr>
<td>Cervico</td>
<td>Neck</td>
<td></td>
<td>Med-</td>
<td>Middle</td>
</tr>
<tr>
<td>Cephalo</td>
<td>Head</td>
<td></td>
<td>Melan-</td>
<td>Black</td>
</tr>
<tr>
<td>Chole</td>
<td>Gall, bile</td>
<td></td>
<td>Micro-</td>
<td>Small, minute</td>
</tr>
<tr>
<td>Costo</td>
<td>Rib</td>
<td></td>
<td>Mono-</td>
<td>One</td>
</tr>
<tr>
<td>Cysto</td>
<td>Bladder</td>
<td></td>
<td>Ne-</td>
<td>New</td>
</tr>
<tr>
<td>Cysto</td>
<td>Kidney</td>
<td></td>
<td>Non-</td>
<td>Not</td>
</tr>
<tr>
<td>Cutane</td>
<td>Skin</td>
<td></td>
<td>Pun-</td>
<td>All</td>
</tr>
<tr>
<td>Durom</td>
<td>Skin</td>
<td></td>
<td>Per-</td>
<td>By, through</td>
</tr>
<tr>
<td>Dermat</td>
<td>Skin</td>
<td></td>
<td>Peri-</td>
<td>Around</td>
</tr>
<tr>
<td>Ectop</td>
<td>Interstities</td>
<td></td>
<td>Poly-</td>
<td>Many, much</td>
</tr>
<tr>
<td>Emia</td>
<td>Blood</td>
<td></td>
<td>Post-</td>
<td>After, following</td>
</tr>
<tr>
<td>ENTERO</td>
<td>Intestines</td>
<td></td>
<td>Pre-</td>
<td>Before</td>
</tr>
<tr>
<td>Exhusta</td>
<td>Symptoms, feelings</td>
<td></td>
<td>Pseudo-</td>
<td>False</td>
</tr>
<tr>
<td>Fibro</td>
<td>Fibers</td>
<td></td>
<td>Re-</td>
<td>Back again</td>
</tr>
<tr>
<td>Gastro</td>
<td>Stomach</td>
<td></td>
<td>Retro-</td>
<td>Backward</td>
</tr>
<tr>
<td>Glyco</td>
<td>Sugar</td>
<td></td>
<td>Semi-</td>
<td>Half</td>
</tr>
<tr>
<td>Hema</td>
<td>Blood</td>
<td></td>
<td>Sub-</td>
<td>Under, beneath</td>
</tr>
<tr>
<td>Hema</td>
<td>Blood</td>
<td></td>
<td>Supra-</td>
<td>Above</td>
</tr>
<tr>
<td>Hemato</td>
<td>Blood</td>
<td></td>
<td>Syn-</td>
<td>Union, together</td>
</tr>
<tr>
<td>Hemo</td>
<td>Blood</td>
<td></td>
<td>Tachy-</td>
<td>Fast</td>
</tr>
<tr>
<td>Hepa</td>
<td>Liver</td>
<td></td>
<td>Trans-</td>
<td>Across, over</td>
</tr>
<tr>
<td>Hepato</td>
<td>Liver</td>
<td></td>
<td>Ultra-</td>
<td>Beyond, excess</td>
</tr>
<tr>
<td>Hydro</td>
<td>Water</td>
<td></td>
<td>Un-</td>
<td>Not, reversal</td>
</tr>
<tr>
<td>Hyperto</td>
<td>Uterus</td>
<td></td>
<td>Uni-</td>
<td>One</td>
</tr>
</tbody>
</table>

Prefixes

- A- | Without |
- An- | Without |
- Ab- | Away from |
- Ad- | Toward |
- Ant- | Against |
- Anti- | Against |
- Auto- | Self |
- Antero- | Before, front |
- Ante- | Before, front |
- Bi- | Twice, two |
- Bis- | Twice, two |
- Bio- | Life |
- Brady- | Slow |
- Co- | Together |
- Con- | Together |
- De- | From |
- Di- | Double, twice or apart |
- Dys- | Abnormal, painful or |
- En- | Into, within |
- Ento- | Within, innermost |
- Endo- | Within, innermost |
- Equi- | Equal |
- Ex- | Out, away from |
- Extra- | Outside of, in addition to |

Suffixes

- Al | Pertaining to, capable of |
- Cide | Destructive, to kill |
- Cule | Little, minute |
- Form | Surgical removal |
- -Form | Shaped like, having the form of |
- -Iasis | A state, condition of |
- -Iritis | Inflammation |
- -Logia | Specialist, a doctor |
- -Logly | Science of, study of |
- -Osis | Disease, a condition |
- -Ostomy | To form an opening or outlet |
- -otomy | Incision, to cut |
- -Plasty | Repair |
- -Scopy | To examine |
- -Pathy | Abnormality |
- -Rhaphy | Flow, discharge |
- -Thora | Flow, discharge |

COMBINED WORDS

Once the meanings of root words, prefixes, and suffixes are solidly memorized, fluency can be developed by practicing the interpretation of medical terms that have been built by this method of combinations. Not all medical words fall into this category, but this is the place to start. The following list of words can be readily broken down into word parts, each part having a meaning of its own. Translate each of the word parts and then interpret the meaning of the entire medical term. Check for accuracy by going back over the preceding lists.
### Abbreviation	 Meaning
---
\\^a\^  & before  
ASA  & aspirin  
ASHD  & atherosclerotic heart disease  
b.i.d.  & twice a day  
BP  & blood pressure  
BR  & bed rest  
BRP  & bathroom privilege  
B.S.  & blood sugar, bowel sounds  
\~T  & with  
CAD  & coronary artery disease  
cc  & cubic centimeter (equals one ml)  
C.C.  & chief complaint  
CCU  & coronary care unit  
CHB  & complete heart block  
CHF  & congestive heart failure  
cm  & centimeter  
c/o  & complaints of  
CO  & carbon dioxide  
COPD  & chronic obstructive pulmonary disease  
CSM  & carotid sinus massage  
CVA  & cerebrovascular accident (stroke)  
D.C.(d/c)  & discontinue  
DOA  & dead on arrival  
DOE  & dyspnea on exertion  
D.M.  & diabetes mellitus  
Dx  & diagnosis  
EKG, ECG  & electrocardiogram  
ER  & emergency room  
HTN  & hypertension  
IL  & fluid  
fx  & fracture  
Gl  & gastrointestinal  
Gm  & gram  
gr.  & grain  
gtt.  & drop  
h, hr.  & hour  
HBD  & has been drinking  
hrs  & hours of sleep  
Hx  & history  
IC  & intracardiac  
ICU  & intensive care unit  
IM  & intramuscular  
IV  & intravenous  
L.a.  & left arm  
LOC  & level of consciousness  
mg, mgm  & milligram  
MI  & myocardial infarction  
MICU  & mobile intensive care unit  
mm  & millimeter  
ms  & minute(s)  
NaHCO3  & sodium bicarbonate  
NPO  & nothing by mouth  
NTG  & nitroglycerine  
O2  & oxygen  
OB  & obstetrics  
OD  & overdose  
P  & pulse  
PL  & physical exam; pulmonary edema  
PERLA  & pupils are equal and reactive to light and accommodation  
PND  & paroxysmal tachycardia  
PR  & by mouth  
PRN  & whenever necessary  
q4h  (q4h)  & every 4 hours  
rh  & every day  
rq1  & every other day  
Rx  & respirations  
RBC  & red blood cell  
RHD  & rheumatic heart disease  
R/O  & rule out  
S.C., S.Q.  & surgical intensive care unit  
S.L.  & sublingual  
S.O.B.  & shortness of breath  
stat  & immediately  
Stx  & sign, symptom  
T & C  & type and cross-match  
TPR  & temperature, pulse and respirations  
V.S.  & vital signs  
WBC  & white blood cell  
Y.o.  & year old  
1/1000  & one, two, three, four, etc.  
M  & male  
F  & female  
PRI  & primary  
TID, QID  & 3X a day, 4X a day  
>  & greater than (5>3)  
=  & less than (2<6)  
\~\  & approximately

With this framework to build upon, an entire vocabulary can be developed and expanded throughout the course of your career.

### ABBREVIATIONS

Through the years, the medical community has adapted this language to meet its own needs. The need for an expedient, efficient, and distinct system of shortening the notoriously long medical words is probably more apparent in emergency medicine than in any other medical specialty. While the use of abbreviated forms of writing is clearly helpful, it can be a stumbling block to the student who is pressed for time and overcommitted with homework assignments.

As with medical terminology, medical abbreviations are most commonly derived from the original Latin or Greek word. For this reason, they frequently make little or no sense to the present-day student. Like any other task requiring rote memorization, practice is the key factor to success. Through the use of flash cards the student can practice translating the abbreviation into the full meaning, and then back into the abbreviation. It is important to emphasize both sides of this translation process, as both methods will be required in the field.

Listed in Table 2 are some of the more essential abbreviations used in field work. As your career develops, the list will grow longer, but this core provides an adequate start.

### S.M.I.-A.S.S.E.S.S.M.E.N.T.

The following paragraph is typical of the communications between the paramedic and the base hospital. Translate this report into English, and then check your work on the preceding lists.

"We are at the scene of a T.A. \& 3 pts. The 1st is a 48 y/o M.C. c/o a l.x of \(\oplus\) ulna \& radius, 5 other apparent injuries. BP \& other V.S. W.N.L."

The 2nd is a 63 y/o 2 \& a c.c. of S.O.B. No hx of C.O.P.D., C.H.F., or M.I. Cardiovascular status stable. C normal electrocardiograph.

The 3rd pt. has cerebral pain, is diaphoretic, hypotensive, and tachycardic. Will stand by for further orders."

Gail Walraven is a consulting editor on the staff of EMERGENCY and has been actively involved in EMS since 1970. She served as a paramedic instructor for five years for Los Angeles County before going to San Diego to establish a paramedic training program there. She is currently a national EMS consultant and has recently co-authored two books, Handbook of Emergency Drugs, and Manual of Advanced Prehospital Care, both published by Robert J. Brady Co.

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Table 18-1. Common causes of vaginal bleeding

<table>
<thead>
<tr>
<th>Not obviously pregnant female</th>
<th>Pregnant female</th>
</tr>
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<tbody>
<tr>
<td>Abortion, spontaneous, induced</td>
<td>Abortion, spontaneous, induced</td>
</tr>
<tr>
<td>Adenomyosis</td>
<td>Abruptio placentae</td>
</tr>
<tr>
<td>Adolescent menorrhagia</td>
<td>Cervical vein hemorrhage</td>
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<tr>
<td>Cancer, cervical, uterine</td>
<td>Ectopic pregnancy</td>
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<tr>
<td>Dysmenorrhea</td>
<td>Labor</td>
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<tr>
<td>Leukorrhea</td>
<td>Placenta previa</td>
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<tr>
<td>Menopausal menses</td>
<td>Polyps</td>
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<td>Normal menses</td>
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<td>Polyps</td>
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Table 18-2. Data pertinent to vaginal bleeding

<table>
<thead>
<tr>
<th>Necessary data</th>
<th>W</th>
<th>D</th>
<th>N</th>
<th>X</th>
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</thead>
<tbody>
<tr>
<td>What caused the uterine amnion and why?</td>
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W: Yes, D: No, N: No, X: No, Z: No.
## CONDITIONS INDICATING POSSIBLE CHILD ABUSE

- Malnutrition; failure to thrive; dehydration
- Unclean or neglected appearance; inappropriate dress (including a dirty child with an injury dressed in clean clothes)
- Quiet, "adult" behaviors; child reassuring parent; child frightened of parent/significant other
- Ecchymoses over wide area; deep muscle bruising/hemorrhage; bruises of various ages
- Burns by cigarettes or in inappropriate areas (palms of hands, feet, and ankles);
  "doughnut" or "zebra" burns
- Fractures in various stages of healing or of posterior ribs; "eggshell" fractures of skull; spiral fractures of long bones
- Marks from belts, whips, buckles, rings; impressions of bottles, bats, sticks
- Unexplained or inappropriate injuries
- Previous unexplained injuries; care provided at several facilities
- Parents overreacting or underreacting to the incident

### Table 17-1. Basic psychological assessment—the ABCDEFs

<table>
<thead>
<tr>
<th>Desired data</th>
<th>Pertinent questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>What is the patient's physical state? Undernourished? Pale? Trembling? Injured? Are there signs of physical illness/injury?</td>
</tr>
<tr>
<td>Body language</td>
<td>Does he move constantly? Not at all? In opposite ways to his expressed feelings? Are his movements inappropriate? Exaggerated?</td>
</tr>
<tr>
<td>Complains</td>
<td>Why were paramedics called? By whom? Does he have specific pain? Disability? Physical symptoms? Are these problems new? Old? Recurrent?</td>
</tr>
<tr>
<td>Distress level</td>
<td>How ill does he feel (on a scale of 1 to 10)? How long has the episode lasted? Has he ever felt just like this before? When? What was done about it?</td>
</tr>
<tr>
<td>Status</td>
<td>What is his level of consciousness? Is he incapacitated? Is his life threatened? Is he in need of professional mental health care? Can he safely be left with significant others? Does he need restraining? Constant observation?</td>
</tr>
</tbody>
</table>

## STRUCTURE OF A SUICIDE

### Stress

- Chronic/repeated failure to have basic needs met at some level or
- Acute situational crisis

#### Stress

- Feelings of frustration, helplessness, anger (directed inward)

#### STRESS

- External stress factors: separation; death; divorce; surgery; childbirth; history of suicide in family; aloneness
- Failure to communicate needs, frustrations; ineffectual pleas for help
- Failure of coping mechanisms; feelings of rejection, hopelessness, depression, guilt
- Decision to commit suicide; detailed plan of action; verbal/action clues to plan
- Suicidal act; may be preceded by "practice" attempt; may be accompanied by ambivalent behaviors

*As defined in Maslow's hierarchy of needs.*

### INTERVENTIONS IN PSYCHOLOGICAL DISTRESS STATES

**Remove the patient from the crisis situation if possible.**

**Ensure his safety and privacy.**

**Assess his behavior.**

**Listen to his interpretation of the situation.**

**Calm him down.**

**Advise him of your plan of care and specific procedures.**

**Respect him as an individual.**

**Enable him to participate in decisions regarding his treatment.**
1. The normal anatomical position is:
   a. The position of rest with the palms facing forward
   b. The position of attention with the palms facing backward
   c. The position of rest with the palms facing backward
   d. The position of attention with the palms facing forward.

2. When discussing a part and making reference to the point of origin, the terms
   __________ meaning closest to and __________ meaning farthest from are used.

3. Two terms of location connected with the ____plane are ___ and ___.
   transverse anterior and posterior
   sagittal inferior and superior
   coronal lateral and medial
   (connect the proper terms)

4. A movement away from the midline is __________.

5. A movement towards the midline is __________.

6. __________ is the opening or lengthening of an angle.

7. __________ is the closing or decreasing of an angle.

8. Connect the common terms with their medical equivalents:
   brain case brachium
   upper arm clavicle
   windpipe colon
   belly button cranium
   voice box larynx
   jaw mandible
   large intestine sternum
   breastbone thorax
   chest trachea
   collar bone umbilicus

9. When I am laying on my ___ I am in the ___ position.
   back laterally recumbant
   side prone
   stomach supine
   (connect the proper terms)

10. The normal breathing rate for adults is ______ to ______ times per minute;
    " " " " " children is ______ to ______ times per minute.

11. The normal pulse rate for an adult at rest is between ______ and ______
    beats per minute; for children between ______ and ______ times per minute.

12. Blood pressure is measured diastolic over systolic. T or F

13. Blood pressure measured by palpation is recorded systolic over diastolic. T or F

14. Rectal temperature is usually about 1° higher than when measured under the tongue. T or F

15. The vital signs are:
    1. ________________ 2. ________________
    3. ________________ 4. ________________

16. What are the four quadrants of the abdomen, and which vital organs are found in
    which quadrant? List on back.
MEDICO-LEGAL RESPONSIBILITIES

1. What are the requirements in the Virginia Regulations of the Board of Health governing ambulance services which specifically pertain to the driver of the ambulance?

2. As an EMT at the scene of an accident, your primary duties and responsibilities are:

3. The law governing ambulances in the state of Virginia requires how many certified attendant(s) to be in an ambulance?

4. At the scene of an automobile accident, who would be the authorized person in charge?

5. Inquiries involving animal bites: What action should the EMT take other than administering first aid to the patient?

6. In cases involving violent or unnatural deaths, the EMT should notify whom?

7. In cases of attempted suicide or murder, the EMT may transport the patient to the hospital for treatment without prior authorization from anyone. T  F

8. When a drunk refuses first aid, should you attempt to administer same?
Use this list of names:

- Epiglottis
- Tongue
- Esophagus
- Larynx
- Trachea

Fill in names:

1) Muscular organ - when relaxed it may fall back and block airway.

2) Vital protective valve - normally prevents food, vowel, or liquids from reaching lungs. May fail to function in unconscious victim.

3) "Voice box" - entrance to this structure may be blocked in "Cafe Coronary", therefore, victim of "Cafe Coronary" cannot utter a sound while he remains conscious.

4) Food tube - stomach contents may rise up through this and back down the windpipe of an unconscious victim, causing "Aspiration pneumonia" - a literal digestion of lung tissue.

5) "Windpipe" - bottom end splits into right and left main bronchi. A doctor may insert a breathing tube directly into this structure during a resuscitation attempt.
ANATOMY

Joints may be characterized by their shape. Draw a line between the name of the joint and the proper description of its shape.

1. Hip
2. Shoulder
3. Metacarpal of thumb
4. Elbow
5. Knee

6. The skull has two main parts:
   a. _______
   b. _______

   Draw a line between the site of articulation and each section of the spine:

7. Cervical spine
8. Thoracic spine
9. Lumbar spine
10. Sacral spine
11. Coccygeal spine

   List the number of vertabrae in each section of the spinal cord, and specify its location.

12. Lumbar
13. Coccygeal
14. Sacral
15. Cervical
16. Thoracic

The upper extremity is divided into three major parts. Give the name for each part, and list the bones of which it is composed.

PART       BONES
17. ________
18. ________
19. ________

20. The pelvic girdle is made up of three major bony parts. Two of these are bilaterally symmetric, and each of these two parts is in turn composed of three subsidiary bones.
   Major part 1: __________
   Major parts 2 & 3: __________, which are each composed of
   1. __________, 2. __________, and 3. __________

21. The femur is divided into three areas:
   1. __________, 2. __________, and 3. __________
The lower extremity is divided into three major parts. Give the name for each part, and list the bones of which it is composed.

PART  | BONES
--- | ---
22. | 
23. | 
24. | 
25. Does the fibula connect with the knee joint?
26. Muscle attaches to bone by 
27. Tendons cross 
28. List the three types of muscle.
   1. 
   2. 
   3. 
29. The muscles of the intestines are classified as 
30. Complete the following diagram:

![Diagram of the Nervous System]

31. Does the sympathetic nerve trunk lie within the spinal canal?
32. Are sensory nerve endings found only in the skin?
33. Motor nerves end in 
34. The capillaries of the lungs are located in the walls of the 
35. The opening of the trachea is guarded from food and drink by the 
36. During inspiration, the diaphragm moves downwards. Is it contracting or relaxing?
37. The lungs are covered by a smooth glistening membrane called the 
   The space between the two layers of it is called the . What does this space contain?
38. If the membranes discussed in the previous question are inflamed, what symptoms will result? What signs?
List the functions of each of the following components of blood:

40. Plasma

41. Red blood cells

42. White blood cells

43. Platelets

Draw a line between names and proper descriptions:

44. Thoracic duct
45. Aorta
46. Superior vena cava
47. Inferior vena cava
48. Mesentery

Major artery
Major vein
Major lymph vessel
None of the above

Complete the following diagram of the heart:

Chambers

49. 
50. 
51. 
52. 

Vessels to and from

53. 
54. 
55. 
56. 
57. 

Valves

58. 
59. 
60. 
61. 

Layers

62. 
63. 
64. 

Indicate the location of each of the following pulse points:

65. Carotid
66. Radial
67. Ulnar
68. Popliteal
69. Posterior Tibialis
70. Dorsalis pedis
71. When counting ribs, one counts the first palpable rib as the first rib. True or false?

72. Severe blows to the left upper quadrant may injure the ________.

73. Tenderness in the upper right quadrant is usually caused by ________.

74. ________ is the most frequent cause of pain in the right lower quadrant.

75. Which of the following are chief topographic landmarks of the abdomen?
   a. Groin
   b. Costal arches
   c. Golden arches
   d. Umbilicus
   e. Anterior superior iliac crests
   f. Pubis
   g. Floating ribs
   h. Manubrium of the sternum

76. It is customary in an emergency to take a pulse at the ________ artery, which is just lateral to the ________.

77. The normal resting respiratory rate for adults is ________ times per minute; that for children is about ________ per minute, and infants breathe about ________ times per minute.

78. Blood pressure levels vary widely with age and sex. However, a useful rule of thumb for a normal male systolic pressure is ________ plus the age of the patient.

79. Normal male diastolic pressures are in the range from ________ to ________.

80. Cool clammy skin
81. Pale ashen skin
82. Hot dry skin
83. Blue skin
84. Red skin

85. Constricted pupils may indicate ________.

86. Dilated pupils may be seen in several states. Name three.
   1. ________
   2. ________
   3. ________

87. What is often the EMT's first warning of developing shock?
1. List five functions of the skin:
   1) ____________________________________________
   2) ____________________________________________
   3) ____________________________________________
   4) ____________________________________________
   5) ____________________________________________

2. The skin is composed of ______________________ layers.

3. The body's first line of defense against bacteria is the___________________.

4. The dermis is responsible for skin color.  T  F

5. The sweat glands are connected to the hair follicles.  T  F

6. Sebaceous glands connect to the skin by single isolated pores.  T  F

7. The air we breathe in contains about _____% O₂ and _____% CO₂.
   The air we breathe out contains about _____% O₂ and _____% CO₂.

8. Why is mouth-to-mouth ventilation (or mouth-to-nose) superior to other methods of manual artificial respiration? List at least three reasons.
   1) ____________________________________________
   2) ____________________________________________
   3) ____________________________________________

9. What is the most common cause of (preventable) death in the unconscious victim?

10. What are three methods for maintaining an airway in a victim with a suspected spine injury without special devices?
    1) ____________________________________________
    2) ____________________________________________
    3) ____________________________________________

11. What method for maintaining an airway (again, without special devices) would be best for a victim with spontaneous respiration, but in danger of vomiting?

12. List two reasons for using mouth-to-nose artificial respiration instead of mouth-to-mouth.
    1) ____________________________________________
    2) ____________________________________________

13. Why should a victim's mouth always be opened during the exhalation phase of mouth-to-nose ventilation?
14. The control center is located in the _____ of the brain.

15. Can breathing movements continue even with complete airway obstruction?

16. Many medical emergencies, including hypovolemic shock, have symptoms and signs resulting from a massive stimulation of the sympathetic nervous system. List at least five:
   1) ___________________
   2) ___________________
   3) ___________________
   4) ___________________
   5) ___________________

17. What is infiltration? What should you do when an IV appears to be infiltrating?

18. If you are not sure whether an IV is infiltrating or not, and you lowered the IV bottle, would you see blood rapidly flowing back through the tubing if it was, in fact, infiltrating?

19. ______________ refers to the administration of blood and ______________ refers to the administration of non-blood fluids.

20. A patient who has received a crushing blow to the entire body, and who has blood shot eyes and cyanosis of the head, neck, and shoulders, probably has: ___

21. When the pleural space is filled by air, the condition is known as ___________, and when this space is filled by _______, as _________ _________.

22. ______________ often follows a stab wound to the heart.

23. What are signs of the condition in 22?

24. The presence of air under the skin is called ____________________.

25. When air trapped in the pleural space is at a higher pressure than atmospheric, the condition is known as ____________________.

26. What is "mediastinal shift" and what can be done to reduce it in a patient with a chest injury?

27. What is "pendeluft" and what does it tell you about the treatment of flail chest?
28. There are two types of paradoxical respiration. One is caused by a chest injury. Describe it.

29. Another type of paradoxical respiration is caused by cervical spine injury. Describe the difference between this type and the type in 28.

30. What is the proper drug treatment for anaphylaxis?
1. The air we breathe in:  
- % Nitrogen  
- % Oxygen  
- % Carbon Dioxide

2. The air we breathe out:  
- % Nitrogen  
- % Oxygen  
- % Carbon dioxide

2. Classify each of the following as High, Medium, or Low concentration, and indicate whether it is appropriate for patients with spontaneous respirations, who need artificial ventilation, or both. (S=spontaneous, A=artificial vent., B=both)

<table>
<thead>
<tr>
<th>Method</th>
<th>% O₂</th>
<th>Type of patient</th>
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<tbody>
<tr>
<td>a. Nasal prongs</td>
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<td></td>
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<tr>
<td>b. 24% Ventimask</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Plain mask</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Partial rebreathing mask</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Non-rebreathing mask</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Pocket mask w/ O₂ port</td>
<td></td>
<td></td>
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<tr>
<td>g. Bag-mask with O₂ reservoir</td>
<td></td>
<td></td>
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<tr>
<td>h. Demand valve</td>
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</table>

3. Why are pressure-cycled mechanical resuscitators not appropriate for CPR?

4. How should a proper-size oropharyngeal airway be selected?

5. What advantage does a nasopharyngeal airway have over the oropharyngeal airway?

6. How long of a section of a flexible suction catheter should be inserted for oropharyngeal suctioning?

7. What prevents oxygen regulators from being hooked up to bottles of other gases than oxygen?

8. Should oxygen regulators be oiled to assure proper function? Why or why not?

9. What problem may be caused by giving high-flow O₂ to certain COPD patients? How does this happen?

10. List three hazards of oxygen administration other than that described in question 9.
1. The nervous system may be broken down into parts in two different ways, structural and functional. The two major structural divisions are the central nervous system (CNS) and the ______ nervous system (______). The CNS in turn consists of the ______ and the ______, and the other major part consists of the ______ nerves and the ______ nerves.

2. Two major functional divisions of the nervous system are the voluntary nervous system and the ______ nervous system, which in turn consists of the ______ nervous system (fight or flight; nerve trunk outside but parallel to the spine) and the ______ nervous system (vagal stimulation, Valsalva maneuver).

3. A reflex arc directly connects motor and sensory nerves through the spinal cord, but does not depend on the brain. True or False?

4. The brain and spinal cord are cushioned by a clear fluid called (______). This fluid is formed from blood (through the blood/brain barrier) by the choroid plexus in the ventricles of the brain. It flows through the CNS, then is reabsorbed by the blood through the arachnoid villi in the midsagittal venous sinus.

5. The fluid described above is not necessary for CNS function, and is easily replaced. True or false?

6. Give two reasons (other than those given above) not to stop the outflow of clear fluid from the nose or ears of the head-injured patient.

7. List, from inside to outside, the meninges.

8. What is nuchal rigidity (a stiff neck, with inability to touch the chin to the chest) often a sign of?

9. Define:
   a. anesthesia
   b. paresthesia
   c. paralysis
   d. paresis
   e. hemiparesis
   f. ipsilateral
   g. contralateral

10. A person with full nerve function in all extremities does not have an injury to the spine. True or False?

11. A patient presents with labored diaphragmatic breathing (paradoxical respiration). Where is the spine injured?

12. An unconscious patient has his hands over his head. Although they have been brought back down to his sides, they keep creeping or falling back to a position above his head. Should you backboard him? Why?
13. Describe the difference between the two types of epileptic seizures.

14. List several causes of convulsive seizures.

15. What commonly-known procedures are not appropriate for a person having a seizure?

16. What are the effects of hypoxia and hypercapnia in an alert person?

17. What effect does hypercapnia have on the blood vessels of the brain?

18. Should a patient with a CVA always be given O₂? Why or why not?

19. What is aphasia? Can an aphasic patient ever understand what is being said around him?

20. List several signs and symptoms of increasing intracranial pressure.

21. Except in very rare instances, regeneration of the CNS does not happen. True or False?

22. What is the difference between concussion and cerebral contusion?

23. What is the cause of neurogenic shock?
1. Assume that all of the following treatments are necessary. In what order should they be given?

- splint a fractured humerus
- control arterial bleeding from the upper arm
- establish an airway
- dress and bandage protruding intestines
- treat for shock
- dress and bandage a lacerated knee

2. A victim of an auto accident is found lying on his back with a large piece of glass imbedded and going completely through his cheek. The glass should be removed
   a. only if the glass or blood is preventing adequate airway maintenance.
   b. because glass inhibits clotting.
   c. to make dressing and bandaging easier.
   d. to make hemostasis easier.

3. Why should you cover both eyes in a patient with major trauma to the eye?

4. What is an alternative to covering both eyes in a situation of major trauma to one eye, but with the patient refusing to have his good eye "blinded"?

5. What type of bandage is not recommended for use by EMTs by many texts? Why?

6. Give a good method of bandaging each of the following:
   a. lacerated scalp
   b. knife protruding from the abdomen
   c. lacerated lower leg
   d. crushed hand
   e. lacerated scalp
   f. abrasion of the knee
   g. burn of the foot and ankle

7. Penetrating injuries to the eyeball proper should be treated by:

8. Eye irrigation fluid must be sterile. True or False?

9. Lacerated eyelids may be treated with gentle direct pressure, except when

10. A victim of an automobile accident with pain and/or tenderness in the upper left abdominal quadrant most probably has injured his _________. You should be on the lookout for signs of developing _________. 
11. Which two abdominal organs are most commonly lacerated by fractured ribs?

12. Which organ is commonly injured by a fractured pelvis?

13. Laceration of hollow organs tends to cause ______________________, whereas laceration of solid organs tends to cause ______________________.

14. Evisceration means:

15. Chemical burns to the eye by strong alkalai should be flushed with water for ___________ minutes, minimum.

16. May a cotton-tipped applicator ("Q-tip") be used to remove foreign matter from the cornea? Why or why not?

17. Heat burns to the eyelids should be treated by: ______________________

18. Light burns to the eyes should be treated by EMTs with ______________________

19. Which of the major organs usually referred to as "abdominal organs" are actually outside the abdominal cavity proper? What word is used to describe their position?

20. Shock associated with fractures of the right lower ribs would lead one to suspect injury to the ____________, while shock associated with fractures of the left lower ribs would lead one to suspect a ruptured ____________.

21. "GI bleeding" is often a result of bleeding ulcers. Where are such ulcers most commonly found? (hint: not in the stomach)

22. A fall or blow resulting in low back and flank pain would lead one to suspect injury to the ____________. What other sign might tend to confirm this suspicion? (several possible answers)

23. What is the major function of the colon? What is the result when it doesn't carry out this function? Can this condition cause shock?

24. The pancreas contains each of the two types of glands found in the body. The ____________ glands of the pancreas produce the hormone ____________ and other hormones, and the ____________ glands produce digestive juices which are secreted into the ____________.

25. ____________ is produced by the liver and stored by the gall bladder. Sometimes secretions known as ____________ form in the gall bladder, and may cause great pain if they become lodged in the ____________. A similar type of pain is caused by secretions that form in the ____________s and become lodged in the ____________.
26. The roof of the mouth consists of the ________ and the ________. The lining of the mouth contains ________ glands, and one of the larger of these glands is known as the ________ and is found in the cheek.

27. The stomach secretes ________ and ________ acid to break down protein.

28. The liver has many functions. It
   a. produces ________, which is stored in the ________ and serves both to aid in fat digestion and to excrete certain waste products.
   b. stores a substance known as ________ or "animal starch" which provides quick energy for the body.
   c. detoxifies the blood of circulating poisons.
   d. "filters" the blood coming from the ________ before it returns to the main circulation.

29. What is the difference between the ureter and the urethra?

30. The testicles secrete ________, ________, and ________.

31. The seminal vesicles store ________.

32. The seminal duct connects the ________ and ________.

33. The male urethra serves as part of both urinary and genital systems, which is not the case with the female urethra. True or false?

34. The ovaries secrete ________ into the blood, and release immature eggs every 28 days or so. The eggs go down the ________ to the ________. If the egg is fertilized, it implants itself in the engorged lining of the ________. If not, the egg passes on out, and the lining sloughs off and follows the egg through the ________, into the ________, and out. Thus, at the end of each ________ period, a discharge of blood from the vagina is normal. Cessation of these menses is an indication of pregnancy, in general.

35. What is meant by ectopic pregnancy? How can this happen? (hint: look at the infundibulum of the tube)

36. The eyes' shape is maintained by an irreplaceable fluid called the ________ ________.

37. The white part of the eye is known as the ________, the lining of the eyelid is the ________, and the clear front part of the eye is the ________.

38. The lacrimal glands secrete ________. The nasolacrimal ducts (also known more commonly as the ________ ducts) are found at the ________ ________ of each eye.

39. The iris is a muscle. True or false?

40. Why should you apply pressure to both ends of a lacerated neck vein, especially if the head is elevated?
1. Give one example each of: saddle joint, ball and socket joint, fused joint.

2. What is an epiphysis?

3. Bone consists of two major parts: a fibrous matrix and deposited _________.

4. What does bone marrow do?

5. List the three major types of muscle, their strength and duration of contraction characteristics, and provide an example of each.

<table>
<thead>
<tr>
<th>TYPE</th>
<th>CHARACTERISTICS</th>
<th>EXAMPLE</th>
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<tbody>
<tr>
<td>a.</td>
<td></td>
<td></td>
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<tr>
<td>b.</td>
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<tr>
<td>c.</td>
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</table>

6. Describe the shoulder girdle in terms of its bones.

7. Describe the pelvic girdle in terms of its bones.

8. What is a major difference between the attachments of the shoulder and pelvic girdles to the spine?

9. List, in descending order, the bones of the upper extremity.

10. List, in descending order, the bones of the lower extremity.

11. What are the three major anatomic areas of the femur? Which of these is most susceptible to breakage, especially in older people?

12. Connect the bone names and appropriate phrases:

<table>
<thead>
<tr>
<th>RADIUS</th>
<th>Elbow Joint</th>
</tr>
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<tbody>
<tr>
<td>ULNA</td>
<td>Wrist Joint</td>
</tr>
<tr>
<td>INNOMINATE</td>
<td>Lateral Malleolus</td>
</tr>
<tr>
<td>FIBULA</td>
<td>Medial Malleolus</td>
</tr>
<tr>
<td>TIBIA</td>
<td>Sacrum, Sacro-iliac</td>
</tr>
<tr>
<td>CRANIUM</td>
<td>Fused sutures</td>
</tr>
<tr>
<td>TENDON</td>
<td>Holds Joints Together</td>
</tr>
<tr>
<td>LIGAMENTS</td>
<td>Attaches Muscle to Bones</td>
</tr>
<tr>
<td>CARPALS</td>
<td>Hand</td>
</tr>
<tr>
<td>TARSALS</td>
<td>Foot</td>
</tr>
</tbody>
</table>
13. What is the difference between "dorsiflexion" and "plantar flexion" of the ankle?

14. What is the difference between a dislocation and a sprain?

15. What is the difference between a sprain and a strain?

16. The bruising discoloration often seen near fractures is called _________.

17. A fracture resulting from bone weakness from bone disease is called a ____________ fracture.

18. A fracture resulting from repeated stresses to a bone (e.g. a long forced march or hike) is called a ____________ fracture.

19. As a general rule, fractures and/or dislocations around a joint (it's often hard to tell them apart in the field) should not be straightened.

20. Fractures of long bones should be gently straightened by traction when applying a splint.

21. For a joint fracture dislocation, immobilize the long bone on either side; for a long bone fracture, immobilize the joint on either side. True or False?

22. Pulse and enervation should always be checked before and after splinting. True or False?

23. Define:
   a. Greenstick fracture
   b. Impacted fracture

24. Should air splints be inflated by pump?

25. Should tight wrappings be placed over a dislocated elbow to reduce swelling? How about cold packs?

26. How should a hand injury usually be splinted?

27. Why are elbow dislocations so dangerous?

28. Why should traction be used on most femur fractures?

29. What type of dislocation may EMTs routinely reduce? Why?
1. What is collateral circulation?

2. What is the most common cause and mechanism for cardiac arrest?

3. What are:
   - CAD?
   - arteriosclerosis?
   - atherosclerosis?
   - angina?
   - AMI?

4. List distinguishing signs and symptoms between angina and AMI.
   **Angina**
   **AMI**

5. List three major possible consequences of an AMI.

6. List at least five factors that indicate high risk of heart disease.

7. What does nitroglycerine do, and what are the side effects?

8. What should you check if a person with angina has taken three tablets of nitroglycerine and has had no relief?

9. What treatment should be given to a suspected MI patient, and how should he or she be transported?

10. What are the differences between right and left heart failure?
    **Right heart failure**
    **Left heart failure**

11. Give the signs and symptoms (in brief), underlying cause, and treatment for insulin shock and diabetic coma.
    **Insulin shock**
    **Diabetic coma**
EMT COURSE
HOMEWORK #9: ENVIRONMENTAL EMERGENCIES

1. What is the most common cause of death in burn victims?

2. List at least three other major problems of burn victims.

3. What treatment should be used for partial thickness burns of a small area?
   1)
   2)
   3)

4. What treatment should be used for extensive partial thickness burns, and for all full thickness burns?
   1)
   2)
   3)

5. What treatment should be employed initially for chemical burns? What difference is there in treating burns from dry (i.e. powdered) corrosives?

6. What are the three types of radiation?

7. What is nitrogen narcosis?

8. What is decompression sickness, and what is the proper treatment for it?

9. (A) What is the proper general first aid treatment for ingested poisons?
   1)
   2)
   3)
   (B) What variations are appropriate for: (and why)
       1) acids
       2) alkalais
       3) petroleum products
   (C) What information/items should be brought to the ER along with the patient?
   (D) What is the treatment for poisoning by mouth for you as an EMT (not first aid treatment)?
10. Why should bee stingers not be removed by tweezers?

11. What is the major problem in anaphylaxis, and what drug should be used in its treatment?

12. How dangerous is a rattlesnake bite?

13. What treatments are effective in reducing the effects of envenomated snake bites? Which are not effective?

14. When is the use of the "cut and suck" snakebite treatment method not appropriate?

15. Should snakebitten limbs be splinted, and if so, why?

16. What treatments should be used for marine animal-stings? -puncture wounds with poisoned spines?

17. Fill in:

<table>
<thead>
<tr>
<th>Heat Cramps</th>
<th>Heat Exhaustion</th>
<th>Heatstroke</th>
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<tbody>
<tr>
<td>Cause</td>
<td>Medical Emergency?</td>
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<td>Signs</td>
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<td>Symptoms</td>
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<tr>
<td>Treatment</td>
<td>Treatment</td>
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</table>

18. What is frostbite, and what is immersion (trench-) foot?

19. Normal healthy human beings are in general not susceptible to frostbite. What then causes people to get frostbite? (several things)

20. What is the proper treatment for frostbitten feet in the backcountry? for frostbitten fingers at a ski area?
20. Provide the signs and symptoms of each stage of hypothermia:
   Stage 1
   Stage 2
   Stage 3
21. What is the treatment for acute hypothermia?
22. What is the treatment for chronic hypothermia?
23. Why should a person with chronic hypothermia not be rewarmed outside a hospital, and why must such a patient be transported "softly"?
24. What are:
   - "rewarming shock"?
   - "rewarming afterdrop"?
   - "rewarming metabolic acidosis"?
25. How should an acute hypothermic person be rewarmed using a bathtub?
26. What are the "three Ws", that is, the three clothing priorities for EMT protection against hypothermia?
27. What is "hypothermia weather", and why is it called this?
28. What areas of the body would be best used for rewarming a person using hot packs?
29. Is it useful to place a person with second or third stage hypothermia alone in a thick sleeping bag? Why or why not?
30. Should a person with hypothermia ever be completely immersed in a hot bathtub (except, of course, for the face and head)?
1. Draw a rough side-view sketch showing the following: ovaries, fallopian tubes, uterus, cervix, vagina, perineum, anus, external genitalia.

2. Describe briefly the sequence of events (perhaps just list) during a period of menses.

3. Describe briefly the process of fertilization and implantation.

4. Draw a rough sketch showing: fetus, amnion, placenta, birth canal, umbilical cord.

5. Describe briefly the three phases of labor:
   I. 
   II. 
   III. 

6. Give possible causes, and the appropriate treatment for, the following presentations when not connected to any obvious pregnancy:
   A. vaginal bleeding
   B. missed menstrual period
   C. abdominal pain

7. Define:
   A. toxemia of pregnancy
   B. ectopic pregnancy
   C. abruptio placentae
(7) D. placenta praevia

8. Can O₂ given to a mother help an unborn or partially born fetus? Can CPR on a fatally injured mother sustain an unborn infant?

9. List, in your own words, the management priorities for childbirth in the field.

10. When responding to an OB call, the EMT must make a decision as to whether to transport or to deliver at the scene. What considerations would make one decide to deliver at the scene? (The orange book lists three possible reasons).

11. When trying to evaluate the possibility of an imminent delivery, the EMT should look for several factors that tend to mean that delivery will occur quickly. List factors that mean:

<table>
<thead>
<tr>
<th>Delivery probably imminent</th>
<th>Delivery probably delayed</th>
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12. Describe a normal delivery by EMTs, including: preparation of equipment and the mother, handling the infant as born, care of umbilical cord, care of placenta, care of the newborn.

13. What important things should you consider in a:
   A. breech presentation?
   B. prolapsed cord?
   C. twins?
14. What should be done after delivery of the placenta to minimize hemorrhage?

15. Define:
   A. intussception
   B. croup
   C. epiglottitis
   D. laryngeotracheal bronchitis
   E. febrile seizures
   F. SIDS

16. Which of the following indicate probable shock?
   - systolic BP of 40 in a child in nursery school
   - systolic BP of 80 in a 11-year-old
   - systolic bp of 60 in a teenager

17. A person in a state of severe anxiety needs outside assistance in the form of support and control. What should you do if
   A. the anxiety is well-founded?
   B. What if it is disproportionate to the injury or situation?

18. What important things should you consider in dealing with a patient
   A. in a state of confusion
   B. in a state of panic?
   C. who is threatening violence to himself or others?
   D. with an aberrant behavior pattern (e.g. psychotic)?

19. Explain the use of body language and active listening in dealing with a potentially violent patient.

20. What is the difference between a suicide attempt and a suicide gesture?
BASIC LIFE SUPPORT

A AIRWAY

Problem

<table>
<thead>
<tr>
<th>Solution</th>
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<tbody>
<tr>
<td>Tongue obstruction</td>
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Foreign body obstruction

| Back blows (4) |
| Abdominal thrusts (4) |
| Finger probe |
| (long Kelley clamps or MacGill forceps) |
| (high tracheostomy=cricothyroidotomy) |

Danger of aspiration

| Position |
| [suction] |
| (esophageal obturator airway) |
| (endotracheal intubation) |

Anatomic obstruction

| (high tracheostomy) |

B-breathing

Problem

<table>
<thead>
<tr>
<th>Solution</th>
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<tbody>
<tr>
<td>Apneic patient</td>
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Collapsed lung/pendelluft

| Seal |
| (decompression with chest tube and flutter valve or water seal drainage) |
| Position with collapsed lung down |

Flail chest

| Stabilize |
| Administer positive-pressure artificial respiration |

Anoxia

| near drowning |
| "Flush out" CO or CO2 with high O2 concentration. |
| CO poisoning |

C circulation

No effective heartbeat:

| External cardiac compression |
| thoracotomy and internal cardiac compression |
| --ribcage rebounds |
| --ribcage can't rebound |
Severe external bleeding.......P E S T:
- direct Pressure
- Elevation
- pressure on the Supplying artery
- Tourniquet
also:
- pinching bleeding vessels directly
- gauze packing
- reflection of galea

Internal bleeding............."MAST" trousers

Traumatic hypovolemic shock.....Position
- Oral fluids*
- Oxygen
- Keep from chilling
  (IV therapy)

SECONDARY SURVEY

VITAL SIGNS
GENERAL APPEARANCE
- alertness (especially note if state of consciousness is deteriorating or has deteriorated)
- orientation to time, person, place
- degree of distress
PULSE
RESPIRATION
BLOOD PRESSURE
- systolic/diastolic
- systolic by palpation

SUBJECTIVE EXAM
Name
Approx. age
Sex
Primary complaint
Rescue situation
Background of problem
Medical history
Medications
Allergies

OBJECTIVE EXAM
Scalp and skull
Pupils and eyes
Eyelids/fingernails
Ears
Mouth
Neck: stoma, Medic Alert, tracheal deviation, cervical spine
Chest: expansion (flail)
  rib fractures
  auscultate
Abdomen: wounds
  tenderness
  masses
  guarding
Lower spine
Pelvis
Legs
Arms
Back
| NAME            | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | A  | B  | C  | P/F | EXT No. |
|-----------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Arnold, Mark    |    |    |    |    |    |    | 90 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 75 | x  | 86 |
| Calvert, Walter |    |    |    |    |    |    | 79 |    |    |    |    |    |    |    |    |    |    |    |    | 90 |    |    |    |    |    |    |    |    |    |
| Chapman, Nancy  |    |    |    |    |    |    |    |    |    |    | 83 |    |    |    | 83 |    |    | 75 |    | 75 |    |    |    |    |    |    |    |    |    | 88 |
| Cohn, Sheldon   |    |    |    |    |    |    | 85 |    | 90 |    |    | 90 |    |    |    |    |    | 84 |    |    |    |    |    |    |    |    |    |    |    | 89 |
| Dubbs, Bill     |    |    |    |    |    | 94 |    |    |    |    |    |    |    | 89 |    | 79 | 85 |    |    |    |    |    |    |    |    |    |    |    | 37 | x  |
| Halstead, Sue   | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 76 |    | 81 | 75 |    |    |    |    |    |    |    |    |    |    |
| Hughes, John    |    |    |    |    |    |    |    |    |    |    |    |    |    | 85 |    | 85 | 83 |    | 75 |    |    |    |    |    |    |    |    |    |    | 85 |
| Ricciardelli, Ed| X  |    |    |    |    |    |    |    |    |    |    |    |    |    | 83 |    | 83 | 83 | 75 |    |    |    |    |    |    |    |    |    |    | 84 |
| Stevens, Pam    |    |    |    |    |    |    | 82 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 91 | x  |

Agency: the Blue Ridge Mountain Rescue Group of the Appalachian Search and Rescue Conference, Inc.
Course Coordinator: Keith Conover   Place of instruction: Jordan Hall, University of Virginia.
Date of completion: 8 Dec 1977    On this roster: non-affiliated students.
## Fall 1977 BRMRG BASIC EMT COURSE ROSTER

| NAME             | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | A | B | C | P/F | EMT No. |
|------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|---|-----|--------|
| Borzelleca, Paul |   |   |   |   |   | 85|    |   |   |    | 77 | 75 |   |   |    |    |    |    |    |    |    |    |   |    |   |   |   |   |   |   | 37  |
| Bush, Ben        |   |   |   |   |   | 76| 72 | 79 | 73 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 80  |
| Bates, Scott     |   |   |   |   |   | 94| 92 | 96 | 93 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 88  |
| Deane, Debbie    |   |   |   |   |   | 94| 94 | 88 | 88 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 86  |
| Duboisson, Paul  |   |   |   |   |   | 85| x  | x  | x  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 84  |
| Griffiths, John  |   |   |   |   |   | 79| 90 | 92 | 75 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 87  |
| Hays, Chris      |   |   |   |   |   | 88| 88 | 79 | 78 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 86  |
| Morrow, David    |   |   |   |   |   | 71| 83 | 67 | 70 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 87  |
| Perlmutter, David|   |   |   |   |   | 94| 81 | 88 | 82 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 86  |
| Pottenger, Lynn  | x | x |   |   |   | 74| 95 | 88 | 79 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 92  |
| Tanner, Kirk     |   |   |   |   |   | 32| x  | 100| 83 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 91  |
| Tetta, David     |   |   |   |   |   | 74| 76 | 67 | 78 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 84  |
| Thomas, Betty    | x | 98|   |   |   | 34|    | 100| 97 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 97  |
| Thomason, Don    | 85|   |   |   |   | 37| 37 | 79 | 84 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 84  |
| Walton, John     | 85| 92| 63 | 79 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 92  |
| Walton, June     | 79| 83|    | 75 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 85  |

Agency: the Blue Ridge Mountain Rescue Group of the Appalachian Search and Rescue Conference, Inc.  
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Place of instruction: Jordan Hall, University of Virginia  
Date of completion: 8 Dec 1977  
On this roster: BRMRG members.
| NAME      | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | A | B | C | F/F | EMT No. |
|-----------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|
| Deane, Brandon |   |   |   |   | X |   |   |   |   | 91 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | F76F |

Note: Mr. Deane attended the entire EMT course rather than a refresher course, in order to renew his state EMT certification.

Agency: the Blue Ridge Mountain Rescue Group of the Appalachian Search and Rescue Conference, Inc.
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Place of instruction: Jordan Hall, University of Virginia
Date of completion: 8 Dec 1977
On this roster: REFRESHER.