



Outdoor Emergency Care

REFRESHER WORKBOOK



2016

OEC Cycle C

2016 Outdoor Emergency Care (OEC) Cycle C Refresher Program

Welcome to the 2016 Outdoor Emergency Care (OEC) Cycle C Refresher Program. The purpose of this *Outdoor Emergency Care Refresher Workbook 2016 OEC Cycle C* is to provide you with a snapshot view of this year's material so that you can be well-prepared for your refresher. To get the most out of this review, it is important to spend time reviewing the *Outdoor Emergency Care Fifth Edition*, focusing especially on the topics listed in this year's Cycle C refresher.

The instructor of record (IOR) for your refresher is the point of contact for any questions that might arise regarding attending an OEC refresher. Annual OEC refreshers are conducted at the patrol, section, region, or division levels. Contact your OEC IOR for refresher details.

What to do to prepare for, and complete, this year's refresher:

- 1) Review and complete the material.
 - *Outdoor Emergency Care Refresher Workbook 2016 OEC Cycle C* must be completed;
 - *Outdoor Emergency Care Fifth Edition*; and
 - www.mynspkit.com.
- 2) Update your NSP contact/demographic information.
 - Check your personal profile in the "Member Resources" section of www.nsp.org to ensure that your contact and demographic information is correct, or call the national office at 303-988-1111. If you have missing or incomplete OEC records, contact your region OEC administrator.
- 3) Complete the online refresher course (if using the hybrid format).
 - Access the online course by checking with the patrol whose refresher you are attending.
 - Follow the directions carefully and completely, and have your *Outdoor Emergency Care Fifth Edition* ready.
 - Print your certificate and take it with you to the refresher event. If your IOR will accept an electronic version, you may save your certificate as a PDF and email it to your IOR. If you do not have a certificate, you may not be allowed into the refresher.
- 4) Gather materials for the refresher event.
 - This completed *Outdoor Emergency Care Refresher Workbook 2016 OEC Cycle C* and the printed certificate (unless electronically sent to the IOR) from the online portion (hybrid only).
 - Your current OEC, CPR, and NSP member cards. Your OEC card should have a blank space in the Cycle C section.
 - A fully stocked aid belt, vest, or pack, and any additional items required at the refresher you will attend.
 - Weather-appropriate clothing for both indoor and outdoor refresher activities.
- 5) Practice the skills listed in the *Outdoor Emergency Care Refresher Workbook 2016 OEC Cycle C*.
 - Check the objectives list on pages 26-29 for the skills you will be reviewing.
 - Practice your *Outdoor Emergency Care Fifth Edition* skills so that you can feel more comfortable at your refresher.
- 6) Attend your skills refresher.
 - Check with your local patrol to ensure that you are completing the appropriate refresher format requirements (traditional versus hybrid).
 - If you complete a refresher with another patrol, contact that patrol's IOR before you attend to ensure that you are preparing for the appropriate refresher format (traditional/hybrid). Also, be sure that your host IOR signs the "Visitor Completion Form" on page 30 of this workbook.

Program content: objectives overview (major topic groupings) Cycle C

- Rescue basics; incident command and triage; special operations and ambulance operations
- Anatomy and physiology of the endocrine, lymphatic, and reproductive systems
- Patient assessment and pediatric emergencies
- Airway management; shock; thoracic trauma
- Principles of trauma; musculoskeletal injuries; face, eye, and neck injuries
- Substance abuse and poisoning; behavioral emergencies and crisis response; obstetrics and gynecologic emergencies
- Case review

Program process

The OEC Refresher Program is a standardized program that provides OEC technicians an annual opportunity to update, renew, and demonstrate competency in specific OEC skills and knowledge. During each refresher cycle, OEC technicians review required material and demonstrate proficiency in all specified skills and information as outlined in this workbook. This refresher process is an excellent opportunity to hone and improve clinical skills.

Verification of OEC technician competency in fundamental knowledge, skills, and scenario management is the basis of the OEC Refresher Program. OEC technician certification is maintained by completing three consecutive annual refreshers. All OEC technicians must complete each of the refreshers (Cycles A, B, and C) to maintain their OEC certification. The only NSP members exempt from this requirement are mountain hosts, registered candidate patrollers enrolled in an OEC course, members who complete a full OEC course after May 31 of the current year, and members registered as medical associates (M.D. or D.O.).

The OEC Refresher Program does not provide a means for a person with previous emergency care or medical training to challenge the OEC course. Additionally, the annual refresher covers a third of the OEC Program curriculum requirements and does not meet the requirements for certification under the full OEC Program.

An inactive NSP member returning to active status must hold a current OEC technician card, complete any missed cycle(s) that occurred during the inactive period, and pay dues for any missed season(s). If the OEC technician card expired during the inactive registration period, the member may need to retake an OEC course. Please refer to the *National Ski Patrol Policies and Procedures* for guidelines on registering as an NSP member and other OEC technician refresher requirements.

Directions to find a copy of the current NSP Policies and Procedures document:

Go to www.nsp.org and log in by clicking the “Sign In” tab. Go to the “Sign In” box and enter your six-digit member number and your password. After signing in, click “For Members.” Find the “Governing Documents” link, click, it, then click “Policies and Procedures (P&P)” on that page. If you have problems, call the national office at 303-988-1111 or email nsp@nsp.org.

The refresher

For each refresher, OEC technicians must complete all of the following components:

- **The didactic, or information portion (either online or in person);**
- **The *Outdoor Emergency Care Refresher Workbook 2016 OEC Cycle C*, and**
- **The skills component at a refresher.**

In order to receive credit for this refresher cycle, OEC technicians must successfully complete one of the following refresher types:

- **The traditional refresher format**, which consists of two steps:
 1. The OEC technician reviews and completes the assignments, skills, and case review in this *Outdoor Emergency Care Refresher Workbook 2016 OEC Cycle C*.
 2. The technician completes a knowledge and skill-based refresher event, where they will demonstrate their OEC skills and discuss the case they have reviewed. Note: The *Outdoor Emergency Care Refresher Workbook 2016 OEC Cycle C* must be collected and reviewed by the IOR prior to completion of the refresher.
- **The hybrid refresher format**, which consists of three steps: **(Please note that the didactic portion of the objectives in the hybrid option is split between the refresher workbook and the online component.)**
 1. The OEC technician reviews and completes the assignments, skills, and case review in this *Outdoor Emergency Care Refresher Workbook 2016 OEC Cycle C*.
 2. The technician completes the online refresher exercise that reviews the knowledge-based portion of the refresher. Note: The *Outdoor Emergency Care Refresher Workbook 2016 OEC Cycle C* must be collected and reviewed by the IOR for completeness prior to completion of the refresher.
 3. The technician completes a skills-based refresher event, where they will demonstrate their OEC skills and discuss the case they have reviewed.

OTHER PROGRAM REQUIREMENTS

CPR for active NSP members: Active NSP members must ensure that they maintain a current professional rescuer level CPR certification and demonstrate their CPR skills annually to an agency-approved certified CPR instructor, regardless of the requirements of the certifying agency or the expiration date on their card. This requirement is not meant to be part of the annual OEC refresher. For a complete list of the NSP-approved CPR certifying agencies, please see the *National Ski Patrol Policies and Procedures*.

Local patrol training, such as local patrol requirements, area needs, lift evacuation, CPR, AED, and other on-hill/on-trail training is arranged through your home patrol and is NOT officially part of the OEC refresher process. The NSP is not responsible for the content, instruction, or scheduling of this training, so it is important to communicate with your local patrol regarding these requirements.

CYCLE C SKILLS OBJECTIVES

During the refresher hands-on portion, you will demonstrate the following skills. For more specific information, please refer to your *Outdoor Emergency Care Fifth Edition* and the Refresher Skills Checklist found in this workbook on pages 26-29.

- Describe and demonstrate how to use the ID-ME triage system.
- Describe and demonstrate how to use the START triage system.
- Describe and demonstrate how to perform a primary assessment and manage the ABCDs.
- Describe and demonstrate how to perform a secondary assessment.
- Describe and demonstrate how to assess the eyes (pupils and motion).
- Describe and demonstrate the procedure for obtaining the following vital signs:
 - a. Respiratory rate;
 - b. Blood pressure; and
 - c. Heart rate.
- Describe and demonstrate how to assess a pediatric patient using the pediatric assessment triangle.
- Compare, contrast, and demonstrate the usage of a rigid suction catheter and a flexible suction catheter.

- List the indications of, and uses for, the following airway adjuncts, and demonstrate the proper methods for choosing the correct size and inserting them:
 - Oropharyngeal airway; and
 - Nasopharyngeal airway.
- Describe and demonstrate how to properly set up an oxygen tank for use.
- Describe and demonstrate how to use the following oxygen delivery, ventilation, and barrier devices:
 - Nasal cannula;
 - Non-rebreather mask; and
 - Bag valve mask.
- Describe and demonstrate how to assess the chest for trauma using the L.A.P. method.
- Describe and demonstrate the emergency management of a sucking chest wound.
- Describe and demonstrate how to assess a leg injury (choose one: dislocated knee injury, ankle injury, proximal tibia fracture, or mid-shaft femur fracture).
- List and demonstrate the use of the following splints on these lower extremity injuries: ankle, tibia, knee dislocation, and mid-shaft femur fracture. Choose one of the following splints to immobilize each injury; use each splint once.
 - Quick splint;
 - Soft splint;
 - Rigid splint; and
 - Traction splint — mid-shaft femur fracture (include long spine board for transportation).
- Demonstrate how to remove a ski boot, snowboard boot, and/or hiking boot (area specific).
- Describe and demonstrate placing a patient in the anatomical position using the principles of “jams and pretzels.”
- Describe and demonstrate how to assess and manage a patient with a non-penetrating eye injury.
- Describe and demonstrate how to assess and manage a patient with a penetrating injury to the eyeball.
- Describe and demonstrate how to assess and manage a patient with face and neck injuries.
- Describe and demonstrate the proper care of a patient who has abused a substance or been poisoned.
- Demonstrate how to examine a female patient with abdominal or pelvic pain.

HOW TO FIND THE ANSWERS

Instructions for completing your *Outdoor Emergency Care Refresher Workbook 2016 OEC Cycle C*

Welcome to the *Outdoor Emergency Care Refresher Workbook 2016 OEC Cycle C*. The Refresher Committee’s task was to create a workbook that would enhance your overall refresher experience. There are six modules, each directed at different subject matter. You will find it helpful and necessary to use your *Outdoor Emergency Care Fifth Edition* when completing the workbook. Another excellent resource is the OEC online website “MyNSPkit.” For more information on “MyNSPkit,” check the inside cover of your *Outdoor Emergency Care Fifth Edition*. Use your *Outdoor Emergency Care Fifth Edition* and *Outdoor Emergency Care Refresher Workbook 2016 OEC Cycle C* together to review the topics and chapters as indicated by the title of each workbook module, answer the questions, and complete each exercise.

The title of each module refers to the chapter(s) you will be reviewing in a particular module. The title and concluding objectives are shown in **bold** print. Consider this example: “**Airway Management, Shock, and Thoracic Trauma**” (workbook module title); objective **10-1. List the four types of shock**. The first number refers to the chapter the answer can be found in, Chapter 10 in this instance. The second number (1 in this example) tells you that this is the first topic to be discussed in the chapter. From there, find the objective in the book, review it, and hopefully the answer will present itself. Please note that some objectives have been combined to shorten the list. For those OEC technicians who use an electronic version of the *Outdoor Emergency Care Fifth Edition*, we have included keyword searches in **bold italics**.

Remember, completing the workbook is an important part of your refresher, and a requirement. The workbook must be brought to the OEC refresher and reviewed by the IOR for completeness.

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Section 1 – Rescue Basics; Incident Command and Triage; Trauma Centers; and Special Operations and Ambulance Operations

- 3-3. Describe the “*fight or flight*” response.
- 3-6. Describe the five *modes of disease transmission*.
- 3-7. Define the following terms:
- **Pathogen**
 - **Standard precautions**
 - **Body substance isolation (BSI)**
 - **Hazardous material**
- 4-1. Define the **Incident Command System**.
- 17-4. Describe the role of a **trauma center** in improving the survival of a trauma patient.
- 35-1. Define **special operations**.
- 35-5. Describe **HAZWOPER**.
- 35-6. Identify the purpose of the **International Hazard Classification System** diamond placard system.
- 35-7. List and describe the three **hazard control zones**.

Rescue Basics

The autonomic nervous system, the part of the central nervous system that we do not control voluntarily, is responsible for the _____ response.

Table 3-1 Body's Reaction to Stress

Stage	When the stage begins	Typical signs and symptoms
Stage I: Alarm	At first exposure to the stressor	Increased heart rate, pupil dilation, increased breathing, sweating, nervousness
Stage II: Resistance	When individual begins to adapt to the stressor	Compensation occurs through the use of coping methods, pulse and blood pressure may return to normal
Stage III: Exhaustion	As prolonged exposure to same stressor exhausts the person's adaptation energy	Signs and symptoms of the alarm stage return and are more difficult to control

Adapted from Bledsoe, B., R. Porter, and B. Shade. 1997. *Paramedic Emergency Care*, Third Edition. Upper Saddle River, NJ: Brady.

Table 3-2 Possible Reactions to Stress

Chills	Nausea, vomiting	Confusion
Diarrhea	Tremors	Decreased attention span
Rapid heart rate	Lack of coordination	Difficulty making decisions
Muscle aches	Sweating	Memory lapses
Dry mouth	Visual problems	Inability to concentrate
Fatigue	Difficulty sleeping	Increased blood pressure
Chest tightness	Difficulty breathing	Dizziness

Adapted from Bledsoe, B., R. Porter, and B. Shade. 1997. *Paramedic Emergency Care*, Third Edition. Upper Saddle River, NJ: Brady.

Infectious diseases are transmitted in five ways; circle the two most common.

Direct contact: close person-to-person contact.

Indirect contact: contact with an object contaminated with pathogens.

Airborne transmission: inhaling droplets containing infectious pathogens.

Ingestion: ingesting contaminated food or water.

Vector transmission: transmission of pathogens to humans by other animals, such as ticks and mosquitoes.

For more information, see pages 71-73.

Match the following terms with their definition.

- ___ **Pathogen** a. The practice of isolating all bodily substances.
- ___ **Standard precautions** b. The practice of protecting healthcare workers from exposure to bodily fluids based on the assumption that all patients are potentially infectious.
- ___ **Body substance isolation (BSI)** c. Any solid, liquid, or gas that has the potential to harm humans, animals, or the environment, either by itself or through interactions with other factors.
- ___ **Hazardous material** d. An infectious agent that can cause disease or illness.

For more information, see pages 62, 76, 77, and 85.

Incident Command and Triage

The **Incident Command System** is defined as a formal, organized method for managing an incident, regardless of its cause, size, scope, or complexity.

For more information, see pages 98-122.

Trauma Centers

OEC technicians should be aware of the relative distances to hospitals that are designated **trauma centers**. A **trauma center** is a specialized hospital providing 24-hour trauma care, including stabilization, critical care, subspecialty care, and nursing care. Trauma centers are equipped to provide care to trauma patients at any time and are specifically designed to manage patients whose injuries involve two or more body systems, a condition known as multi-system trauma. The American College of Surgeons designates each trauma center at one of five levels.

Match the following **trauma centers** with their classifications.

- | | |
|--------------------|--|
| ___ Level I | a. Has a designated trauma surgeon available at all times, but does not have every subspecialty available. |
| ___ Level II | b. Highest designation, it has 24-hour in-house general/trauma surgeons, as well as prompt availability of all major surgical specialties. |
| ___ Level III | c. Has a trained trauma nurse available at all times and access to a physician. |
| ___ Level IV and V | d. Has the same surgical availability requirements as a Level I; not required to conduct research. |

For more information, see pages 527-528.

Identify the closest hospital and Level I trauma center near you: _____.

For more information, see pages 526-528.

Special Operations

Special operations is a generic term that denotes the various infrequently performed activities that require specialized training, skills, and equipment in remote and/or difficult settings.

HAZWOPER stands for (*fill in the blank*).

HAZ _____

W _____

OP _____

E _____

R _____

It refers to federally mandated training for anyone who may encounter uncontrolled hazardous materials.

The **International Hazard Classification System** is designed to identify hazardous materials. Hazardous materials include any solid, liquid, or gas that has the potential to cause harm to humans, animals or the environment, either by itself or through interaction with other factors. The system is set up to distinguish nine types of hazardous materials. They include explosives; gases; flammable/combustible liquids; flammable solids; oxidizers and organic peroxides; poisonous material and infectious substances; radioactive substances; corrosive materials; and miscellaneous hazardous material.

There are several widely used systems for labeling hazardous materials. Each has a specific purpose, and it is important to recognize the differences between them. They include the **DOT placard system** and the **NFPA 704 diamond system**.

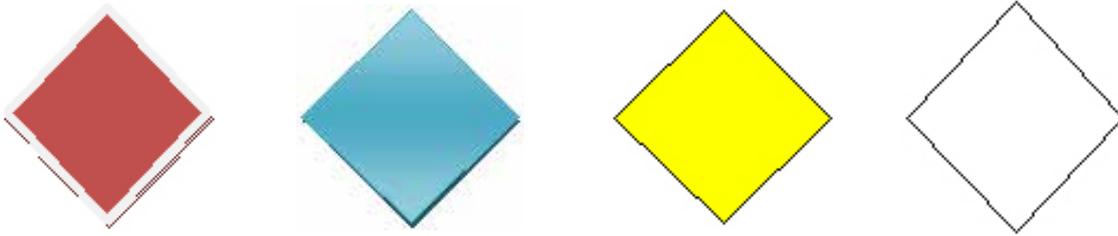


The DOT placard (example at right) system provides information about hazards to transportation workers and emergency responders. The placards mark tank cars, cargo tanks, portable tanks, and other vehicles transporting a hazardous commodity. The DOT requires that each hazardous material in transit be identified by a special placard. Additional information may be found at www.dot.gov/.

The NFPA 704 diamond system (shown at left) provides information about hazards that occur during emergency response. The system is characterized by a “diamond” that is actually a “square-on-point” shape. It identifies the hazards of a material and

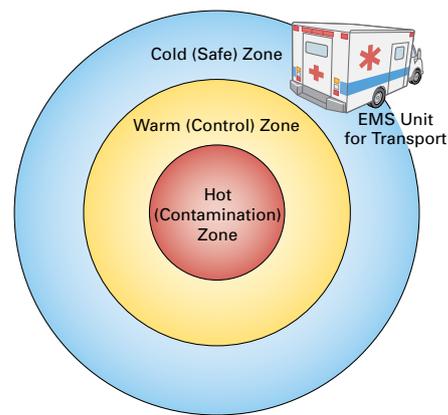


the degree of severity of the health, flammability, and reactivity/instability hazards. The hazard severity is indicated by a numerical rating that ranges from zero (0), indicating a minimal hazard, to four (4), indicating a severe hazard. The hazards are arranged spatially, with health at 9 o'clock, flammability at 12 o'clock, reactivity/instability at 3 o'clock, and special precautions/hazards at 6 o'clock. In addition to the spatial orientation that can be used to distinguish the hazards, they are also color-coded: blue for health; red for flammability; yellow for instability; and white for special precautions. These placards are typically found outside of buildings, on doors, and on tanks visible to emergency responders during a spill or fire. Additional information may be found at www.nfpa.org/704.



In the "squares-on-point" above, write the hazard associated with each color. Refer to Figure 3-29, page 86, and Table 35-2, page 1113.

The diagram at right identifies the three hazard control zones.



Hot (Contamination) Zone

Contamination is actually present.
Personnel must wear appropriate protective gear.
Number of rescuers limited to those absolutely necessary.
Bystanders never allowed.

Warm (Control) Zone

Area surrounding the contamination zone.
Vital to preventing spread of contamination.
Personnel must wear appropriate protective gear.
Lifesaving emergency care is performed.

Cold (Safe) Zone

Normal triage, stabilization, and treatment performed.
Rescuers must shed contaminated gear before entering the cold zone.

In the following list, write in the letters **H** [hot (control) zone]; **W** [warm (control) zone]; and **C** [cool (safe) zone] for where each activity takes place.

- ___ Normal triage, stabilization, and treatment performed.
- ___ Lifesaving emergency care performed.
- ___ Bystanders are never allowed.
- ___ Personnel must wear appropriate protective gear.
- ___ Vital to preventing spread of contamination.
- ___ Rescuers must shed contaminated gear before entering this zone.
- ___ Number of rescuers limited to those absolutely necessary.
- ___ Area surrounding the contamination zone.

For more information, see page 1114.

Section 2 – Anatomy and Physiology

- 1-1. Define the following terms:
- **Anatomy**
 - **Body system**
 - **Cell**
 - **Homeostasis**
 - **Organ**
 - **Physiology**
 - **Tissue**
- 6-5 Identify and describe the fundamental **anatomy and physiology** of the **endocrine, lymphatic, and reproductive body systems**.
- 34-1. Identify the major **anatomical structures** within the **pelvic cavity**.
- 34-2. List the functions of the **female genitourinary and reproductive system**.
- 34-3. List the functions of the major **gynecologic structures**.

Define the following terms:

Anatomy: _____

Body system: _____

Cell: _____

Homeostasis: _____

Organ: _____

Physiology: _____

Tissue: _____

The **endocrine system** is comprised of structures that secrete hormones that influence activity in different parts of the body. These structures include the pineal gland, the pituitary gland, the hypothalamus gland, the thymus gland, the thyroid and parathyroid glands, the adrenal glands, the pancreas, and the ovaries and testes. **For more information, see pages 191, 193, and 195.**

The **lymphatic system** is comprised of the thymus, tonsils and adenoids, lymph nodes, spleen, and lymphatic vessels. The lymphatic system returns interstitial fluid located around cells to the bloodstream, transports particular material such as molecular proteins and bacteria from the tissues, absorbs fats and fat-soluble vitamins for the intestines, and produces lymphocytes. **For more information, see pages 206 and 207.**

The **female reproductive system** is comprised of the ovaries, fallopian tubes, uterus, and the vagina, a group of organs responsible for human reproduction; it sometimes includes the breasts as well. **For more information, see pages 201, 203, 205, and 206.** The **male reproductive system** is comprised of the testes, epididymis, vas deferens, seminal vesicles, prostate gland, bulbourethral gland, and the penis, a group of organs responsible for human reproduction. **For more information, see pages 201, 203, and 204.**

The major structures found within the **pelvic cavity** are the uterus, fallopian tubes, ovaries, part of the large intestines, and urinary bladder in women, and part of the large intestines, the urinary bladder, and prostate gland in men.

Match the key term to the functions of the **female genitourinary and reproductive system** with their descriptions.

- | | |
|----------------------------|--|
| ___ Uterus | a. Two solid organs; contain the ova (eggs) and produce hormones. |
| ___ Fallopian tubes | b. Hollow muscular organ in which the fertilized ovum develops to a fetus. |
| ___ Ovaries | c. Two hollow structures that serve as a conduit for the mature egg as it travels to the uterus. |
| ___ Urinary bladder | d. Stores urine. |

For more information, see pages 1069 and 1070.

Section 3 – Patient Assessment and Pediatric Emergencies

- 30-1. List and describe the **anatomical and physiological differences between children and adults**.
- 30-3. List the normal range of **vital signs** for each **pediatric age group**.
- 30-4. Understand and be able to incorporate **communication tips and techniques for assessing and interacting with a pediatric patient**.
- 30-5. Describe the signs and symptoms of **respiratory distress and failure in a child**.
- 30-9. List five indicators of potential **child abuse and neglect**.

Fill in the blanks. Two of the most important **anatomic differences** between children and adults are the size of the _____ and the mechanism of _____. As a group, children have relatively _____ mouths and _____. The child's tongue is proportionately larger and more bulbous in relation to the oral cavity until about the age of _____.

For more information, see page 943.

Table 30-2 Normal Values for Pediatric Vital Signs

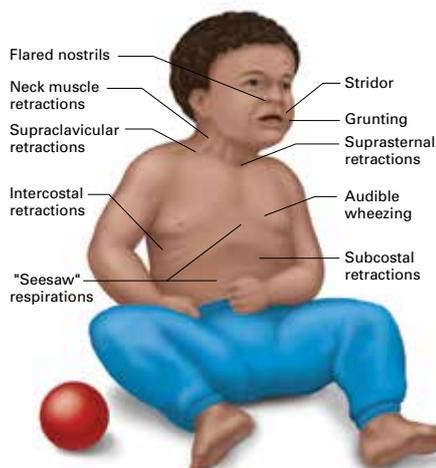
	Infants (Birth–1 year)	Children (1–8 years)
Pulse	100–120 beats per minute	80–100 beats per minute
Respirations	25–50 respirations per minute	15–30 respirations per minute
Blood pressure		
Systolic	75–95 mmHg	80–100 mmHg
Diastolic	75–95 mmHg	70–110 mmHg
Temperature	36.1–38.0° C (97.0–100.4° F)	36.1–38.0° C (97.0–100.4° F)
Pulse oximetry	> 95%	> 95%
Mental status	GCS = 15	GCS = 15

Good communication is important when dealing with children. Indicate which statements are **true** or **false**.

- ___ It is especially important to be honest with children.
- ___ Make eye contact.
- ___ You don't need to involve their caregivers.
- ___ "Is it OK to splint your arm?" is a good example of a question posed to a child.
- ___ "Would you like me or Patroller Peter Parker to splint your arm?" is a good example of a question to a child.

For more information, see page 968.

SIGNS OF EARLY RESPIRATORY DISTRESS



Signs and symptoms of **respiratory distress** are shown in the picture at left.

Respiratory failure is defined as the inability of the lungs to exchange gases properly. It is a true emergency, and if not immediately corrected, it can be fatal. Exhaustion occurs, respiratory rate slows, and the child becomes hypoxic. Cardiac arrest subsequently occurs due to anoxia.

For more information, see pages 950-952.

Several indicators of *child abuse*.

Table 30-4 When to Suspect Child Abuse

- Multiple injuries (mix of new, old, and/or partially healed injuries)
- Bilateral injuries (injuries on both sides of the body)
- Circumferential bruising (bruise extends completely around an extremity)
- Bruises located in unusual places (especially the genitalia)
- Pattern bruises (e.g., an outline of an adult's hand, or a clear line of demarcation)
- Age-inappropriate injuries (e.g., a skull fracture in a child who is too young to walk)
- Inconsistent histories from the child and caregiver or from two caregivers
- History that is vague or changes over time
- Older children who cannot or will not provide an explanation for their injuries
- Any infant with an altered level of responsiveness

For more information, see pages 960 and 961.

NOTES

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Section 4 – Airway Management; Shock; and Thoracic Trauma

- 9-7. Describe how to calculate the **oxygen flow duration rate**.
- 9-9. List four tips for the safe use of **oxygen**.
- 10-1. Define **shock**.
- 10-5. Compare and contrast the **three stages of shock**.
- 10-6. List the **four types of shock**.
- 10-7. Describe how the **body compensates for shock**.
- 10-8. List the classic **signs and symptoms of shock**.
- 23-1. List the major anatomical structures of the **thoracic cavity**.
- 23-3. Describe the **pathology of the following thoracic injuries**:
- **Flail chest**
 - **Pneumothorax**
 - **Hemothorax**
 - **Tension pneumothorax**
 - **Sucking chest wounds**
 - **Pericardial tamponade**
- 23-4. List the **signs and symptoms of various thoracic injuries**.

Airway Management

Using a D cylinder showing 1,600 PSI and administering oxygen at a flow rate of 15 liters per minute, how long will the oxygen last? _____

For more information, see page 309.

Circle the correct responses for safe oxygen use.

No smoking

Don't use under 0 F

Don't use near open flame

Carry from valve stem

Don't drop cylinder

Stand upright

Lay on side

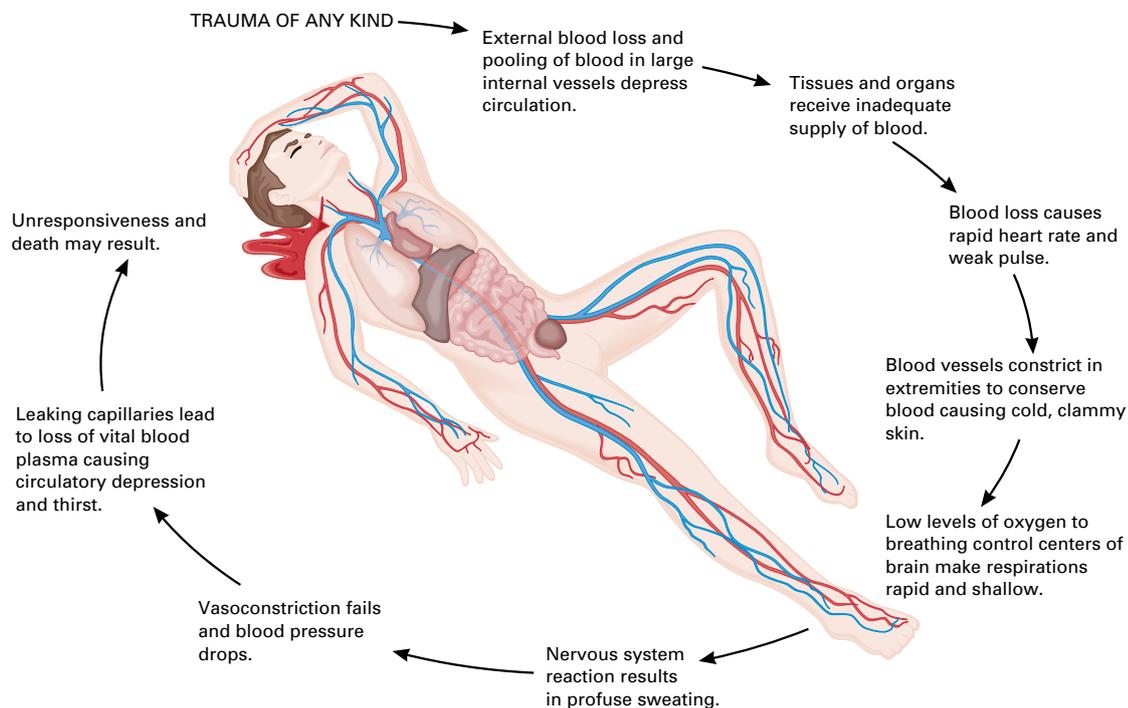
Keep in protective carrier

Over-tighten regulator

For more information, see page 309.

Shock

The definition of shock is failure of the circulatory system to maintain adequate blood flow to tissues.



Compare and contrast the *three stages of shock*.

Compensated shock is the body's ability to maintain blood perfusion to vital tissues under conditions that, if left uncorrected, would inevitably lead to death.

Decompensated shock is shock that results from the body's inability to compensate for low blood volume or inadequate tissue perfusion.

Irreversible shock is where the body's compensating mechanisms fail and cells begin to die. This sets in motion a cascading effect that cannot be reversed. As more cells die, the tissues of various organs die, resulting in organ system failure and, eventually, death. Even with aggressive treatment, this form of shock is neither reversible nor survivable.

For more information, see page 335.

Fill in the blanks naming the four types of shock.

- SIGNS**
- Restlessness or combativeness
 - Becomes unresponsive
 - Profuse bleeding
 - Vomiting
 - Shaking and trembling

- PATIENT APPEARANCE**
- Skin—cool and clammy
 - Eyes—lackluster
 - Pupils—dilated
 - Face—pale
 - Lips—blue
 - Pulse—rapid and weak
 - Breathing—rapid and shallow



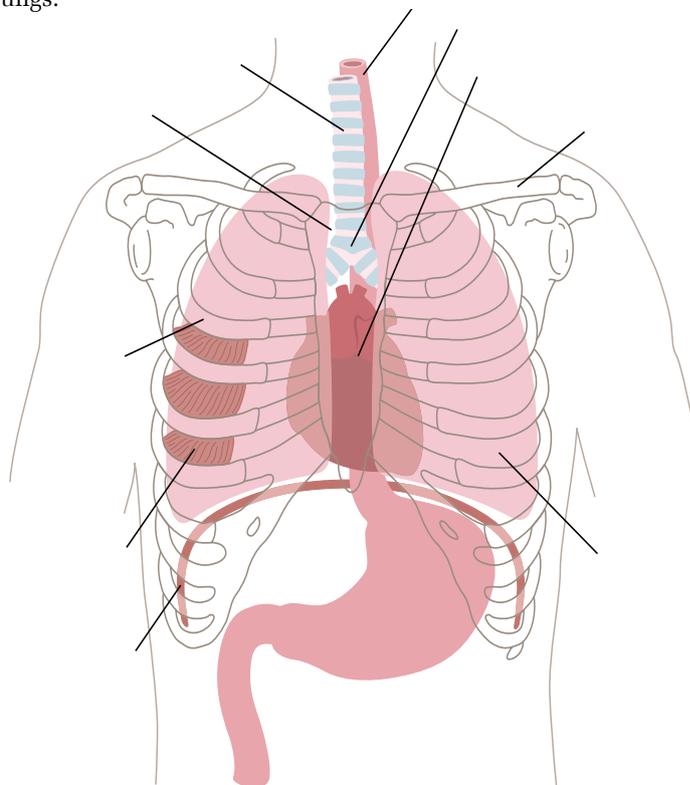
- SYMPTOMS**
- Nausea
 - Thirst
 - Weakness
 - Restlessness
 - Fear
 - Dizziness

For more information, see pages 336, 339, and 342.

As the body compensates for shock, the classic signs and symptoms of shock shown at right begin to appear.

Thoracic Trauma

Label the diagram with the following: trachea, sternum, esophagus, carina, heart and major vessels, clavicle, ribs, intercostal muscles, diaphragm, and lungs.



For more information, see page 772.

Match the following *thoracic injuries* or conditions with the appropriate description.

- | | |
|----------------------------------|--|
| ___ <i>Flail chest</i> | a. An accumulation of blood in the pleural space. |
| ___ <i>Pneumothorax</i> | b. An accumulation of blood or other fluid in the pericardial sac. |
| ___ <i>Hemothorax</i> | c. A condition in which two or more adjacent ribs are fractured in two or more places, causing a free-floating segment of chest wall. |
| ___ <i>Tension pneumothorax</i> | d. The accumulation of pressurized air within the pleural space; causes the displacement of the great vessels, tracheal deviation, distension of the jugular veins, and compression of the other lung. |
| ___ <i>Sucking chest wounds</i> | e. Air in the pleural space. |
| ___ <i>Pericardial tamponade</i> | f. A wound that penetrates the pleural space or lung, allowing air to be “sucked” into the pleural space upon each inspiration. |

For more information, see pages 775-778.

Match each of the following conditions to the correct set of signs and symptoms of various *thoracic injuries*.

- | | |
|--|---|
| ___ <i>Aortic rupture and dissection</i> | a. A collapsed lung; great vessels and trachea deviate to the opposite side. |
| ___ <i>Comotio cordis</i> | b. Pain; shortness of breath; distended neck veins; muffled heart sounds. |
| ___ <i>Pericardial tamponade</i> | c. Hypoxia; lung collapse; sucking noise from chest wall on inspiration. |
| ___ <i>Tension pneumothorax</i> | d. Blunt trauma to the chest in children, presenting as V-tach or V-fib. |
| ___ <i>Sucking chest wound</i> | e. Acute chest or back pain; tearing or stabbing pain radiating from the chest to the back between the shoulder blades; blood pressure that varies in each arm; profound shock. |
| ___ <i>Traumatic asphyxia</i> | f. Profound hypoxia or anoxia; bulging eyes; purple color to the face. |

Chapter review: Question 2 from page 791.

For more information, see pages 774-781.

NOTES

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Section 5 – Principles of Trauma; Musculoskeletal Injuries; Head and Spine Injuries; Face, Eye, and Neck Injuries

- 17-1. Define the following terms:
- **Kinematics**
 - **Mechanism of injury**
 - **Index of suspicion**
- 17-2. Compare and contrast **high-velocity injuries** and **low-velocity injuries**.
- 17-3. Compare and contrast the **five mechanisms of injury**.
- 20-1.4. List the six types of **musculoskeletal injuries**.
- 20-1.8. Define the following terms; be **leg injury specific**:
- **dislocation**
 - **fracture**
 - **sprain**
- 21-3. Describe common **traumatic injuries** involving the **neck**.
- 22-2. List possible causes of **eye injuries**.
- 22-5. Identify the important structures of the **anterior and posterior neck**.
- 22-6. List the signs and symptoms of emergencies of the **neck and upper airway**.
- 22-8. List the signs and symptoms of emergent injuries to the **face, eye, and neck**.

Principles of Trauma

_____ is the branch of mechanics that studies the movement of body segments without consideration given to its mass or the forces making it move.

The **index of suspicion** can best be described as the initial impression of what could be injured and how bad the injury is based on the mechanism of injury.

To better understand mechanism of injury (MOI), review the diagram at right.

Compare and contrast the five **mechanisms of injury**. Using the diagram at right (figure 17-7), list one example of each of the following types of injuries.

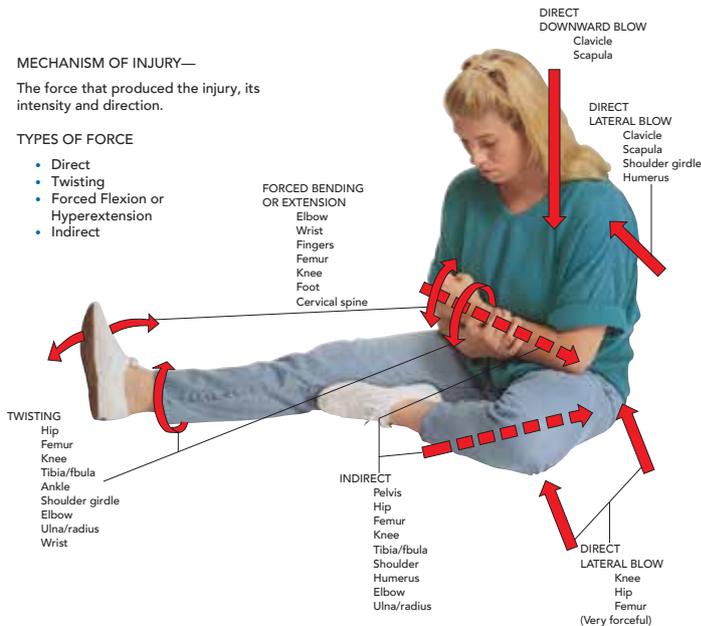
Blunt injury: _____

Penetrating injury: _____

Rotational injury: _____

Crush injury: _____

Blast injury: _____



High-velocity objects travel at more than 2,000 feet per second; **low-velocity** objects travel at less than 2,000 feet per second. From the list below, indicate which are high-velocity with an **H** and which are low-velocity with an **L**.

___ High-powered hunting rifle

___ Military rifle

___ Hand gun

___ BB gun

___ Pocket knife

___ Ski pole

For more information, see Chapter 17, “Principles of Trauma.”

Musculoskeletal (MS) Injuries

There are six types of *musculoskeletal (MS) injuries*. Match each of the following injuries to the assessment findings.

- | | |
|---------------------------|--|
| ___ Fracture | a. Injuries involving MS system; often damage more than one structure. |
| ___ Strain | b. Pain or swelling; visible deformity; reduced joint motion; locking/freezing in place. |
| ___ Sprain | c. Point of tenderness over ligament; swelling and bruising; joint instability; decreased range of motion; inability to bear weight. |
| ___ Dislocation | d. Minimal pain; minimal bruising or swelling; lack of joint movement; noticeable “gap” under the skin. |
| ___ Ruptured tendon | e. Pain over site that increases with movement; tenderness; swelling; ecchymosis; decreased range of motion; deformity; crepitus. |
| ___ Multiple simultaneous | f. Point tenderness over muscle; pain with extension and flexion; bruising; swelling/hematoma over muscle. |

NON-REQUIRED ACTIVITY: If you want a challenge, match the following terms to their definitions.

- | | |
|---------------------------|--|
| ___ Impacted fracture | a. A separation or displacement of the bones of a joint. |
| ___ Strain | b. An injury in which a third piece of broken long bone is located on the opposite side of the fracture; common with tibial and humeral fractures. |
| ___ Compression fracture | c. A long bone fracture caused by twisting. |
| ___ Ruptured tendon | d. A bone being shortened into itself; common in vertebrae. |
| ___ Displaced fracture | e. A fracture in which the skin above a fractured bone is breached (opened); also called a compound fracture. |
| ___ Sprain | f. Caused by simultaneous muscle contracture and stretching. |
| ___ Incomplete fracture | g. A simple fracture in which the overlaying skin is not damaged or disrupted. |
| ___ Nondisplaced fracture | h. A fracture that is often difficult to detect because the bone remains in correct anatomical alignment. |
| ___ Complete fracture | i. Includes total separation of the bone surface. |
| ___ Butterfly fragment | j. A fracture in which one side of the bone remains intact; also called a hairline or torus fracture; swelling may be its only sign. |
| ___ Epiphyseal fracture | k. An injury that results in the stretching or tearing of a ligament. |
| ___ Greenstick fracture | l. A stretched or torn muscle. |
| ___ Spiral fracture | m. A fracture with two or more parts. |
| ___ Dislocation | n. A fracture in which bone ends are anatomically misaligned. |
| ___ Comminuted fracture | o. A fracture in which the bone ends are embedded into each other. |
| ___ Closed fracture | p. A fracture in a child’s growth plate. |
| ___ Open fracture | q. A fracture in a straight line across a bone. |
| ___ Transverse fracture | r. An incomplete fracture commonly seen in children. |

For more information, see Chapter 20.

Define the following terms; be leg-injury specific.

A _____ of the knee joint is a true orthopedic emergency with complete tears of three or more of the ligaments.

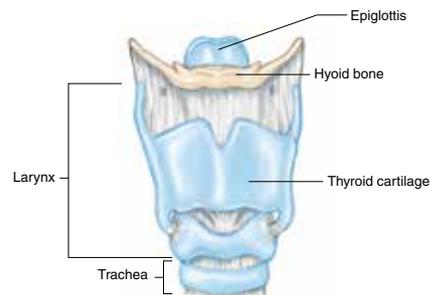
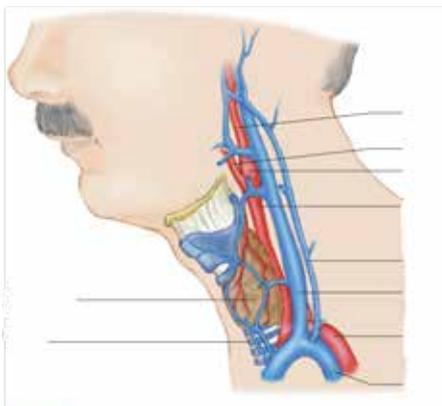
A boot top _____ is one of the common types of injury a patroller may see.

A _____ is defined as a stretching or tearing of a ligament.

For more information, see pages 612, 613, 633, 634, and 635.

Head and Spine Injuries and Face, Eye, and Neck Injuries

Label the two diagrams below. On the first, label the divisions of the **spinal cord**. On the second, label the **anatomical structures of the neck**. The word list is below the diagrams.



- | | | |
|----------|-------------------------|---|
| Thoracic | External jugular vein | Carotid common artery (coccyx is given) |
| Sacral | Left subclavian vein | Carotid sinus (thyroid gland and trachea are given) |
| Lumbar | External carotid artery | Internal carotid artery |
| Cervical | Internal jugular vein | Left subclavian artery |

Described in the diagram at right are common traumatic injuries involving the head, neck, and spine.

The **eyes** are especially vulnerable to abrasive and penetrating injuries, as well as injuries that may cause sensitivity to bright lights. Please describe an injury that may cause an abrasion to the eye, a penetrating injury to the eye, and an injury that may cause sensitivity to bright lights.

Abrasion injury: _____

Penetrating injury: _____

Sensitivity injury: _____

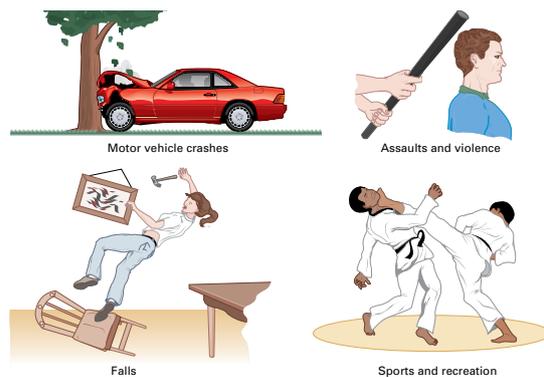
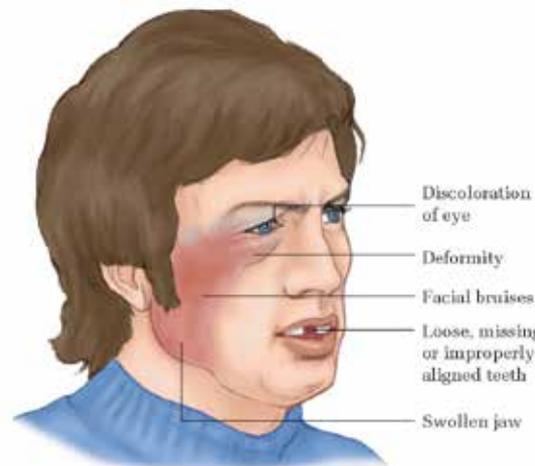


Figure 21-4 Different mechanisms of head injury.

Here are some points to remember when dealing with face, eye, and neck injuries.

- Facial and neck injuries can be associated with severe pain and anxiety.
- Facial and neck injuries can rapidly become life-threatening.
- Facial and neck injuries may result in a compromised airway.
- Assess the stability of the patient's airway by listening to the patient talk.
- Direct pressure applied to an injured globe of the eye may worsen the injury.
- Facial fractures require a significant mechanism of injury, so associated closed head or cervical-spine injuries must be considered as well.
- Facial and neck injuries are likely to increase your chance of exposure to the patient's bodily fluids.
- Face and neck injuries require frequent assessment.
- Any significant face, neck, or head injury requires cervical (and spinal) immobilization.
- Due to the vascular nature of the face and the proximity of major nerves to the surface of the skin, bleeding can be severe and may on occasion be accompanied by nerve damage.



For more information, see Chapter 22.

Please give a brief answer to the following questions.

Skiing in the trees, the patient's anterior-lateral neck was lacerated and their **eye** was **impaled** with a small branch. What are the signs and symptoms of an **open neck wound**? What are the signs and symptoms of a **penetrating injury to the eye**?

A patient was punched in the mouth. What are the signs and symptoms of an **avulsed tooth**?

A patient was struck across the anterior neck with a ski pole. What are the signs and symptoms of **blunt force trauma** to the anterior neck?

A patient walked into your aid room after spending multiple hours without a hat or face mask in sub-zero weather and is suffering from **frostbite** of the nose and ears. What signs and symptoms are associated with frostbite? (Chapter 25, page 825, Table 25-1)

Table 25-1 Signs and Symptoms of Frostnip and Frostbite

Superficial (frostnip)	Skin appears cool and pale and may be painful; tissues remain intact
Partial thickness (frostbite)	Skin has white or gray colored patches that are not painful; tissue may indent if pressed; tissue loss, if present, is minimal
Full thickness (frostbite)	Skin is cold and feels hard or woody; tissue is white or gray and will not rebound when pressed; the area is numb (no pain); no pulse can be detected

NOTES

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Section 6 – Substance Abuse and Poisoning; Behavioral Emergencies and Crisis Response; and Obstetric and Gynecologic Emergencies

- 12-1. List and describe the **four ways a drug enters and moves** through the body.
- 12-2. List the four routes of **absorption**.
- 12-3. Define the following terms:
- **poison**
 - **substance**
 - **substance abuse**
 - **toxin**
- 12-4. List and describe three commonly **abused substances**, and the signs and symptoms associated with their use.
- 12-7. List and describe two emergency sources for **poison-related or chemical-related information**.
- 33-1. Define the following terms:
- **behavior**
 - **behavioral emergency**
- 33-2. Compare and contrast **neurosis and psychosis**.
- 33-3. List and explain four factors that can cause **stress** or lead a person to behave strangely.
- 33-4. List the signs and symptoms of common **behavioral emergencies**.
- 33-5. Identify techniques to help maintain rescuer safety when responding to a **behavioral emergency**.
- 33-8. List the indications for **restraining a patient**.
- 34-3. List the **functions of the major gynecologic structures**.
- 34-4. List three causes of **abdominal pain of gynecologic or obstetrical origin**.
- 34-5. List four possible causes of **vaginal bleeding**.
- 34-6. List the three stages of a normal **pregnancy**.
- 34-7. List three possible consequences of **abdominal trauma in a pregnant patient**.
- 34-8. Describe four possible complications of **pregnancy**.
- 34-10. Describe how to **assess the abdomen of a pregnant patient**.
- 34-11. Describe the process of assisting an **emergency delivery**.
- 34-12. Describe the management of a **pregnant patient with abdominal trauma**.

Substance Abuse and Poisoning

Substances can enter, affect, and exit the system through four physiologic actions. They are (fill in the blanks):

absorption, _____, metabolism, and _____.

For more information, see page 387.

Label the following four photos as to which way a substance can be absorbed into the body. The terms are: ingestion, inhalation, transdermal, and injection.



For more information, see pages 387 and 388.

Fill in the blank using the following terms: **poison, substance, substance abuse, toxin**.

_____ A poison that comes from an organism.

_____ The intentional misuse of a substance that results in significant impairment or harm.

_____ A substance that causes harmful effects when introduced into the body.

_____ Anything that has mass and occupies space; it is any matter that can harm the body.

For more information, see pages 387 and 390.

There are two emergency sources for poison-related or chemical-related information.

- **Poison control** (National Capital Poison Control Center): 1-800-222-1222. They have ready access to poison data, care, and management.
- **CHEMTREC** (Chemical Transportation Emergency Center): 1-800-262-8200. Your first call if you happen upon an accident scene involving the transportation of a toxic chemical.

Behavioral Emergencies and Crisis Response

Match the following terms with their definitions.

- | | |
|---------------------------------|--|
| ___ Behavior | a. An individual's actions or reactions in response to external or internal stimuli. |
| ___ Behavioral emergency | b. A situation in which a person acts in a way that is unacceptable or intolerable to others and often poses a danger to themselves or others. |
| ___ Neurosis | c. A condition in which a person exhibits abnormal behavior and has altered perceptions of reality. |
| ___ Psychosis | d. A condition in which a person exhibits abnormal behavior but remains able to understand the normal boundaries of reality. |

For more information, see pages 1040 and 1043.

There are numerous factors that can cause **stress** or lead a person to **behave strangely**. What four factors are you most likely to see at your venue?

Table 33-1 Causes of Behavioral Alterations

- Reduced oxygen to the brain (hypoxia)
- Very low blood pressure
- Low blood sugar (hypoglycemia)
- Illnesses such as a seizure disorder, Alzheimer's disease, or infections
- Dehydration
- Abnormal electrolyte levels
- Situational stress (e.g., witnessing the death of a loved one)
- Head injuries
- Environmental exposures (hypothermia or hyperthermia)
- Accidental ingestion of mind-altering substances such as wild herbs, berries, or mushrooms
- Ingestion of drugs or alcohol
- Psychiatric disorders

Match the signs and symptoms to the correct word. Definitions may be used more than once.

- | | | |
|-----------------------------|----------------------------------|-----------------------------|
| ___ Anxiety | a. May make a person more alert. | g. Excessive motion |
| ___ Depression | b. Low self-worth | h. Eccentric behavior |
| ___ Paranoia | c. Guilt | i. Heightened sensitivity |
| ___ Agitation | d. Sleep disturbances | j. Lifelong mental disorder |
| ___ Schizophrenia | e. Feelings of suicide | k. Impaired reasoning |
| ___ Bipolar Disorder | f. Delusions | l. Impulsive behavior |

For more information, see pages 1044-1045.

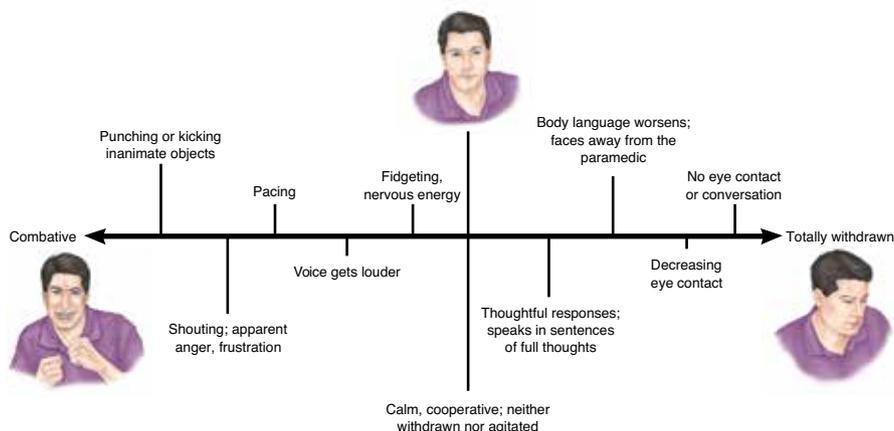
To help maintain rescuer safety when responding to a **behavioral emergency**, consider the techniques outlined in table 33-3.

Table 33-3 Approaching and Caring for the Behavioral Emergency Patient

- Maintain your safety at all times; always have an escape route.
- Approach patients in a way that they can see you.
- Avoid unnecessary physical contact with patients.
- Try to calm patients.
- Take time to talk to patients and to listen to their responses.
- Never lie to patients.
- Never play along with any auditory or visual hallucinations.
- Review the medical conditions that might resemble a behavioral emergency.
- Treat any life-threatening problems you encounter.
- Monitor patients for signs of agitation or worsening of their condition.

It is imperative to review your local protocols regarding restraining patients. Local protocols will include area management and local law enforcement.

When a patient's **behavioral emergency** escalates to the point at which words are no longer calming and the patient poses an imminent threat of violence, physical restraint is needed. Under these circumstances, there is no alternative but to protect the safety of the patient, the rescuers, and bystanders. The most common indication for the use of restraints is a violent psychotic patient.



Before applying restraint, OEC technicians should decide if the patient has the capacity (or ability) to refuse medical care. If the patient does and is not an imminent danger to themselves or others, you should neither touch nor threaten to touch the individual. Assessing for capacity to refuse medical care is a complex issue that is beyond the scope of this workbook; it is ultimately dictated by local protocols with the guidance of medical direction. **Ask for the assistance of area security or law enforcement personnel in isolating the individual, both for your safety and the safety of others. MAKE SURE LOCAL MANAGEMENT IS IN AGREEMENT WITH RESTRAINING A PERSON.**

For more information, see pages 1058-1059.

Obstetric and Gynecologic Emergencies

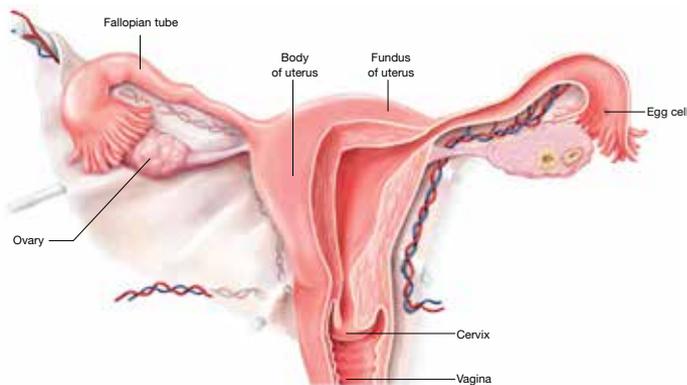
Ovaries: Two solid organs; contain the ova (eggs), or germ cells, and produce hormones (progesterone and estrogen).

Fallopian tubes: Hollow structures; serve as a conduit for the mature egg as it travels from the ovary to the uterus.

Uterus: Hollow muscular structure where a fertilized ovum develops into a fetus.

Vagina: Birth canal.

Perineum: Outer soft tissue; extends from the vaginal opening to the anus.



For more information, see pages 1070-1071.

List three common causes of abdominal pain of **gynecologic** or **obstetrical** origin.

- 1) _____
- 2) _____
- 3) _____

For more information, see pages 1073-1074.

Circle all of the possible causes of **vaginal bleeding**.

- | | | | |
|----------|----------------|---------|--------|
| swimming | miscarriage | stress | cancer |
| skiing | sexual assault | running | hiking |

For more information, see page 1075.

List the three stages of **pregnancy**.

- 1) _____
- 2) _____
- 3) _____

For more information, see pages 1073-1074.

Indicate in which **trimester** each of the following will occur.

- | | | |
|---------------------------------|----------------------------|--------------------------|
| ___ uterus begins to expand | _____ may feel off balance | _____ swelling of feet |
| ___ swelling of breasts | _____ swelling of hands | _____ fatigue |
| ___ difficult breathing | _____ vomiting is common | _____ frequent urination |
| ___ difficulty sleeping on back | | |

For more information, see page 1078.

The two main risks for pregnant women who participate in sports are falling and collisions. An indirect blow to the abdomen can be just as dangerous as a direct blow, and could potentially harm the developing fetus or the woman's enlarging uterus.

List three potentially dangerous consequences of a fall or collision.

- 1) _____
- 2) _____
- 3) _____

For more information, see page 1088.

Match the condition of the **complications of pregnancy** with the definition.

- | | |
|---|---|
| ___ Hemorrhage | a. Toxemia, a form of high blood pressure that develops during pregnancy. |
| ___ Placenta previa | b. Vaginal bleeding during first trimester; may signal an impending miscarriage. |
| ___ Abruptio placentae | c. After 20 weeks of gestation, the enlarged uterus can compress the vena cava when the pregnant woman is lying on her back and can result in profound maternal hypotension. |
| ___ Pregnancy-induced hypertension | d. Spontaneous abortion, the loss of a pregnancy prior to 20 weeks of gestation. |
| ___ Pre-eclampsia | e. Occurs after the first trimester, the placenta is implanted abnormally low over the cervix. |
| ___ Eclampsia | f. A premature separation of the placenta from the wall of the uterus. |
| ___ Miscarriage | g. Develops after 20 weeks, more common in first-time pregnancy, in twin pregnancies, and in women with preexisting diabetes. BP greater than 140/90, or a significant rise in one or both pressures; edema of face and/or hands. |
| ___ Supine hypotension syndrome | h. Pregnancy-induced hypertension complicated by seizures; severe form of pregnancy-induced hypertension; usually develops late in pregnancy. |

For more information, see pages 1078-1079.

When **assessing the abdomen** of a pregnant patient and managing a pregnant patient with **abdominal trauma**, be mindful of the woman's need for privacy. Place the patient in the position of comfort — usually supine with the knees flexed to allow the abdominal and pelvic muscles to relax. Look at the abdomen, noting any distention or discoloration. Have the patient use one finger to point to where her pain is most intense. Next, palpate the four quadrants of the abdomen and the suprapubic region as described in Chapter 16. Note whether the woman reveals any tenderness or shows signs of guarding. OEC technicians need not examine a non-pregnant woman's genital region unless she has a history of trauma and ongoing hemorrhage.

Begin your assessment of a pregnant woman as you would any other assessment, with an evaluation of the ABCDs and vital signs. Use SAMPLE and OPQRST to guide you in obtaining both a general medical history and a history of the current illness. For a complete list of questions to ask your patient, refer to pages 1089 and 1090 of the *Outdoor Emergency Care Fifth Edition*. Place the patient in the position of comfort or on her left side, unless a spinal injury is suspected. Note whether the uterus feels tight, as during a contraction, or if there is tenderness upon palpation. If the uterus is easily palpable, attempt to detect any fetal movement.

The general management of a pregnant woman following trauma is similar to that of any other trauma victim, but with a few additional considerations. Following the scene survey and BSI precautions, begin — as always — with the ABCDs and

a rapid assessment. Early critical interventions include application of high-flow oxygen, even without maternal signs of shock or respiratory difficulty. Suction as needed to clear the patient's airway. If possible, position the woman on her left side, or if her injuries prevent this, either elevate the right hip or manually displace the uterus until she is immobilized on a long spine board to avoid possible supine hypotension from pressure on the vena cava. When immobilizing a pregnant woman on a long spine board, avoid placing any straps directly over her abdomen. Tip the spine board to the patient's left by placing a patrol pack or a folded blanket under the right side of the board. Abdominal pain may be associated with nausea and vomiting, so anticipate the need to provide an emesis basin or to assist with removing an oxygen mask.

Transport rapidly but gently, reassessing the patient regularly. In late stages of pregnancy, the uterus pushes up toward the diaphragm and makes it more difficult to take a deep breath. This can be compounded by transporting the woman in a toboggan with her head downhill, and should be avoided if possible. In case of shock or suspected fetal shock for which transport in a head-downhill position is needed, an object such as a fanny pack can be placed under the head of the board to bring the board to a more neutral position, thus lessening respiratory difficulties while simultaneously treating for shock.

For more information, see page 1091.

Childbirth begins with labor, which can be gradual or abrupt in onset and is divided into three stages. Signs of **imminent delivery** include:

- **Bloody show** (passage of mucus plug that seals the cervix throughout pregnancy).
- **Rupture of the amniotic sac** (bag of waters).
- The urge to push or defecate.
- **Crowning.**

If you are assisting in a normal **childbirth**, put the following steps in the correct order, from 1-15. For reference, see the Skill Guide on page 1094.

- _____ Time the woman's contractions.
- _____ Assist the mother with removing clothing and provide privacy.
- _____ Initiate BSI.
- _____ Assist in delivery of the placenta.
- _____ Put a sanitary pad over the mother's vagina.
- _____ Cut the umbilical cord (if hospital is more than 20 minutes away).
- _____ Gather a sterile OB kit if available; if not, improvise one by gathering clean towels, 4x4 gauze sponges, scissors, a baby blanket, rubber syringe, clean shoelaces, and cloth tape. If there is time, boil these in sterile water.
- _____ Place in a Semi-Fowler's position.
- _____ Once the head and shoulders are delivered, the rest of the body slides out. Support the baby's body as it emerges.
- _____ Suction the mouth and nose as necessary.
- _____ With one hand on either side of the baby's head, gently guide down to assist in delivery of shoulders.
- _____ Once the baby is crowning, allow the woman to push the baby's head out and support the head with a gloved hand as it emerges.
- _____ Evaluate infant vital signs/Apgar score. Provide interventions as needed.
- _____ Check the position of the umbilical cord.

For more information, see pages 1081-1082.

First stage:
beginning of contractions to full cervical dilation



(a)

Second stage:
baby enters birth canal and is born



(b)

Third stage:
delivery of the placenta



(c)

CASE REVIEW

It is the end of your patrol day shift, and it is getting dark. You are walking from the ski lifts to the parking lot behind an obviously pregnant woman escorting her small child, who is fumbling while carrying his skis. Suddenly, he loses control of one ski, and it hits the pavement and sails down the icy walkway into the road near the crosswalk. Mom and the child slip and fall to the ground. An area employee, working as a crossing guard at the crosswalk, sees the loose ski and tries to stop it, but he also slips and falls onto the icy road.

A few moments later, a school bus full of students approaches the crosswalk. Seeing the person lying in the roadway, the bus driver slams on the brakes and the bus fishtails on the ice and ends up slamming into the rear of a parked car. Unfortunately, a snowboarder is standing at the back of the car loading his equipment into it after a day of riding. He is pinned between the bus bumper and the car. The unbelted driver of the car is thrown forward by the impact of the bus and is hit by a flying snowboard from the back of the car. The front end of the car is heavily damaged as it is pushed forward into the snow bank, causing a wall of snow to come down on the car.

As the dust settles, you assess this accident that you have just witnessed. This is what you know so far in order to call for help:

1. The mother and child have fallen on the icy pavement. The woman is complaining of abdominal pain and the child is crying and holding his left ankle.
2. The crossing guard is down in the roadway writhing in pain and holding his right knee.
3. There is screaming from the school bus; it is unknown how many people are on it, but you see two adults standing in the bus attending to the children.
4. The bus driver is slumped forward over the steering wheel.
5. The pinned snowboarder lets out blood-curdling screams of pain. He is only wearing a T-shirt.
6. Of what can be seen of the car driver, there is blood over his head and neck. He is not moving and not making any sounds.
7. The walkway and road are very icy.
8. The roadway is busy with skier traffic, and is now blocked to vehicle traffic.
9. It is starting to get dark.

Known Patients

- Pregnant woman
- Young child
- Area employee crossing guard
- Snowboarder
- Car driver
- Bus driver
- Bus riders: children and adults

Bystanders

Pedestrians, resort parking attendants, arriving/departing skier traffic

Write down your radio call.

The Incident Command System has five components:

- **Incident Command**
- **Operations**
- **Planning**
- **Logistics**
- **Finance/Administration**

As the first person on scene, you assume Incident Command (IC). Within five minutes of your radio call, you see five patrollers coming your way and hear the sirens of responding EMS agencies.

What do you think needs to be done next?

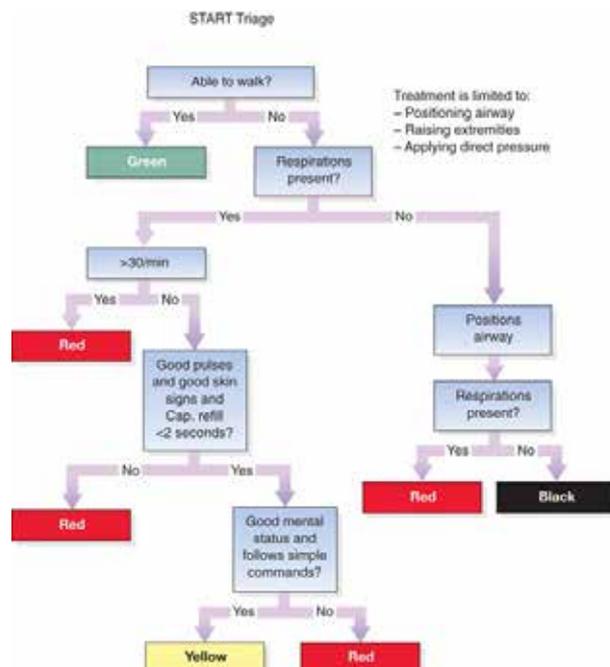
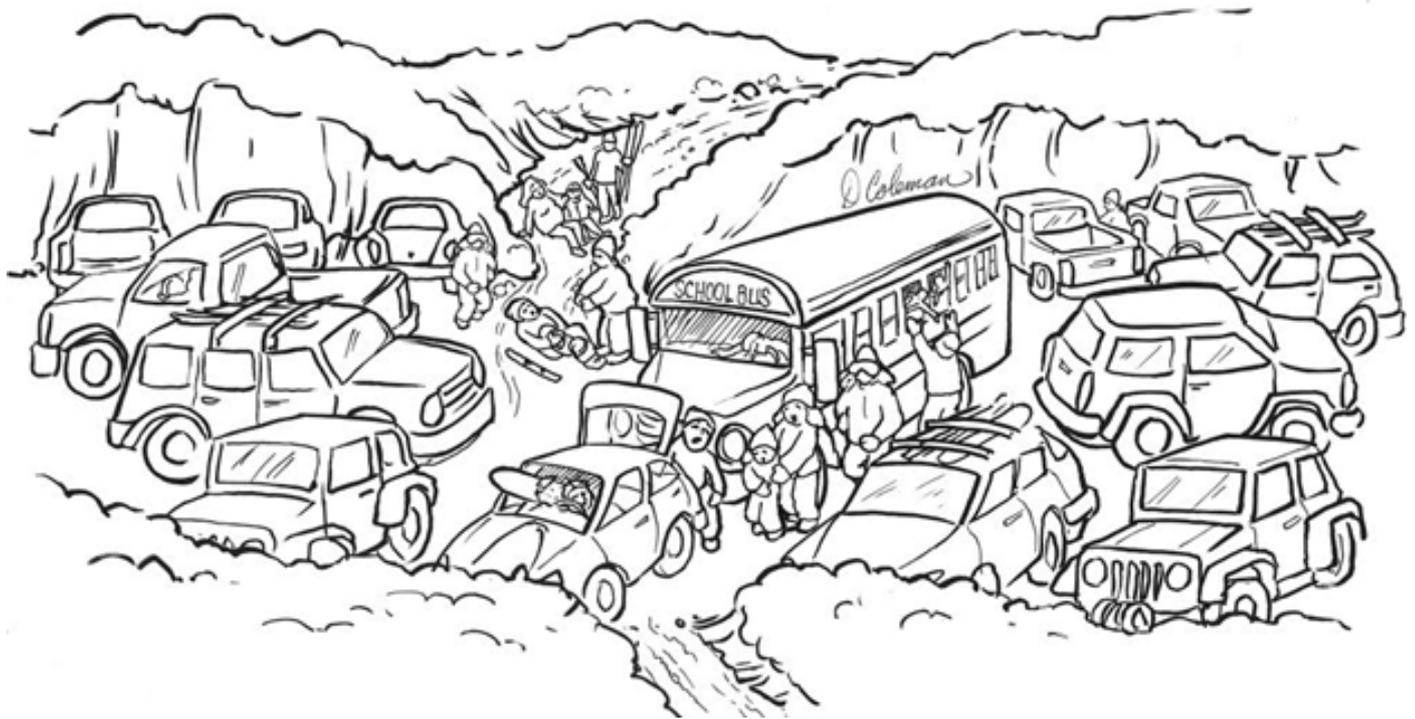
When a fellow patroller whom you know has experience working at disasters approaches you, you relinquish command to him.

Is this action acceptable, and if so, why?

A command post is quickly established and section chiefs are assigned, incorporating ski patrol personnel with senior level fire department responders. Next, a triage group is dispersed to evaluate the medical needs/conditions of the accident scene.

There are two triage methodologies. What are they, which one would you choose, and why?

Consider the scene below and how you would carry out triage.



Using the START Triage system shown in the diagram on the preceding page, triage the patients.

R = Respiratory rate (>30 breaths/minute)

P = Perfusion/pulse (radial pulse absent or cap refill > two seconds)

M = Mental status (cannot follow simple commands/unconscious or altered mental status)

MCI patients: Triage the following patients. Write down a triage color for each patient.

36 Weeks Pregnant Woman

R: 32
 P: Pale, diaphoretic, rapid pulse
 M: Alert
 Abdominal contractions, loss of vaginal fluid
Triage color:

Child

R: 28
 P: Strong radial pulse
 M: Alert
 Ankle pain
Triage color:

Crossing Guard

R: 24
 P: Pale, clammy, strong radial pulse
 M: Alert
 Knee deformity/pain
Triage color:

Bus Driver

R: 24
 P: Pale, diaphoretic, rapid radial pulse
 M: Responsive to name
 Chest pain/trauma
Triage color:

Snowboarder

R: 28
 P: Pale, shivering, bounding radial pulse
 M: Alert
 Pelvic/LE injuries
Triage color:

Car Driver

R: Absent with repositioning
 P: Active arterial bleeding from neck
 M: Unresponsive
 Neck laceration/head injury
Triage color:

Bus Girl

R: 28
 P: Strong radial pulse, faint distal leg pulses
 M: Alert
 Open lower leg fracture
Triage color:

Bus Boy 1

R: 20
 P: Strong radial pulse
 M: Alert
 Bloody face with eyelid laceration
Triage color:

Bus Boy 2

R: Absent with repositioning
 P: Faint carotid pulse
 M: Unresponsive
 Prone on bus floor
Triage color:

Two Adult Bus Chaperones

Talking and walking
Triage color:

25 Bus Kids

Crying and walking
Triage color:

In total, how many patients do you have in each color category?

Green: _____; **Yellow:** _____; **Red:** _____; **Black:** _____

Discussion:

Green:
 Yellow:
 Red:
 Black:

Are there any extraordinary concerns/issues that need to be addressed?

What could have been done in hindsight to prevent the cascade of events that occurred?

List the normal range of vital signs for each pediatric age group.	X				
Describe the signs and symptoms of respiratory distress and failure in a child.	X				
List five indicators of potential child abuse and neglect.	X				
Describe and demonstrate how to assess a pediatric patient using the pediatric assessment triangle.		X			
Airway Management					
Compare, contrast, and demonstrate the usage of a rigid suction catheter and a flexible suction catheter.			X		
Describe how to calculate the oxygen flow duration rate.	X				
Describe and demonstrate how to properly set up an oxygen tank for use.			X		
List four tips for the safe use of oxygen.	X				
Describe and demonstrate how to use the following oxygen delivery, ventilation, and barrier devices:					
a. Nasal cannula			X		
b. Non-rebreather mask			X		
c. Bag valve mask				X	
List the indications and uses for the following airway adjuncts, and demonstrate the proper methods for choosing the correct size and inserting them:					
a. Oropharyngeal airway			X		
b. Nasopharyngeal airway					
Shock and Thoracic Trauma					
Define shock.	X				
Compare and contrast the three stages of shock.	X				
List the four types of shock.	X				
Describe how the body compensates for shock.	X				
List the classic signs and symptoms of shock.	X				
List the major anatomical structures of the thoracic cavity.	X				
Describe the pathology of the following thoracic injuries:					
a. Flail chest	X				
b. Pneumothorax	X				
c. Hemothorax	X				
d. Tension pneumothorax	X				
e. Sucking chest wounds	X				
f. Pericardial tamponade	X				
List the signs and symptoms of various thoracic injuries.	X				
Describe and demonstrate how to assess the chest for trauma using the L.A.P. method.		X			
Describe and demonstrate the emergency management of a sucking chest wound.		X			

Station	Objective	Knowledge Objectives	Each OEC technician must perform the following skills	OEC technician must participate as a team member	Skill completed
Overall	Integrate the appropriate use of scene size-up, BSI, and shock management at each station.				
	Case Review	X		X	
	Rescue Basics, Incident Command and Triage, Special Operations and Ambulance Operations, Trauma Centers				
	Describe the "fight or flight" response.	X			
	Describe the five modes of disease transmission.	X			
	Define the following terms: pathogen, standard precautions, body substance isolation (BSI), and hazardous material.	X			
	Define the incident command system.	X			
	<i>Describe and demonstrate how to use the ID-ME triage system.</i>			X	
	<i>Describe and demonstrate how to use the START system of triage.</i>			X	
	Describe the role of a trauma center in improving the survival of a trauma patient.	X			
	Define special operations.	X			
	Describe HAZWOPER.	X			
	Identify the purpose of the International Hazard Classification System diamond placard system.	X			
	List and describe the three hazard control zones.	X			
	Anatomy and Physiology				
	Define the following terms: anatomy, body system, cell, homeostasis, organ, physiology, and tissue.	X			
	Identify and describe the fundamental anatomy and physiology of the reproductive, endocrine, and lymphatic systems.	X			
	Patient Assessment and Pediatric Emergencies				
	<i>Describe and demonstrate how to perform a primary assessment and manage the ABCDs.</i>		X		
	<i>Describe and demonstrate how to perform a secondary assessment.</i>		X		
	<i>Describe and demonstrate how to assess the eyes (pupils and movement).</i>		X		
	<i>Describe and demonstrate the procedure for obtaining the following vital signs:</i>				
	a. Respiratory rate		X		
	b. Blood pressure		X		
	c. Heart rate		X		
	List and describe the anatomical and physiological differences between children and adults.	X			
	Understand and be able to incorporate communication tips and techniques for assessing and interacting with a pediatric patient.	X			

List the four routes of absorption.	X			
Define the following terms: a. Poison b. Substance c. Substance abuse d. Toxin	X X X X X			
List and describe three commonly abused substances and the signs and symptoms associated with their use.	X			
<i>Describe and demonstrate the proper care of a patient who has abused a substance or been poisoned.</i>			X	
List and describe two emergency sources for poison-related or chemical-related information.	X			
Behavioral Emergencies, Crisis Response				
Define the following terms: a. Behavior b. Behavioral emergency	X X			
Compare and contrast neurosis and psychosis.	X			
List and explain four factors that can cause stress or lead a person to behave strangely.	X			
List the signs and symptoms of common behavioral emergencies.	X			
Identify techniques to help maintain rescuer safety when responding to a behavioral emergency.	X			
List the indications for restraining a patient.	X			
Obstetric and Gynecologic Emergencies				
Identify the major anatomical structures within the pelvic cavity.	X			
List the functions of the female genitourinary and reproductive system.	X			
List the functions of the major gynecologic structures.	X			
List three causes of abdominal pain of gynecologic or obstetrical origin.	X			
List four possible causes of vaginal bleeding.	X			
List the three stages of a normal pregnancy.	X			
List three possible consequences of abdominal trauma in a pregnant patient.	X			
Describe four possible complications of pregnancy.	X			
<i>Demonstrate how to examine a female patient with abdominal or pelvic pain. (Team focus.)</i>			X	
Describe how to assess the abdomen of a pregnant patient.	X			
Describe the process of assisting an emergency delivery.	X			
Describe the management of a pregnant patient with abdominal trauma.	X			

For the describe and demonstrate objectives, the patroller should verbalize what they are doing while demonstrating the skill.

Principals of Trauma					
Define the following terms:					
a. Kinematics	X				
b. Mechanism of injury	X				
c. Index of suspicion	X				
Compare and contrast high-velocity injuries and low-velocity injuries.	X				
Compare and contrast the five mechanisms of injury.	X				
Musculoskeletal Injuries					
List the six types of musculoskeletal injuries.	X				
Define the following terms (leg injury specific):					
a. Dislocation	X				
b. Fracture	X				
c. Sprain	X				
<i>Describe and demonstrate how to assess a leg injury. Choose one from: dislocated knee, proximal tibia fracture, mid-shaft femur fracture.</i>		X			
<i>Describe and demonstrate the use of the following types of splints:</i>					
a. Quick Splint – dislocated knee				X	
b. Soft splint – ankle				X	
c. Rigid splint – proximal tibia				X	
d. Traction splint – mid shaft femur; must include long spine board for transport				X	
<i>Demonstrate how to remove a ski boot, snowboard boot, and/or hiking boot (area specific).</i>				X	
<i>Describe and demonstrate placing a patient in the anatomical position using the principles of “jams and pretzels.”</i>				X	
Head and Spine Injuries					
Describe common traumatic injuries involving the neck.	X				
List possible causes of eye injuries.	X				
<i>Describe and demonstrate how to assess the eyes (pupils and motion).</i>		X			
<i>Describe and demonstrate how to assess and manage a patient with a non-penetrating injury to the eyeball.</i>			X		
<i>Describe and demonstrate how to assess and manage a patient with a penetrating injury to the eyeball.</i>				X	
Identify the important structures of the anterior and posterior neck.	X				
List the signs and symptoms of emergencies of the neck and upper airway.	X				
List the signs and symptoms of emergent injuries to the face and neck.	X				
<i>Describe and demonstrate how to assess and manage face and neck injuries. (One member does a face and one does the neck.)</i>				X	
List the signs and symptoms of cold exposure.	X				
Substance Abuse and Poisoning					
List and describe the four ways a drug enters and moves through the body.	X				

2016 Cycle C OEC Refresher Completion Acknowledgement

(VISITING OEC technician uses and returns this form to their patrol representative after IOR signs. **DO NOT SEND TO NSP**; return it to your patrol representative!)

Have this form signed by the instructor of record at the refresher, **then return it to your NSP patrol representative**. This verifies that you have attended and successfully completed all requirements for the 2016 refresher. *Please print.*

OEC Technician Name: _____

NSP ID #: _____

Ski Patrol/Affiliate Group Registered With: _____

Refresher Location/Date: _____

OEC Instructor of Record: _____

IOR Signature: _____

2016 Cycle C OEC Refresher Supplemental Roster Information

(VISITING OEC technician fills out this form and gives to the IOR of the refresher they attend when they arrive. **DO NOT SEND TO NSP**; in order to receive credit for the refresher, leave the completed form with the IOR!)

This will help the instructor document your completion of this year's OEC refresher requirements to the national office. *Please print.*

OEC Technician Name: _____

NSP ID #: _____

Address: _____

City: _____ State: _____ Zip: _____

Email: _____

Ski Patrol/Affiliate Group Registered With: _____

Refresher Location/Date: _____

OEC Instructor of Record: _____

REFRESHER EVALUATION FORM

2016 CYCLE C

Name (optional): _____

Date: _____

Home Patrol: _____

Refresher Location: _____

1. The refresher was well-organized.
 Strongly agree Agree Neutral Disagree Strongly disagree
2. The presentations were clear and well-prepared.
 Strongly agree Agree Neutral Disagree Strongly disagree
3. At the skills stations, I understood what I needed to do at each one.
 Strongly agree Agree Neutral Disagree Strongly disagree
4. The equipment we used was in good condition, and there was enough to go around.
 Strongly agree Agree Neutral Disagree Strongly disagree
5. The instructor(s) provided fair feedback of my skills.
 Strongly agree Agree Neutral Disagree Strongly disagree
6. The refresher was run in a relaxed, positive manner.
 Strongly agree Agree Neutral Disagree Strongly disagree
7. I am confident in applying the skills reviewed and presented in this refresher in a rescue/patrolling environment.
 Strongly agree Agree Neutral Disagree Strongly disagree
8. The *Refresher Workbook* was very helpful in preparing for this refresher.
 Strongly agree Agree Neutral Disagree Strongly disagree
9. Did you use your *Outdoor Emergency Care Fifth Edition* manual to review the refresher topics and complete your workbook?
 Yes No
10. The "Case Review" was helpful, and a valuable part of the refresher.
 Strongly agree Agree Neutral Disagree Strongly disagree
11. Overall, I would rate this refresher:
 Excellent Very Good Good Needs Improvement

12. What are the strengths of the refresher?

13. What could be improved in the refresher?

14. I'd like my instructors to do a better job of:

15. My instructors did an excellent job of:

16. Have you used your OEC skills in a place other than your normal patrol environment? If so, where?

We welcome your comments and suggestions for improving NSP OEC programs. Please be as specific as possible, and use another sheet of paper if needed.



2016 Cycle C OEC Refresher Committee Statement

The mission of the OEC Refresher Committee is to provide assistance to all Outdoor Emergency Care technicians so that they may effectively review Outdoor Emergency Care content and skills each year and render competent emergency care to the public they serve. The objectives of the program are to:

- Provide a source of continuing education for all OEC technicians.
- Provide a method for verifying OEC technician competency in OEC knowledge and skills.
- Review the content of the OEC curriculum over a three-year period.
- Meet local patrol and area training needs in emergency care.

Please take a moment and let us know how we can make your refresher better!

Email the Refresher Committee at refresher@nsp.org.

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