



PHOTOS CHRIS SWABB, ON ASSIGNMENT STUDIOS

“My three-year-old daughter just broke her arm!”

“I just witnessed a car crash. The driver was thrown from the vehicle.”

“I’m a construction foreman, and one of my men just got his arm caught in the cement mixer.”

These injuries can all be classified as *trauma*, which is generally defined as “physical injury caused by accident or violence.” According to the Centers for Disease Control and Prevention’s National Center for Injury Prevention and Control (NCIPC), injuries are the leading cause of death for Americans of all ages. In addition, millions of Americans are injured each year and survive. In 2004, approximately 29.6 million people were treated for an injury in U.S. hospital emergency departments (EDs). Of those injuries, nearly 2 million were severe enough to require patient hospitalization.

Keeping these numbers in mind, the likelihood of an emergency medical dispatcher (EMD) receiving a 9-1-1 call involving trauma to a patient is very high. Understanding the mechanism of injury (i.e., the circumstances in which the injury occurred) and relevant signs and symptoms of bleeding and shock is crucial. The dispatch of the appropriate EMS response and pre-arrival instructions given to callers regarding traumatic incidents largely depend on the EMD’s ability to obtain information from the caller regarding the nature of the incident, extent and location of the injuries, and critical symptoms.

TERMINOLOGY

Signs vs. symptoms: Although commonly discussed together, signs and symptoms fundamentally differ. A sign is an objective finding that can be perceived and described by an observer. It can be seen, heard, smelled or felt. Examples include a fever, a

TRAUMA TALK

rash or clammy skin. A *symptom* is subjective and something the patient reports or describes feeling, such as pain, nausea or dizziness.

Types of bleeding: Bleeding can be external (visible) or internal (contained within the body). *External* bleeding can be described as arterial, venous or capillary. Arterial bleeding, characterized by bright red, oxygen-rich blood that spurts from a wound, is the most difficult to control due to the pressure at which arteries bleed. A venous bleed flows as a steady stream and is dark red because it is oxygen poor. Capillary bleeding oozes, is dark red and often clots spontaneously.

Internal bleeding can result in severe blood loss, shock and possibly death. Injured or damaged internal organs commonly lead to extensive internal bleeding. Signs and symptoms that may help you identify serious internal bleeding include swollen or deformed extremities that are painful.

Hypoperfusion, or *shock*, refers to inadequate tissue perfusion or the lack of blood circulation through an organ structure. Perfusion is the process by which the body delivers oxygen and other nutrients to the cells of all organ systems and removes the waste products, so inadequate blood flow (shock) can result in hypoperfusion of vital organs (e.g., heart, lungs, brain, kidneys). Cell and organ malfunction and death can result.

Shock is a major killer of patients and can appear rapidly, almost without symptoms. For this reason, shock is often called *the silent killer*. Trauma patients develop shock from the loss of blood via internal and external bleeding. The most common type of shock is referred to as *hypovolemic* or *hemorrhagic* shock.

Symptoms of shock include weakness, nausea, thirst, dizziness, coolness and restlessness/anxiety, as well as a feeling of “impending doom” or a feeling that something terrible is going to happen or a feeling that death is imminent.

Signs of shock include pale, cool and/or moist skin; shallow and/or rapid breathing; lackluster eyes and/or dilated pupils; decreased level of consciousness leading to unconsciousness; fluid loss from bleeding, vomiting or diarrhea; weak or “thready” pulse; and a steady drop in blood pressure.

Early signs and symptoms include restlessness and anxiety and a weak and thready pulse. A late sign is the steady to decreased drop in blood pressure.

STOP THE BLOOD LOSS

The average adult has 5–6 liters (L) of blood. The sudden loss of 1 L (1000 cc) of blood in an adult, 0.5 L (500 cc) in a child, or 100–200 cc in an infant is considered serious. A determination of the severity of blood loss must be based on the patient’s signs and symptoms and a general impression of the amount of blood loss. If the patient exhibits signs and symptoms of hypoperfusion, the bleeding is considered *serious*. Uncontrolled bleeding or significant blood loss leads to shock and possibly death.

The body attempts to stop bleeding through a process called *clotting*. Blood platelets break down and block the injury through which the blood is escaping. When bleeding is severe, clotting can’t happen quickly enough or completely enough to stop further bleeding, which can result in shock and death.

Severe bleeding must be treated immediately. Almost all bleeding can be controlled by direct pressure. The EMD should direct the caller (or bystander) to apply a universal bandage or clean gauze pad and press down directly on the open wound. If the caller doesn’t have a bandage or gauze pad, instruct the caller to use the cleanest cloth available and to put a lot of pressure on the wound. Enough pressure will stop even arterial bleeding.

Tell the caller *not* to remove soaked bandages. Removing a soaked bandage will likely remove the clot as well. Instead, instruct the caller to add additional bandages on top of the soaked bandages and continue holding pressure.

Never instruct a caller to apply a tourniquet. Tourniquets can completely stop the flow of blood through a limb, causing significant cell, tissue and nerve damage, which may necessitate amputation of the limb. However, if a caller advises that a tourniquet has already been applied, have them leave it on the limb.

Suspicion of internal bleeding and an estimation of its severity should be based on the mechanism of injury and the signs and symptoms of the patient. Mechanisms of injury that may result in internal bleeding include both blunt and penetrating traumatic injuries, such as those sustained in falls, motorcycle crashes, pedestrian impacts, automobile collisions and blast injuries.

Signs and symptoms of internal bleeding include pain, tenderness, swelling or discoloration at the suspected site of injury; bleeding from the mouth, rectum or vagina; vomiting red blood or dark coffee-ground-colored blood; and a tender, rigid and/or distended abdomen. The late signs of hypoperfusion include combativeness and altered mental status.

DEALING WITH SHOCK

An EMD can instruct a caller to do a number of things to alleviate the immediate danger of shock and keep the patient alive until help arrives, including the following:

- Don’t give the patient anything to eat or drink;
- Make sure the patient’s airway is maintained and kept clear;
- Control external bleeding with clean dressings and direct pressure;
- Calm and reassure the patient;
- Don’t move trauma patients unless it’s a life-or-death situation; and
- Keep the patient warm, and prevent the loss of body heat by covering the patient.

TRAUMA & THE EMD

Traumatic incident types should be assessed differently than medical chief complaints. The primary determining factors in response to traumatic incidents are the mechanism of injury, the location of the injury on the body (e.g., central or peripheral, torso, or arms and legs) and the presence of significant critical symptoms.

Pre-arrival instructions for trauma calls vary by situation and the reported complaint. In many cases, the instructions are similar to those for medical chief complaints, especially in regard to airway control. But traumatic incident guidecards include more specific injury-related instructions designed to prevent further injury.

COMMON INCIDENTS & RELATED SIGNS & SYMPTOMS

Animal bites: Callers usually describe solitary bites, often without serious bleeding. Children are common victims of pet bites. (See “Cats, Dogs & Snakes, Oh My!” July 2007 PSC.)

Assault/sexual assault: Because of the frightening nature of such situations, the caller often exhibits extreme emotion. The EMD should exhibit compassion and patience. The victim suffers from psychological and/or physical injuries. Facial

injuries are commonly associated with severe bleeding.

Burns: Burns are usually very painful. The caller may describe blistering or peeling skin. Patients with electrical burns may be described as unconscious. Prepare to provide CPR instructions to these callers.

Carbon monoxide (CO) poisoning/toxic inhalation: Headache, nausea and altered level of consciousness are common CO-poisoning complaints. In other inhalation and hazmat situations, callers may report respiratory difficulty, burning of the eyes, superficial chemical burns, nausea, vomiting and decreased level of consciousness.

Drowning/diving accident/water-related injury: Callers may report that a patient is coughing or having difficulty breathing, lowered level of consciousness, vomiting and change in skin color. With possible spinal cord injury, the patient may also be experiencing numbness, tingling and immobility in the extremities.

Eye injuries: Severe eye injuries include penetrating wounds to the eye, lacerations and retinal detachments, as well as eye injuries that are associated with a lowered level of consciousness, indicative of an underlying head injury.

Common moderate eye problems include chemicals in the eyes, welding burns and thermal burns.

Minor eye problems include problems with contact lenses, foreign bodies, corneal abrasions and contusions resulting from fractures of the bones surrounding the eye.

Falls: External trauma may be visible. Numbness, tingling or loss of movement may be present in cases with associated spinal cord injury. The patient may be experiencing high anxiety due to the mechanism of injury.

Industrial accidents: Symptoms from industrial accidents are typically case specific. Often, the only information relayed to the calltaker is that an ambulance is needed at the location.

Stabbings/gunshot wounds: Callers reporting these incidents often have emotional responses to the situation. Proper calming techniques may be necessary. Callers may describe external bleeding, multiple victims or unconscious patients.

Other traumatic injuries: Callers may describe fractures, pain and swelling, or immobility. In cases of back pain, numb-

ness, tingling or immobility may be described. A spinal injury should be assumed and precautions taken. The caller may also describe external bleeding.

Vehicle-related injuries: The EMD may receive multiple calls for the same vehicle crash. Callers may offer different accounts of the same crash. Callers may describe multiple patients, patients thrown from vehicles, roll-overs and numerous other scenarios. Auto vs. pedestrian, auto vs. motorcycle and auto vs. bicycle should always be considered high-level emergencies.

Pre-arrival instructions in these cases relate primarily to ensuring the safety of the scene for patients, bystanders and responders. Instructions are provided for the control of external bleeding and ensuring the patient's airway is maintained, advising the caller when it may be best to do nothing, to guide the responding units to the patient and to call back if the patient's condition worsens.

PEDIATRIC CONSIDERATIONS

Traumatic incident types are the most common chief complaint used to report incidents involving children. In cases of traumatic injury, the child should not be moved unless in danger. *A common error:* Someone moves or picks up a child, runs into the house and holds the child to comfort them. This practice could lead to further injuries in a patient who has sustained a spinal injury. If a child moves on their own, the child should be instructed to lie down on a flat surface and asked to remain still until responders arrive on scene. Bystanders should be asked to keep the child calm and reassured.

Conscious injured children require extra attention. Support and reassurance, preferably from a single, consistent bystander, will be needed. This need must be communicated through the EMD to the bystanders.

The emotional condition of the patient and/or caller should not be used as an indication of the severity of the problem. Children may not understand the severity of an incident and may appear to be very calm in the face of crisis. Likewise, bystanders and children may be distraught from witnessing the incident and reacting to the sight of blood or traumatic injuries.

Prevention is the most powerful treatment for most childhood injuries. *Some statistics from the NCIPC:*

- Each year, EDs treat more than 200,000 children age 14 and younger for playground-related injuries.
- Each year, hundreds of thousands of children suffer abuse or neglect. In most cases, the abuser is someone known to the child—a parent, family member, teacher or caregiver.
- Motor vehicle injuries are the greatest public health problem facing children today. In fact, they are the leading cause of death among children in the U.S.
- Children, especially those under age six, are more likely to suffer unintentional poisonings than older children and adults.
- Children age four years and younger are among those at highest risk for residential fire deaths and injuries.
- Among children age 0–14 years, traumatic brain injuries (TBI) result in an estimated 400,000 ED visits each year.
- Drowning is the second leading cause of injury death among children 14 years and younger. And for every child who drowns, three receive ED care for nonfatal submersion injuries.

The EMD can play a role in injury prevention by recognizing and reporting traffic, playground or other hazards as they are identified through child-injury calls.

SUMMARY

Statistics show that the leading cause of death among Americans of all ages is injury. Traumatic incident calls are assessed differently by the EMD than medical chief complaints. Knowing the different types of traumatic incidents, the underlying causes of death among these incident types and ways to assist the caller in managing the incident will enable the EMD to better manage traumatic injury calls. **||PSC||**

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RESOURCES

- *Emergency Medical Dispatcher 5.2 ed.* APCO Institute: www.apcointl.org/institute.
- U.S. Department of Transportation, National Highway Traffic Safety Administration, EMT-Basic: National Standard Curriculum
- CDC NCIPC: www.cdc.gov/ncipc

CLASS SCHEDULE



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Active Shooter Incidents for Public Safety Communications			\$199
24665	Woburn, Mass.	June 12	
24869, 24870	New Brunswick, N.J.	June 12, 13	
24741, 24742	Tallahassee, Fla.	June 16, 17	
24594	Keyser, W.Va.	June 25	
25137, 25138	Muncie, Ind.	July 15, 16	
24258	Kansas City, Mo.	Aug. 3*	
24956, 24957	Benton Harbor, Mich.	Sept. 9, 10	
Communications Center Supervisor			\$349
24664	Woburn, Mass.	June 9-11	
24743	Ogden, Utah	June 9-11	
24652	Titusville, Fla.	June 9-11	
23355	Web Class	June 11	
24916	Parsippany, N.J.	June 17-19	
23458	Web Class	July 2	
24874	Greenville, S.C.	July 7-9	
24260	Kansas City, Mo.	Aug. 1-3*	
Communications Training Officer			\$259
24930	Page, Ariz.	June 16-18	
24749	Layton, Utah	June 23-25	
23457	Web Class	July 2	
24958	Seneca, S.C.	July 16-18	
24259	Kansas City, Mo.	Aug. 1-3*	
23465	Web Class	Aug. 6	
25083	Park City, Utah	Aug. 26-28	
Communications Training Officer Instructor			\$509**
23459	Web Class	July 9	
23468	Web Class	Aug. 13	
EMD Concepts			\$249
23461	Web Class	July 23	
23472	Web Class	Aug. 27	
Emergency Medical Dispatch Instructor			\$509**
23463	Web Class	July 30	
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Fire Service Communications, 1st ed.			\$379
23460	Web Class	July 16	
23469	Web Class	Aug. 20	
24593	Centennial, Colo.	Sept. 16-19	
Fire Service Communications, 1st ed., Instructor			\$509**
23354	Web Class	June 25	
23466	Web Class	July 30	
Public Safety Telecommunicator 1, 6th ed.			\$309
23456	Web Class	July 2	
24945	Columbus, Ohio	July 7-11	
23464	Web Class	Aug. 6	
23474	Web Class	Sept. 3	
Public Safety Telecommunicator 1, 6th ed., Instructor			\$459
23360	Web Class	June 25	
25047	Minneapolis, Minn.	July 14-18	
23462	Web Class	July 30	
Radio Tech Test for FCC Radiotelephone: Operator's Certificate			\$99
Class #	Location	Date	
24056	Web Class	June	
24057	Web Class	July	
24058	Web Class	August	
Telecommunicator's Role in Homeland Security			\$199
24653	Titusville, Fla.	June 12	
24592	Centennial, Colo.	June 20	
24735	Web Class	July 16	

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CDE #24274 TRAUMA TALK

1. _____ is generally defined as "physical injury caused by accident or violence."
2. Injuries are the leading cause of death for Americans of all ages:
 a. True b. False
3. A _____ is objective and described as something that can be seen, heard, smelled or felt by an observer.
4. A _____ is subjective and is described as something felt or reported by the patient
5. _____, or _____, refers to inadequate tissue perfusion or circulation of blood through an organ structure
6. _____ is often called *the silent killer*.
7. Almost all bleeding can be controlled by direct pressure.
 a. True b. False
8. Never instruct a caller to apply a tourniquet
 a. True b. False
9. Traumatic incident types should be assessed differently than medical chief complaints:
 a. True b. False
10. _____ is the most powerful treatment for most childhood injuries

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