**Hospital Triage Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_**

You and your partners are a team of physicians in the emergency room of Desert Metropolitan Hospital. It is about 8:30 pm on a Friday in July. You have been busy, as you usually are on summer weekends. Unfortunately, you are about to become even busier. You have just received a flurry of calls from local paramedics, and now you and your colleagues are preparing for an influx of patients suffering from a variety of illness and trauma injuries. The influx includes a helicopter carrying Monique and an ambulance carrying Nelson, the two canyon hikers discussed in the scenario, *A Sweltering Experience*.

Because there are many patients and only a handful of doctors, you cannot treat every patient at the same time. In the activity, *Hospital Triage*, your first task is to assess the severity of each patient’s condition and establish a “priority for treatment,” which is called triage. Triage is a process used in emergency rooms as well as in battlefields and disaster areas to assign the order for assisting patients and maximizing medical efficiency and success. You will need to use everything you currently know about the body’s normal homeostatic mechanisms to complete the triage. Keep in mind that there is not a single “right” answer for your medical team. The most important measure of your success in this Explore-Explain activity will be your team’s ability to explain the treatment choices that you will make.

**Part A Triage in the Emergency Room**

When you visit your doctor’s office, a medical professional first measures and records your vital signs including temperature, blood pressure, heart rate and breathing rate. Have you ever considered what your vital signs tell the doctor? Vital signs are body characteristics that can be measured quickly. They provide important information about major body systems. This information is particularly important for quickly determining when patients are experiencing severe trauma.

Read through the *Glossary of Vital Signs* in preparation for interpreting your patients’ conditions.

 ***Glossary of Vital Signs***

Vital signs are body charcterisitics that can be measured quickly. They provide important information about major body systems:

**Pulse** is the rate of the heart’s beating. It provides clues to how well the heart is functioning. It also indicates how well the blood is carrying oxygen and other important substances to the tissues including brain tissues.

**Blood pressure** is another indicator of circulation. It is measured at an artery and is usually represented as two numbers such as 125/85 (read as “125 over 85”). The first number (**systolic pressure**) is a measurement of the force of blood against the walls of the arteries, veins, and chambers of the heart as the heart contracts. The second number (**diastolic pressure**) is a measurement of the lowest pressure reached as the heart relaxes.

**Body temperature** can indicate how the body is responding to a disruption in homeostasis. An elevated body temperature may indicate a fever generated by the body to fight an infection. A low core body temperature indicates hypothermia or shock.

**Breathing rate** reflects how well oxygen is being delivered to the body it also is associated with heart rate and circulation.

**Breathing sounds** refer to the specific sounds identified in the lungs when a person takes a breath. The-se sounds should be observed with a stethoscope and recorded when taking a patient‘s respiratory rate. The presence of altered breathing sounds may suggest some form of respiratory complications. The five common breathing sounds include: clear, wheeze, stridor, stertor and crackle.

A clear breath is produced by the free-flow of air throughout an unobstructed respiratory tract (airway).

A wheeze is a high-pitched sound produced by a narrowed or obstructed airway. They can be heard best during exhalation and are commonly associated with conditions such as asthma and emphysema.

 A stridor is a higher pitched ―wheeze-like‖ sound heard when a person inhales; usually due to a blockage of air flow in the trachea or larynx. A stridor can be present as a result of laryngitis, tonsillitis or allergic reactions.

A stertor is described as a snoring sound with heavy breathing heard during both inhalation and exhalation that usually arises from the vibration of fluid or blockage around the throat (pharynx). A stertor can be a result of conditions such as pneumonia or bronchitis.

 A crackle is a brief, discontinuous, rattling sound caused by the explosive opening of the small airways. Crackles are normally a result of inflammation or infection of the lung‘s airways and more common during the inhalation than exhalation. A crackle can also be a sign of pneumonia or chronic obstructive pulmonary disorder (COPD).

**Oxygen saturation** (SpO2) is a measurement of the amount of oxygen carried by the red blood cells throughout the body. As blood is pumped from the heart into the body, it passes through the lungs where oxygen molecules bind to red blood cells. The percentage of red blood cells that are fully saturated with oxygen is called blood oxygen saturation. A standard blood oxygen saturation reading is between 95-100%.

Taken together, vital signs give the physician a quick view of a patient’s internal state, even if the patient is unconscious and cannot explain how he or she feels. These measurements vary over a relatively narrow range in healthy people, indicating that the body normally has precise control of internal conditions. When the vital signs are far outside the normal ranges, homeostasis usually is disrupted in the patient. Under these circumstances, the vital signs are direct indicators of problems with internal systems that are involved in maintaining homeostasis. Vital signs, however, usually do not indicate the precise cause of the disruption of homeostasis.

What determines the value of a “normal” vital sign? In figure 6.4 “normal” is defined by averaging the values found in healthy people. Occasionally, healthy individuals have normal reading that are outside of these average ranges. For example highly trained athletes may have low resting heart rates. Normal ranges of vital signs also vary by sex and age. Many young people have systolic blood pressure lower than 100 millimeters of mercury (mm Hg). In general, blood pressure is evaluated in relation to to other vital signs and the patient’s age and condition. For the purposes of this activity, assume that the normal state for each patient is within the normal ranges listed in the table.

Figure 6.4



1. **Visit each vital sign station to measure and record your own vitals.**

**Explore Your Own Vital Signs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Vital Sign** | **Definition** | **Standard Range** | **Your Vitals** |
| **MP900321093[1]Temperature** | The measurement between heat lost and heat produced by the body | 98.6 °F (37.0°C) |  |
| **Heart Rate/Pulse**  | The number of times the heart beats per one minute | 60-100 beats per minute |  |
| **Respiratory Rate MC900212125[1]** | The number of breaths taken per one minute | 10-18 breaths per minute |  |
| **MCHM00386_0000[1]Breathing Sounds** | The specific sounds identified in the lungs when a person takes a breath | Clear and unobstructed during both inhalation and exhalation | ClearObstructed* Wheeze
* Stridor
* Sterdor
* Crackle
 |
| **MC900437091[1]Blood Pressure**  | The force of circulating blood pushing against the walls of the blood vessels. Blood pressure readings consist of two numbers. The top number is the **systolic blood pressure**: the highest level the blood pressure reaches when the heart beats (contracts). The bottom number is diastolic blood pressure: the lowest level the blood pressure reaches as the heart relaxes between beats.  | 90-100 mmHg 60-80 |  |
| **Oxygen Saturation** | The measurement of the amount of oxygen carried by the red blood cells throughout the body. | 97-99% |  |

**Part A Triage in the Emergency Room Continued**

1. **Read the handout, *Patients’ Vital Signs: Preliminary information*, as a team. Briefly discuss the condition and future outlook of each patient.**
	1. *Pay particular attention to the description of each patient’s injury or illness*
2. **Divide your triage team to work in pairs. Each pair should complete the following tasks for half of the patients, using the *Triage Data Sheet* handout:**
	1. **Task 1: Record the vital signs of each patient and mark whether they are within or outside normal ranges. Use a checkmark to indicate vital signs that are within normal limits. Use an X to indicate those that are outside normal limits.**
	2. **Task 2: Identify the body systems that are most likely disrupted by each patient’s injury or illness.**
3. **How will your team decide whom to treat first? Read the *Patient Assessment Guidelines*. As you read, note whether any of your patients has an airway obstruction, critically impaired breathing or circulation, shock or hyperthermia.**

***Patient Assessment Guidelines***

1. All emergency care begins with the ABCs. Make sure there is an open airway, that the patient is breathing, and that the patient has adequate circulation.
	1. *Airway*. Remove obstructions from the mouth, if necessary. Move the tongue if it is obstructing the airway. Close opening such as the nose or wounds that prevent the lungs from filling air
	2. *Breathing*.Restore breathing by artificial resuscitation. (In artificial resuscitation, another person or device can temporarily provide air to a patient.) Or administer oxygen, if necessary.
	3. *Circulation*. Checking and restoring circulation take priority over airway and breathing. Restore heartbeat by cardiopulmonary resuscitation (CPR), if necessary. CPR is a technique in which another person temporarily provides air and heart contractions for a patient whose heart has stopped beating or si no pumping blood effectively. Stop blood loss from serious wounds.
2. Look at the patient and assess his or her injuries. Immobilize any injuries to the neck. The patient may become paralyzed if you initiate any movement. Always suspect neck injuries when there is extensive injury to the head or face.
3. Check the patient for **shock**. This condition is extremely serious and life threatening. It occurs when blood flow to the tissues drops to a dangerously low level. Often, shock is accompanied by very low blood pressure. When a person is in shock, the circulatory system no longer delivers adequate supplies of oxygen and nutrients to the tissues. Shock can result from failure of the heart to pump vigorously enough. It can also result from serious blood loss or from a reduction of effective blood volume due to pooling in the capillaries or to dehydration.

Shock due to reduced blood volume can be treated by elevating the feet, by using pressure suits that force blood from the extremities (arms and legs) back into the body core, or by infusing blood or saline solution into the circulatory system. Shock due to weakness of the heart or damage to the circulatory system may require medication or mechanical devices that assist circulation.

1. Check the patient’s temperature. The hypothalamus normally controls internal body temperature. If this control is lost, the core body temperature can rise to dangerously high levels, a condition known as **hyperthermia**. Extreme hyperthermia can kill cells, particularly brain cells. In these cases, external measures must be taken, such as rubbing the patient with ice to bring the body temperature back within normal limits.

Conversely the body can cool to dangerous levels. This is a condition known as **hypothermia**. Hypothermia can occur when people are cold and wet for a long period of time. Rapid evaporation of water can cool a person quite quickly, even if the air temperature is not extremely cold. In such cases, the body must be warmed slowly to bring it back within normal limits.

1. Consolidate your assessment by designating the patient’s condition as critical, serious, or stable. “Critical” indicates that the patient has a life-threatening condition. “Serious” indicates that the patient has a condition that causes a loss of normal function. “Stable” indicates that the patient’s condition will not change quickly and that a delay in treatment would not cause further harm.

**5. Complete the next 3 tasks as a group of 4.**

**a. Task 1: Compare all your patients and, as a team, decide treatment priorities for each patient. Assign treatment priorities of critical (+++), serious (++), or stable (+) to each patient and record on the *Triage Data Sheet*.**

**b. Task 2: Suggest initial triage treatments and explain your priority choice for each patient. Write a brief justification for the treatment priority your assigned each patient.**

**c. Task 3: Decide the order that patients should be given their triage treatment. Consider how many of the patient’s vital signs are in the serious range and how fast you think the patient may be declining. In the first column, next to the patient’s name, write the number that corresponds to the order of treatment your team agrees on.**

**Part B Triage in the Emergency Room – Let’s Get More Information**

While you were performing your triage evaluation, hospital staff continued to monitor the patients’ vital signs. This new information will help you reprioritize the order of care.

1. Read the *First Priority* handout. Discuss the importance of the new information about Monique, Nelson and Albert.
2. With your team, reevaluate the order you should treat each remaining patient. Record your order of priority in the “part B modified priority” column of the *Triage Data Sheet*. The new order may be different from the order you wrote in the first column.
3. Record your reasoning for the rankings you made for part B.
4. Read the *Additional Information* handout to learn the outcome of your secondary triage decisions.
5. What is the long-term outlook for each patient, now that each has moved out of the emergency room. What is your reasoning? For example, you might think that some patients will recover completely, others will recover slowly and may suffer long-lasting effects, and other may never recover and even die because of their injuries or illnesses.

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Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_\_\_\_\_\_

Triage in the Emergency Room - Analysis

1. Why are vital signs so valuable in quickly assessing a patient’s condition?
2. Explain how a head injury, such as the one Albert suffered when his motorcycle crashed, could affect several body systems at once but leave others unaffected.
3. Monique and Nelson both had very high temperatures when they were brought into the emergency room. Why do you think Monique’s heart rate was high and Nelson’s heart rate was low?
4. Why was Monique likely to survive if she received treatment in time, but Nelson died in spite of the priority he was given?
5. What, if any, nonmedical considerations did you use to rank the patients? Explain your response.
6. In 1 or 2 paragraphs, compare and contrast an illness or injury that the body can recover from on its own with one that requires medical intervention. Explain how the responses of internal body systems that are necessary to maintaining homeostasis differ in the 2 situations.
7. Compare and contrast the process of triage with the process of scientific inquiry.