

First aid at school

Learning objectives

You will be able to gain proper understanding and explain:

- What vital signs mean, and assess them correctly.
- How to care for minor injuries and illnesses that may happen around you.
- Rest, Ice, Compression, and Elevation (RICE) method for injuries.
- The importance of cardiopulmonary resuscitation (CPR) and Automated external defibrillators (AEDs), and practice using them.

In this chapter, you will learn about injuries and illnesses that may happen around you, and how to observe and provide care. Here we will focus on minor injuries and illnesses for which children can provide care by themselves. Specifically, we will look at injuries such as those of limbs, and illnesses such as abdominal pain, diarrhea, headache, and fever. In addition, you will also learn about **vital signs** as an important measure of the level of urgency of a particular sickness.

Since teachers are not medical experts, this chapter covers **first aid for laypeople**. Understanding what is included in first aid can vary among different countries and regions. For the purpose of this chapter, **the International First Aid and Resuscitation Guidelines 2016¹** are used as a primary reference.

1. Necessities for learning first aid

First aid is the immediate assistance provided to a sick or injured person until professional help arrives. You never know when or where an injury or illness can happen. Some injuries and illnesses are **time sensitive**. In a time-sensitive situation, it may be too late if you wait until the ambulance arrives. If someone present (i.e., a bystander) happens to have knowledge and skills of first aid and is able to respond quickly, it may save a life.

Some injuries and illnesses are medical emergencies and require immediate care, while others are not so time sensitive. In Cambodia, there are situations where it takes time for one to reach a hospital. Even if a person is not in a life-threatening situation, providing proper care can help prevent an injury or illness from becoming worse and alleviate pain. It is therefore important to learn **first aid knowledge and skills**, even for the general public.

Teachers, besides being members of the general public, are in a position to keep children safe at school. School is a place where children of different ages learn in groups, a circumstance which can give rise to an unexpected injury. For these reasons, teachers need to learn first aid. In addition, school is one of the places best suited to learn about first aid, not only for teachers but for pupils/students and their

parents and guardians, as well as other members of the community at large.

2. Vital signs

Vital signs are basic indications (signs) of the human body's life-sustaining (vital) functions, indicating the maintenance of basic physiological functions that are necessary for a human body to survive. Specifically, vital signs refer to the **level of consciousness, respiratory rate, pulse rate, blood pressure, and body temperature**. Assessment of these signs, i.e., performing a **vital sign check**, provides a measure of a person's physical condition.

Vital signs are affected by factors such as age and gender. They also constantly fluctuate to some degree with daily activities such as exercise and food intake. Nevertheless, a sudden change in a vital sign may indicate the presence of a threat to life, and knowing the correct ways of measuring vital signs and their reference ranges is critical when you provide first aid. It is also useful to be familiar with your normal respiratory rate, pulse rate, blood pressure, and body temperature, for it helps detect any abnormalities in your body based on your vital signs.

1) Consciousness

Being medically **conscious** means that one is able to respond properly to stimuli from within one's body or from the outside world. One's state of consciousness is assessed based on both one's state of alertness and cognitive function.

To assess someone's consciousness, you talk to the person, saying, "Mr./Ms. ●●, are you OK?", gently shake their shoulder, or apply a mild pain stimulus (**Figure 15.1**). Because the brain is responsible for consciousness, a **decreased level of consciousness** is a sign that there is a problem with the brain, making it a medical emergency.



Figure 15.1 Assessing consciousness

There are many scales used to evaluate impairment of consciousness. Here we pick one that is commonly used globally, called the **Glasgow Coma Scale (GCS)**.² On the GCS, lower total scores indicate lower levels of consciousness. A GCS total score of 15 or higher indicates the person is fully

conscious, while scores of 13–14 indicate mild impairment of consciousness, and 12 or lower, semicomatose or coma (Table 15.1).

Table 15.1 Glasgow Coma Scale (GCS)²

Eye opening response (E)	Opens spontaneously	4
	Opens to voice sound	3
	Opens to pain / pressure	2
	None	1
Best verbal response (V)	Oriented	5
	Confused	4
	Inappropriate words	3
	Incomprehensible sounds	2
	None	1
Best motor response (M)	Obeys commands	6
	Localizes pain	5
	Normal flexion / withdraws to pain	4
	Abnormal flexion	3
	Extension	2
	None	1

Column: What is orientation?

Orientation is one's capability to grasp and understand the situation in which they are placed, such as the time now, and why they are there. In order for one to have good mental orientation, there should be no significant damage done to their function in terms of consciousness, perception, attention, memory, and thoughts, at the very least. If people have impaired consciousness or memory problems due to organic brain disorders, they have become "disorientated." They lose their sense of place and identity, or time and date.

2) Respiration

Respiration involves bringing oxygen, which is required to produce energy to sustain life and perform activities, into the body through inhalation, and flushing carbon dioxide, which is generated as a metabolic end product, out of the body through exhalation (see Chapter 2). Low respiratory rates and shallow respiration indicate inadequate oxygen intake. You assess respiration based on the measurement and rhythm of respiration, by looking at the movements of the chest and abdomen per minute. Poor respiration results in the face or lips turning dark purple. If one shows such symptoms (i.e., cyanosis), assess their respiration very carefully. Special attention is required in a case of very high (20, 30, 40, and

60 breaths per minute or more in adults and adolescents, children, infants, and neonates, respectively) or very low (10, 15, 25, and 40 breaths per minute or fewer in adults and adolescents, children, infants, and neonates, respectively) respiratory rates.¹

3) Pulse

A **Pulse** is a palpable wave of blood that is sent into the aorta by the pumping action of the heart as the left ventricle contracts, and which travels through the arterial system of the body (see Chapter 2). A slow pulse rate or an irregular pattern indicate abnormalities in the heart or the circulatory system. The pulse may be palpated through the walls of a peripheral artery. The pulse is typically taken at the **radial artery** (Figure 15.2). To take the pulse, you place the tips of your index, second, and third fingers on the artery of a subject and count the beats for a period of 1 minute. While doing so, you also assess the rhythm, amplitude, tension, and quality in addition to the number of beats. When one is in shock, it may be difficult to take the pulse at the radial artery. In such a case, you take the pulse at the **carotid artery** (Figure 15.2). If the pulse is not palpable, immediate **cardiopulmonary resuscitation (CPR)** is required. Reference ranges for pulse rate vary among different organizations and authorities, but they are typically **70–90 pulses per minute for children of school age**, and a rate of lower than 50 pulses per minute or 120 pulses per minute and higher should be considered a medical emergency.³

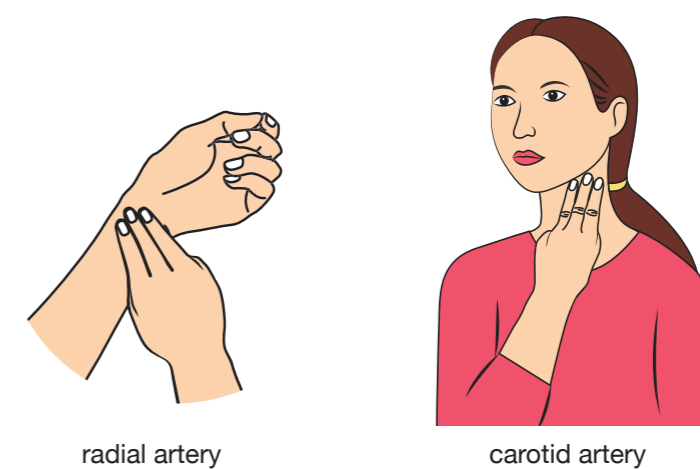


Figure 15.2 Points to take pulse

4) Blood pressure

Blood pressure is the pressure of circulating blood against the walls of arteries. The pressure of blood against the arterial walls as the heart contracts is called the **systolic pressure**, while that of blood as the heart relaxes is called the **diastolic pressure** (see Chapter 2). The higher the cardiac output is, and the higher the peripheral resistance is, the higher the blood pressure becomes. Decreased blood pressure indicates abnormalities in the blood circulation. Meanwhile, hypertension serves as an indicator of progression of arterial stiffness. As blood pressure varies depending on age, gender, ethnicity, and

measurement conditions, the **parameters of hypertension** are determined by individual organizations and authorities.

WHO defines hypertension as follows:

“Hypertension is diagnosed if, when it is measured on two different days, the systolic blood pressure readings on both days are ≥ 140 mmHg and/or the diastolic blood pressure readings on both days are ≥ 90 mmHg.”⁴

Blood pressure is measured using a sphygmomanometer. There are several types of sphygmomanometers; they may be aneroid or digital sphygmomanometers, and sites of placement may include an upper arm, wrist, or finger.



Figure 15.3 Examples of digital sphygmomanometers

5) Body temperature

Body temperature refers to **internal body temperature**, and values vary depending on the site used for measurement. While body temperature may be measured in the rectum, in the mouth, or at the tympanic membrane, it is commonly measured in the axilla. **Axillary temperature** is skin temperature, and is therefore lower than internal temperature by about 1°C . When taking measurements, wipe any sweat off first, then place the thermometer under the arm, angling it so that its tip is in the deepest crease of the armpit, as shown in the picture (Figure 15.4). Body temperature varies among individuals, and it is important to assess the temperature by taking one's normal temperature into account. A temperature of 38°C (100.4°F) or higher is considered a fever.¹

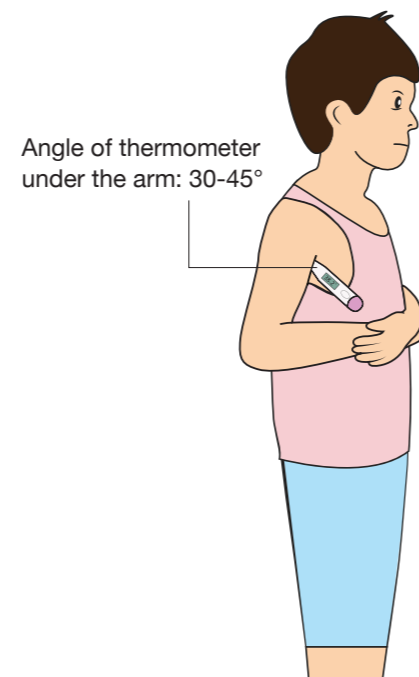


Figure 15.4 Taking body temperature

Column: Non-contact body thermometer

With the onset of the COVID-19 pandemic, “non-contact” body thermometers are becoming increasingly more common. Such thermometers measure the amount of infrared radiation emitted by a human body and convert it into a temperature. They offer great convenience, for you can use one to take the body temperature hygienically and quickly. However, due to the space between the sensor and the object of measurement, temperature readings may be affected by the air condition, and may not be accurate under measurement conditions. It is recommended that you follow manufacturer's instructions, and if the reading is not in agreement with the observed conditions (e.g., you feel hot but the temperature reading is low), you should take another measurement using an axillary thermometer.

3. First aid procedures

First aid procedures are as follows: **observation, assessment, and care.**

1) Observation

First aid begins with **observation**. You make an assessment by **listening (interview)**, **looking (visual examination)**, and **touching (palpation)**. Listening means that you ask about the circumstance in which an affected person's injury or illness occurred (when, where, why, what, how). Looking means observing the person's general condition and the state of injury or illness very closely. Touching means placing your hand over the affected area and assessing any skin swelling, heat sensation, or tension. Vital signs are also a critical part of observation.

2) Assessment

Based on the information obtained through listening, looking, and touching, as well as the vital sign values, you make an assessment. **Teachers are laypeople and not healthcare professionals**, and are not able to make a diagnosis. Nevertheless, you can infer the injury or illness, and take action accordingly. First, you **determine the level of urgency**. If the case is urgent, the affected person should seek medical attention immediately. If it is not very time sensitive, then you provide care according to the symptoms. Urgent conditions of sickness include a lack of consciousness, stab or gunshot wounds to the head, chest, neck, or abdomen, fractures of the pelvis or the femur, amputations of limbs, and burns covering a large area.³

3) Action

Based on the assessment that has been made, take action. How to provide care according to the symptoms will be discussed in the following section.

Column: What is shock?

Shock is an acute syndrome in which an attack to a living body or the response of body to the attack has caused a failure to maintain blood flow to vital organs, resulting in a disturbance in cellular metabolism or damage to organs, potentially threatening to the life of the person. If shock progresses, it can cause malfunctions and result in death; if any symptom of shock is observed, urgent action is needed in response. Symptoms of shock include pallor, writhing movements, cold sweat, impalpable pulse, and decreased blood pressure.

4. Appropriate first aid care for different situations

1) First aid for injuries

(1) Head trauma

Head traumas vary widely depending on the site and extent of injury, ranging from severe to mild. Examples of severe cases of head trauma include a fracture of the skull, and a concussion caused by a jolt to the head. Some symptoms, such as acute epidural hematoma, may appear several days later.

Common steps that should be taken are as follows. First, find out how the injury occurred. Since the injured person may not know everything that has occurred, seek information from other people who have been on the scene. Knowing how it occurred will help you determine the severity of the injury. Next, check the vital signs, especially the level of consciousness. If there is any vital sign abnormality, transfer the person to a healthcare facility as quickly as possible. If there is any wound, stop the bleeding and protect the affected area, as appropriate for the type of trauma. If there is swelling, cool the affected area. In cases of head contusion, symptoms may worsen gradually; the injured person should be placed at rest for 24 hours with their conditions monitored. Symptoms to look out for during this 24-hour period include vomiting, seizures, headache, numbness of the limbs, and vision problems. If any of these abnormalities is observed, seek medical attention immediately.

(2) Facial trauma

Features projecting from the face, such as the forehead, nose, mouth, and cheeks are more prone to facial trauma. One type of facial trauma that requires particular attention is **ocular contusion**. Cases of ocular contusion can become severe, as it can involve damage to the retina or a fracture of the bone under the eye, which is thin and prone to fracture. Assess the injured eye by comparing it to the other, uninjured eye, focusing on any bleeding, eye movement, and change in vision. If the injured person has anything wrong with eye movement, double or blurry vision, or constriction of visual fields, seek medical attention

immediately.

Column: Management of nosebleeds

Most nosebleeds are caused by picking of the nose or scratching it with fingernails. Bleeding often occurs in the 1-cm area at the front of the nose (i.e., **Kiesselbach's area**). To care for a nosebleed, have the injured person tilt their head down slightly, pinch the nose around Kiesselbach's area between the thumb and index finger, and press firmly towards the back of the nose (Figure 15.5). Bleeding should normally stop after around five minutes. Tipping the head up may cause blood to run down the throat; tilting the head down is preferable. A nosebleed as a result of trauma may indicate a potential fracture of the nasal bone; cool the nose with a wet towel and seek medical attention.

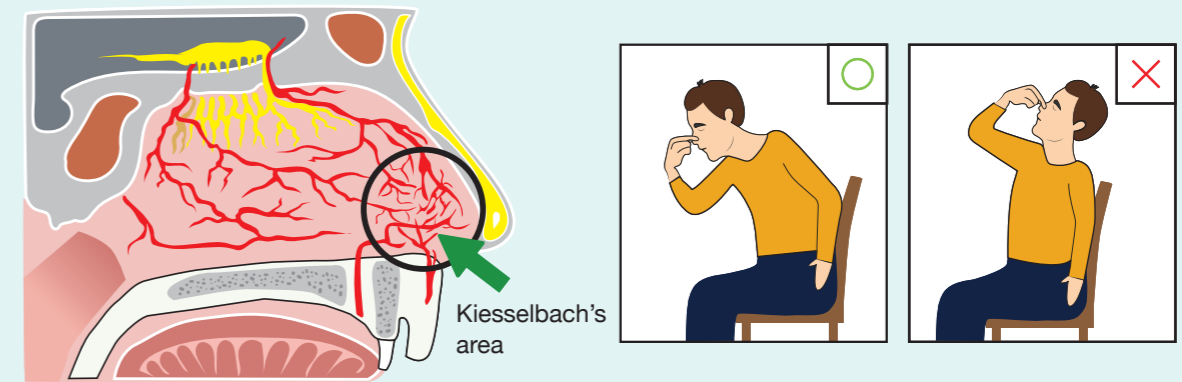


Figure 15.5 Points to apply pressure

(3) Chest or abdominal trauma

In the case of chest or abdominal trauma, it is possible that internal organs may be damaged. Assess the injured person's general condition, focusing on the vital signs. It is also helpful to ask about the cause of the contusion in making necessary decisions. If the injured person has any vital sign abnormality, complains of intense pain, or has symptoms of shock, seek medical attention immediately.

(4) Limb trauma

a) Wounds

Wounds include **abrasions, cuts, puncture wounds, and bites**. An abrasion is a wound where an area of the epidermis is damaged due to external friction. A cut is a line of damage to the skin caused as a result of a sharp object moving on the body surface. A puncture wound is a puncture caused by the stab of a sharp object into the skin. A bite is a wound caused by the teeth of an animal or a human (**Figure 15.6**).

The basics of care are: **rinse** the wound, **stop the bleeding**, and **protect** the wound (**Figure 15.7**).

First, rinse the wound with clean water. As any foreign matter remaining in the wound can make it susceptible to suppuration, rinse the wound carefully with clean water to wash off any foreign matter or

bacteria around the wound. This may also help stop bleeding more quickly, as the cold water cause the capillaries to constrict. It is preferable to use tap water to rinse the wound; if you have no access to clean water, however, bottled water or tea with no sugar added may be used in its stead. In the absence of clean water, using an antiseptic may be beneficial. Do not use pooled water to rinse a wound as it may potentially be contaminated with pathogens.

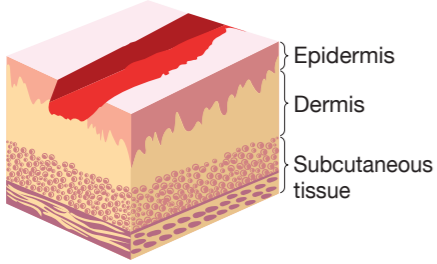
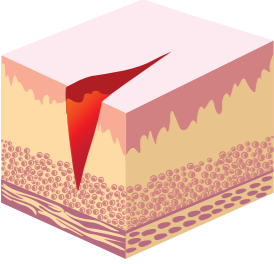
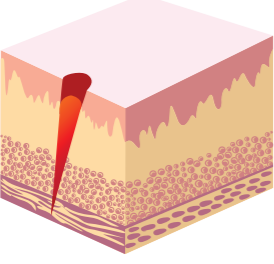
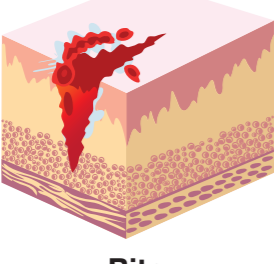
Type	Characteristics / keys to treatment
 <p>Abrasion</p>	<p>An abrasion is a wound where an area of the epidermis is damaged due to external friction. The surface of the wound is scraped off, leaving it irregular; this often causes foreign matter to remain in the wound, making it susceptible to infection. It is important to rinse any foreign matter off thoroughly.</p>
 <p>Cut</p>	<p>A cut is a line of damage to the skin caused as the result of a sharp object moving on the body surface. A cut left open is susceptible to infection. It is advisable to cover the wound by holding the skin on either side of the cut so that the cut is closed, and securing it with a strip of surgical tape.</p>
 <p>Puncture wound</p>	<p>A puncture is caused by the stab of a sharp object into the skin. A wound may be small in area, but if it is deep, it may have caused internal damage. A wound caused by a rusty or contaminated object can result in tetanus infection, which is caused by anaerobic bacteria; check the vaccination status and seek medical attention.</p>
 <p>Bite</p>	<p>Caused by an animal or a human. A bite with sharp teeth in particular can cause deep tissue destruction. In addition, animals may harbor various bacteria and viruses in their mouth, which may result in not only wound infection but animal-borne infection as well. Provide first aid, and make sure the injured person seeks medical attention without fail.</p>

Figure 15.6 Major types of wounds, their characteristics and treatment

Stop the bleeding, if any. Cover the wound with a clean cloth (preferably gauze), and apply pressure directly over the dressing. Blood has a **coagulation mechanism** (i.e., platelets form a plug the rupture of the blood vessel, followed by the action of coagulation factors, which forms a fibrin clot). Most injuries are bleeding from capillaries or small veins (i.e., blood oozing out), and this can be stopped by simply applying pressure. In the case of bleeding from an artery, however, blood spurts out and thus cannot be stopped by direct compression alone; seek medical attention as soon as possible.

Once the wound has been rinsed clean and the bleeding stopped, apply a clean cloth (preferably gauze) over the wound and secure it with a strip of surgical tape to keep the wound clean and prevent it from drying out. Change the gauze as appropriate if it is contaminated by blood or effusion.



Figure 15.7 Keys to caring for wounds

Column: Special considerations when treating bleeding

Some infectious diseases, such as hepatitis B and AIDS, are transmitted through blood. When caring for a person who is bleeding, wear vinyl gloves or use plastic bags, taking care not to come in direct contact with the injured person's blood. In the event of having contact with blood, wash it off with water immediately.

There is no problem for a victim to touch one's own blood; it may be advisable to occasionally have an injured child try to stop the bleeding, so long as the injury is minor.

Column: Management of outdoor injuries caused by animals or insects

• **Snake bites**

Squeeze out effusion (blood) from the snake bite wound, rinse it thoroughly, and cover it with a clean cloth. Keep the wound location at a level below the heart, and keep the person still. If one is bitten by a venomous snake, one will experience intense pain and a burning sensation immediately following the bite, and the site of the bite will start swelling. When you are unsure if the bite has been made by a venomous snake, yet the injured person suffers from intense pain and significant swelling, seek medical attention without delay in case it was indeed a venomous snake bite. If you know what kind of snake it was that made the bite, inform the staff at the hospital.

• Animal bites

Animals harbor various bacteria in their mouths, and their bites may potentially cause the wound to become suppurative or lead to **tetanus**. A bite by a stray dog or cat can result in **rabies**. In Cambodia, there are approximately 800 deaths a year from rabies, and 40% of the victims are those under the age of 14.⁵ In the case of an animal bite, it is important that the wound be rinsed with clean water and protected with clean cloth (gauze), and that the injured person seek medical attention without delay.

• Bee stings

Pinch the sting site firmly and rinse the wound, squeezing out effusion (blood). Remove the bee stinger, if it is left behind. When doing so, exercise caution and avoid grabbing the stinger, as it may cause the venom to be released into the body of the person stung. It is advisable to cool the sting site with a wet towel.

With a person who has in the past received a bee sting and experienced symptoms such as rash and nausea, another sting may trigger **anaphylactic shock**. Anaphylactic shock is a medical emergency, and a stung person should be monitored for about 30 minutes following the sting (see Chapter 5).

Outdoor injuries caused by animals and insects are preventable. Familiarize yourself regularly with information concerning areas infested with snakes, bees, etc., and avoid places where one may potentially encounter them. Give children guidance on clothing and precautions to take when going outdoors. It is also important to take public health measures such as wild dog control and canine rabies vaccination.⁵

b) Contusions, sprains, fractures, and dislocations (Figure 15.8)

A **contusion** is a condition in which a strong impact due to a fall, collision, etc., inflicts damage to the tissues beneath the skin even without a wound on the surface of the skin, causing **internal bleeding**. As it can occur in any area of the human body, it is necessary to have an accurate understanding of the level of risk and its characteristics.

A **sprain** is a condition in which force is applied to a joint, causing damage to periarticular tissues such as tendons, ligaments, or cartilages. A sprain often occurs in the ankle. In particular, a form of sprain where the foot turns inward, causing the damage to the outside of the ankle, called an **inversion sprain**, is quite common.

A **fracture** is a broken bone caused by the application of force greater than the bone strength. In cases of growing children, an incomplete fracture in which the bone is bent or cracked is quite common, in addition to a complete fracture in which the bone is broken completely.

A **dislocation** is a condition in which the articular surface of the head of a bone and that of the socket of another have shifted from their normal locations due to external force and become stuck in abnormal locations. A dislocation commonly occurs in the shoulder, elbow, finger, and jaw joints.

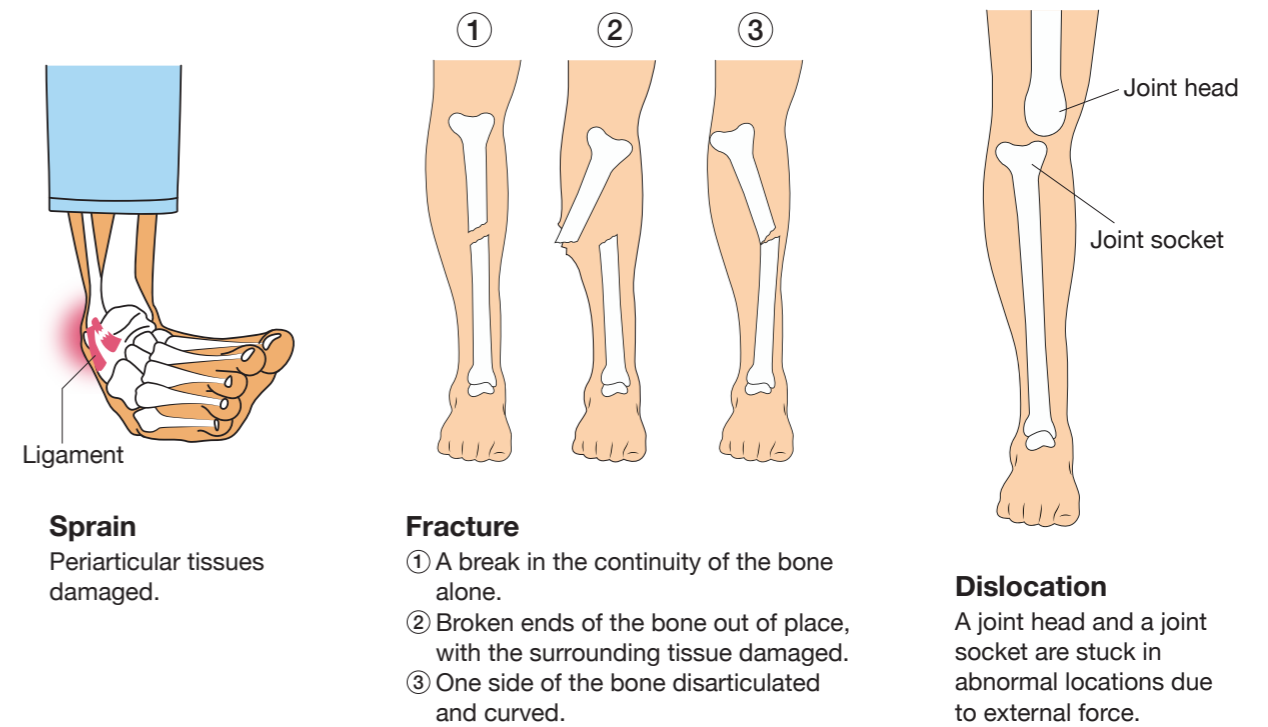


Figure 15.8 Differences between sprains, fractures, and dislocations

c) The RICE method for treating injuries

The basics of care for these conditions are: **Rest, Ice, Compression, and Elevation (RICE)** (Figure 15.9).

Rest refers to resting the affected area. It helps to reduce the movement of the injured site and relieve pain, as well as reducing bleeding (internal bleeding) and swelling. Make sure the injured person moves or rests in a position that prevents any weight from being put on the injured site.

Ice refers to cooling the affected area. It promotes the constriction of the blood vessels in tissues of the affected area, minimizing the progression of bleeding (internal bleeding) and reducing swelling. It also helps reduce pain from the injury. It is advisable to use iced water at 0°C or so to cool deeper parts efficiently. Place ice cubes and water in a plastic bag, and apply it to the affected area. Ice the area for around 15–20 minutes; stop when the injured person experiences a loss of sensation on the skin, and resume the icing when they regain the sensation. Repeat this process for the first 72 hours after injury, which is considered the acute stage.

Compression involves application of an appropriate level of pressure over the affected area, which prevents cellular fluid in tissues from flowing into other areas, thus reducing bleeding (internal bleeding) and swelling. Pay attention to the degree of pressure applied, as overly tight compression can compromise blood circulation. Check the color of the tips of the digits and measure their temperature as appropriate to ensure that blood circulation is not compromised.

Elevation refers to keeping the injured area above the level of the heart. This facilitates the return of blood flow to the heart, helping to reduce bleeding (internal bleeding) and swelling.

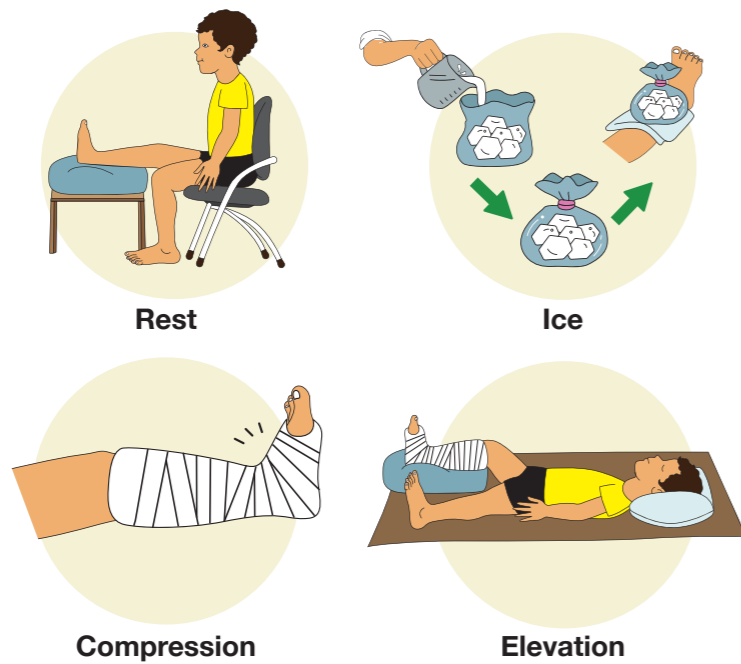


Figure 15.9 RICE method for treating injuries

Column: Preparedness for injuries at school

Children can get injured at school. To avoid panicking in such eventualities, it is important that schools have a response system in place in advance. Specifically, arrangements for emergencies should be made, including who will provide care, who will contact parents, and what to do when an injured child needs to be transported to hospital. Individual communities may or may not have a healthcare institution, and may have different approaches to care (e.g., schools with only male teachers may not provide care to girls, parents or guardians of children cannot afford medical fees); it is recommended that schools work together with parents/guardians and local specialist organizations to build such a system.

Column: First aid in school

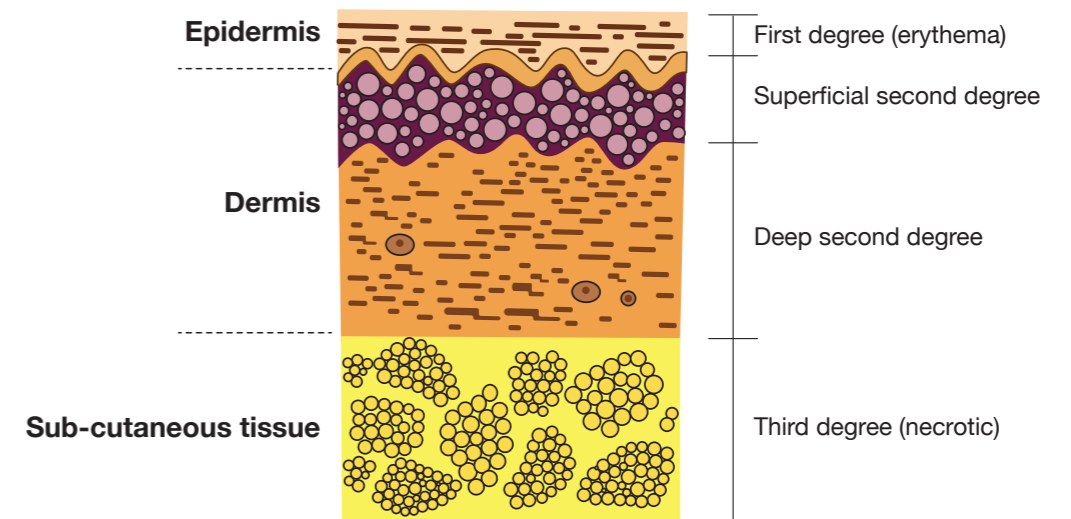
You are advised to have a first-aid kit of basic items including thermometers, nail clippers, adhesive bandages, face masks, gauze, surgical dressing, and antiseptics, so that you can respond to injuries or other health problems. That being said, first aid provided at school is a procedure to temporarily keep an injury or illness from worsening and relieve pain, and is not medical treatment. As a matter of principle, **a teacher, who is not a healthcare provider, should not use pharmaceutical products.**

One of the pillars of the National School Health Policy 2019 is the establishment of “health rooms” to provide first aid. This suggests that schools in Cambodia are slowly starting to implement school nurse’s offices (see Chapter 1). It is advisable that a health room or its equivalent be equipped with what they need to provide first aid, including first-aid kits, treatment tables, chairs, and cots. In addition to providing first aid, a health room serves as a school health center as they keep a record of health room visits and identify when, where, and what types of injuries and health problems have

occurred, as well as assessing children’s growth on an ongoing basis (through health check-ups) and sharing health-related information.

(5) Burns

A **burn** is damage to skin tissues caused by heat. Pain may persist and worsen with time. Burns are classified as first-, second-, and third-degree burns (I, II, III), depending on the depth of tissue damage (Figure 15.10). That said, the severity of a burn is determined not only based on how deep the skin damage is alone but in combination with how large the area affected is. The larger the affected area is, and the deeper the damage penetrates, the severer a burn is.



First degree (I)	<u>Damage to the epidermis.</u> The site appears red on the surface; symptoms include stinging pains and burning sensation. Sunburn is an example of first-degree burns.
Second degree (II)	<u>Damage extends into the dermis.</u> Includes two subcategories: superficial dermal burns and deep dermal burns. The site appears red on the surface, with the presence of blisters. With a superficial second-degree burn, the affected person will experience the same subjective symptoms as those with first-degree burns, while a deep second-degree burn is less painful due to the damage caused to the sensory nerves.
Third degree (III)	<u>Damage to all skin layers,</u> involving the subcutaneous tissues. The site appears white, and painless.

Figure 15.10 Classification of burns

To care for a burn, cool the affected area with water as soon as possible. For a site that cannot be cooled with water, apply a cool, wet towel. Do not use ice directly on the site, as it can cause damage to the skin. Cool the site until the pain eases. After cooling, protect the wounds with gauze or other dressing. Do not break any blisters, as they serve to protect the wounds. A burst blister can lead to bacterial infection. Seek medical attention for a second-degree or severer burn that covers a wide area, or a third-degree burn. If a person sustains a burn with clothes on, taking the clothes off may cause damage to skin tissues; do not remove the clothes but cool the affected area over the clothes, and seek medical attention promptly.

Column: Care for injuries provides an opportunity for health education

According to the International first aid and resuscitation guidelines 2016,¹ we need to teach children how to provide first aid not only in school health classes but also in other classes, and using a variety of other opportunities as well. Teachers may find themselves in a position to provide care for a child who was injured at school. Rather than stopping at simply providing care, you can instead take it as an opportunity for children to think about prevention of and response to injuries. For children, doing so when they have just gotten injured will drive the point home to them, giving them a chance to learn something they will be able to use in years to come.

2) First aid for illnesses

(1) Abdominal pain / diarrhea

Abdominal pain or diarrhea is often caused by a digestive problem. However, some may complain of abdominal pain caused by a urinary or gynecological problem. For these reasons, it is necessary to perform thorough assessment and vital sign checks to determine the level of severity.

First, observe the characteristics of the abdominal pain a person experiences, and ask whether or not he/she has symptoms such as vomiting and diarrhea. Ask the person about his/her experience with meals, urination, and for females, menstruation. If the person suffers from frequent vomiting or diarrhea in addition to abdominal pain, suspect infectious gastroenteritis (see Chapter 7). If it is not an urgent case, keep the sick person at rest and monitor their conditions. If he/she is experiencing diarrhea, have him/her replace lost water and salts (electrolytes) in small, frequent amounts to avoid dehydration.

Column: Disposal of bodily waste / vomit

School is a place where people live their lives in groups, and it is necessary to properly dispose of human bodily waste or vomit as a source of infection. Failure to dispose properly of bodily waste or vomit may potentially lead to widespread infection (such as norovirus infection). It is therefore necessary for teachers to be able to dispose of them properly. The disposal procedures are as follows (Figure 15.11).

- i) Put on protective equipment (wear a mask and vinyl gloves at minimum; single-use masks and gloves are preferable). In the case of a closed space, ventilate the space.
- ii) Wipe up bodily waste / vomit with paper towels, working inward to prevent spreading.
- iii) Put the collected bodily waste / vomit, as well as the paper towels used, immediately in a plastic bag, seal tightly, and dispose of it.
- iv) Disinfect the areas that have been soiled with bodily waste or vomit, using a disinfectant. Vomit tends to spread over a wide area; disinfect a 2-meter circle from its center, working inward. Dispose of the paper towels, mask, and gloves used in a plastic bag.
- v) After completing the process, wash your hands with soap and gargle.

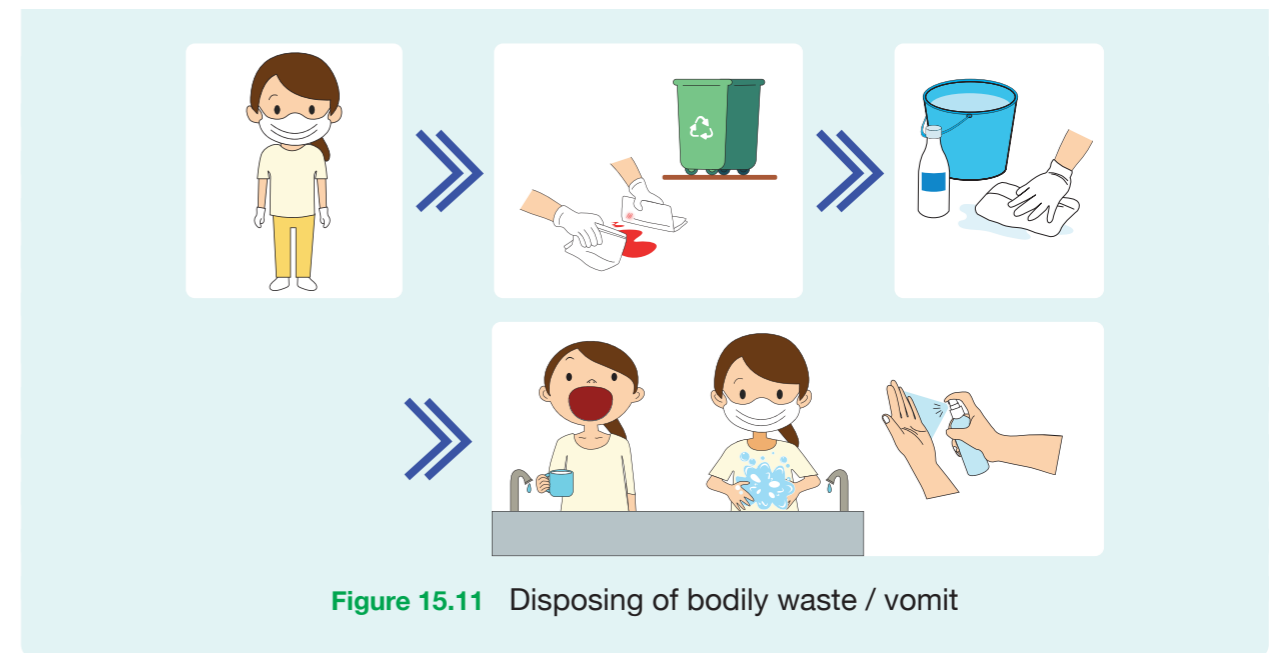


Figure 15.11 Disposing of bodily waste / vomit

(2) Headache

Headache may occur due to a variety of factors. Check the vital signs of the sick person, and ask about the characteristics of the headache in detail (i.e., when did it start? What kind of headache? How long has it been going on?).

First of all, check for any trauma. If the person has trauma, and experiences vomiting and impaired consciousness, it is a medical emergency. Headache accompanied by high fever and seizures also requires particular attention. Check for a runny nose and assess the condition of the throat, too, for ear, nose, and throat problems can also be a cause of headache.

If the sick person has normal vital signs and only mild symptoms, keep him/her at rest and monitor their conditions. Since headache may be caused by irregular lifestyle habits, including lack of sleep and eyestrain, it is also important to review his/her daily life.

(3) Fever

Fever is an inflammatory response to various virus or bacterial infections. Check the vital signs and observe the general condition of the sick person. In general, a fever of 38°C or higher is considered to be high. One has the chills as their body temperature goes up. During fever, have the sick person lie quietly and replace water and salts (electrolytes) to prevent dehydration. If he/she has the chills, keep him/her warm with blankets and towels. If sweating, have him/her change clothes. If a person has a fever accompanied by severe headache/abdominal pain or vomiting, seek medical attention promptly as he/she may be at a risk of falling into a critical condition.

Column: Responsible self-medication, self-care and self-healing mechanisms

WHO, in its guidelines on the use of pharmaceutical products (the Guidelines for the Regulatory Assessment of Medicinal Products for Use in Self-Medication), recommends the practice of **self-care** and **responsible self-medication**, in which individuals take responsibility for their own health

and care for “minor ailments” of body and mind that do not require medical attention, by means of making adjustments in their everyday lives and using non-prescription medicinal products.^{6,7} The human body has innate defense and other systems, which give our body the ability to heal illness (**self-healing mechanisms**) (see Chapter 7). For instance, having a fever or inflammation means that our body’s defensive response is at work, trying to rid the body of viruses and other invaders. And in addition to using healthcare services, we can also use our wisdom to adopt everyday lifestyle behaviors that are effective in helping our body restore its health, such as eating well-balanced meals and getting adequate sleep, all based on particular symptoms we may be experiencing.

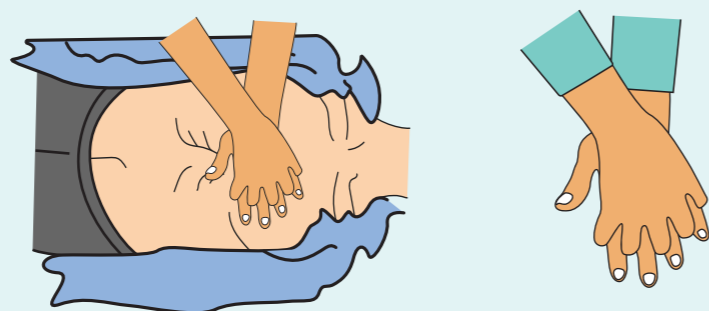
In some cases, however, self-care or self-medication may have a negative impact. In order to promote self-care and self-medication successfully, it is necessary to promote social empowerment as well, with an aim to advance people’s health education, general knowledge, and socioeconomic status.^{6,7}

Column: Cardiopulmonary resuscitation and AED

• Why is cardiopulmonary resuscitation (CPR) necessary?

If you find yourself in the presence of a sick person who requires immediate emergency medical care, such as one who is unconscious, in cardiac arrest, or in respiratory arrest, you may be able to save the sick person’s life if you can perform cardiopulmonary resuscitation (CPR). Even if you are a member of the general public who is not a healthcare provider, if you have received training and are able to give CPR, the chance of the person’s life being saved will increase if you perform **chest compression** while waiting for an ambulance to arrive after contacting medical services.

- i) Place the heel of one hand on the center of the person’s chest, and place the heel of the other hand over the first.



- ii) Push straight down on the chest, keeping your elbows straight and positioning your shoulders over the point of compression.



**100 compressions per minute
Push down by 5 cm**

Figure 15.12 Keys to chest compression

CPR is a technique to restore spontaneous blood flow and the respiration of a sick person who is in cardiopulmonary arrest. Chest compression promotes the flow of blood to the brain and the heart by applying pressure to the area around the heart (Figure 15.12). If the person who finds a sick person performs CPR at once, the person’s chance of survival will increase.^{8,9}

• Increased access to AEDs

AED stands for **automated external defibrillator**. An AED is a medical device that can analyze the electrocardiogram and deliver **defibrillation** (i.e., sending an electrical shock to the heart to reset a normal rhythm), and a layperson can operate one (Figure 15.13). When you turn on the AED, it will give voice prompts. When you attach a pair of pads to the chest area, automated analysis of the electrocardiogram will be performed. If defibrillation is required, instructions to do so will be given in voice prompts. Press the defibrillation button to start defibrillation. Once a person falls into cardiopulmonary arrest, their survival rate decreases by 7–10% for every minute without defibrillation.^{8,9} It is therefore critical to use an AED at the first possible moment to save their life.

In Cambodia, AED awareness is not very high yet, and there are not many AED locations, although it is gradually becoming more common. In Phnom Penh, a Japanese soccer player has donated an AED to the KMH Stadium, while another has been placed at Aeon Mall, as well. It is anticipated that there will be more AEDs accessible, primarily at locations where large crowds of people gather and accidents are prone to happen. At the same time, it is necessary to create more opportunities for as many people as possible to learn how to use an AED first-hand.



Figure 15.13 Example of AED use

• Special considerations when performing CPR

- (1) If the sick person is an infant, you may need to adjust the point and depth of compression, taking into account the smaller body.
- (2) Recommended CPR steps are subject to update. You will need to check the most current information.

Exercises for further thought and research

- [15-1] Find out about injuries common among children in Cambodia, and discuss what to do to prevent them.
- [15-2] Assuming an injury that is likely to happen to children, such as an abrasion or cut, discuss possible ways to teach children how to treat it.
- [15-3] Concerning first aid procedures that are actually performed in daily life, discuss what kinds of scientific evidence form a basis for the procedures, and whether there is anything that can be done to improve on them.
- [15-4] Look back on experiences of your own or someone close to you of injuries or illnesses in the past, and reflect on what care was given, what action was taken in response, and what you/they were and were not able to do. Discuss what issues Cambodia has.

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Chapter 16

Disability and special education needs

Learning objectives

You will be able to gain a proper understanding and explain:

- The definition of disease, impairment, disability, and handicap using specific examples.
- The medical model of disability, the social model of disability, and the integrated model of disability (International Classification of Functioning, Disability and Health: ICF).
- Challenges in education of children with disabilities in Cambodia.

This chapter first provides basic knowledge necessary to understand disease, impairment, disability, and handicap. Secondly, we explain the medical model of disability, the social model of disability, and the International Classification of Functioning, Disability and Health (ICF) as an integrated model of disability. Finally, we describe the present situation of special education needs for children with disabilities in Cambodia.

Note that in this chapter health is mainly treated as a factor of disability; that is, in terms of health conditions such as disease or injury. This differs from the broad meaning ascribed to health in the previous chapter (e.g. Chapter 1).

1. Aspects of disease, impairment, disability, and handicap

1) Disease

Disease results from abnormalities in all or part of the physiological state of living creatures. Someone suffering from a disease is incapable of fulfilling normal functions, and generally experiences various types of pain. However, some diseases such as diabetes produce no sense of pain before growing severe. A disease can be defined as a condition in which cells suffer damage for some reason and fail to function normally.

Diseases recognized as resulting from morphological abnormalities in cells are referred to as “**organic diseases.**” They contrast with “**functional diseases,**” in which current medical knowledge cannot identify any cellular abnormalities. Cancer, diabetes, cerebrovascular disease, and heart disease are considered organic diseases, while mental illnesses are placed in the functional disease category.