



COMMON CONDITIONS IN CHILDREN WITH SPINA BIFIDA AND HYDROCEPHALUS REQUIRING EMERGENCY MEDICAL CARE

This booklet is designed to help the medical staff in schools and kindergartens act quickly, safely and effectively when children with spina bifida and hydrocephalus need emergency medical care. The information provided herein is not intended to substitute first aid training and courses.

SHUNT PROBLEMS

Hydrocephalus refers to dilatation of the cerebral ventricles. Cerebrospinal fluid is produced and reabsorbed constantly and all cerebrospinal fluid is refreshed between 3, 4 or 6 times a day. When the space occupied by the cerebrospinal fluid is deformed or when cerebrospinal fluid is produced in excess inside the skull or the spine, its impaired resorption and reabsorption in the blood leads to compression of the brain. The valve placed helps drain the fluid into the abdominal cavity or into the circulatory system. Thus, the compressed brain is relieved of the pressure. The valve allows maintaining an exact pressure difference between the cerebral ventricles and the abdominal cavity.

The shunt is a delicate device that can become clogged or infected. As the child grows, the shunt may need to be replaced. A clogged valve or a malfunctioning mechanism causes the symptoms of hydrocephalus. This requires urgent surgery to replace the malfunctioning shunt.

Shunt infection is a relatively common complication after surgery. The risk of infection is up to 1 in 5 children and decreases in adults. Infection is more likely to occur during the first few months after the surgery.

The symptoms of an infection or shunt problems may vary. Some symptoms develop more slowly and are chronic, and they may include:

- Irritability or other abrupt changes in the child's personality;
- Deterioration of school performance;
- Headache, more pronounced in the morning;
- Generalized weakness

In these cases, the nurse should alert the parents and the child's family doctor.

APPENDIX 7

Other symptoms require immediate consultation with a neurosurgeon and/or neurologist. These include:

- Severe, intolerable headache
- Nausea and vomiting, more pronounced in the morning;
- Neck and throat pain;
- Impaired vision;
- Double vision;
- Sensitivity to light;
- Redness along the shunt line;
- Abdominal pain if there is drainage to the abdomen;
- Difficulty moving due to spasticity;
- Drowsiness or inability of the child to stay awake;
- Loss of consciousness.

In the case of an emergency, the nurse must call 112 and provide information to the emergency team about the neurosurgeon/neurologist/doctor who monitors the child, as specified in the health passport. The nurse must also inform the child's parents.

SEIZURES

After any type of brain surgery, there is always a risk of seizures. Seizures can lead to reduced oxygen supply of the brain.

First aid in the case of a seizure

Before the arrival of the emergency team: Place the child lying in a horizontal position on his/her back, with the lower limbs raised at 45-degree angle. The head and shoulders should be levelled with the pelvis. The legs may be placed on a stool. Adequate oxygen supply must be provided, the child's collar and belt must be unfastened, and any scarfs should be removed. The windows of the room should be open. The child's head should be turned slightly to the side in order to avoid aspiration of vomit. If ammonia, vinegar or essential oil is available, put it on a swab and bring it to the child's nose. Its inhalation stimulates the respiratory and vascular centres.

Another approach is to put a wet and cold kerchief on the forehead or to wet the face with cold water, pat the cheeks or warm the body.

SKIN BURNS

Skin injuries caused by burns can range from mild to severe necrotic conditions in the event of third- or fourth-degree burns.

Some children with spina bifida may not feel pain in the lower part of the body at all!

First aid in the case of burns

Before the arrival of the emergency team: Place a sterile gauze pad on the burned area and secure it by wrapping it with a bandage several times. A clean ironed kerchief or a bedsheet can be used until the patient is transported to a medical centre. An analgesic may be used for pain relief. The skin can be cooled for 5 to 10 minutes under running water before placing the sterile gauze pad as this significantly reduces pain. If the blisters have ruptured, apply cold running water again and then place a sterile gauze pad or bandage again.

In the case of limited burns that cause only redness of the skin, cooling the skin with running water and applying ointment such as Deflamol or spraying Panthenol spray are the treatments performed most often. The blisters can appear up to 24 hours after the burn, and the need to consult a surgeon is determined according to their size.

CHEMICAL BURNS

Acids can cause necrosis. When the body is burned with sulfuric acid, the resulting necrosis is brownish-black in colour, grayish - in burns with hydrochloric acid, yellow - in burns with nitric acid, and golden-yellow - in burns with picric acid, respectively. Bases are known to cause moist necrosis, which is grayish-yellowish in colour, and limited but deep burns to the skin.

First aid in the case of chemical burns

Wash profusely with water using a shower or a jet. Acids are neutralized using 2-5% sodium bicarbonate solution, while bases are neutralized with 1% acetic acid solution. The wounds should be dressed with a gauze pad and a bandage, and the child should be referred to the child's family doctor.

In the case of phosphorus burns, the surface of the skin should be cleaned and a dressing damped with a potassium permanganate solution (1:50,000) should be placed.

FROSTBITE OF THE LOWER LIMBS

Frostbite could result due to low temperatures and due to circulatory disorders. The child may not be able to feel cold.

First aid for frostbite of the lower limbs

Wet clothes should be changed, if possible, and the child should be wrapped and warmed.

The widespread practice of "warming up" by rubbing with snow is harmful! It is essential to massage the frozen area with a dry and warm palm after which a "heat-insulating dressing" of cotton, a gauze pad or a bandage should be applied to the affected area. The feet should be immersed in a water bath at a temperature of 36 degrees for 20 to 30 minutes. Gradually add warm water and then place a heat-insulating dressing. The child should be referred to a medical centre.

HEATSTROKE

Some children with spina bifida and hydrocephalus have difficulty with thermoregulation. This can happen even if the temperature is not very high. The signs of heatstroke may include fatigue, restlessness, flushing, fever, dizziness, headache, dry and hot skin or rapid heartbeat. In severe cases, seizures and loss of consciousness may occur.

First aid in the case of a heatstroke

Quickly bring the child to a cool and ventilated place. Place the child in a horizontal position. Remove all tight clothing. The child should be given cold liquids. Spray the child with cold water.

FRACTURES

Some children with spina bifida have thinning of the bone structure and therefore are at increased risk of fractures, especially of the lower extremities. The absence of pain due to fractures of the lower extremities is common in this group of children

First aid for fractures

Call 112 if a fracture occurs. Before the arrival of the medical team, the following steps can be taken:

The upper limb should be immobilized by attaching it to the chest, elbow bent at right angle. In the part with the fracture, the lower limb should be immobilized using a splint. Readily available tools such as wood boards or other hard materials suitable for making splints can be used. Do not try to reduce the fractured bones when providing first aid in the case of a fracture. If the fracture is open and there are bones poking through the wound, no attempt to reduce the bones should be made; instead, the wound should be covered with a sterile gauze pad. Splints should be placed over the clothes or should be padded in advance so that they do not damage the skin. When placing the splint, two adjacent joints (below and above the fracture) must be covered by the splint. In the case of a spinal injury, a fracture of the spine should be considered. This is a very serious trauma and the child should not be moved without the presence of a doctor. If the injury is life-threatening, minimal movement is allowed.

BLEEDING

Hemostatic dressings should be applied only in the case of bleeding from the limbs and a gauze pad, a cloth or a triangular bandage should always be applied to the wound.

Arterial bleeding - when the integrity of an arterial vessel is compromised, the colour of the blood is bright red. These bleedings are most dangerous because they result in rapid blood loss.

First aid in the case of arterial bleeding

In the case of arterial bleeding, call 112 immediately.

Compression of the bleeding vessel. Apply a tight bandage above the bleeding wound using a belt, a kerchief or a bandage. Dress the wound. Take a note of what time the bandage was placed, because it should not remain in place for more than two hours or more than one hour in winter, as there is a risk of tissue death if left without blood circulation. If the bandage needs to stay in place longer than the above-mentioned, it should be loosened for a few minutes to supply the peripheral tissue. The release of the bandage should be done gradually. The child should be lying.

Venous bleeding - when the integrity of a vein is compromised, the blood flows smoothly. When a large venous vessel is damaged, this is a life-threatening condition. The blood is dark red. The steps for providing first aid are the same as those in arterial bleeding.

Capillary bleeding

The integrity of capillaries is compromised. Impaired capillary integrity. The blood oozes as a result of superficial injuries.

Clean the wound with hydrogen peroxide if possible and cover it with a sterile gauze pad. At the discretion of the nurse, the child should be referred to an emergency pediatric care office for wound treatment and consultation.

SKIN INFECTIONS

Skin infections can quickly develop into an abscess with concomitant fever, nausea or vomiting. The child may not feel that there is a wound or that this wound has become infected;

When these symptoms are present, the nurse should perform a thorough examination of the child's skin, paying special attention to the pressure points; places underneath splints or corsets as well as the groin, ankles, heels, buttocks and the caudal region.

An infected wound requires urgent consultation with a surgeon.

BLOW TO THE HEAD AFTER A FALL

If we have a reason to think that the injury to the child's head could be life-threatening, we must immediately call 112. If the child is breathing easily and is not in immediate danger, we should not move the child. If the child is unconscious, we should position the child lying on one side in a stable position and seek help. The child can be turned to lie on the other side every 30 minutes.

If the child has suffered an injury and is not breathing, oxygen should be provided no later than 4 minutes in order to avoid brain damage. Start by clearing the airways by lifting the child's chin and tilting the head backwards. In children between 1 and 8 years of age, give two short breaths or one if the patient is a baby. If the child has an injury, do not tilt the chin, but move the lower jaw forward and do artificial respiration. If the patient is an adult, give one breath every 5 seconds, and in children under 8 years of age do one breath every 3 seconds. The normal respiration rate is 20 per minute.

FOREIGN BODY IN THE AIRWAYS

Wrap your arms around the child's waist coming from the back. Place one hand above the navel and under his ribs while keeping your thumb bent and directed inwards under the child's breastbone. Place your other hand over your first hand and push the abdomen hard inwards and upwards until the child begins to breathe. If the child is unconscious, the procedure can be repeated twice. If breathing is still absent, artificial respiration with cardiac massage should be performed by making 15 chest compressions and giving 2 breaths if the patient is an adult, and 5 compressions and 1 breath in children from 1 to 8 years of age. Before giving breath, the mouth should be checked for foreign bodies.

ALLERGIC REACTIONS

The most common allergic reactions in children with spina bifida are those to latex products. Most often the reactions are mild and present as allergic contact dermatitis - skin redness, blisters, itching, flaking of the skin, eye burning and tearing.

In some children, symptoms may progress to:

- Fast heartbeat (tachycardia)

- Tremor

- Chest pain

- Difficulty breathing

- Low blood pressure

Allergic reactions should be treated with antihistamines, adrenaline or steroids.

First aid in the case of severe allergic reactions:

Call 112, remove clothes that fit tight around the neck and open the windows of the room wide to get a better oxygen supply.

SWALLOWING DISORDERS IN CHILDREN WITH HYDROCEPHALUS AND CHIARI MALFORMATION TYPE 2.

Chiari malformation type 2 is a malformation in children with developmental disorders, in which parts of the cerebellum are displaced in the spinal canal and it is associated with smaller occipital fossa. When the medulla oblongata is compressed, symptoms of swallowing disorders appear, the voice changes, and the heart function and respiration are also affected.

In older children, this condition is characterized by neck/occipital pain, paralysis of the vocal cords, muscle atrophy, scoliosis and head flexion.

Swallowing disorders may cause aspiration of food into the trachea. Aspiration usually provokes a strong cough reflex. If sensitivity is impaired, "silent aspiration" may occur. Subsequently, an aspiration pneumonia may develop.