

**Topic 1.12 part 1 «First aid for
common traumas and poisonings»**

Burns

- Stop the exposure of high temperature;
- Evacuate the patient from hazard zone (if it's necessary);
- Call the emergency;
- Estimate damaged area;
- Estimate the depth of the damage.

**Light burns
I and II degree of burn**

**Severe burns
III and IV degree of burn**

Cooling with water or snow during at least 15 minutes

The clothes should be cut along the edge of the burn

Antiseptic bandage application

Control all vital features: the consciousness, the pulse, the breathing.

The clothes should be cut along the edge of the burn

Antiseptic bandage application

Cooling (cryo-treatment) with ice or snow through the dressing

Gentle immobilization in the case of limbs' burns.
Painless position

Analgesia

Give the patient salted water if there are no contraindications or incoercible vomiting

Cover the patient to prevent overcooling (independently of the weather)

Observation

First of all, it is necessary to stop the exposure of causing factors: extinguish the flame immediately, cover the victim with blanket to prevent income of oxygen, extinguish smoldering or burning clothes and take them off.

Evacuate the victim, take him out to the fresh air.

In the case victim's mouth or nose are full of soot, clear it out with your fingers covered with wet fabric. If the victim is unconscious, assess pulse and breathing, begin CPR in the case of their absence.

If the patient is conscious and there are no signs of abdomen injury, give the patient several liters of warm water despite of possible vomiting (salino-alkaline solution: 1 spoon of baking soda and 1 spoon of sodium chloride per 1 litre of water). It is prohibited to remove parts of stuck burning clothes from damaged surface. Sterile bandage seems the most suitable for localized burns. For major burns use sterile sheets to cover the victim with them.

Try to cool burning surface immediately. Cool small light burns under jet of cold water (without strong pressure). Severe burns are cooled with ice (you can use frozen package from refrigerator) through sterile bandage.

It is prohibited to treat burns with oil!



NB!

While extinguishing the fire it is prohibited to use small amount of water to avoid quick evaporation and increasing the damage as a result

Both degree of burn severity and prognosis depend on the size and the depth of damaged area.

Surface area of human skin is approximately 16000 cm². It is important to assess the size and severity of damaged area and the prognosis. There are several ways how to do it.

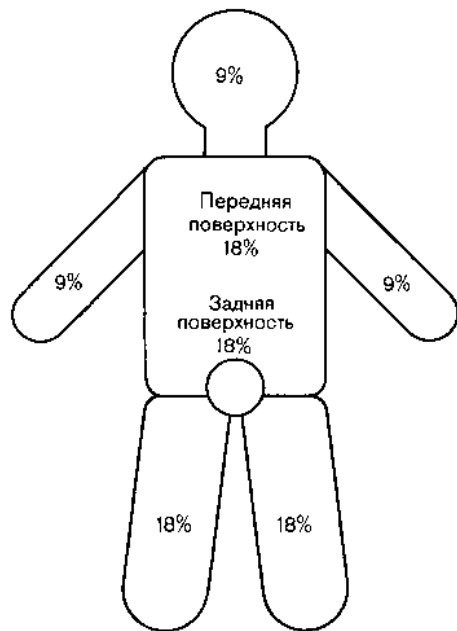
1) “Rule of a palm” A human palm corresponds to 1% of the skin surface, which makes it possible to be used as measuring unit for estimation of burn area. Compare the damaged area with size of victim’s palm and calculate approximate percentage of damaged area.

Правило ладони при ожогах

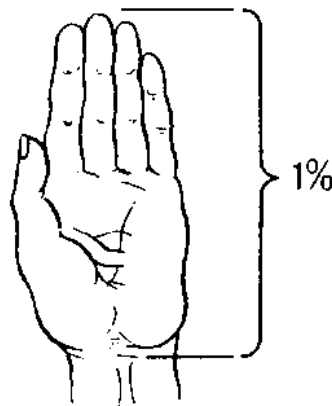


от площади поверхности тела человека

МЕТОДЫ ОПРЕДЕЛЕНИЯ ПЛОЩАДИ ОЖОГА



Методом «девяток»



Ладонью

Слайд 4.5.45

2) “Rule of 9” It is used in the case of broad burns. Surfaces belonging to the different parts of the body make approximately 9%. Calculate the damaged area according to their size, using “rule of 9”:

- Head and neck– 9%;
- Each upper limb – 9%;
- Chest and abdomen– 18%;
- Each hip– 9%;
- Sheen with feet – 9%;
- Perineum – 1 %

Draw your attention on the percentage of perineum – 1%

These measures are different for infants and children. There is a dependence between the percentage of body surface and the age.

How the skin surface percentage depends on age

| Body | 0-1 year old | 5 years old | Adults |
|------------------------|---------------------|--------------------|---------------|
| Head,neck | 20% | 16% | 9% |
| Each upper limb | 10% | 9% | 9% |
| Each lower limb | 15% | 17% | 9+9% |
| Chest,abdomen | 15% | 16% | 9+9% |
| Back, buttocks | 15% | 16% | 18% |

3) The easiest way of severity burn estimation is “the rule of 100”

Add victim’s age to the size of damaged surface. If the sum isn’t more than 60 points – the forecast is favorable. If the sum is in the range from 61 till 80 points – the forecast is relatively favorable. If the sum is in the range from 81 till 100 points – the forecast is doubtful; the sum is more than 101 points - the forecast is unfavorable.

Disadvantages of this method:

- You should know victim’s age exactly,
- The method doesn’t consider the depth of the damage.

Tabular method

| Sign | Index | Prognosis |
|------------------------|---------------------------|--|
| Age | 60 and more | 4 and more signs – unfavorable prognosis 3 signs – doubtful prognosis |
| The reason of burn | Flame | |
| Common damaged surface | More than 60% | |
| Comorbid pathologies | Decompensated | |
| Consciousness | Absence | |
| Urinary output | Anury | |
| Burns of airways | Presence | |
| Pulse | More than 60 per 1 minute | |

To assess the severity of burns of infants and children use Frank Index.
Frank Index considers the burning surface and the depth of the damage.

Light burn - 1 score for 1 %

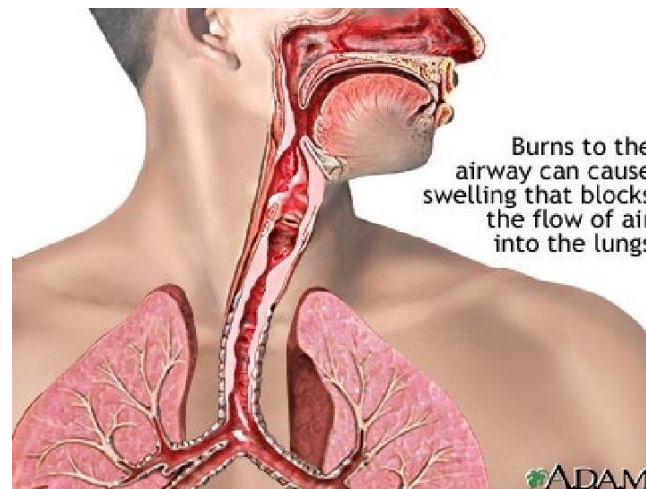
Severe burn – 3 scores for 1 %

If the sum is less than 30 points – the forecast is favorable; the sum is 31-60 points – the forecast is relatively favorable, the sum is 61-90 - forecast is doubtful, the sum is more than 90 - forecast is unfavorable.

Burns of upper airways are considered as severe damage of 10-15 %.

Clinical features of airway burns:

- the victim was taken out from closed space;
- there are burns of face and neck;
- singed nose hair;
- soot in the airway;
- stridor;
- hoarseness, hacking cough.



Burn shock

For adults: burn shock is developing if the burning surface is more than 25-30% in the case of light burn or more than 5-10% in the case of severe form.

For infants: burn shock is developing if the burning surface is about 5-7%.

Within first 2 hours the casualties demonstrate erectile stage of the burn shock. Further the shock passes to the next stage, demonstrates the inhibition. The victim complains on chill, skin becomes pale and cold. In the case of severe damage – skin is greyly pale. The victim suffers from thirst, but usually patient is vomiting while drinking water.

On the case of severe broad burns, developing of shock is quick process, the victim stays in extremely severe condition with mixed consciousness, decompensation of hemodynamics, respiratory failure.

To assess the severity of shock use index of burn injury severity. Each 1% of light superficial burn of I degree is equal 0,5. Each 1% of burn of II degree is equal 1 score, III degree – 2 scores, IV degree – 4 scores.

If sum is 30-70 scores - I-degree shock

If sum is 71-130 scores - II-degree shock

Sum is more than 130 scores – III-degree shock.

Chemical burns

Call the emergency

The agent caused the burn

Acid and alkali

Phosphor

Caustic lime

Phenol, cresol

The injured parts of skin need to be washed with warm tap water without taking clothes off. Then after washing take off the clothes with residuary chemical agents.

Wash phosphorus particles with tap water

It is prohibited to wash with water!

Wash particles out with oil or liquid vaseline

Wash the wound with ethyl alcohol (40%) or vodka

If it is possible remove residuary particles of chemical agent from the wound

• Cover the wound with sterile dressing

• In the case of phosphorus burns cover the wound with dressing dampened in 2-4% soda solution

• Simplest analgesia

• Gentle immobilization in the case of limbs' injury

• Painless position

• Observation

NB!

Both phenol and cresol don't dissolve in water.

In the case of chemical burns the damaged area needs to be washed with the jet of water (without strong pressure) for 15 minutes!

Medical practice shows that it is important to wash the wound during at least 15 minutes to prevent further penetration of chemical agent. Through several minutes wrong feeling of alleviation appears, but it takes a lot of time to remove chemical substances, therefore continue to wash the burning surface during at least 15 minutes.

It is prohibited to wipe chemicals from damaged area with any swabs or tampons as soon as it causes additional injury.

Synthetic clothing can dissolve in some aggressive substances (e.g. sulfuric acid). While washing with water polymer coagulates and cover skin with sticky membrane. In this case washing is ineffective method. Firstly, you need to erase acid from skin carefully with dry cotton fabric and then wash under tap water.

In the case of eye's burn – remove the agent with wet tampon and wash the eye with weak solution of boric acid (0.5 of teaspoon per 1 glass of water) or with tea brew. In the case of eye's burn with acid or alkali - wash it during at least 10 minutes.

Burns of mouth cavity or pharynx are common case of household accidents. The reason is swallowing of different acids (sulfuric, acetic and etc.), alkalis (caustic alkali), spirit of ammonia.

The signs of mouth cavity's burn are: strong pain after swallowing, salivation discharge, labored breathing.

The first aid is to wash mouth cavity with neutralizing liquids. In the case of acid damage – use lime water or soapy water, in the case of alkali damage – use water with lemon juice. You may also use milk or water with egg whites. Also give the patient small pieces of ice to swallow the up. Don't forget to call the emergency to carry out further manipulations.

Burns of mouth cavity or pharynx are dangerous as they can cause swelling and breathing obstruction.



Overcooling

Call the emergency

- Protect from the wind (cover with blanket);
- Lay the patient down;
- Avoid sudden movements;
- Observe the body temperature constantly;
- Observe pulse frequency.

No

Ask for help;
CPR;
Continue to warm the patient during CPR;
Provide CPR until medical emergency team arrives

Breathing, pulse, verbal contact

Yes

Patient's temperature

Active external warming.
Hot sweat drink.
Alcohol only for adults – 50 ml, **only one time.**

Mild hypothermia (36-34°)

Moderate hypothermia (34-30°).

Deep hypothermia (less than 30°).
Patient is unconscious.
Pronounced rigor.

Active external warming of corpus only.
Hot sweat drink in the case of consciousness.
Alcohol is prohibited.
Insulating dressings on the limbs.

Change the clothes carefully.
Control all vital functions: pulse and breathing. Be ready to begin CPR.

It is important to define the severity of overcooling before providing the first aid.

Classification of overcooling according to the clinical manifestation.

There is another classification of severity of overcooling according to the body temperature

| Stage | Signs |
|-------------------|--|
| Dynamic | Skin covers are pale, “chicken skin”. Muscle trembling. The victim feels chill, tiredness, drowsiness, apathy and thirst. He demonstrates passive movements, retarded reactions, slurring speech. Rapid breathing and heartbeat. |
| Stuporous | Skin covers are pale. Patient’s cheeks, ears, nose are bluish. Muscle trembling is absent. Muscle rigor. Mild coma. The pupils are moderately dilated. Response only on pain stimulation. Bradycardia and weak pulsation and breathing. |
| Convulsive | Skin is pale, bluish, cold to touch with occasional severe frostbites. Severe muscle rigor. Severe coma. The pupils are dilated. Pupillary response to light is absent or weak. Motor response is absent. Convulsions repeat every 15 – 30 minutes. |

Severity of overcooling according to the body temperature

| Severity degree | Body temperature | Reversibility |
|------------------|-----------------------------|---------------|
| Mild | 32-33 ⁰ C | Reversible |
| Moderate | 28-32 ⁰ C | |
| Severe | 24-28 ⁰ C | |
| Extremely severe | Less than 24 ⁰ C | Irreversible |

First aid for overcooling:

1. Prevent further cold impact, warm the victim up, take his clothes off and put dry and clean clothes on.
2. Warm the victim with hot tea or bouillon. The temperature of hot drink should not exceed the body temperature more than 20-30 degrees to avoid burns of mucosa of oral cavity and stomach.
3. Wrap the patient with insulating material (e.g. special blankets from dense foil).
4. Avoid patient's displacement, excess movements may cause pain.
5. Massage in the form of light attrition. Avoid rude massage, it may contribute heartbeat disturbance.
6. The best way to warm the patient is to set him in warm bath. The temperature of water should be equal to body temperature (or more than body temperature on 2-3 degrees). Increase the temperature gradually. Control all vital functions, there is a risk of sharp drop of blood pressure while active and rapid warming.

Peculiarities of overcooling of children

Infants don't seem to be able for chill. Chill is a way to keep warming. Immature organism hasn't all thermoregulatory mechanisms, so body temperature will decrease faster.

Signs of overcooling of children

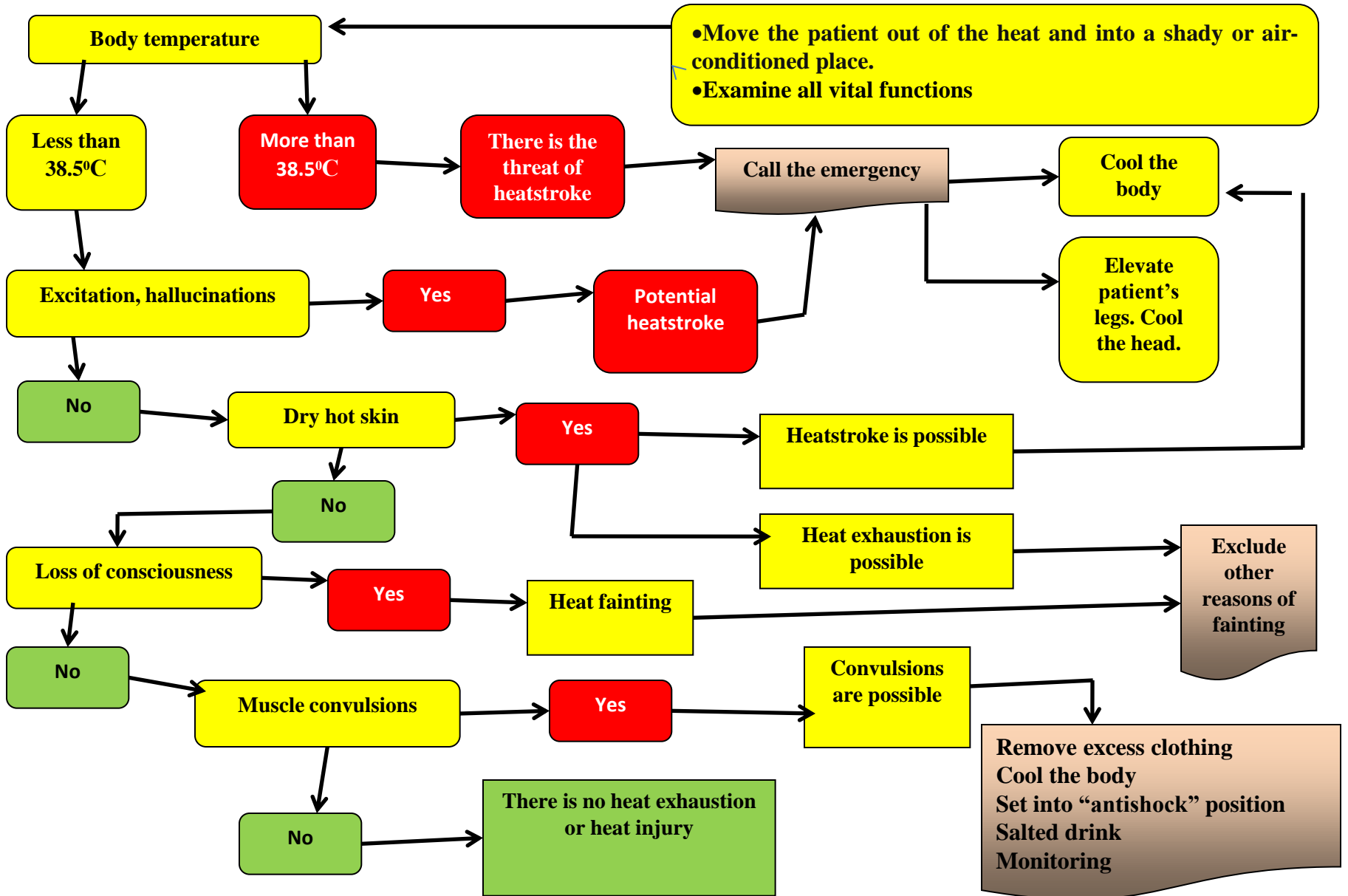
- 1. Child suffering from hypothermia seems to look healthy because of his pink skin covers.**
- 2. In case of severe overcooling child's skin becomes greyish, lips become pale or bluish.**
- 3. Child becomes weak, tired, unusually quiet.**
- 4. Impairments of consciousness, clumsiness, lack of coordination.**

NB!

It is prohibited to use heating lamps or warmers. Warm the child little by little, avoid quick warming.

Don't give him any drinks or food.

Overheating



First aid for overheating

Call the emergency immediately.

Move the patient out of the heat and into a shady or air-conditioned place. If the patient is unconscious, lay him down and elevate the legs and feet slightly or set him into a stable lateral position (recovery position) to prevent falling back of the tongue. Remove tight or heavy clothing. Cool the person by spraying or sponging with cool water or place bag with ice on his head. Monitor all vital functions carefully. Be ready to provide CPR if there is such a need.

If the patient is conscious give him cool tea or salted water.

If there is such an ability, wrap the patient with wet sheet or place wet piece of fabric on the area of inguinal folds or under patient's knees.



thank you for attention