

PLAN FOR DEALING WITH A MASS BURN CASUALTY INCIDENT IN THE CZECH REPUBLIC

ČLS JEP, z.s.
Society for Emergency
and Disaster Medicine



ČLS JEP, z.s.
Czech Society of Burn
Medicine

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INTRODUCTION

A mass burn casualty incident (hereinafter "MBCI") is a foreseeable crisis situation, where a system of ensuring and providing acute health care must be prepared in advance to resolve it. However, from the point of view of the capacity of the healthcare system and the setting of optimal reaction algorithms, this situation represents a fundamental organizational challenge. That is due to the disparity between the immediate requirements for the provision of health care and its availability; not only in the phase of providing pre-hospital emergency care at the scene, but especially in the phase of the need to provide acute highly-specialized hospital care.

In the normal conditions of emergency medicine, health care for severely burned patients in the Czech Republic has been systematically concentrated in centers of highly specialized care for patients with burns for many years (burn centers, hereinafter "BC").

These centers are (according to the Ministry of Health Bulletin, chapter 3/2016):

1. **Faculty Hospital of Královské Vinohrady
Clinic of Burn Medicine**
Šrobárova 1150/50,
100 34 Prague 10
2. **University Hospital Brno
Clinic of Burn Medicine
and Plastic Surgery**
Jihlavská 340/20, 625 00 Brno
3. **University Hospital Ostrava, Department
of Burn Medicine and Reconstructive
Surgery**
17. listopadu 1790/5, 708 52
Ostrava-Poruba



The current setting of rules for pre-hospital emergency care and early acute hospital care in the Czech Republic ensures the immediate availability of this highly specialized center care for most patients with more severe thermal injuries by primarily routing them to a BC, which is a procedure from which these patients objectively benefit. Other health care personnel providing acute inpatient care (hereinafter referred to as "MF"), including highly specialized trauma care centers (hereinafter "TC"), have therefore been practically without contact with patients with this type of injury for many years, resulting in little or no readiness for their treatment, both at the professional level and at the material and organizational level.

Since the immediate capacity of the 3 national BCs for the admission of acute patients is limited, in the case of an MBCI, only a limited number of patients, ideally only the most severely affected ones, can be directed to these centers. At the same time, it will be necessary in these cases to also

provide acute care for other patients with a thermal injury in MF outside the BC, at least for the time necessary to gradually free up and create capacity in the BC.

In this situation, burn centers will need to be provided as quickly as possible with a complete overview and maximum information on all patients with thermal injuries who were primarily transported to other MF so that their secondary transfer to a BC is as rational and smooth as possible.

The aim of this document is to determine the optimal procedure for this emergency situation, which will enable the quality survival of as many patients with thermal injuries as possible ("do the most for the most"). All recommendations contained in this document are intended solely for dealing with MBCI and do not in any way change the applicable rules and professional best practices for the provision of healthcare for patients with other thermal injuries than an MBCI.

DEFINITIONS OF BASIC TERMS

MBCI – a mass burn casualty incident. According to an analysis of MBCI events in the world in recent decades, we assume that it is necessary to ensure the readiness of the national system to care for about 50 severely burned patients. In the event of a major emergency, it will be necessary to activate the mechanisms of international cooperation and involve the surrounding European states in dealing with it according to predefined rules (follow-up to the National Burn Plan of the Czech Republic and the European Burn Plan).

Patient with a serious thermal injury – for the purposes of this document, we refer to an adult patient as such with burns to the extent of 50% or more of the total body surface area (hereinafter referred to as % TBSA). This group of patients is burdened with the statistically highest mortality and benefits the most from the provision of highly specialized health care.

Pediatric patient with a serious thermal injury – for the purposes of this document, we refer to a patient as such aged 0–15 years with burns of at least 20% TBSA or with an associated injury, which includes a burn. In the case of MBCI with a larger number of severely burned children, it is necessary to respect the specifics and differences in the approach to securing and routing pediatric patients with this type of injury, which are emphasized in this document.

Spectrum of injuries in an MBCI – it is necessary to assume that within this type of event there will be different types

of injuries of patients, i.e. not only pure thermal injuries. At the same time, it is necessary to assume a varying age structure of injured patients. Both must be taken into account in the proposed algorithms for classification, routing and therapy.

Burn center capacity (burn bed) determines the number of patients with a serious thermal injury that can be admitted and adequately treated at a BC.

Immediate capacity determines the number of patients with a serious thermal injury, which the BC is able to receive and treat immediately (within 6 hours) after the occurrence of an emergency. Numerical expression of the immediate capacity of burn centers in the Czech Republic, see the table.

Deferred capacity defines the total number of patients with a serious thermal injury that the BC should be able to treat and receive within 48-96 hours after the event.

The national capacity of burn centers in the Czech Republic is estimated at about 40–50 patients with a serious thermal injury.

At the moment of fulfilling the expected capacity of national BCs, it is possible to request the assistance of other EU countries according to the valid and approved rules (connection to the National Burn Plan of the Czech Republic and the European Burn Plan).

Table with numerical expression of the instantaneous capacity of individual BCs for adults / children with serious thermal injury

	BC Prague	BC Brno	BC Ostrava
A total of all patients within 6 hours	10x	5x	5x
Children up to 6 hours	<p>4x FHKV Faculty Hospital of Královské Vinohrady</p> <p>2x MUH Motol University Hospital</p> <p>2x TH Thomayer Hospital</p> <p>2x GUH General University Hospital</p>	<p>3x UH Brno TC Children's Hospital, UH Brno</p>	<p>2x UH Ostrava</p>

Document breakdown

The material is divided into 4 basic chapters describing the individual follow-up steps necessary to ensure the necessary health care in the case of an MBCI, at all its levels (pre-hospital emergency care provided by emergency medical service ambulance groups (hereinafter "EMS"), acute hospital care in the nearest MF / TC, care in a BC):

1. Classification

2. Therapy

3. Transport

4. Communication

CHAPTER 1

CLASSIFICATION

Proper classification of patients fundamentally affects the fulfillment of the main goal of the entire plan, i.e. ensuring the survival of as many injured patients as possible.

Its principle is to divide all injured patients into groups according to the severity and type of injury, which will make it possible to decide on the implementation of the necessary therapeutic measures and on the optimal primary routing of patients to a MF.

For this reason, it is necessary to create uniform and simple rules applicable to the classification of patients in the various stages of health care.

It is necessary to assume **that various types of injuries will occur** within this type of event, i.e. not only pure thermal injuries (although this type of event may also occur). At the same time, it is necessary to assume a varying age structure of injured patients.

Assumed structure of injury types in an MBCI:

1. patients with burns or burns and inhalation trauma (hereinafter referred to as group "B")
2. patients with burns or burns and inhalation trauma associated with another serious injury (polytrauma, associated injury with burns; hereinafter referred to as group "B + T")
3. patients with severe injury without burns (polytrauma, associated injury; hereinafter referred to as group "T")
4. patients with inhalation trauma (hereinafter referred to as group "I")

The classification of patients in the event of an MBCI will gradually take place on 3 levels:

1st LEVEL – EMS

Primary triage on-site performed by EMS ambulance groups; it is necessary to assume that it will be burdened with a significant error rate for objective reasons.

It should permit a decision to already be made on the implementation of the necessary therapeutic measures at the scene and on the primary routing of patients according to the severity of their condition and the type of injury (to the nearest MF, TC, BC).

2nd LEVEL – MF

Secondary triage performed in a TC, or the nearest MF, to which the patient with a thermal injury was primarily transported. It should make it possible to refine the diagnosis and extent of the injury so as to ensure the prioritization of the treatment of patients and determine the optimal order in the group of all patients with a thermal injury from all MF for secondary transport to the BC.

3rd LEVEL – BC

Tertiary triage in the BC performed by a specialist in the field of burn medicine. It enables the determination of the patient's definitive diagnosis and prognosis and the determination of a comprehensive treatment plan.

PATIENT CLASSIFICATION FOR MBCI: 1st LEVEL – EMS

The general principles and rules for the classification of patients during an MBCI are determined by the valid recommended procedures of the Society of Emergency and Disaster Medicine of ČLS JEP (hereinafter referred to as the "SUMMK") Mass disability of health / persons – procedure of solution by the medical rescue service in the field (update 2018) and Classification and identification card for medical classification in case of a mass health disability in the Czech Republic (update 2009). However, these rules need to be modified in some way for use with patients with thermal injuries.

Key principles:

- The triage of patients with a **mechanical injury** ("T") is carried out according to the general rules given by the aforementioned recommended procedures.
- For patients with a purely **thermal injury** ("B"), the determination of the **extent of the burned surface area** is decisive for the triage, **regardless of the depth of the burn**.

The extent of the burn is given as a percentage of the total body surface area (% Total Body Surface Area, hereinafter % TBSA) and several methods can be used to determine it.

1. Estimating the extent of the burned surface area can be performed using the "**palmar rule**": the patient's hand with the fingers together and the thumb extended corresponds to about **1% TBSA**.

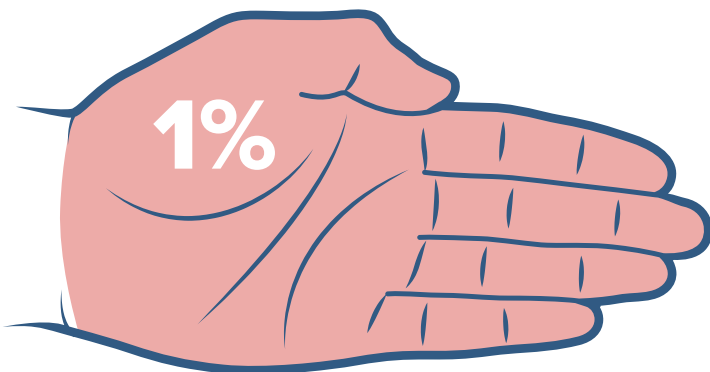


Fig. 1 "Palmar rule"

TIP

IN THE EVENT OF PATIENTS WITH EXTENSIVE BURNS, IT IS EASIER TO DEDUCT THE NON-BURNED AREA.

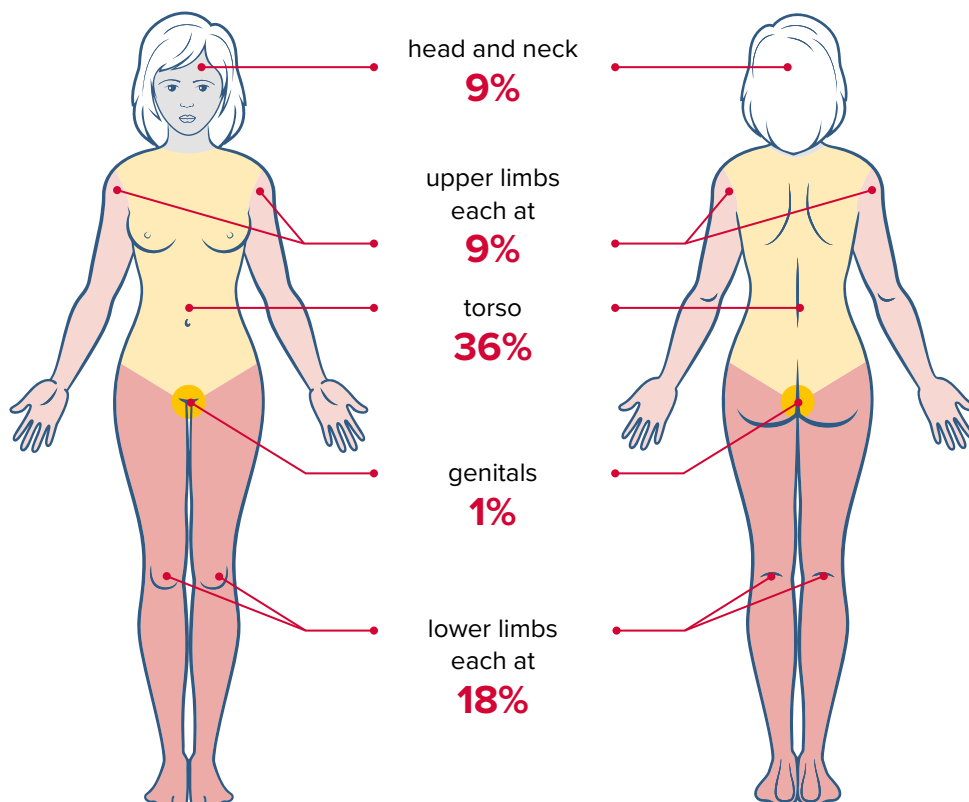
2. The "**Rule of nines**" uses the division of the body surface into compartments with an approximate range of 9% to estimate the extent of the burned area.

It is limited by the fact that burns almost never exactly copy the boundaries of individual compartments. It is also necessary to remember that the "**Rule of nines**" **does not apply to children**.

Fig. 2 "Rule of 9s"

NOTE

"THE RULE OF NINES" DOES NOT APPLY TO CHILDREN



TIP

THE "RULE OF NINES" CAN BE ADVANTAGEOUSLY APPLIED TO LARGER BURNED AREAS.

According to the estimate of the extent of the burned surface area, we classify **adult patients** with thermal injuries into individual groups according to severity as follows:

ADULT PATIENT:

GREEN

extent of the burned area up to $\frac{1}{3}$ of the body surface

YELLOW

extent of the burned surface area $\frac{1}{3}$ - $\frac{1}{2}$ of the body surface area

RED

the extent of the burned surface area above $\frac{1}{2}$ of the body surface area

Dle odhadu rozsahu popálené plochy třídíme **dětské pacienty** s termickým úrazem do jednotlivých skupin dle závažnosti (bez ohledu na jejich věk) takto:

DÍTĚ:

GREEN

extent of burned area up to **10%** of the body surface

YELLOW

extent of the burned surface area **10-20%** of the body surface area

RED

the extent of the burned surface area above **20%** of the body surface area

- In patients **with a combination of both types of injuries** (mechanical, thermal – "B + T"), the resulting priority of the condition is determined by the trauma that is more severe – the "**more severe wins**" rule. Example: a patient with a non-life-threatening mechanical injury with a green + priority and a burn at the same time above 50% TBSA has a resulting red priority; a patient with a 30% TBSA burn [priority yellow] and a concomitant mechanical life-threatening mechanical injury [priority red] has a final priority of red).
- The expression of suspected inhalation trauma ("I") is based on an assessment of the following **indirect signs**:
 - » **development of respiratory failure,**
 - » **a feeling of increasing edema in the throat or a feeling of a foreign body,** worsened swallowing or an inability to swallow,
 - » **phonation disorder** (hoarseness),
 - » **increased salivation,**
 - » **obvious vocal cord edema during laryngoscopy,**
 - » **signs of thermal damage to the mucous membranes of the lips, nose and oral cavity,**
 - » **burning of eyebrows and eyelashes,**
 - » **soot in the oral cavity and in the nostrils,**

- » **listening findings** stridor, wheezing and other respiratory phenomena,
- » anamnestic data on the **mechanism of injury** (explosion, burning in an enclosed space).

We evaluate the priority of the condition **according to the severity of the clinical picture** (impaired consciousness, airway obstruction, respiratory insufficiency) and the **patient's age**.

In case of burns to the upper respiratory tract (supraglottic damage), burns of the mucous membranes occur as a direct result of the effect of thermal NO_x, most often during an explosion in the face. As a result of the onset of edema, dyspnoea and respiratory failure may develop rapidly. **Securing the airways can be difficult due to a swelling of the mucous membranes.**

TIP

THE PRIORITY OF THE CONDITION INCREASES AS AGE DECREASES – THE YOUNGER THE CHILD, THE SMALLER THE TRANSPARENCY OF THE RESPIRATORY TRACT AND THE HIGHER RISK OF RESPIRATORY TRACT OBSTRUCTION.

In the case of lower respiratory tract burns, the inhaled smoke is toxic. Lower respiratory tract burns are often associated **with concomitant CO and hydrogen cyanide intoxication**. Lower airway burns significantly increase the lethality of burn patients.

PATIENT CLASSIFICATION FOR MBCI: 2nd LEVEL – MF / TC

The **secondary triage** in a MF is intended to enable the patients to have a more precise diagnosis with the determination of the extent and depth of the injury. Its main goal is to determine the priorities in the treatment of patients and to enable the determination of their optimal order for secondary transport to the BC.

Determination of the extent and depth of the burn

To more accurately determine the extent of the burned surface area, we use the **Lund Browder diagram** (see the Therapy chapter and the *Patient Card Annex*).

Aid for approximate resolution of burn depth

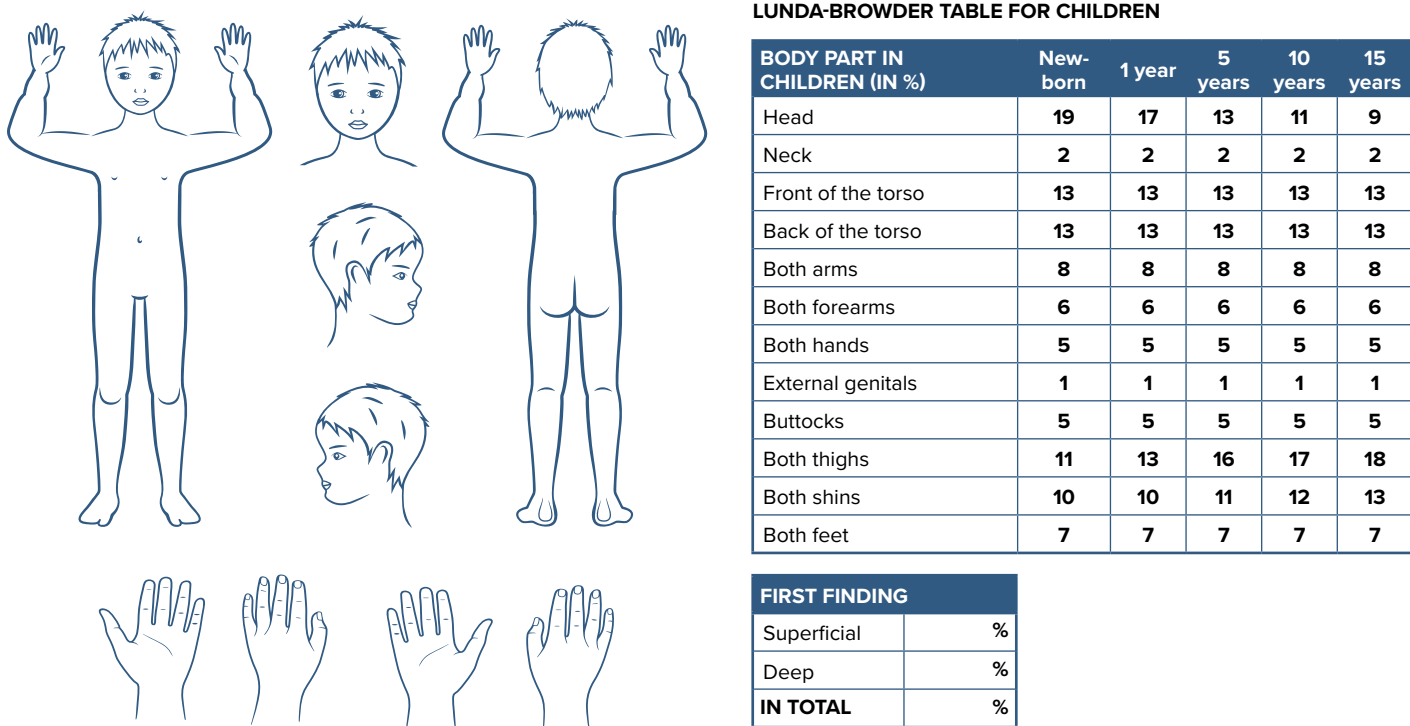
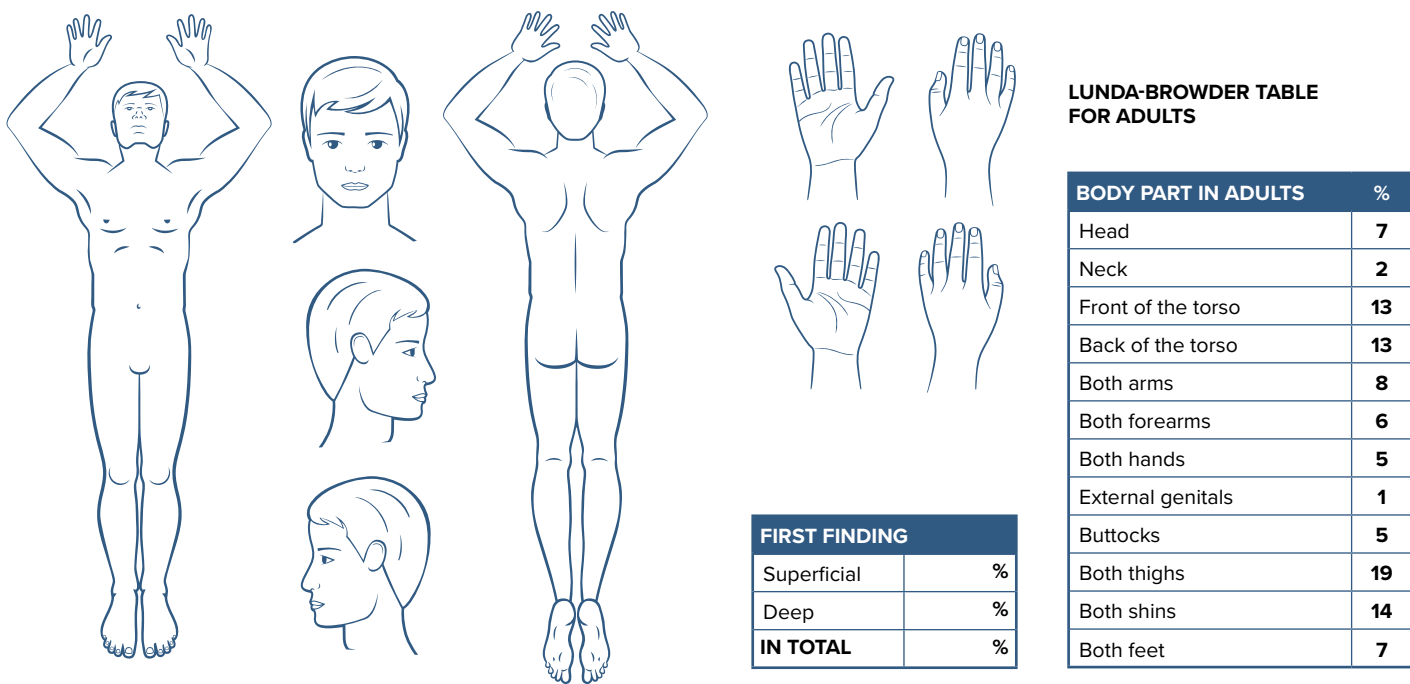
You can orient yourself **according to the color and capillary return**.

The superficial surface area is pink, the capillary return is within 3 seconds. The formation of bulla is typical.

TIP ONLY ERYTHEMA IS NOT COUNTED IN THE SCOPE

The deep surface area is white or whitish in color, often with red dots, and may be black, brown or crimson red, i.e. not pink. The capillary return is over 3 seconds.

Fig. 3 Lund Browder diagram for calculating the burned surface area for adults and children



CHAPTER 2

THERAPY

Healthcare providers providing pre-hospital emergency care, early acute hospital care and ultimately acute care in a specialized BC gradually participate in the treatment of patients with thermal injuries within an MBCI. This material provides all healthcare professionals with little or no experience in the treatment of major burns with a simplified guide to the basic and uniform treatment of patients with a thermal injury.

1. level: **EMS healthcare professional at the scene**
2. level: **A – MF physician providing intensive care**
B – MF physician providing surgical care
3. level: **Physician specializing in BC**

1st LEVEL: EMS HEALTHCARE PROFESSIONAL AT THE SCENE OF THE EVENT

The tasks of an EMS healthcare professional intervening at the scene are:

- ensure the basic vital functions of patients,
- classify patients according to established rules for classification,
- initiate the necessary treatment on site,
- determine the priorities of transport and determine the optimal routing of patients (to the BC, to trauma centers, to the nearest MF).

Recommendations for therapy – EMS:

A – Airways

- if it is necessary to secure the airways, an air duct or laryngeal mask is preferred
- intubate only if there is a risk of suffocation of the patient

B – Breathing



- give all patients an oxygen half mask 6 L/min (assume inhalation trauma or CO poisoning)
- if it is necessary to secure the airways, it is preferable to use spontaneous ventilation (do not use muscle relaxants)
- in ventilated patients always monitor EtCO₂ and SpO₂

C – Circulation

Cannulation ONLY

- ensure 1 venous access site, preferably at least 18G (green flexile)
- in case of 2 unsuccessful attempts to secure venous access, provide intraosseous access
- if not possible, cannulate over burned areas

Fluid resuscitation



- use only modern balanced crystalloids
- the basic dose for an adult patient is 5 ml/kg of estimated weight per hour, which corresponds to approximately 300 to 500 ml/hour (2 to 3 drops per second), regardless of the extent of the burn
- **basic dose for a child according to table no. 1**
- add other fluids according to the patient's condition (other injuries, etc.)
- administer heated solutions, if possible



- adult patients can drink, if possible, equip them with 500 ml of bottled still water

D – Disability (Other disability)



Analgesia in spontaneously ventilating patients

- intravenous **ketamine 0.5 mg/kg** (in adults = approx. Calyptol inj. 1 ml); **in children 1 mg/kg**, can be repeated after 5 minutes
- intramuscular **ketamine 3 mg/kg** (in adults = approx. Calyptol inj. 5 ml); **in children 5 mg/kg**, can be repeated after 10 minutes

Analgesia in ventilated patients – can be administered

- intravenously **fentanyl 200 µg** (= Fentanyl 4 ml); **in children fentanyl 2 µg/kg**, can be repeated after 5 minutes in half amount
- intravenously **sufentanil 20 µg** (= Fentanyl 4 ml); **in children 0.2 µg/kg**, can be repeated after 5 minutes in half amount

Sedation (only if necessary and always as a supplement to analgesia)

- intravenously/intramuscularly **midazolam 5 mg**; in **children 0.2 mg/kg**, can be repeated after 10 minutes



Analgesia

- if possible, give oral analgesics
- intranasally **ketamine 100 mg** (Calypsol inj. 1 ml in each nostril)
- intramuscular **ketamine 3 mg/kg** (in adults = approx. Calypsol inj. 5 ml), can be repeated after 10 minutes

E – Exposure (total treatment)



NOTE

Thermal comfort

- limit cooling to only the face, neck, and hands
- expect a rapid drop in the patient's temperature, avoid catching a chill (blanket, thermofoil) – **priority for children**

Treatment of burned surface areas

- temporarily cover burned surface areas with sterile bandage material or food foil
- do not delay transport due to detailed surface area treatment

Table 1 – dosing of solutions in children

ESTIMATED AGE	10–20 % TBSA	OVER 20% TBSA
1-3 years	100 ml/hour	200 ml/hour
3-5 years (preschool children)	150 ml/hour	250 ml/hour
5-9 years (younger school children)	200 ml/hour	300 ml/hour
10-15 years (older school children)	250 ml/hour	350 ml/hour

2nd LEVEL: A – MF PHYSICIAN ENSURING THE PROVISION OF INTENSIVE CARE

The tasks of the MF physician providing intensive care are to:

- monitor and support the patient's vital functions,
- set adequate fluid resuscitation,
- administer adequate analgesia,
- treat burn shock.

Recommendations for therapy – MF/IC:

A – Airways

- check and ensure airway patency
- replace temporary aids with definitive ones (intubation, tracheostomy)

B – Breathing

- check the adequacy of breathing or start mechanical ventilation or adjust the ventilation regime according to the principles valid for the general population of the patients in intensive care

- all patients with a thermal injury are considered to be carbon monoxide intoxicated and they are administered 100% oxygen until the objective elimination of CO intoxication (i.e. until the determination of the COHb level)

C – Circulation

- check and secure vascular inputs – at least 2 peripheral inputs size 18G (green);
 - » an arterial catheter is indicated in hemodynamically unstable patients or with limb burns that prevent the application of a tonometer cuff
 - » a central venous catheter is indicated in hemodynamically unstable patients or in those with insufficient peripheral venous access
- volume resuscitation is indicated in adult patients with burns exceeding 20% of the body surface area (in children over 10%)
- use modern solutions of balanced crystalloids for volume resuscitation

- the basic dose of fluids is 2-4 ml/kg/% of the burned surface area for the first 24 hours, half of which is given during the first 8 hours
- in the case of insufficient volume effect of crystalloids, administer fresh frozen plasma in a volume ratio of 10 (crystalloids) : 1 (FFP)
- do not use synthetic colloids
- only administer vasoconstrictors (e.g. noradrenaline) in life-threatening hypotension, only after adequate volume supplementation, in otherwise healthy patients permissive hypotension (i.e. mean arterial pressure 55 mm Hg) can be accepted.

• **NOTE**
evaluation of the adequacy of burn shock resuscitation is based primarily on the restoration of diuresis (target: hourly diuresis 0.5 ml/kg/h in adults and 1 ml/kg/h in children)

- in the case of insufficient diuresis, increase the dose of fluids by only 20%, max. 30% per hour against the initial rate; do not use fluid challenges
- a markedly positive cumulative balance is a normal reaction of the organism in the initial phase of the treatment of burn shock and is not a reason to administer diuretics if, at the same time, there are no signs of fluid overload
- increased hematocrit (i.e. Hb >160 g/L) is a normal reaction in the first 48 hours after the injury and is not a sign of insufficient volume substitution
- fluid therapy can usually be de-escalated after the first 36 hours

D – Disability (Other disability)

Analgesia in spontaneously ventilating patients:

- Ketamin (např. 0,5 mg/kg/hod i.v.) v monoterapii nebo v kombinaci s paracetamolem či NSAIDs

Analgesia in ventilated patients:

- Opiates (sufentanil, fentanyl or morphine) continuously according to workplace habits in combination with paracetamol, NSAIDs, or ketamine

Sedation (only if necessary and always only as a supplement to analgesia):

- Midazolam or dexmedetomidine continuously (propofol is not preferred in patients with thermal injury, or it is necessary to monitor triacylglycerol levels)

E – Exposure (General examination)

- Always undress the patient completely, examine thoroughly and obtain photo documentation

• **NOTE**
all burns are endangered by heat loss due to loss of thermoregulation in the affected skin, monitor (preferably continuously) their temperature, maintain normothermia

Other measures and management:

- input samples: blood count, basic coagulation, acid-base balance, carboxyhemoglobin, basic ion values, glycemia, lactate, urinary sediment, basic microbiological swabs from burned areas for cultivation
- initial X-ray of the lungs in patients with suspected inhalation trauma, or bronchoscopy to diagnose lower airway burns and their degree
- mucolytic therapy in patients with inhalation injury: N-acetylcysteine 300 mg + unfractionated heparin 5,000 IU by inhalation every 4 hours
- anticoagulant therapy: continuous infusion of unfractionated heparin 10,000 IU/24 h i.v. in adults
- proton pump inhibitors in all patients with a thermal injury
- ophthalmological examination in all patients with facial burns
- the prophylactic administration of antibiotics is not indicated due to burn and/or inhalation trauma
- the blanket systemic or inhaled administration of corticosteroids is not indicated due to burn and/or inhalation trauma

2nd LEVEL: B – MF PHYSICIAN ENSURING THE PROVISION OF SURGICAL CARE

The tasks of the MF physician providing surgical care are:

- adequately treat burned surface areas,
- draw and document burned surface areas, determine the estimated depth of burns, determine a more accurate diagnosis according to a calculation from the LB diagram,

- if necessary, perform basic surgical intervention – relieving incisions,
- share information on the patients with a thermal injury with the BC (standard form, structured information – *Patient card*)

Recommendations for therapy – MF/SU:

The treatment of patients with a thermal injury must take place under sterile conditions, preferably in an operating room. Due to the considerable pain when handling body surfaces, deep analgesia or general anesthesia is required during treatment.

1. ensure **tetanus prophylaxis**
2. perform **primary treatment of burned body surface areas**
 - remove all clothing and ornaments that the patient is wearing
 - wash all surfaces with antiseptic soap, mechanically remove residual epidermis
 - if the epidermis clings and only bulla filled with clear contents remain: perforate the bulla, vacuum their contents into a sterile square, return the bulla cover to the wound bed, apply tulle gras and an antiseptic dressing
3. the **extent and depth of the burn**
 - plot the extent and depth of the burned area in the Lund Browder diagram (*Patient Card Annex*)
 - take photo documentation of the burned surface areas, if possible (think about the need to identify the patient)
4. carry out the **dressing of the burns**

The main objectives of the dressing are to prevent the drying and mechanical trauma of the burned area and bacterial colonization of the wound.

- in the first layer, use tulle gras with an antiseptic ointment (e.g. Betadine ointment, Flamigel, Flammazine, Dermazine, Yalugen)
- in the second layer, use a dressing with an antiseptic agent (e.g. Prontosol sol., Betadine sol.) – apply directly to the surface area covered with tulle
- apply a dry dressing to the surface (the already covered area should not leak – leakage increases the risk of infection)

5. NOTE

cool burned surface areas (only face, neck, hands), but never more than 5% TBSA

Facial treatment:

- **always cool the face** – preferably with a sterile gel mask for burns (continue cooling until the cooling gel is used up)
- in the case of facial burns, **always indicate an examination by an ophthalmologist**

6. consider performing surgical intervention – **relieving incisions** (escharotomy)

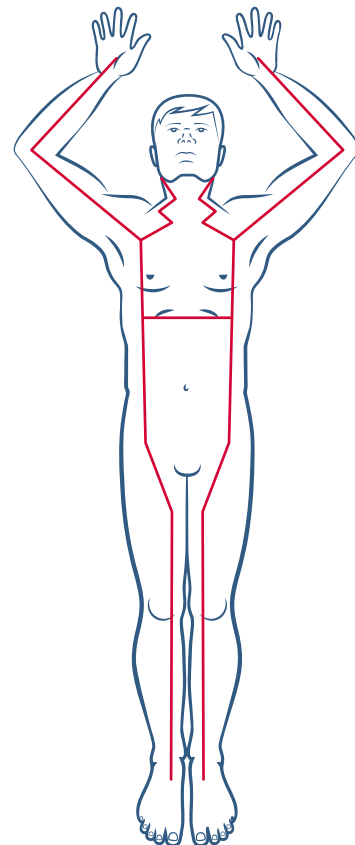
Indications: deep circular burns of limbs, neck and torso, when there is a risk of developing compartment syndrome (hereinafter "CS")

Periodization:

- **immediately in clear cases of 3rd degree circular burns**
- only in case of **clinical signs of CS**, in cases of **3rd degree circular burns** without progression of edema

Execution technique:

- necrosis intersects with a scalpel or electrocautery in full force up to deep into the subcutaneous tissue, or up to the surface fascia
- start and finish the incision in healthy tissue; if the beginning and end of the incision cannot be placed in healthy tissue, it is advantageous to connect the incisions with another anatomical location (e.g. limb with the chest)
- make the incision straight above the ongoing neurovascular bundles
- bleeding condition with a cautery, apply a layer of tulle gras and dressing to the incisions, then compress the squares
- in the case of injury by electric shock or crush syndrome, perform a fasciotomy as well



3rd LEVEL: SPECIALIST PHYSICIAN IN THE BC

The tasks of the BC physician are:

- to establish a definitive diagnosis, including an accurate determination of the extent and depth of burns and the presence of inhalation trauma,
- set up a comprehensive multidisciplinary patient care strategy.

Part of the comprehensive care plan should be a clearly declared surgical procedure including the possible need to use biological covers beyond the scope of normal use. Within the multidisciplinary team, it is possible to decide on the transfer of the patient to palliative care on the basis of transparent medical arguments. Part of the BC physician's work is also communication with other MF and burn centers in the Czech Republic, in the case of an emergency also within the scope of the creation of B teams according to EU recommendations and in accordance with the National Burn Plan of the Czech Republic.

CHAPTER 3

TRANSPORT

The **priority of transport and determination of the primary routing of patients** with thermal injuries from the place of the event are given by the performed triage, which respects the severity of their condition and at the same time the type of injury (to the nearest MF, TC, BC). A necessary part of the deliberation must always be the evaluation of current transport options and the time factor of reachability of individual MF, as well as the total number of patients and the related filling of BC or TR capacities.

For the **secondary transport** of patients from an MF to a BC, the most suitable time is within 48–96 hours from the injury; after this time, there may be an increase in infectious complications, which worsen the overall condition of the patient and limit the possibility of transport.

In the event that the number of burn patients exceeds the national capacity of the BC of the CR (i.e. approx. 40–50 severe burn patients), the mechanisms of international cooperation within the European Union will be activated (following the National Burn Plan of the Czech Republic and the European Burn Plan).

ROUTING OF PATIENTS WITH THERMAL INJURY IN THE EVENT OF AN MBCI

1st LEVEL – EMS (PRIMARY TRANSPORT FROM THE SITE OF THE EVENT)

Patients with a purely thermal injury

Patients with a *pure* thermal injury (group "B") are primarily routed to the nearest BC according to the severity of the impairment and condition, children have a higher priority in groups with the same severity. We prioritize patients with secured airways – ventilated over spontaneously ventilating patients. After filling the immediate capacity of the BC, other patients with a thermal injury are routed to the TC or to another MF.

Patients with a combination of mechanical and thermal injuries

Patients with a combination of mechanical and thermal injuries (group "B + T") are, according to the degree of severity of the impairment, the condition, and after considering other

factors (filling the capacity of the BC, current transport options, time availability of the BC), primarily routed either to the nearest BC or to the TC in its immediate vicinity (Prague/Brno/Ostrava).

Patients with inhalation trauma

Depending on the degree of severity of the impairment and the condition, patients with inhalation trauma (group "I") are primarily routed to the nearest MF that is able to provide them with adequate care.

Pediatric patients

In the case of a danger of delay (especially the "B + T" group), pediatric patients are always directed primarily to the nearest TC for children.

FOR THE PRIMARY ROUTING OF PEDIATRIC PATIENTS WITH A THERMAL INJURY (GROUPS "B", "B + T" AND "I"):

<p>FHKV Prague Faculty Hospital of Královské Vinohrady</p>	<p>BC FHKV TC for children Thomayer Hospital TC for children FN Motol ICU of the Department of Children and Adolescents of GUH (only group "I")</p>
<p>UH Brno</p>	<p>BC UH Brno BC for children in the Children's Hospital, University Hospital Brno</p>
<p>UH Ostrava</p>	<p>BC UH Ostrava</p>

2nd LEVEL– MF (SECONDARY TRANSPORT FROM MF TO BC)

For the successful course of this phase, it is necessary to provide the BC with a complete overview of the number of patients with thermal injuries who were primarily transported to other MF, the severity of their injuries and their current clinical condition **as quickly as possible**. This in turn will allow the determination of the optimal order of patients for secondary transport to the BC. **The sharing of information about patients from MF takes place in the form of structured information transmitted electronically to the BC on a standard form** (*Patient Card Annex*).

The safe and effective sharing of documentation electronically between individual MF and BC should be enabled in the near future by the SIMPOC project (Sharing information between burn centers in the Czech Republic) currently under preparation.

The determination of the order of patients for secondary transport to the BC is always determined by the BC physician in cooperation with the MF physicians.

TIP PATIENT PRIORITY FOR SECONDARY TRANSPORT IS PARTICULARLY DEPENDENT ON THE SCOPE OF INJURIES AND THE SEVERITY OF THE CLINICAL STATE OF THE PATIENT. CRITICAL AGE GROUPS ARE CHILDREN AND GERIATRIC PATIENTS WHERE EVEN A SMALLER BURN RANGE CAN BE CRITICAL AND THUS THE PATIENT'S AGE MUST BE INCLUDED IN THE DELIBERATION.

A special group consists of patients with burn monotraumas of the face and with deep burns of the hands, who benefit from specialized care mainly in terms of long-term consequences – in the event of free BC capacity, the **location of the impairment** should also be taken into account.

For the secondary transport of patients to the BC, the best time is within 48-96 hours of the injury; after this time, there may be an increase in infectious complications, which worsen the overall condition of the patient and limit the possibility of transport.

In the case of pediatric patients, the cooperation of individual workplaces that provide pediatric IC is required. The decision on patient distribution will be based on interdisciplinary cooperation between the BCs, pediatric TCs and pediatric ICUs.

3rd LEVEL– BC (TERTIARY TRANSPORT FROM THE MF OR FROM THE BC TO A BC OUTSIDE THE CZECH REPUBLIC)

If the capacity of the national BCs is filled, it is possible to request the assistance of other EU countries according to valid and approved rules so that the tertiary transport of patients from the MF or from the BC to a BC certified in the European backbone network is possible (in relation to the National Burn Plan of the Czech Republic and the European Burn Plan).

CHAPTER 4

COMMUNICATION

1st LEVEL – COMMUNICATION OF EMS / MF, BC

In the event of an MBCI, the activities of the medical operating center (hereinafter referred to as "MOS") and EMS ambulance groups at the scene take place according to the general principles defined in the recommended procedure of SUMMK ČLS JEP "*Mass disability of health/persons – the procedure of dealing with the emergency medical services in the field*".

After specifying the information on the extent of the MBCI and the expected number of patients from the event location, **the MOS announces the appropriate degree of activation of the trauma plan to the EMS** and also passes

on this information **in the usual way to the MF, including the nearest BC.**

As BCs are always part of trauma centers, **the transmitted notification must contain clear information that the emergency applies to patients with thermal injuries.** This information is continuously updated by the MOS depending on its update from the place of the event.

At the moment of a clear confirmation of an MBCI, it is necessary to verify and confirm the immediate capacity of the BC to receive patients from the event site.



CONTACT TELEPHONE NUMBERS FOR THE TRANSMISSION OF THE NOTICE OF THE ACTIVATION OF A TRAUMATOLOGICAL PLAN IN THE EVENT OF AN MBCI FOR INDIVIDUAL BCS IN THE CZECH REPUBLIC

FHKV Prague	contact point BC FHKV +420 267 163 410 and/or +420 602 322 184 (consulting mobile BC 24/7)
UH Brno	contact point TC UH Brno (+420 532 231 010 – Urgent admission Brno University Hospital)
UH Ostrava	contact point TC UH Ostrava (+420 597 372 366 – Emergency admission of UH Ostrava)

After the completion of the intervention from on the part of the EMS (i.e. after the EMS ambulance group hands **over the last patient** to the MF, TC or BC), **it is necessary (through the MOS) to ensure complete information for the BC on the total number of transported patients with a thermal injury and on their routing to individual MFs** (electronically along the MOS EMS axis to the contact e-mail – see below, or to the contact telephone **number** – see below)

2nd LEVEL – COMMUNICATION MF / BC

In the event of an MBCI, it is necessary to provide burn centers with a complete overview and the maximum necessary information about all patients with thermal injuries who were primarily transported to other MFs. The main goal is to enable the determination of the optimal order of patients for their secondary transport to a BC with a gradual freeing up of capacity. A standard form (Patient Card Annex) is used to share patient information, which is sent electronically from the MF to the contact e-mail address at the PC.



CONTACT E-MAILS FOR THE TRANSMISSION OF INFORMATION ABOUT INDIVIDUAL PATIENTS IN THE EVENT OF AN MBCI FOR INDIVIDUAL PCS IN THE CZECH REPUBLIC

FHKV Prague	popaleniny@fnkv.cz
UH Brno	popaleniny@fnbrno.cz
UH Ostrava	popaleniny@fnostrava.cz

Telephone consultations between the MF and BC are also possible on these designated telephone **numbers (available 24/7 in the case of an MBCI)**.



TELEPHONE CONSULTATIONS ON DESIGNATED TELEPHONE NUMBERS

FHKV Prague	+420 267 163 392 (ICU)
UH Brno	+420 532 233 205 (ICU I)
UH Ostrava	+420 597 372 790/791 (ICU)

ANNEX

**PATIENT CARD
– THERMAL INJURY
ADULT / CHILD**

PATIENT CARD – THERMAL INJURY

ADULTS

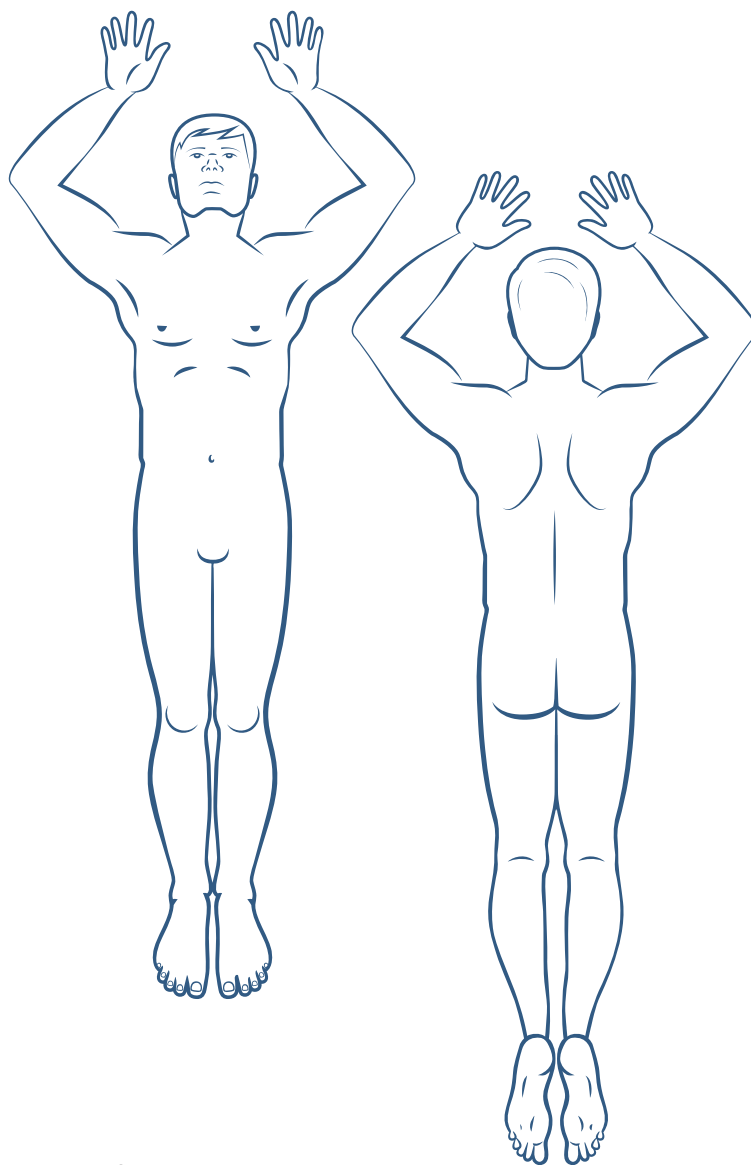
PATIENT:

City:	Hospital:	Contact at the hospital (tel.):
Patient identification:	Age:	Date:

Personal anamnesis:

Comorbidities:

Chronic medication:



INJURY:

Associated trauma: YES NO

If YES, which ones?

Burn:

Inhalation trauma: YES NO

Relieving incisions: YES NO

STATUS PRAESENS:

A Securing the respiratory tract:

YES NO

If YES, how?

B Artificial lung ventilation:

YES NO

FiO₂ _____

C Circulation:

Catecholamines YES NO

LUNDA-BROWDER TABLE

BODY PART OF ADULTS	%	ČÁST TĚLA U DOSPĚLÝCH	%
Head	7	Both hands	5
Neck	2	External genitals	1
Front of the torso	13	Buttocks	5
Back of the torso	13	Both thighs	19
Both arms	8	Both shins	14
Both forearms	6	Both feet	7
IN TOTAL			
Superficial	%	Deep	%

PATIENT CARD – THERMAL INJURY

CHILD:

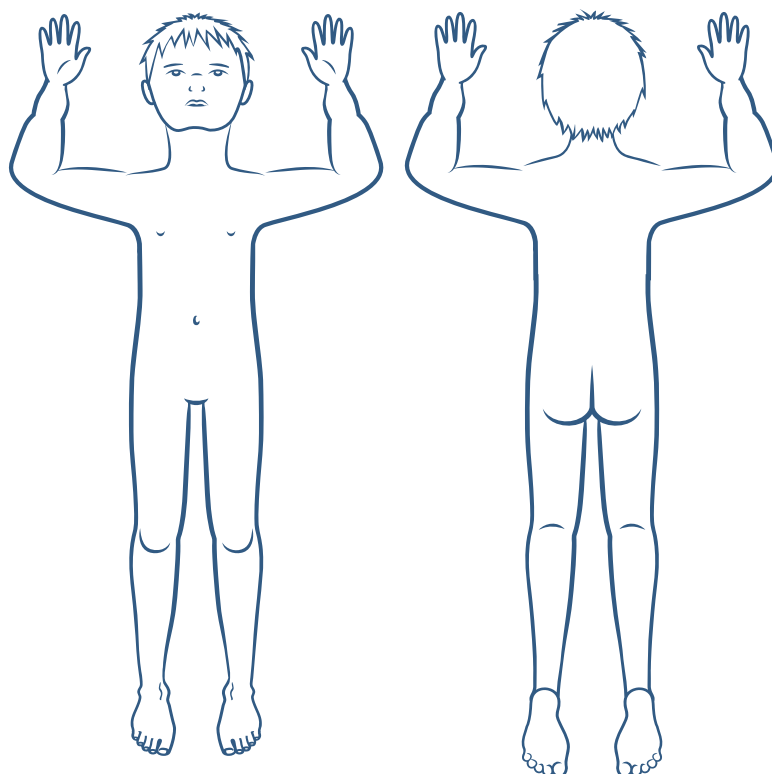
PATIENT:

City:	Hospital:	Contact at the hospital (tel.):	
Patient identification:	Age:	Weight:	Date:

Personal anamnesis:

Comorbidities:

Chronic medication:



INJURY:

Associated trauma: YES NO
If YES, which?

Burn:

Inhalation trauma: YES NO
Relieving incisions: YES NO

STATUS PRAESENS:

A Securing the respiratory tract:

YES NO

If YES, how?

B Artificial lung ventilation:

YES NO

FiO₂ _____

C Oběh:

Catecholamines YES NO

LUNDA-BROWDER TABLE

BODY PART IN CHILDREN (IN %)	%				
	NEWBORN	1 YEAR	5 YEARS	10 YEARS	15 YEARS
Head	19	17	13	11	9
Neck	2	2	2	2	2
Front of the torso	13	13	13	13	13
Back of the torso	13	13	13	13	13
Both arms	8	8	8	8	8
Both forearms	6	6	6	6	6
Both hands	5	5	5	5	5
External genitals	1	1	1	1	1
Buttocks	5	5	5	5	5
Both thighs	11	13	16	17	18
Both shins	10	10	11	12	13
Both feet	7	7	7	7	7
IN TOTAL					
Superficial	%		Deep	%	

ANNEX

EMS CARD

1

PROCEDURE IN CASE OF A MASS BURN CASUALTY INCIDENT – EMS

CLASSIFICATION

1

USE THE

CIC

WRITE CLEARLY ON THE CIC:

"P"
"P+T"
"I"

2

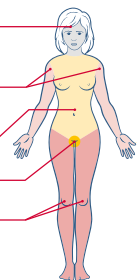
BURN

"P"

DETERMINE THE SCOPE OF THE BURNED SURFACE AREA



head and neck **9%**
upper limbs each by **9%**
torso **36%**
genitals **1%**
lower limbs each by **18%**



3

INHALATION TRAUMA

"I"

INDIRECT SIGNS

- development of respiratory failure
- hoarseness
- salivation
- soot in the oral cavity and in the nostrils

AGE

Priority of the condition according to the clinic and age, the lower the age, the higher the risk.

4

BURN + MECH. TRAUMA

"P+T"

The following applies to burns with mechanical injuries:

"THE MORE SEVERE WINS"

the resulting priority is determined by the more serious injury.

"P"

ADULT PATIENT:

GREEN extent of the burned surface area up to $\frac{1}{3}$ of the body surface area

YELLOW extent of the burned surface area $\frac{1}{3}$ – $\frac{1}{2}$ of the body surface area

RED extent of the burned surface area above $\frac{1}{2}$ of the body surface area

CHILD:

GREEN extent of the burned surface area up to **10%** of the body surface area

YELLOW extent of the burned surface area **10-20%** of the body surface area

RED extent of the burned surface area above **20 %** of the body surface area

2

PROCEDURE IN CASE OF A MASS BURN CASUALTY INCIDENT – EMS

THERAPY

A – Airways

- if it is necessary to secure the airways, an air duct or laryngeal mask is preferred
- intubate only if there is a risk of the suffocation of the patient

B – Breathing

- give all patients an O₂ half mask 6 l/min (assume inhalation trauma or CO poisoning)
- if it is necessary to secure the airways, it is preferential to use spontaneous ventilation (do not relax)
- always in ventilated patients monitor EtCO₂ and SpO₂

C – Circulation

Cannulation

- ONLY** /
- secure 1 i.v. input (if possible, at least 18G – green flexible)
 - in the case of 2 unsuccessful i.v. entry, ensure intraosseous entry
 - if not possible otherwise, cannulate over burned areas

Fluid resuscitation

- /
- use only crystalloids, if possible, administer them heated
 - the basic dose for an adult is 5 ml/kg estimated weight for 1 hour (approx. 300 to 500 ml/hour – i.e. 2 to 3 drops per second), regardless of the extent of the burn
 - basic dose for a child according to the table:

ESTIMATED AGE	10–20% TBSA	OVER 20% TBSA
1-3 years	100 ml/hour	200 ml/hour
3–5 years (preschool children)	150 ml/hour	250 ml/hour
5-9 years (younger school children)	200 ml/hour	300 ml/hour
10-15 years (older school children)	250 ml/hour	350 ml/hour

- add other fluids according to the patient's condition (other injuries, etc.)
- adult patients can drink – if possible, equip them with 500 ml of water

3

PROCEDURE IN CASE OF A MASS BURN CASUALTY INCIDENT –

EMS

D – Disability (Ostatní postižení)

Analgesia in spontaneously ventilating patients

- **ketamine 0.5 mg/kg** i.v. (in adults = approx. Calypsol inj. 1 ml); **in children 1 mg/kg**, can be repeated after 5 minutes
- intramuscular **ketamine 3 mg/kg** i.v. (in adults = approx. Calypsol inj. 5 ml); **in children 5 mg/kg**, can be repeated after 10 minutes

Analgesia in ventilated patients – 200 µg

- of **fentanyl** can be administered i.v. (= **Fentanyl 4 ml**); **in children fentanyl 2 µg/kg**, can be repeated after 5 minutes in half the amount
- **sufentanil 20 µg** i.v. (= **Sufenta 4 ml**); **in children 0.2 µg/kg**, can be repeated after 5 minutes in half the amount

Sedation (only if necessary and always as a supplement to analgesia)

- **midazolam 5 mg**; in children **0.2 mg/kg i.v./i.m.**, can be repeated after 10 minutes

Analgesia

- if possible, administer oral analgesics
- **ketamine 100 mg** intranasally (Calypsol inj. 1 ml in each nostril)
- **ketamine 3 mg / kg** i.m. (in adults = approx. Calypsol inj. 5 ml), can be repeated after 10 minutes

E – Exposure (total treatment)

Thermal comfort

- limit cooling to only the face, neck and hands
- expect a rapid drop in the patient's temperature, avoid catching a chill (blanket, thermofoil) – **preferentially for children**

Treatment of burned surface areas

- temporarily cover burned areas with sterile dressing material or cling film
- do not delay transport due to detailed surface area treatment

4

PROCEDURE IN CASE OF A MASS BURN CASUALTY INCIDENT – EMS

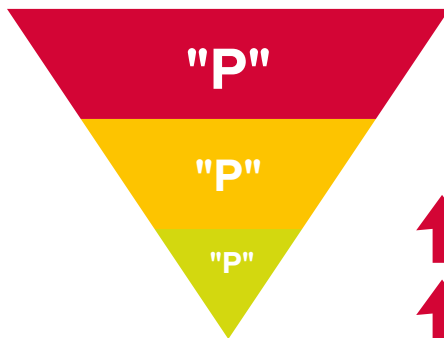
EMS

TRANSPORT

Consider the current transport options, the time availability of the BC or TC and the filling of their capacities.

BURN CENTERS

Capacity Prague / Brno / Ostrava
10 + 5 + 5



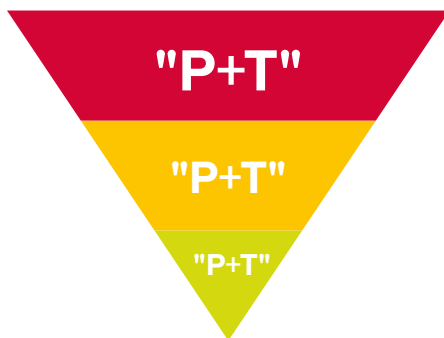
"P" → PC

↑ children

↑ ventilated patients

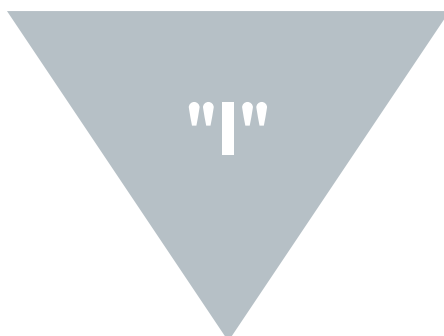
TRAUMA CENTER

"P+T" → TC



If there is no danger of delay, B + T can be routed to a BC or TC near it.

MEDICAL FACILITIES – HOSPITAL



"||"



NEAREST
SUITABLE
MEDICAL
FACILITY

ANNEX

HOSPITAL CARD

1

PROCEDURE IN CASE OF A MASS BURN CASUALTY INCIDENT – HOSPITAL

KARTA PACIENTA

PATIENT CARD – THERMAL INJURY ADULTS

PATIENT:

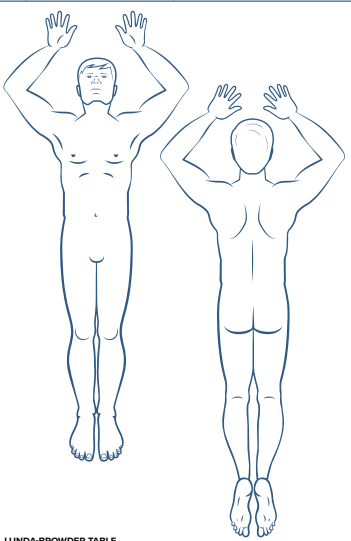
City: _____ Hospital: _____ Contact at the hospital (tel.): _____

Patient identification: _____ Age: _____ Date: _____

Personal anamnesis:

Comorbidities: _____

Chronic medication: _____



INJURY:

Associated trauma: YES NO
If YES, which ones? _____

Burn:

Inhalation trauma: YES NO
Relieving incisions: YES NO

STATUS PRAESENS:

A Securing the respiratory tract:
 YES NO
If YES, how? _____

B Artificial lung ventilation:
 YES NO

FiO₂ _____

C Circulation:

Catecholamines YES NO

LUNDA-BROWDER TABLE			
BODY PART OF ADULTS	%	ČÁST TĚLA U DOSPĚLÝCH	%
Head	7	Both hands	5
Neck	2	External genitals	1
Front of the torso	13	Buttocks	5
Back of the torso	13	Both thighs	19
Both arms	8	Both shins	14
Both forearms	6	Both feet	7
IN TOTAL			
Superficial	%	Deep	%

PATIENT CARD – THERMAL INJURY CHILD:

PATIENT:

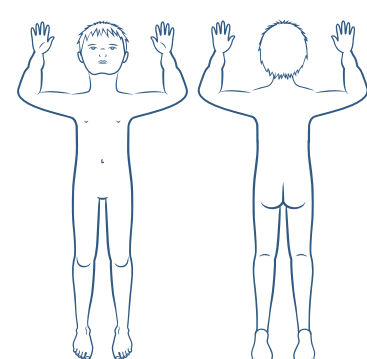
City: _____ Hospital: _____ Contact at the hospital (tel.): _____

Patient identification: _____ Age: _____ Weight: _____ Date: _____

Personal anamnesis:

Comorbidities: _____

Chronic medication: _____



INJURY:

Associated trauma: YES NO
If YES, which? _____

Burn:

Inhalation trauma: YES NO
Relieving incisions: YES NO

STATUS PRAESENS:

A Securing the respiratory tract:
 YES NO
If YES, how? _____

B Artificial lung ventilation:
 YES NO

FiO₂ _____

C Oběh:

Catecholamines YES NO

LUNDA-BROWDER TABLE					
BODY PART IN CHILDREN (IN %)	%				
	NEWBORN	1 YEAR	5 YEARS	10 YEARS	15 YEARS
Head	19	17	13	11	9
Neck	2	2	2	2	2
Front of the torso	13	13	13	13	13
Back of the torso	13	13	13	13	13
Both arms	8	8	8	8	8
Both forearms	6	6	6	6	6
Both hands	5	5	5	5	5
External genitals	1	1	1	1	1
Buttocks	5	5	5	5	5
Both thighs	11	13	16	17	18
Both shins	10	10	11	12	13
Both feet	7	7	7	7	7
IN TOTAL					
Superficial	%		Deep		

2

PROCEDURE IN CASE OF A MASS BURN CASUALTY INCIDENT –

HOSPITAL

THERAPY – INTENSIVE CARE

A – Airways

- check and ensure airway patency
- replace temporary aids with definitive ones (intubation, tracheostomy)

B – Breathing

- check the adequacy of breathing, or initiate mechanical ventilation or adjust the ventilation regime according to the principles valid for the general population of patients in intensive care
- all patients with thermal injuries are considered to be intoxicated with carbon monoxide and are administered 100% oxygen until CO intoxication is objectively ruled out (i.e. until COHb levels are determined)

C – Circulation

- check and secure vascular access (minimum 2 sizes 18G – green);
 - » arterial catheter is indicated in hemodynamically unstable patients or with limb burns that prevent the application of the tonometer cuff
 - » central venous catheter is indicated in hemodynamically unstable patients or with insufficient provision of peripheral venous access
- volume resuscitation is indicated in adult patients with burns exceeding 20% of the body surface area (in children over 10%)
- use modern solutions of balanced crystalloids for volume resuscitation

- the basic dose of fluids is 2–4 ml/kg/% of the burned surface area for the first 24 hours, half of which is given during the first 8 hours
- in case of the insufficient volume effect of crystalloids, administer fresh frozen plasma in the volume ratio of 10 (crystalloids): 1 (FFP)
- do not use synthetic colloids
- vasoconstrictors (e.g. noradrenaline) only in life-threatening hypotension, only after adequate volume supplementation, in otherwise healthy patients' permissive hypotension (i.e. mean arterial pressure 55 mm Hg) can be accepted)

NOTE

- **evaluation of the adequacy of burn shock resuscitation is based primarily on the restoration of diuresis** (target: hourly diuresis 0.5 ml/kg/h in adults and 1 ml/kg/h in children)
- in case of insufficient diuresis, increase the dose of fluids by only 20%, max. 30% per hour against the initial rate; do not use fluid challenges
- a markedly positive cumulative balance is a normal reaction of the organism in the initial phase of treatment of burn shock and is not a reason to administer diuretics, if at the same time there are no signs of fluid overload
- increased hematocrit (i.e. Hb > 160 g/l) is a normal reaction in the first 48 hours and is not a sign of insufficient volume substitution
- fluid therapy can usually be de-escalated after the first 36 hours

3

PROCEDURE IN CASE OF A MASS BURN CASUALTY INCIDENT –

HOSPITAL

D – Disability (Other disabilities)

Analgesia in spontaneously ventilating patients:

- Ketamine (e.g. 0.5 mg/kg/hr i.v.) alone or in combination with paracetamol or NSAIDs

Analgesia in ventilated patients:

- Opiates (sufentanil, fentanyl or morphine) continuously according to workplace habits in combination with paracetamol, NSAIDs or ketamine

Sedation (only if necessary and always as a supplement to analgesia)

- Midazolam or dexmedetomidine continuously (propofol is not preferred in patients with thermal injuries, or triacylglycerol levels should be monitored))

E – Exposure (General examination)

- Always undress the patient completely, examine thoroughly and obtain photo documentation

NOTE

- **all burns are endangered by heat loss due to loss of thermoregulation in the affected skin, monitor (preferably continuously) their temperature, maintain normothermia**
-

Other measures and management:

- input samples: blood count, basic coagulation, acid-base balance, carboxyhemoglobin, basic ion profile, glycemia, lactate, urinary sediment, basic microbiological swabs from burned areas for cultivation
- **baseline** X-ray of the lungs in patients with suspected inhalation trauma, or bronchoscopy to diagnose lower airway burns and their degree
- mucolytic therapy in patients with inhalation injury: N-acetylcysteine 300 mg + unfractionated heparin 5,000 IU by inhalation every 4 hours
- anticoagulant therapy: continuous infusion of unfractionated heparin 10,000 IU/24 h i.v. in adults
- proton pump inhibitors in all patients with thermal injuries
- ophthalmological examination in all patients with facial burns
- prophylactic administration of antibiotics is not indicated due to burn and/or inhalation trauma
- blanket systemic or inhaled administration of corticosteroids is not indicated due to burn and/or inhalation trauma

4

PROCEDURE IN CASE OF A MASS BURN CASUALTY INCIDENT –

HOSPITAL

SURGICAL CARE

1. **provide tetanus prophylaxis**
2. **perform primary treatment of burned body surfaces**

under sterile conditions, deep analgesia or under general anesthesia

- remove all clothing and ornaments that the patient is wearing
- wash all surfaces with antiseptic soap, mechanically remove residual epidermis
- if the epidermis clings and only bulla filled with clear contents remain: perforate the bulla, vacuum their contents into a sterile square, return the bulla cover to the wound bed, apply tulle gras and apply an antiseptic dressing

3. **the extent and depth of the burn**

- draw the range and depth of the burned area in the LB diagram in the Patient Card
- take photo documentation of the burned surface areas, if possible (think about the need to identify the patient)

AID FOR APPROXIMATE RESOLUTION OF BURN DEPTH

Orient yourself **according to the color and capillary return.**

The superficial surface is pink, the capillary return is within 3 seconds. The **formation of bulla** is typical.

TIP

ONLY ERYTHEMA IS NOT COUNTED IN THE SCOPE

The deep surface is white or whitish in color, often with red dots, and can also be black, brown or crimson red, i.e. **not pink.** The **capillary return is over 3 seconds.**

4. **carry out the dressing of the burned surface areas**

The main objectives of the dressing are to prevent drying and the mechanical trauma of the burned area and bacterial colonization of the wound.

- in the first layer, use tulle gras with antiseptic ointment (e.g. Betadine ointment, Flamigel, Flammazine, Dermazine, Yalugen)
- in the second layer, use a dressing with an antiseptic agent (e.g. Prontosan sol., Betadine sol.) – apply directly to the surface covered with tulle
- apply a dry dressing to the surface (the already covered area should not leak – leakage increases the risk of infection)

5. **cooling of burned surfaces**

always only cool areas up to 5% of the body surface (face, neck and hands), never larger areas – there is a risk of catching a chill

Facial treatment:

- **always cool the face** – preferably with a sterile gel mask for burns (continue cooling until the cooling gel is used up)
- in case of facial burns, **always indicate an examination by an ophthalmologist**

5

PROCEDURE IN CASE OF A MASS BURN CASUALTY INCIDENT –

HOSPITAL

6. consider performing a surgical intervention – relieving incisions (escharotomy)

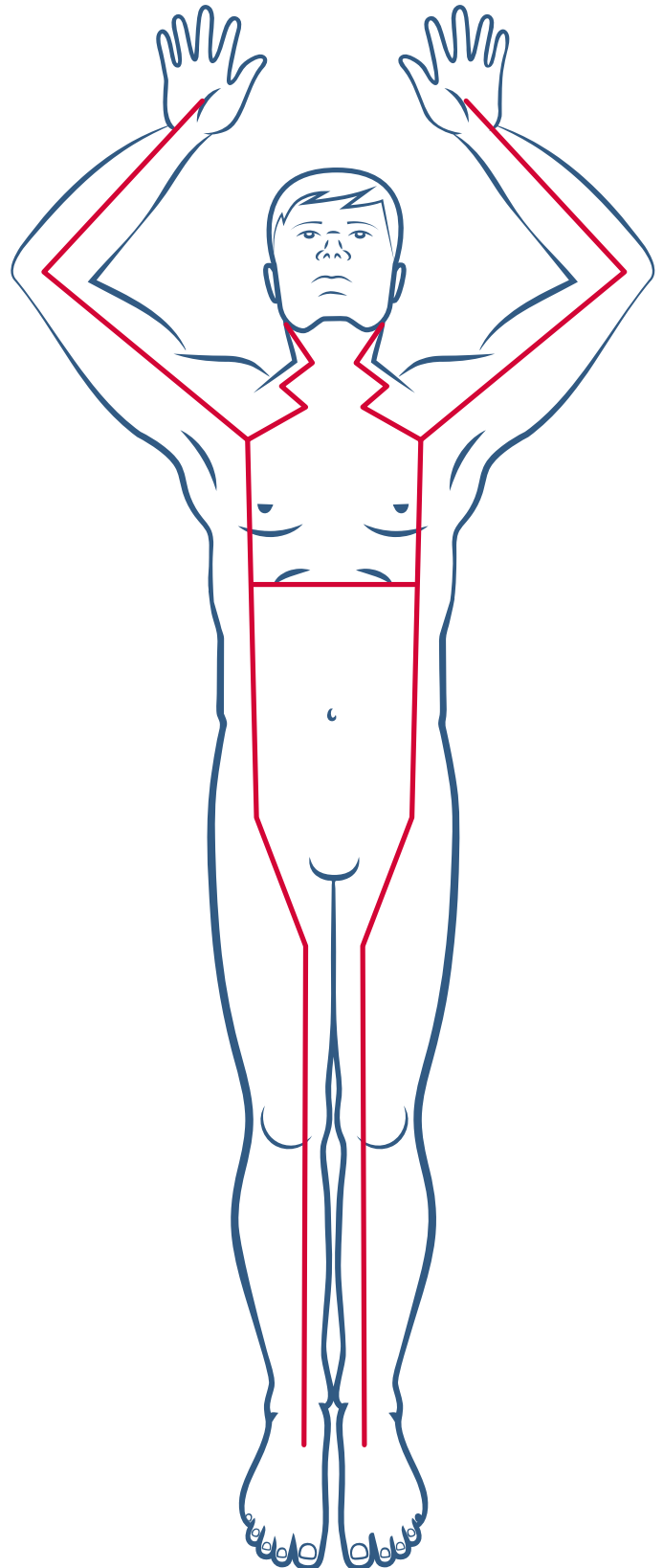
Indications: deep circular burns of the limbs, neck and torso, when there is a risk of developing compartment syndrome (hereinafter "CS")

Periodization:

- in clear cases of 3rd degree circular burns immediately
- in cases of 3rd degree circular burns without progression of edema only in case of clinical signs of CS

Execution technique:

- The incision must be deep into the subcutaneous tissue, or even down to the fascia
- start and finish the incision in healthy tissue; if the beginning and end of the incision cannot be placed in healthy tissue, it is advantageous to connect the incisions with another anatomical location (e.g. a limb with the chest)
- make the incision straight above the ongoing neurovascular bundles
- Hemostasis can be achieved with cautery, by application of a layer of tulle gras and dressing on the incisions, and then compression with gauze
- in the case of electrical injury or crush syndrome, perform a fasciotomy as well



CITATION

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