

31 MAY 2024- OSTEND – De Grote Post



THE ANNUAL BESEDIM CONGRESS –
YOU DO NOT WANT TO MISS THAT!

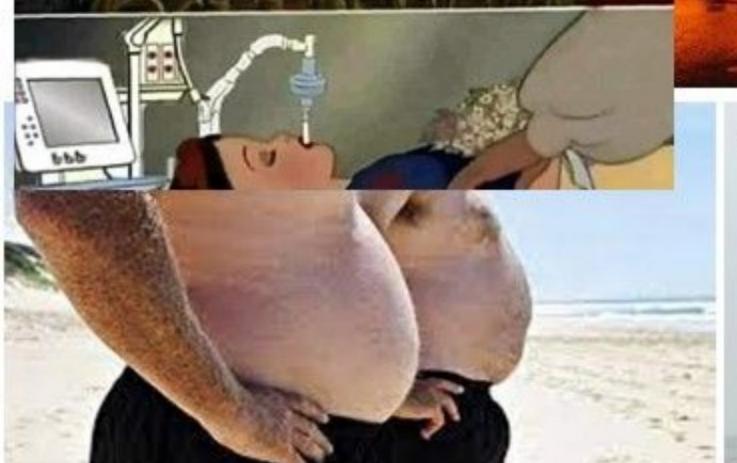
ABSTRACT DEADLINE 15 APRIL 2024



BE·S·E·D·I·M
BELGIAN SOCIETY OF EMERGENCY
AND DISASTER MEDICINE



ARE U PREPARED?



Outside the burning house

Dr. Bart Lesaffre

Be·S·E·Di·M

BELGIAN SOCIETY OF EMERGENCY
AND DISASTER MEDICINE



Before we start...

- + Emergency physician
AZ Sint Jan Brugge
- + No conflict of interest



Before we start...

- + Emergency physician
AZ Sint Jan Brugge
- + No conflict of interest





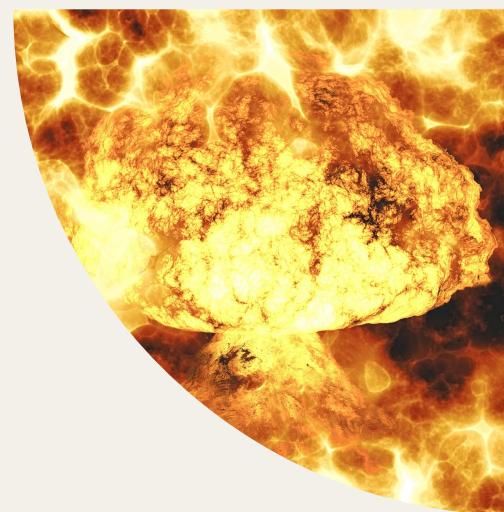
Outside the burning house- BeSEDiM 2024

+ Pre-hospital

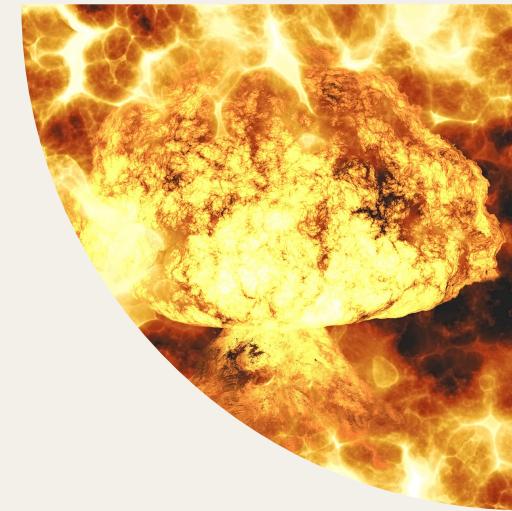
+ Smoke

+ Thermal burns

+ Explosion- Structural collapse



Pre- hospital

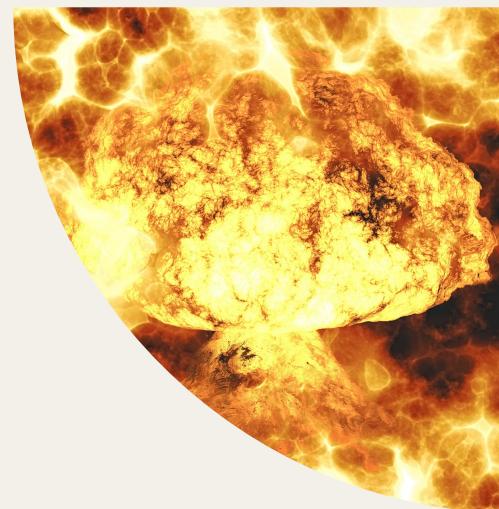


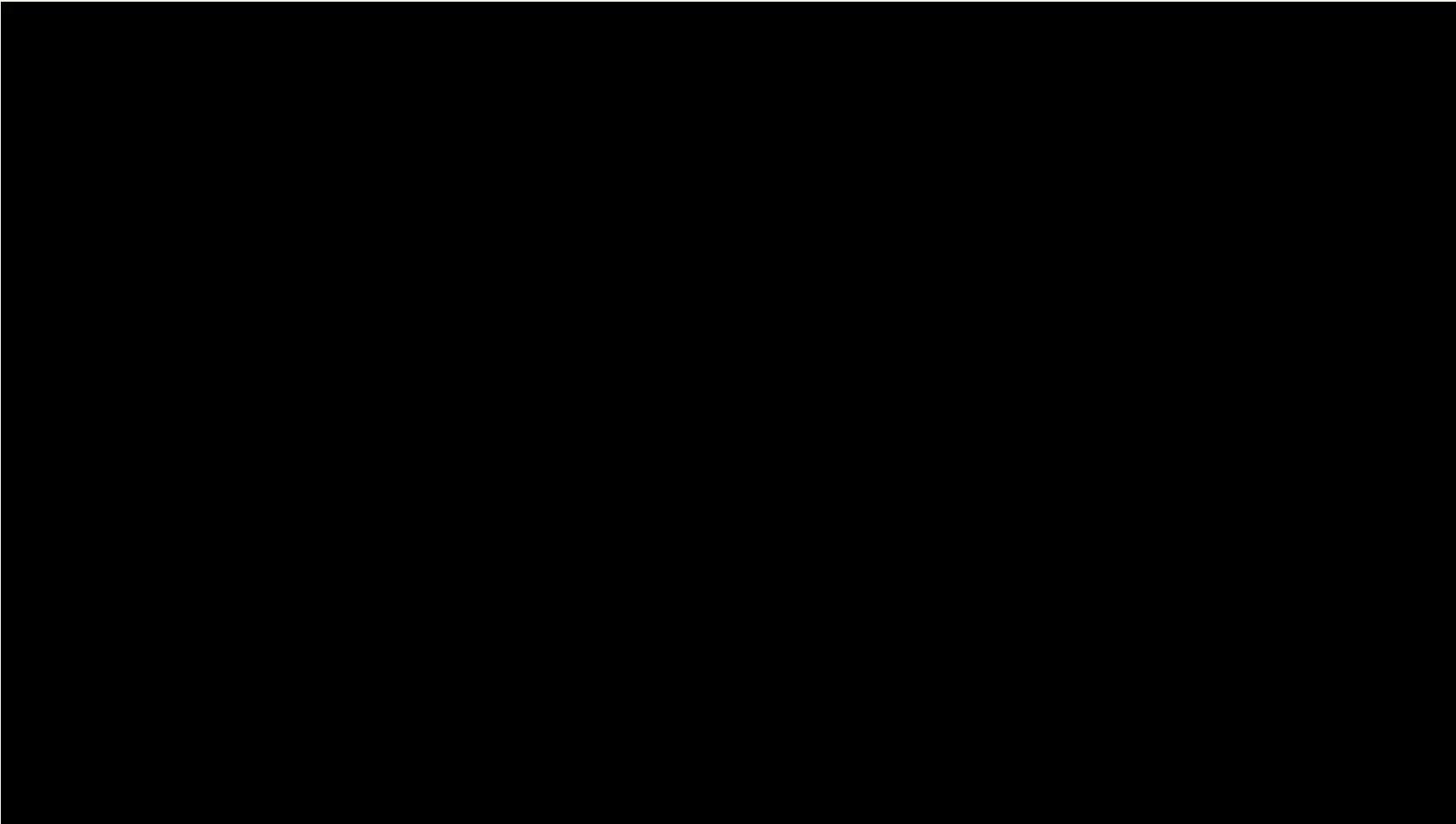


Key Data in Healthcare Emergency Medical and Psychosocial Services 2021ed. FOD

	ALERTING						
	(DEP) HI	(DEP) DIRMED	PSM	MUG/SMUR	ZW112	RIR	
PRE ALERT	+	+	+				<ul style="list-style-type: none"> Potentially dangerous situation
ALERT	+	+	+	3	5	+	<ul style="list-style-type: none"> 5 seriously injured people 10 injured people - nature unknown > 20 potentially in danger (except for evacuation due to law enforcement)
EXTENDED MIP	+	+	+	10	20	+	<ul style="list-style-type: none"> 20 seriously injured people 40 injured people - nature unknown
MAXI MIP	+	+	all	20	40	+	<ul style="list-style-type: none"> 50 seriously injured people 100 injured people - nature unknown

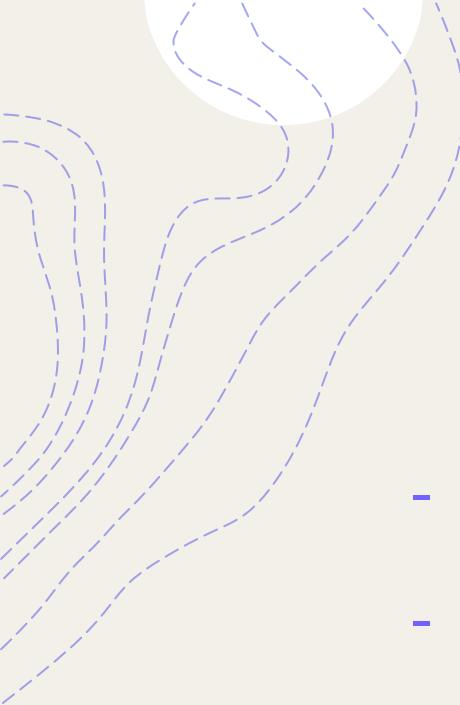
Smoke inhalation





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10



Smoke inhalation Inhalation injury

- Smoke, chemical irritants, heat
 - Composition depends on:
 - Fuel type
 - Temperature
 - Oxygen
 - Smoke kills more than flames
- 

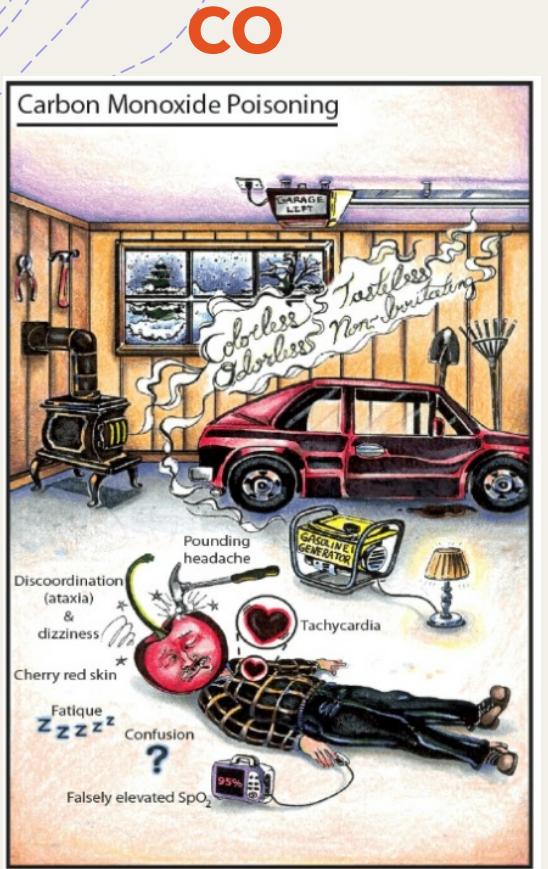
Inhalation

Systemic toxicity

Supraglottic: heat and chemicals- edema

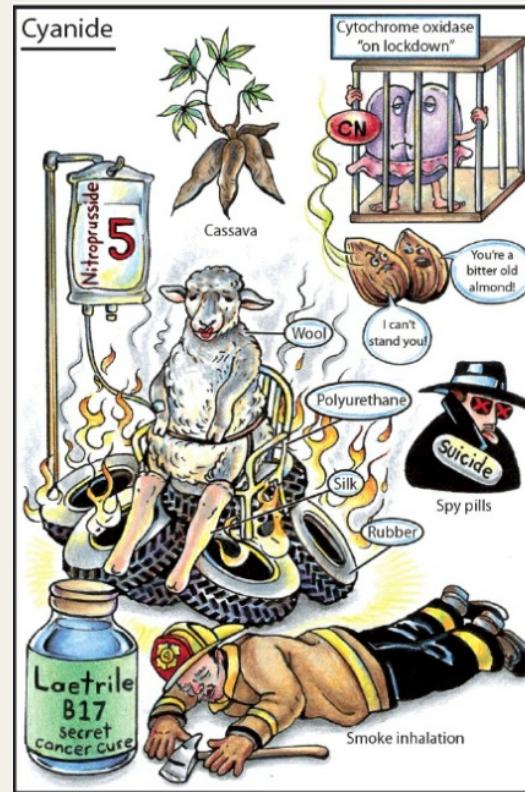
Subglottic: chemicals- inflammation and edema
(atelectasis/ pneumonia)

Systemic toxicity



HBOT?

HCN



5g IV/IO- 15 min
(Ped: 70mg/kg)
Decreased GCS <13
Lactate

Cyanide poisoning by fire smoke inhalation: a European expert consensus

Kurt Anseeuw^{a,*}, Nicolas Delvau^{b,*}, Guillermo Burillo-Putze^d, Fabio De Iaco^e, Götz Geldner^f, Peter Holmström^g, Yves Lambert^h and Marc Sabbe^c

European Journal of Emergency Medicine 2013, 20:2-9

Belgian cost-effectiveness analysis of hydroxocobalamin (Cyanokit) in known or suspected cyanide poisoning

Severien Drieskens,¹ Kurt Anseeuw,² Lieven Annemans,³ Christine Fetro⁴

Drieskens S, et al. Eur J Hosp Pharm 2013;20:161–167. doi:10.1136/ejhp-2012-000213

Key message

- ▶ Hydroxocobalamin appears cost-effective to dominant compared with standard treatment in cyanide poisoning from a healthcare payer's perspective.

Ik ondergetekende, geneesheer-specialist met bijzonder bekwaamheid in de urgentiegeneeskunde, geneesheer-specialist in de acute geneeskunde of geneesheer-specialist in de urgentiegeneeskunde, verzekert dat de bovenvermelde patiënt een gekende of vermoede cyanidevergiftiging heeft opgelopen.

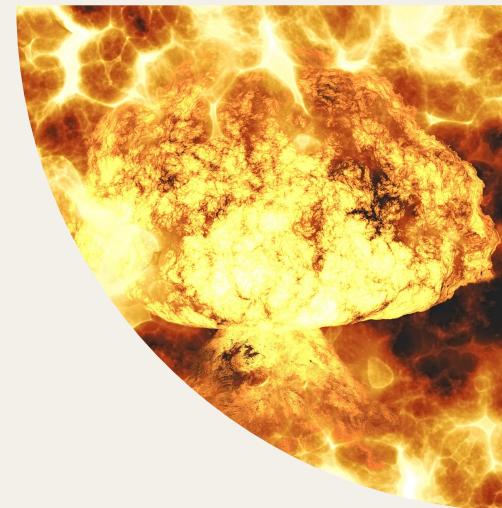
Je soussigné, médecin spécialiste avec une compétence particulière en médecine d'urgence, médecin spécialiste en médecine aiguë ou médecin spécialiste en médecine d'urgence, certifie que le patient mentionné ci-dessus a subi une intoxication confirmée ou suspectées au cyanure.

Intubation?

Consider intubation if:

- ▶ GCS <12. Can be caused by trauma, drugs, alcohol, carbon monoxide. Consider CT Head
- ▶ Impending upper airway obstruction
 - ▶ Pharyngeal oedema **INTUBATE NOW**
 - ▶ Inspiratory stridor **INTUBATE NOW**
 - ▶ Difficulty swallowing secretions **INTUBATE NOW**
 - ▶ Intra-oral burns including tongue Intubate
 - ▶ Intra-oral swelling. No stridor Intubate
 - ▶ Burns around mouth or nose Observe carefully
 - ▶ Soot in mouth or nostrils, singed nasal hairs Observe carefully
- ▶ Respiratory distress
- ▶ Ventilatory inadequacy caused by circumferential burns to chest and / or abdomen
- ▶ Deep facial burns and circumferential neck burns
- ▶ Increasing swelling of head and neck. May be particularly obvious once fluid resuscitation commenced.
- ▶ Other serious trauma / significant associated injuries

Thermal Burns



Don't be overwhelmed by the appearance of the burn

Primary Survey

- + Airway and cervical spine protection
- + Breathing
- + Circulation: normal heart rate 100-120, no hypotension
- + Disability: normally alert
(if not: trauma, drugs, alcohol, medication, CO)
- + Environment: hypothermia prevention

Treat first what kills first

- + Penetrating Trauma
- + Blunt Trauma
- + Burn Trauma

STOP the burn

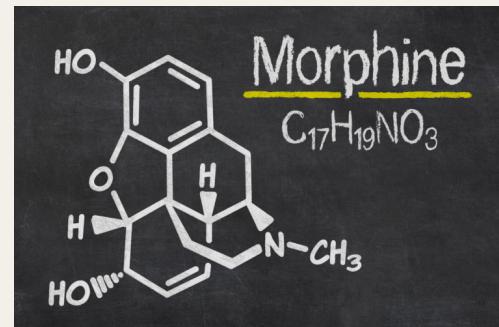
Cooling

- + ASAP (within 3 hours)
- + 'cool' tap water (25-37°)
- + 30 minutes
- + Hydrogel: max 20min., only affected area



Analgesia

- + Pain
 - catecholamines
 - peripheral ischemia
 - depth increases



Remove

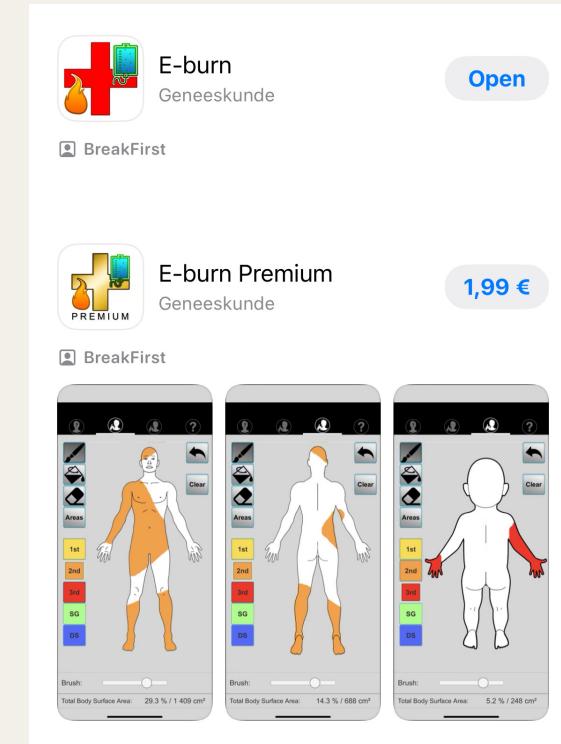
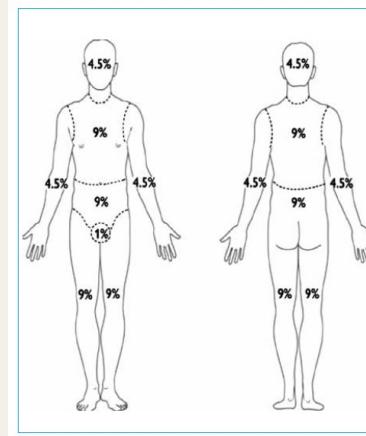
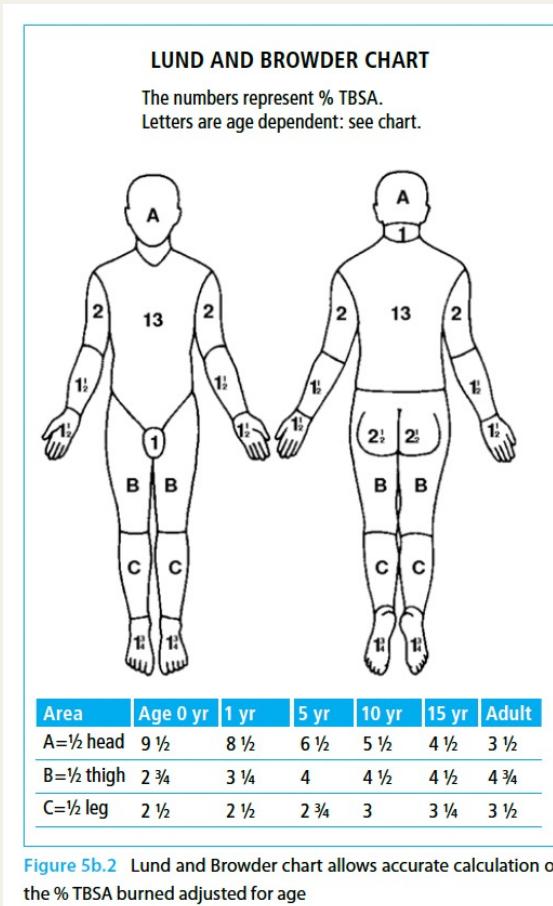
- + Clothing
- + Jewelry
- + Diapers
- + Contact lenses

Cool the burn, warm the patient

- Warm environment
- Cool the burn region by region (head- hand- feet- gen.)
- Keep patient covered



Total Body Surface Area: 2nd- 3rd degree



Fluid Management

Initial fluid $\geq 20\%$ TBSA

- + $\leq 5y$: 125ml/h
- + 6-13y: 250 ml/h
- + $\geq 14y$: 500ml/h

Adjusted fluid

- + Weight (ideal body weight)
- + TBSA
- + Titration!

Category	Age and Weight	Adjusted Fluid Rate
Flame or scald	Adults and teenagers (≥ 13 years old)	$2 \text{ ml LR} \times \text{kg} \times \% \text{ TBSA} =$ $\text{ml}/24\text{hrs} \div 16 = \text{m/hr starting rate}$
	Children (≤ 12 years old)	$3 \text{ ml LR} \times \text{kg} \times \% \text{ TBSA} =$ $\text{ml}/24\text{hrs} \div 16 = \text{m/hr starting rate}$ Plus D ₅ LR at maintenance rate
Electrical Injury	All ages	$4 \text{ ml LR} \times \text{kg} \times \% \text{ TBSA} =$ $\text{ml}/24\text{hrs} \div 16 = \text{m/hr starting rate}$ Plus D ₅ LR at maintenance rate for children ≤ 12 years old

Fluid loss is slow and progressive
 Avoid boluses and blood transfusion

Fluidtitration

Blood pressure measurement

- + May be misleading in burned limb(s)
- + Auditory signal diminished as edema increases
- + Intra- arterial monitoring may be inaccurate due to vasoconstriction
- + Inaccurate as fluid resuscitation guide

Urine output

- + Adult (>12y)
 - + 0,5ml/kg/h
 - + 30-50ml/h
- + Child
 - + 1ml/kg/h
- + Increase/ decrease fluid by 1/3rd if not met
- + Myoglobinuria: 1-1,5ml/kg/h

Complications of fluid administration

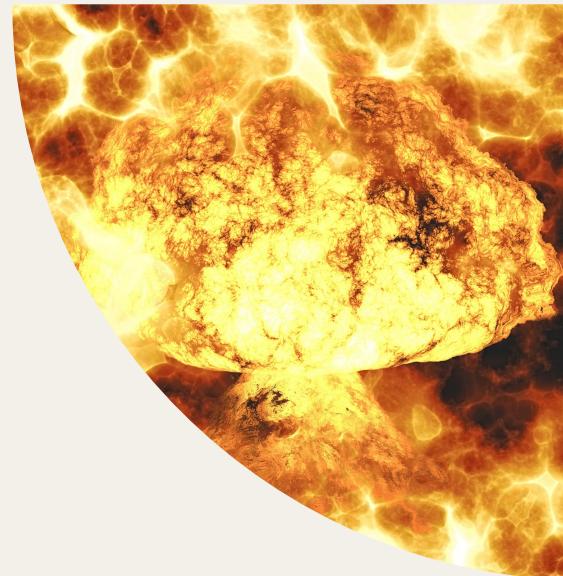
- Increase laryngeal swelling- ETT dislocation
- ARDS
- Pneumonia
- Multiple Organ Failure
- Compartment syndrome (abdominal, extremities, orbital)

Other interventions

- Cover with cling film/ loose dressing
- Tetanusvaccination
- Elevation of head/ affected extremities
- No antibiotics
- No steroids
- Seldom escharotomy in the first hours



Explosion/ structural collapse



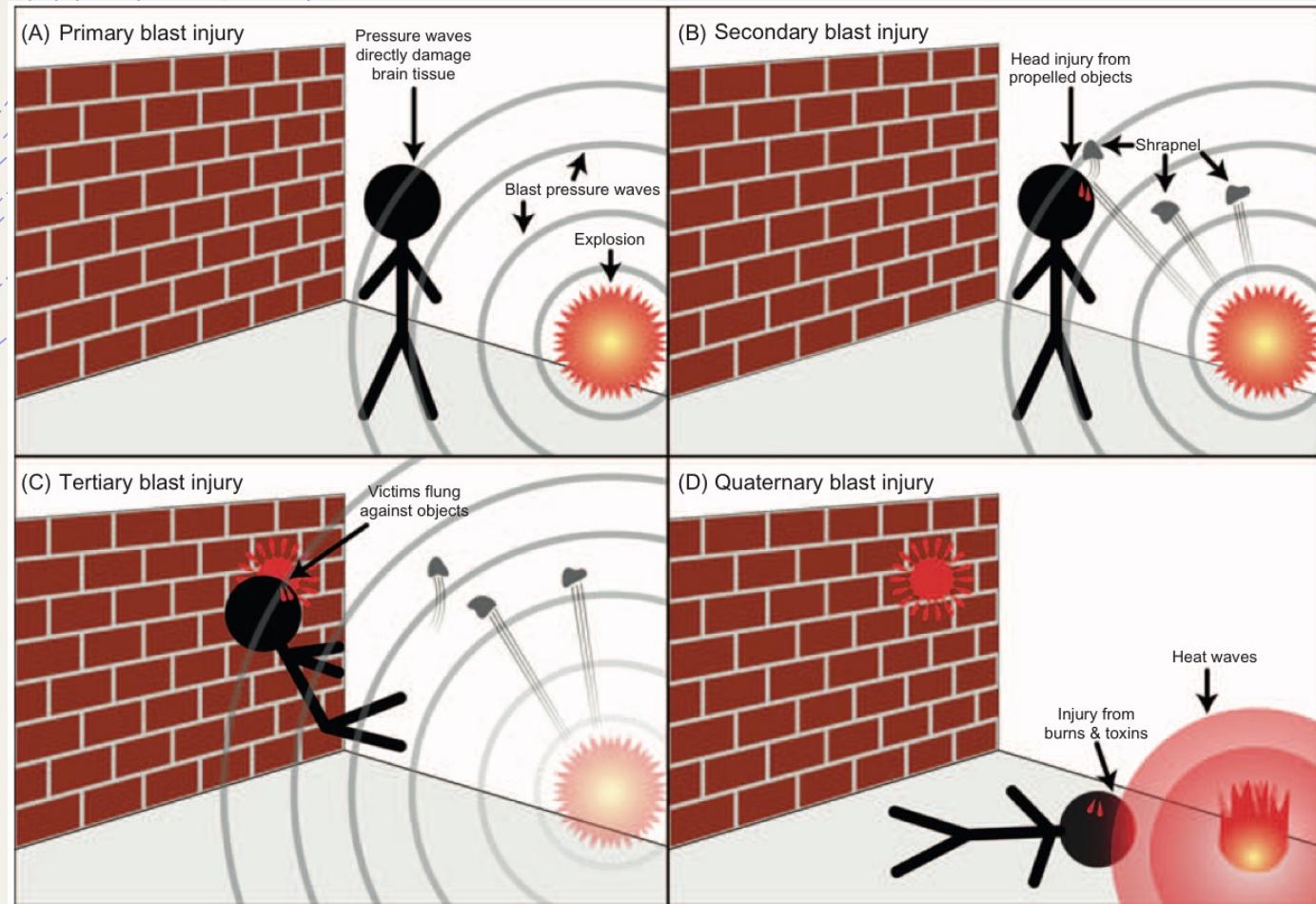
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Oostende, 13/10/22



OUTSIDE THE BURNING HOUSE- BESEDIM 2024

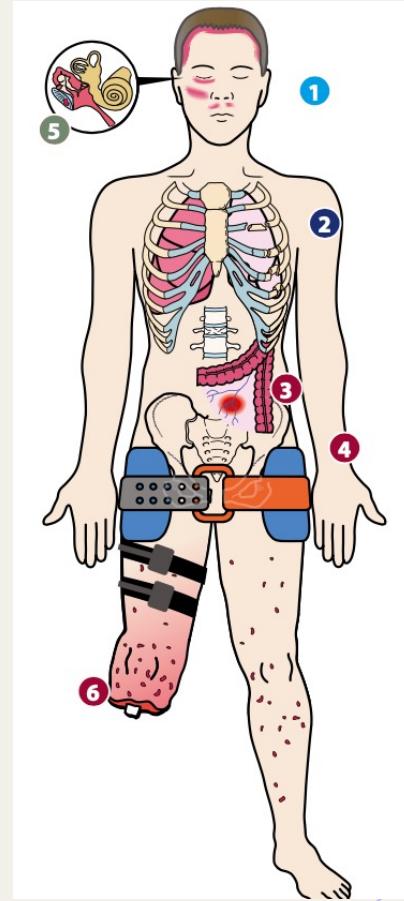
Effects



Injuries From Explosions: Physics, Biophysics, Pathology, and Required Research Focus

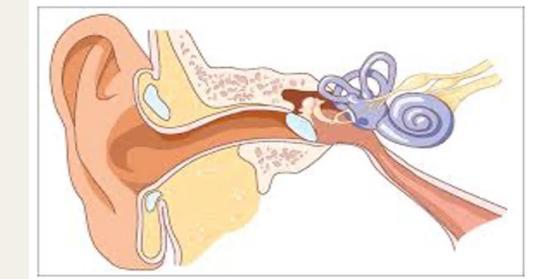
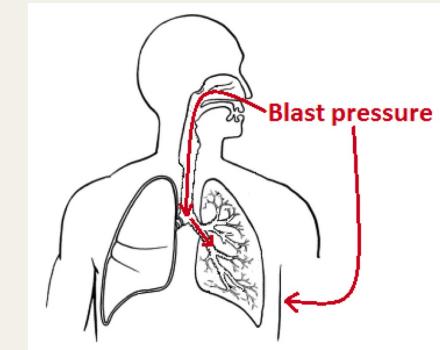
Howard R. Champion, MD, FRCS, FACS, John B. Holcomb, MD, FACS, and Lee Ann Young, MA
The Journal of TRAUMA® Injury, Infection, and Critical Care

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Primary Blast Injuries

- Pressure wave: stress and shear forces
- Barotrauma
 - Ear
 - Lung
 - Abdominal
- Enclosed environment



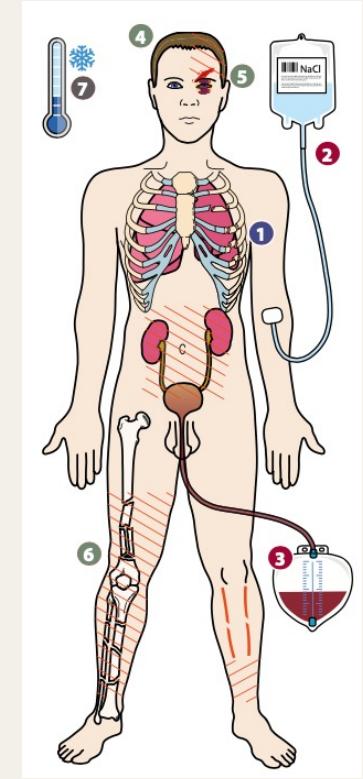
Secondary and Tertiary Blast Injuries

- Most common blast injuries
- Penetrating trauma
- Blunt trauma



Crush- Rhabdomyolysis

- Is possible after continuous pressure (1-4h)
- Reperfusion Injury
- Cardiac rhythm disorders
- Myoglobinuria
- Compartment syndrome
- Kidney failure



Transfer to Burn Center

Complex burn injuries

A burn is defined as complex if one or more of the following criteria are met:

- age:
 - under 5 or over 60 years.
- area:
 - over 10% TBSA burnt in adults;
 - over 5% TBSA burnt in children.
- site:
 - face, hands, perineum or feet;
 - any flexure, particularly the neck or axilla;
 - any circumferential dermal or full thickness burn of the limbs, torso or neck.
- inhalation injury:
 - any significant inhalation injury, excluding pure carbon monoxide poisoning.
- mechanism of injury:
 - high pressure steam injury;
 - high voltage electrical injury;
 - chemical injury >5% TBSA burnt;
 - hydrofluoric acid injury (>1% TBSA burnt);
 - suspicion of non-accidental injury, adult or paediatric.
- pre-existing medical conditions:
 - cardiac disease;
 - respiratory disease;
 - diabetes mellitus;
 - pregnancy;
 - immunosuppression of any cause;
 - hepatic impairment, cirrhosis.
- associated injuries:
 - crush injuries;
 - major long bone fractures;
 - head injury;
 - penetrating injuries.

Brandwondencentra

- Antwerpen
ZNA Algemeen Ziekenhuis STUYVENBERG
T: 03 217 75 95
- Gent
Universitair Ziekenhuis
T: 09 332 34 90
- Luik
Hôpital universitaire de Liège - Domaine du Sart Tilman
T: 04 366 72 94
- Leuven
Universitair ziekenhuis Gasthuisberg
T: 016 34 87 50
- Loverval
Grand Hôpital de Charleroi - Site IMTR
T: 071 10 60 00
- Neder-Over-Heembeek (Brussel)
Militair hospitaal
T: 02 268 62 00

Belgian Association for Burn Injuries plan

Take home

Smoke inhalation kills more than flames- CO/HCN

Stop the burn

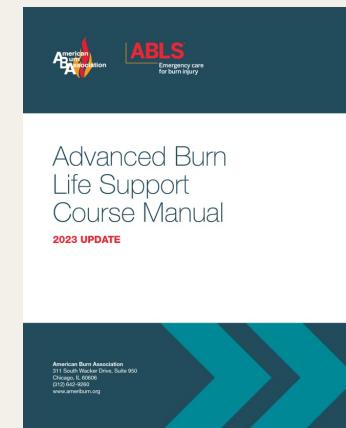
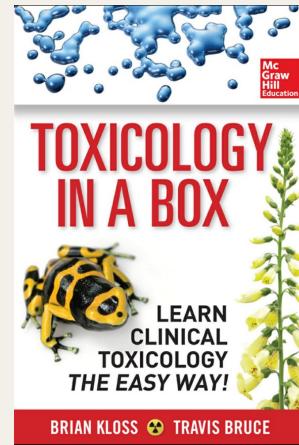
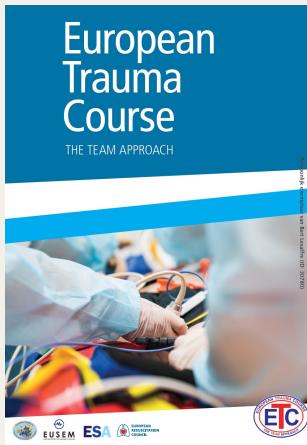
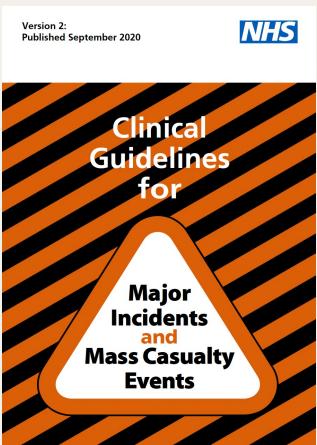
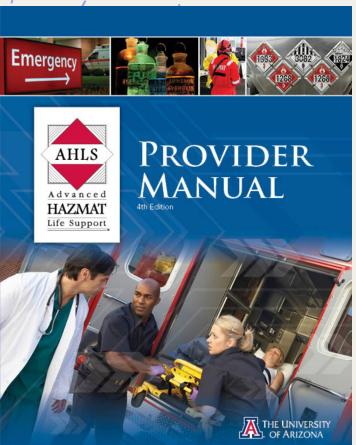
Cool the burn, warm the patient

Fluid titration

Blast injury- Crush Trauma

Specialised advice- burn centers

References



Pictures by Pexels



Thank you

Questions?



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