

3rd Swiss Rauma & Resuscitation Day Bern

# Targeting the most suitable trauma center for my severely injured patient: Is it time for guidelines?

Michael Lehmann



## Swiss conference of the cantonal health directors



### Definiton of 12 specialised trauma centers with subspecialisation in Switzerland



## Treatment of polytrauma and/or severe head trauma in adults

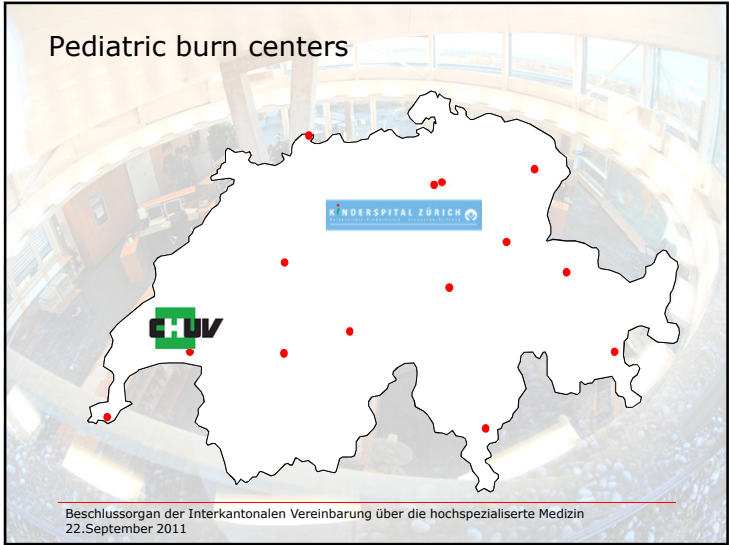
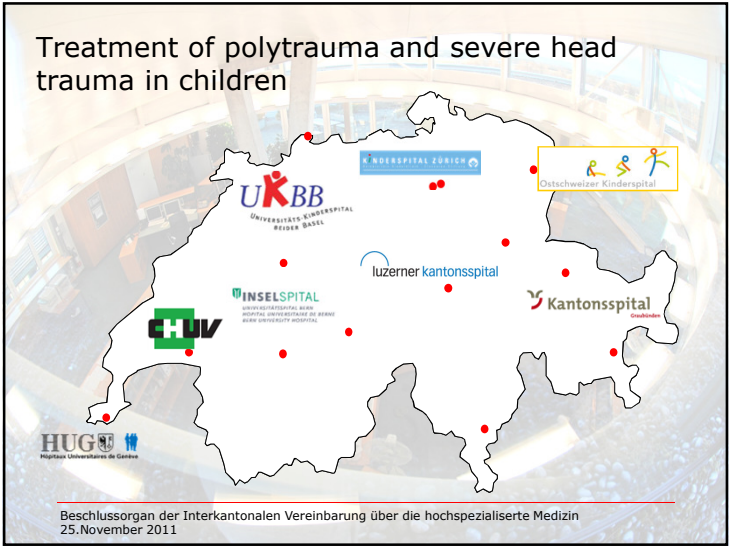
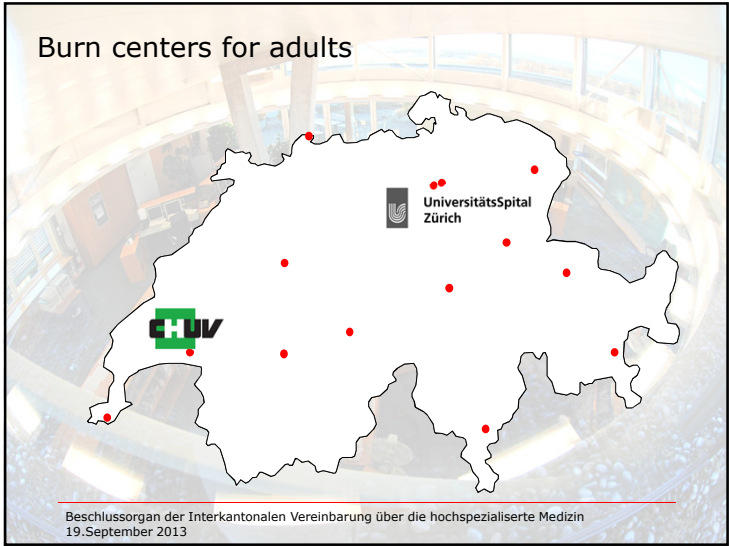


Beschlussorgan der Interkantonalen Vereinbarung über die hochspezialisierte Medizin, 20. Mai 2011

## Stroke units



Beschlussorgan der Interkantonalen Vereinbarung über die hochspezialisierte Medizin, 21. Juni 2011



### 3<sup>rd</sup> Swiss Trauma & Resuscitation Day Bern

**Targeting the most suitable trauma center for my severely injured patient: Is it time for guidelines?**

rega

A collage of emergency scenes including a helicopter, an ambulance, and various rescue operations.

3<sup>rd</sup> Swiss Trauma & Resuscitation Day Bern

**Targeting the most suitable trauma center for my severely injured patient: Is it time for guidelines?**

**We have guidelines but...**





PHTLS

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„Treat first what kills first!“

regal+

PHTLS

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„Treat first what kills first!“

...and bring the patient to the right place

regal+

PHTLS

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„Treat first what kills first!“

...and bring the patient to the right place

If our preclinic assesment of the patient is correct...

regal+

## Preclinical assessment of the severity of injury

«A fast and reliable evaluation of the severity of injury through the emergency doctor has a major impact on the treatment goals, on choosing which target clinic and on timely providing personal and material resources in the trauma center»

*Der Anaesthesist 2013; 62:380-388 M.Muhm, T.Danko, H.Winkler  
Präklinische Einschätzung der Verletzungsschwere bei Kindern.*



## Preclinical assessment of the severity of injury

How good is the preclinical evaluation

What are the scores used

Anually 790`000 trauma victims

10% polytrauma

602 deaths

*SUVA; Unfallstatistik 2012*



## Scores – NACA

**National Advisory Comitee for Aeronautics Score**

- Important preclinical score but highly subjective
- Underestimation of NACA Score in 20 in polytrauma and up to 51% in myocardial infarction (> 100'000 patients, all air-medical transport)

Patient Status	Intervention	Score Level
no acute life-threatening disease or injury	acute intervention not necessary	1
further diagnosis: studies needed	acute intervention not necessary	2
no acute but not life-threatening disease or injury	acute intervention necessary	3
development of vital danger possible	acute intervention necessary	4
acute vital life-threatening danger	acute intervention necessary	5
acute cardiac or respiratory arrest	emergency resuscitation	6
fatal		7

*Notfall und Rettungsmedizin 2005; 8:96-108. T. Schlechtriemen et al*



## Scores – ISS/TRISS

TRISS Score  
Trauma Injury Severity Score  
Predicted Death Rate (%)  
TRISS (blunt): 58.6 CALCULATE  
TRISS (penetrating): 69.0 RESET  
AGE: =>15 and <55  
Variables - ISS  
Head and Neck: Moderate - 2pt  
Face: Serious - 3pt  
Chest: Serious - 3pt  
Abdomen, Pelvic Contents: Critical - 5pt  
Extremity, Pelvic Girdle: Moderate - 2pt  
External: Moderate - 2pt  
Injury Severity Score: 43  
Variables - RTS  
Respiratory Rate (per min): 1-5 - 1pt  
Systolic Blood Pressure (mmHg): 50-75 - 2pt  
Glasgow Coma Scale: 9-12 - 3pt  
Revised Trauma Score: 4.57



## ISS (Injury Severity Score)

Score depending on **anatomic** injury

Prognostic value for **surviving**



## TRISS (Trauma Injury Severity Score)

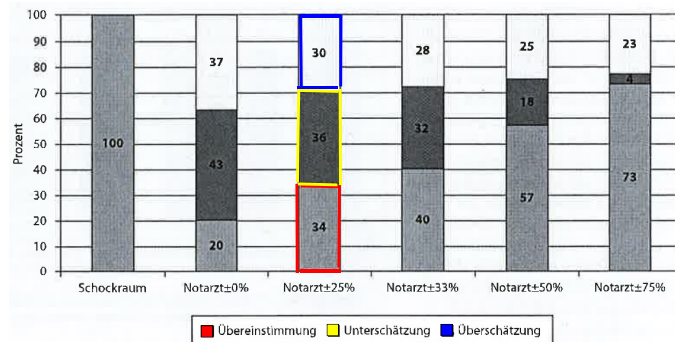
Combined Score with **anatomic** and **physiologic** parameters

(GCS, p syst, resp frequency, age, penetrating/blunt trauma)

-> Prognostic value for **predicted death rate**



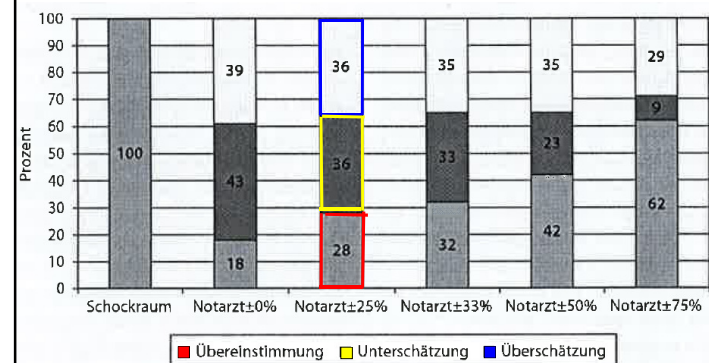
### Preclinical assessment of the severity of injury comparing ISS preclinical/emergency room



Anaesthesist 2011 60:534-540  
M. Muhm, T. Danko, C. Madler, H. Winkler



### Preclinical assessment of the severity of injury comparing TRISS preclinical/emergency room



Anaesthesist 2011 60:534-540  
M. Muhm, T. Danko, C. Madler, H. Winkler



**Preclinical assessment of the severity of injury comparing NACA preclinical/emergency room**

Underestimation of NACA Score of 20% in polytrauma and up to 51% in acute myocardial infarction  
(> 100'000 patients, all air-medical transport)

Patient Status	Intervention	Score Level
non-severe ICI (trauma only) / minor trauma	score intervention not necessary	1
trauma (major) / major trauma	score intervention not necessary	2
trauma (major) / major trauma	score intervention necessary	3
trauma (major) / major trauma	score intervention necessary	4
trauma (major) / major trauma	score intervention necessary	5
trauma (major) / major trauma	score intervention necessary	6
trauma (major) / major trauma	score intervention necessary	7

Notfall und Rettungsmedizin 2005; 8:96-108. T. Schlechtriemen et al



**Target clinic?**

- Better outcome for polytrauma in trauma centers
- Lower mortality if transported direct to a trauma center

Garwe T et al. 2010. Acad Emerg Med. 17: 1223-32

Haas B et al, 2012. J Trauma Acute Care Surg 72: 1510-5

Osterwalder J., 2002. J Trauma, 52: 1030-6

Ruchholz S et al. 2007. Der Unfallchirurg. 110: 373-380



### Future tools?

FAST



Infrascan/Pneumoscan

Preclinic lab, Point of care testing



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CMAJ

### COMMENTARY

#### Urgent air-medical transport: Right patient, place and time

Alexander Isakov MD MPH

Cite as CMAJ 2009; DOI:10.1503/cmaj.091258

#### Rule of the 3 « R »

- Get the Right patient
- to the Right hospital
- in the Right time





