

Mild Traumatic Brain Injury/ MTBI – peanuts or serious injury with consequences to observe”



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Mehr als eine Versicherung

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MTBI

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Outline

- What is it?
- Who gets it?
- How to classify?
- How to manage?
- What is the outcome?
- When return to play, learning, work?

Definition

- Complex pathophysiological process
- Affecting the brain
- Induced by biomechanical forces

Definition

- Confusion or disorientation
- Loss of consciousness (loc) < 30´
- Posttraumatic amnesia (pta) < 24h
- Other transient neurologic abnormalities – focal signs, seizure, intracranial lesion not requiring surgery
- GCS 13 – 15

WHO Collaborating Center Task Force on MTBI; Centers for Disease Control and Prevention (CDC)

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Epidemiology

MTBI

- 70 - 90 % of all TBI
- 600 adults/100´00

in sports

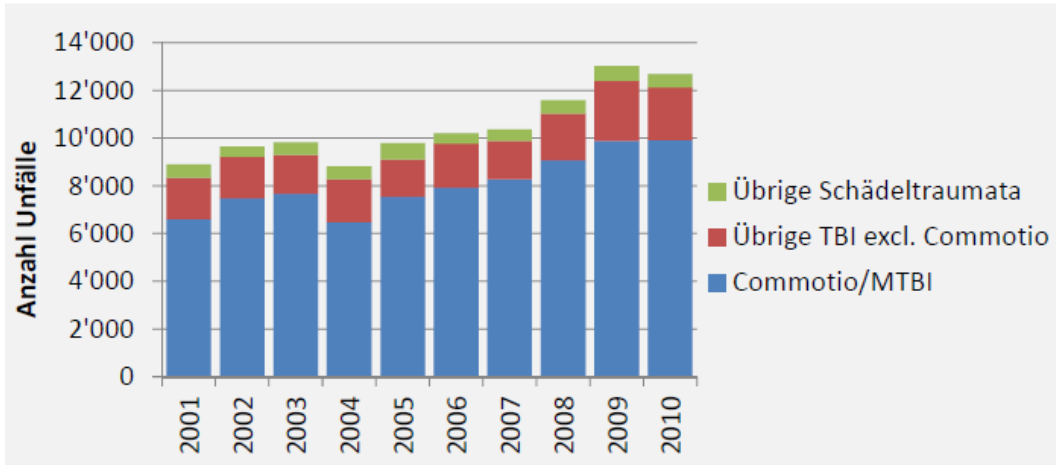
- 1.6 to 3.8 million individuals annually in USA

Holm 2005 Cancelliere 2014

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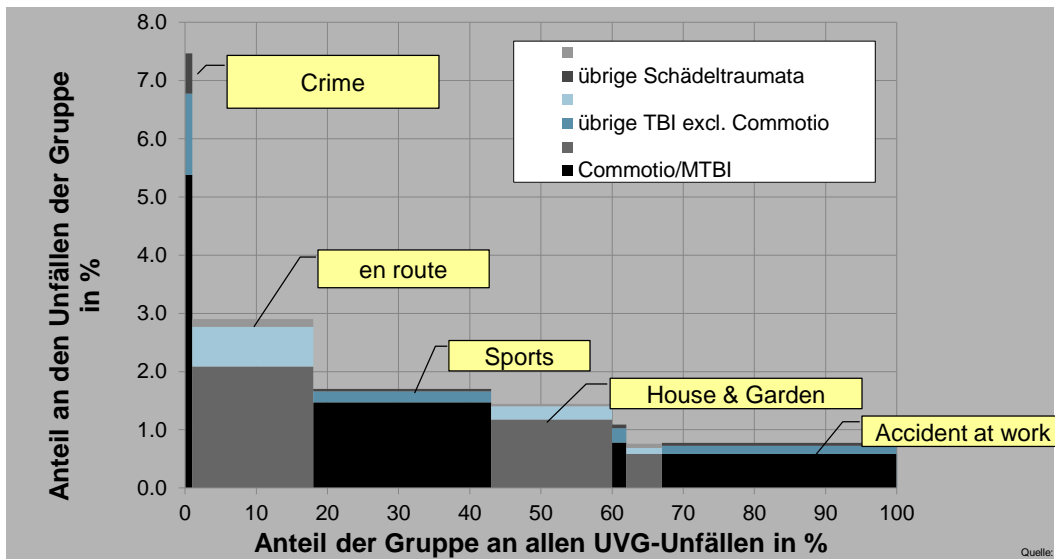
Epidemiology



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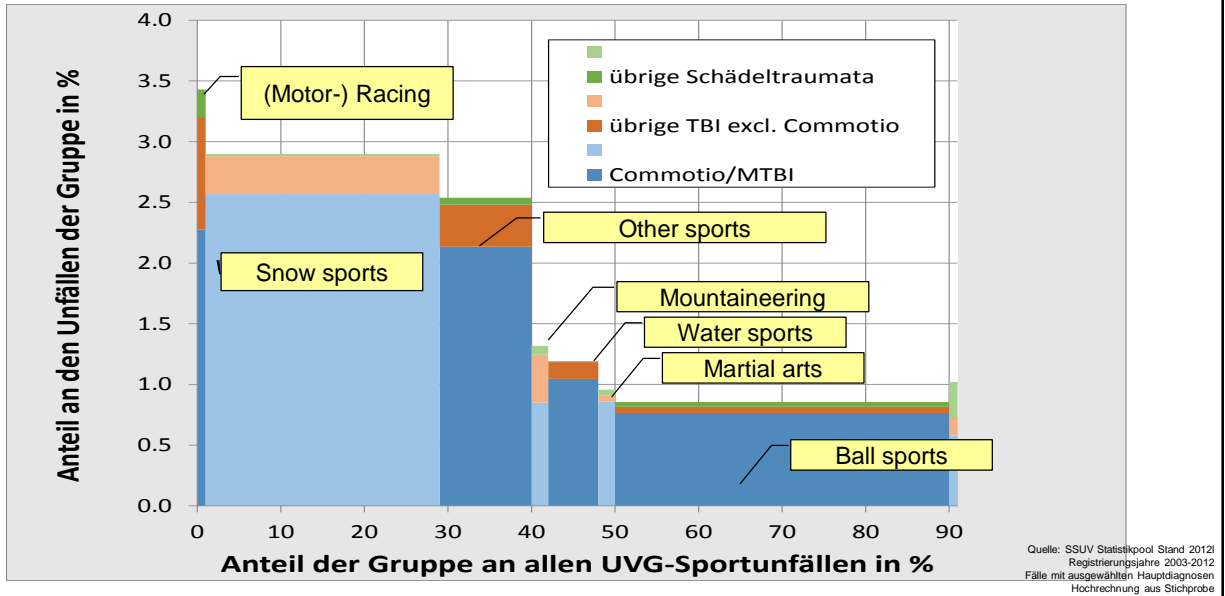
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Epidemiology

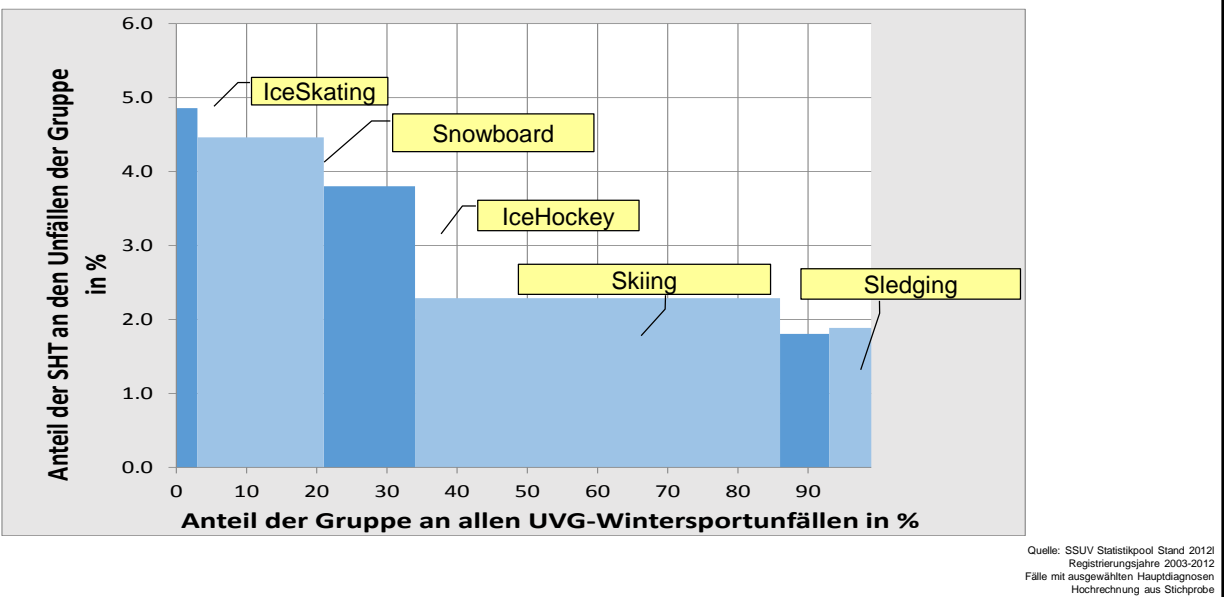


Quelle: SSUV Statistikpool Stand 2010
 Registrierungsjahre 2001-2010
 Fälle mit ausgewählten Hauptdiagnosen
 Hochrechnung aus Stichprobe

Epidemiology



Epidemiology



Epidemiology

Distribution of concussions by sport

| Sport During Which Concussion Occurred | Patients, N (%) |
|--|-----------------|
| Ice hockey | 104 (61.2) |
| Soccer | 15 (8.8) |
| Basketball | 14 (8.2) |
| Football | 10 (5.9) |
| Rugby | 7 (4.1) |
| Snowboarding | 4 (2.4) |
| Other | 16 (9.4) |
| Total | 170 (100.0) |

Carson 2014

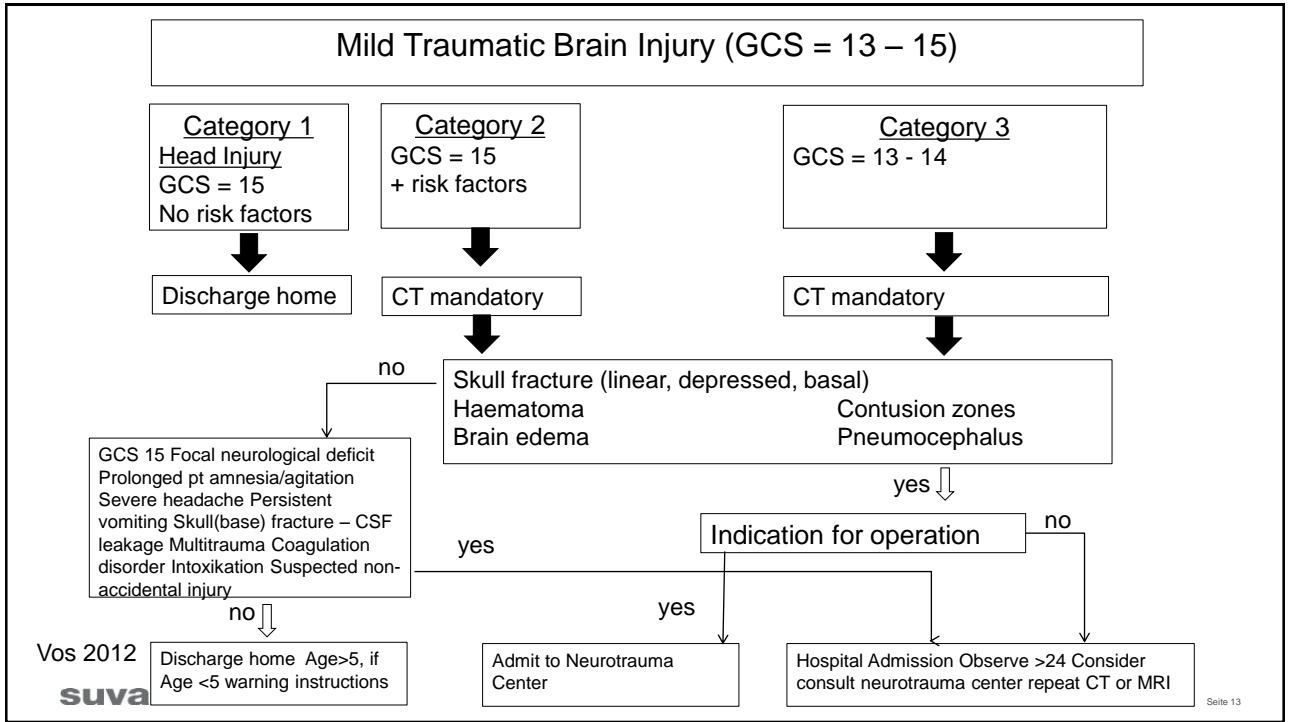
Classification

| Classification | Characteristics |
|-----------------|--|
| Mild Category 1 | GCS = 15 No risk factors or only 1 minor risk factor present (CHIP Rule) Head injury, no TBI |
| Mild Category 2 | GCS = 15 With risk factors: ≥ 1 major or ≥ 2 minor risk factors |
| Mild Category 3 | GCS = 13-14 |
| Moderate | GCS = 9-12 |
| Severe | GCS ≤ 8 |
| Critical | GCS = 3-4, with loss of pupillary reactions and absent or decerebrate motor reactions |

Vos et al 2012

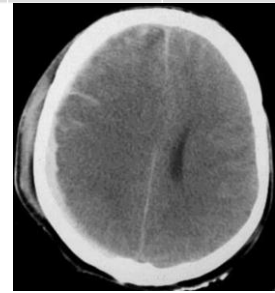
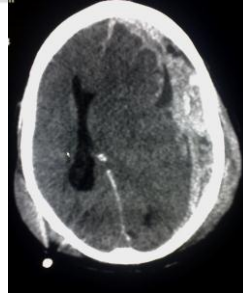
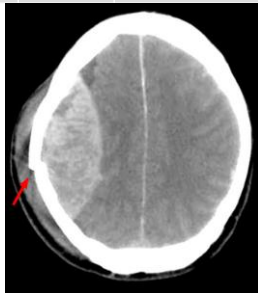
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Complications

| GCS | Pathol. CT | % | contusion | aEDH | aSDH | edema | SAB |
|-----|------------|----|-----------|------|------|-------|-----|
| 15 | 95 / 2179 | 4 | 39 | 6 | 23 | 2 | 36 |
| 14 | 118 / 775 | 16 | 63 | 14 | 29 | 0 | 54 |
| 13 | 48 / 173 | 28 | 30 | 7 | 15 | 6 | 12 |



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Culotta et al 1996

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Complications

| GCS | Number of patients | CT lesion % |
|-------|--------------------|-------------|
| 13-15 | 243 / 3181 | 7.6 |
| 15 | 135 / 2462 | 5.5 |
| 14 | 77 / 568 | 13.6 |
| 13 | 31 / 151 | 20.5 |

Smits M, et al. 2007

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Complications

| GCS | CT | % | N |
|-----|------------------------------|-----|--------|
| 15 | Normal | 96 | (1210) |
| | Pathology, total | 4 | (52) |
| | Haemorrhage/contusion | 2.1 | (27) |
| | Haematoma | 0.8 | (10) |
| | Fracture, no other pathology | 0.5 | (7) |
| | Oedema/other pathology | 0.6 | (8) |

Lannsjö M, et al 2013

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Complications

Recurrent concussions

- Second Impact Syndrome (SIS)
- Postconcussion Syndrome
- Dementia
- Parkinson's disease

Complications

Second Impact Syndrome (SIS)

- Elevated intracranial pressure leads to death
- Case Reports
- WHO task force: No evidence on incidence or risk
- Controversial

Complications

Postconcussion syndrome (PCS)

Headache
 Balance problems
 Dizziness
 Fatigue
 Depression
 Anxiety
 Irritability
 Memory disturbances
 Attention disturbances

validity of PCS is questioned



Complications

Parkinson's Disease

- WHO task force: "Taken together, the results suggest that MTBI does not make a clinically relevant contribution to the risk of PD."

Complications

Dementia

- WHO task force: "No evidence of an increased risk of dementia after MTBI"

Marras et al 2014

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Management concussion in sports

Best practice recommendations

- Onsite evaluation e.g. SCAT (www.cjsportmed.com) ImPACT (www.impact.com)
- Medical evaluation - exclusion structural lesion
- Physical and cognitive rest until all symptoms are resolved
- Implementation of a graded program of exertion (6 step protocol)
- No premature return to activity

McCrory et al 2013

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Take home

MTBI is defined by clinical symptoms

- Consciousness
 - GCS 13-15
 - LOC < 30´ or
 - Alteration of consciousness
- Posttraumatic Amnesia < 24 h

Take home

MTBI has.....

- a 10% risk for intracranial abnormalities
- a low risk (1%) of life threatening intracranial haematoma that needs immediate neurosurgical operation
- a very low mortality of 0.1% in adults

Take home

MTBI is benign, if

- Acute management includes
 - standardized medical evaluation with imaging and education of patient
 - mental and physical rest until all symptoms resolve
 - stepwise RTP, RTL, RTW
- Special attention to recurrent MTBI within short period esp. in kids (SIS)

Literature

- PE Vos et al EFNS guideline on mild traumatic brain injury: report of an EFNS task force. *European Journal of Neurology* 2012; 9:207-219
- JD Carson et al Premature return to play and return to learn after a sport-related concussion. *Canadian Family Physician* 2014; 60:e310-315
- *Archives of Physical Medicine and Rehabilitation* 2014; 95(3 Suppl 2)
- McCrory P, Meeuwisse WH, Aubry M, Cantu B, Dvořák J, Echemendia RJ, et al. Consensus statement on concussion in sport: the 4th International Conference on Concussion in Sport held in Zurich, November 2012. *Br J Sports Med* 2013;47(5):250-8.