

How to avoid Mild Traumatic Brain Injury in Wintersports



suvaliv

Sichere Freizeit

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The Matterhorn



Agenda

MTBI in Snow Sports

- What is MTBI?
- How big is the risk?
- What are the risk factors?
- What to do?

MTBI

Brian Campbell



Epidemiology

MTBI

- 70 - 90 % of all TBI
- 600 adults/100'000

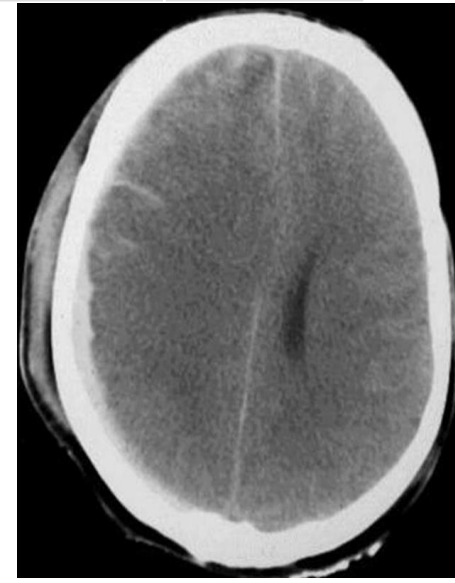
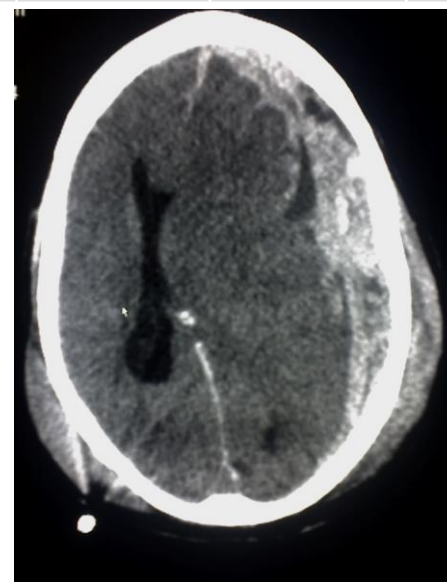
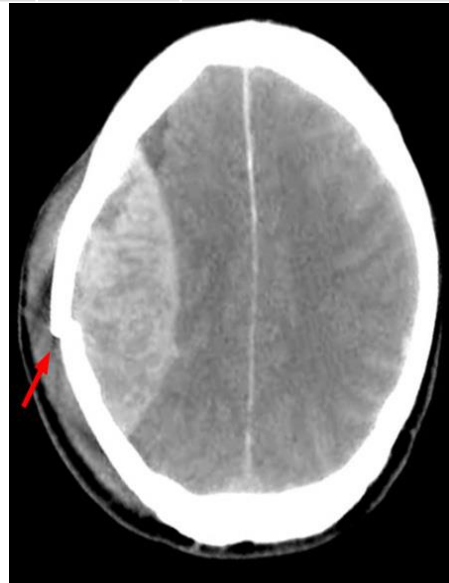
in sports

- 1.6 to 3.8 million individuals annually in USA

Holm 2005 Cancelliere 2014

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



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)

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

Mild Traumatic Brain Injury (GCS = 13 – 15)

Category 1
Head Injury
GCS = 15

No risk factors

Discharge home

Category 2
GCS = 15
+ risk factors

CT mandatory

Category 3
GCS = 13 - 14

CT mandatory

no

Skull fracture (linear, depressed, basal)
Haematoma
Contusion zones
Brain edema
Pneumocephalus

yes

yes

Indication for operation

no

yes

Admit to Neurotrauma Center

Hospital Admission Observe >24
Consider consult neurotrauma center repeat CT or MRI

GCS 15 Focal neurological deficit
Prolonged pt amnesia/agitation
Severe headache
Persistent vomiting
Skull(base) fracture – CSF leakage
Multiple trauma
Coagulation disorder

Discharge home
Age >5, if Age <5
warning instructions

Take home

MTBI is benign, if

Acute management includes

- ✓ standardized medical evaluation with imaging
- ✓ education of patient with instruction to
 - keep mental and physical rest until all symptoms resolve
 - stepwise RTP, RTL, RTW

Falls in skiers and snowboarders

How frequent and why?

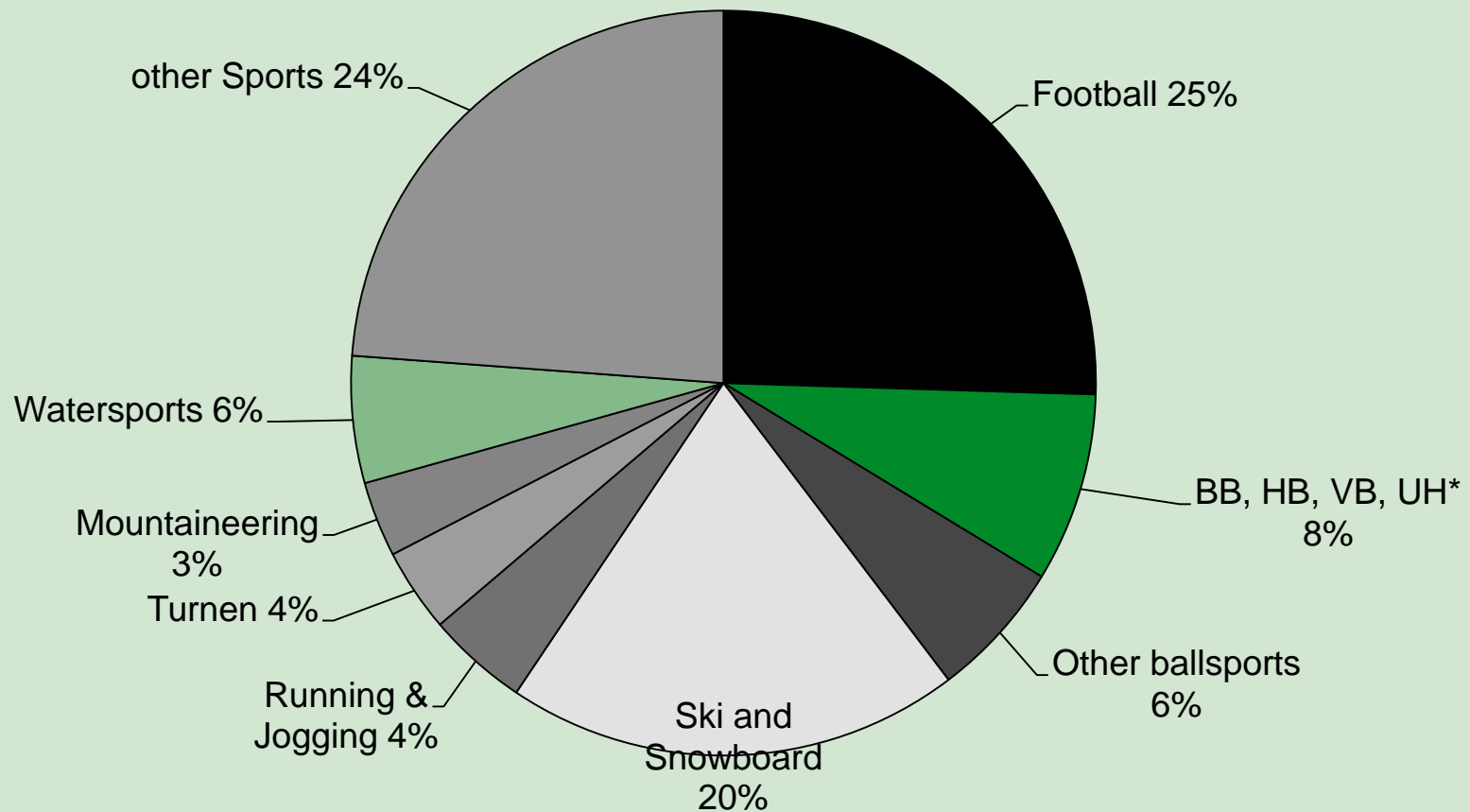
- Survey in 6 Tyrolean skiresorts 2012 vs 2002
- How frequent and why are skiers and snowboarders falling?
- 1436 male and female skiers and snowboarders
- Questions about personal characteristics, falls, equipment, risk taking behaviour

Results

- Incidence of falls lower compared to 2002
- Improvement of
 - Skiing and snowboarding equipment
 - Slope preparation

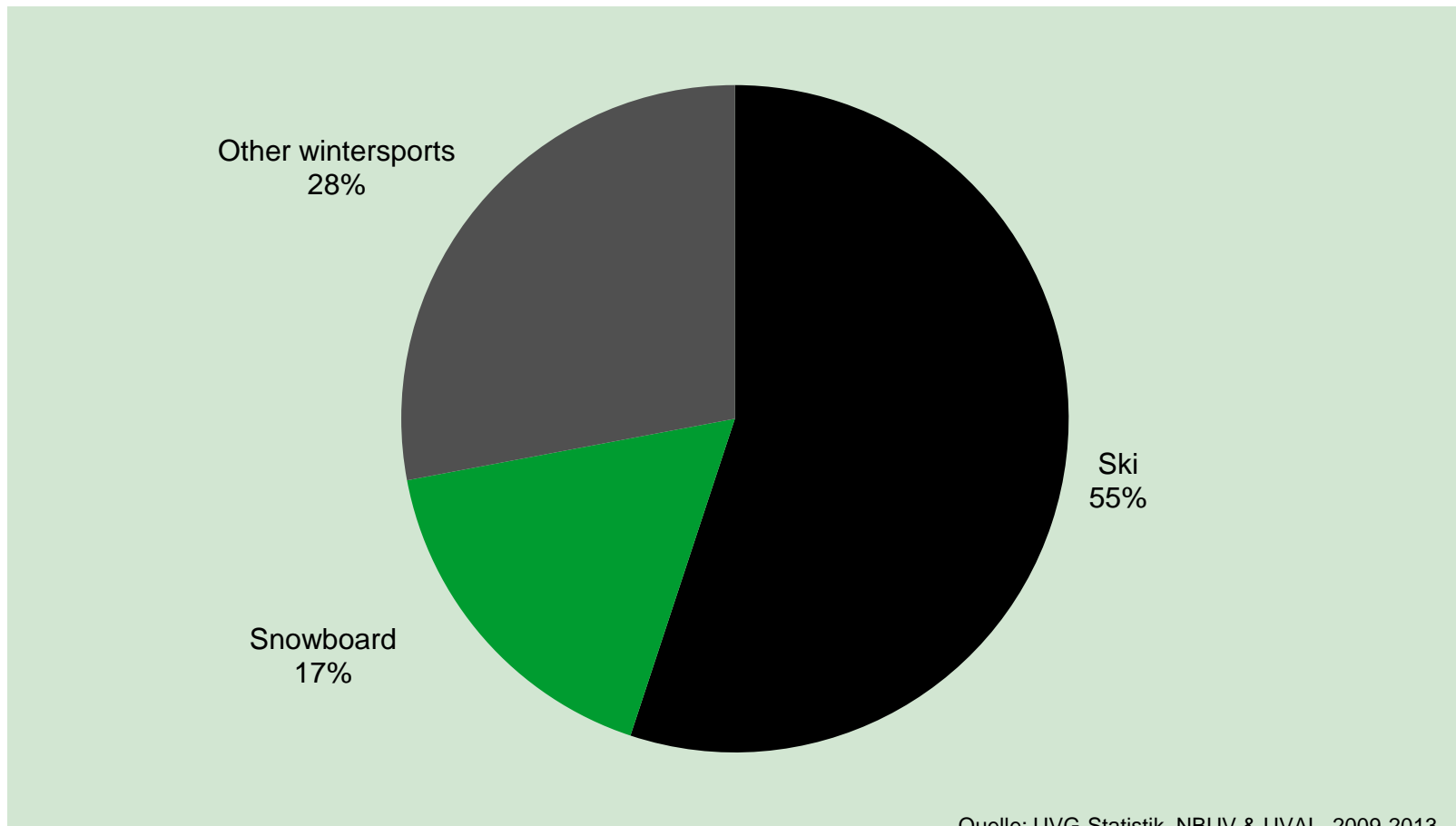
Accidents in Sports and Leisure

Ø175 302 accidents per year



Accidents in Wintersports

Ø 48 265 accidents in wintersports per year,
34 573 Skiing and Snowboarding



Quelle: UVG-Statistik, NBUV & UVAL, 2009-2013
Hochrechnung aus Stichprobe

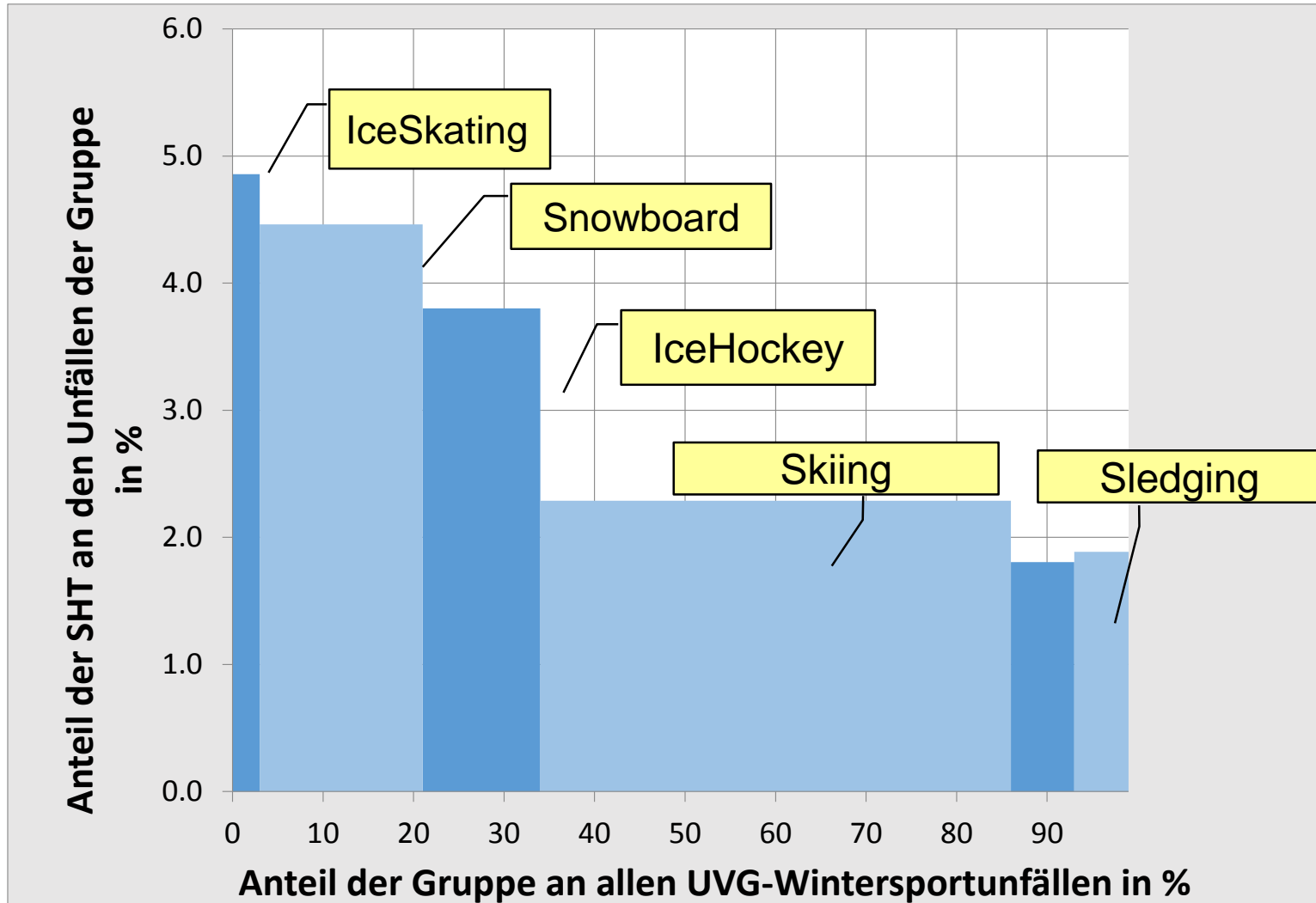
Accidents in snowsports by injured bodyparts

	Fälle in %*	
	Ski	Snowboard
Head	12	16
Spine	5	10
Trunk, back and bottom	15	22
Upper Extremities	38	43
Wrist	12	12
Lower Extremities	49	28
Knee	30	14
Others or not specified body parts	1	0

Quelle: UVG-Statistik, NBUV & UVAL, 2009-2013 Hochrechnung aus Stichprobe

* Es werden alle Verletzungen ausgewiesen. Weil ein Fall mehrere Verletzungen haben kann, ergibt die Summe der Einzelkategorien mehr als das Total (100%)

Risks for MTBI by different snow sports



Riskfactors for Accidents in Snowsports

Behaviour



- Insufficient awareness for danger
- Excessive speed
- Lack of training
- Insufficient skills
- Adverse conditions (overfatigue, alcoholized)

Environment and equipment



- Design of slopes
- Snowparks
- Binding not correctly adjusted
- Lack of protection

Frequency of falls



Frequency of falls in snowboarders 5 times higher!

Snowboarders 2.15 / d
 0.429 ± 0.70 Falls / h

Skiers 0.38 / d
 0.076 ± 0.21 Falls / h

Risk Factors for falls

Skiers

1. Soft snow conditions
OR 4.1 CI 1.9-8.8
2. Poor skiing Skills
OR 2.6 CI 1.2-8.1
3. Young Age
OR 0.96 CI 0.95-0.97

Snowboarders

1. Poor snowboarding skills
OR 8.3 CI 3.1-27.4
2. Alcohol consumption
OR 2.1 CI 1.2-3.9
1. Wearing a helmet
OR 0.47 CI 0.23-0.94

Individual prevention



Equipment

- Material
- Protective equipment



Behaviour

- Physical preparation
- Awareness for the challenges of the slope
- Adaption to the conditions and skiing/snowboarding skills

Material



Skibindings being proved by a specialist

The screws of the snowboard-binding being proved

Wax skis and sharpen edges



Protective equipment



- Wear helmet
- Wear gloves
- Protector for back
 - in Snowparks
 - for Skiraces
 - for Freerider

Physical preparation

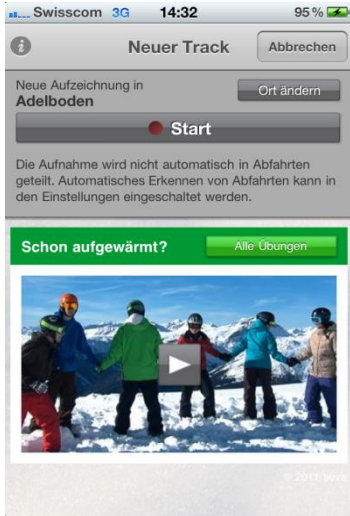


«Top 10»- special training programm
which focuses on muscle strength of
legs and trunk

+

Cycling, Walking or Jogging regularly
for power of endurance and
coordination

Warm-up



Warm-up, tuning and running in prevent injuries

- Perform some exercises before the first run
- For the first run take it easy
- Warm-up Spots: App «Slope Track» or Youtube.



Skiing abilities



- Good skiing abilities have a positive effect on security
- Concentrate on the run, slope and other skiers
- Adapt speed to ability and conditions
- Anticipate enough space for stopping or siding

Suva Events that aim in changing behaviour



Event-Series:

- «Trading with risks in snow sports»
- «Balancing challenge and skills»
- «Adapting conditions (wether, slope) and skills»

Surprise-Actions:

- «Don´t risk too much».

Dates and locations on
www.suva.ch/schneesport

Posters in selected ski areas

Snow sport loses its attraction when risking too much

Schneesport verliert seinen Zauber, wenn Sie zu viel riskieren.



Many accidents happen at 11 o'clock
Don't risk too much



Um 11 Uhr passieren sehr viele Schneesport-Unfälle.
Riskieren Sie nicht zu viel.



Avalanche-accident prevention

www.whiterisk.ch



Danger of avalanches off-slope

Getting expert in avalanches and route planning on: www.whiterisk.ch.

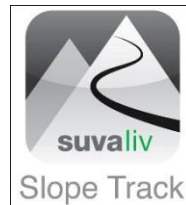
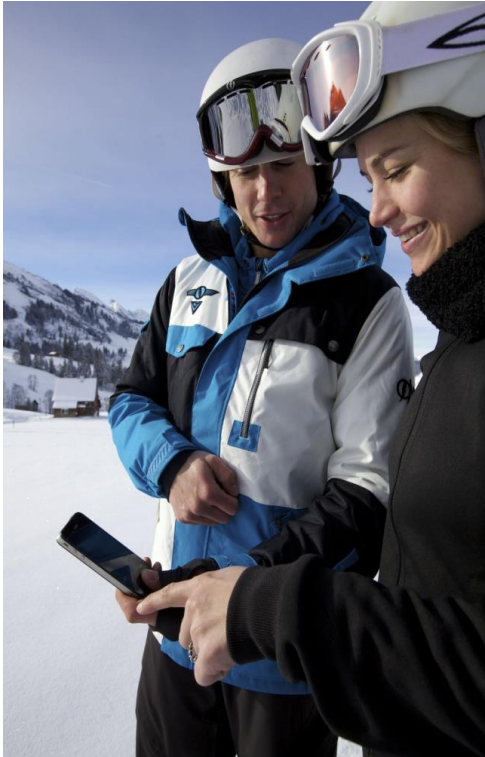
App «White Risk» gratis downloaden.

Effect of speed



Speed	Distance for reaction	Falling heights
20 km/h	5 m	2 m
30 km/h	7 m	4 m
40 km/h	10 m	6 m
50 km/h	12 m	10 m
60 km/h	15 m	14 m
70 km/h	17 m	19 m

«Slope Track» - an App for the slope



«Slope Track» records ski-run and the personal velocity.

Tips for the reduction of the individual risk.

Informations about the skiarea, the actual snow and wether conditions, Webcams.

«Slope Track» download (gratis)

- App Store
- Google Play Store

«Slope Track» - an App for the slope



Thank you for your attention



Thanks to Samuli Aegerter
Leader of snowsports campaigns

Further informations

www.suva.ch/schneesport

rita.schaumann@suva.ch

Plakat/Inserat: Schneesport verliert seinen Zauber, wenn Sie zu viel riskieren



Botschaften:

Wenn Sie aufmerksam fahren, erkennen Sie die Herausforderungen auf der Piste rechtzeitig.

Passen Sie Ihre Fahrweise deshalb Ihrer Verfassung und dem Können an.

Damit Unfälle schon bald Schnee von gestern sind.

Aim of prevention in «Schneesport»



Stay active and secure

On and off slope

Be aware of the challenges of the slope

Adapt to the conditions and your ability



Experience with Helmet use



How effective?

- Population based study in Sweden
- Helmet use in bicycle trauma patients
- Retrospective
- 186 patients, 3-year period, Level 1 Trauma Centre

Results

- Non-helmet use is associated with an increased risk of injury to head and face
- Helmet use is associated with an increased risk of limb injuries in all types of crashes

Vier Präventionsmodule Schneesport

Präventionsmodule

Präventionsmodule: Angebot

Präventionsmodule: weshalb?

Präventionsmodule

Film anschauen - entscheiden - bestellen

Schauen Sie sich zuerst den Kurzfilm oder die Präsentation über das gewünschte Präventionsmodul an. Die wichtigsten Informationen sind auch in einem Factsheet zusammengefasst, die Einsatzmittel werden abgebildet und die Kosten angegeben. Ein Klick genügt, und das gewünschte Modul ist bestellt. Bei Fragen kontaktieren Sie uns bitte per E-Mail unter praeventionsmodule@suva.ch.

Themen



Stolpern / Stürzen



Sicher Velo fahren



Fussball



Schneesport



Bewegung

Tempomessung

Schneesportsicherheit

Fit für den Winter

- Tempomessung
- Schneesportsicherheit
- Fit für den Winter
- PR-Artikel für Mitarbeiterzeitung

Die Präventionsmodule: das umfassende Angebot erzielt Wirkung

Wir unterstützen die Betriebe mit attraktiven Präventionsmodulen zu den Kampagnenthemen Schneesport, Stolpern und Stürzen, Fussball, sicher Velofahren, Bewegung und Gesundheit.

Für die Schneesportkampagne haben wir aktuell vier Module aufbereitet. Damit können die Mitarbeitenden über eine bestimmte Zeit mit verschiedenen Einsatzmitteln und Massnahmen sensibilisiert werden.

Alle Module finden Sie auf www.suva.ch/praeventionsmodule

Flyer, posters and spots



To order Information
www.suva.ch/waswo

Flyer

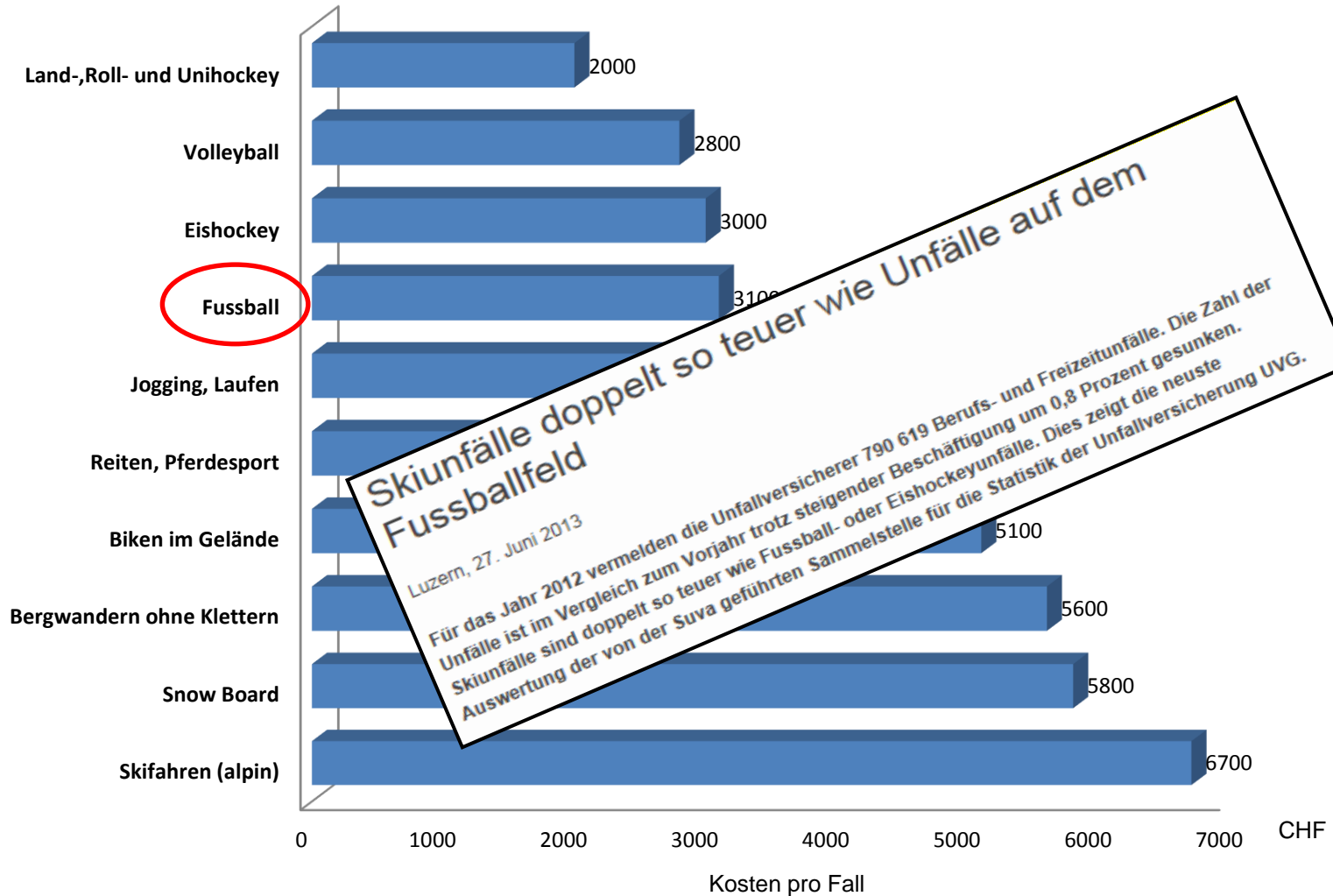
- Tipps für sicheren Schneesport
- «Top 10» für den Winter

Posters, Postcards

DVD oder Youtube:

- TV-Spot
- Ski-Crash-Test
- «Top 10»-Trainingsprogramm
- Warm-up

Sportunfälle 2007: mittlere Kosten/Fall (BU/NBU)



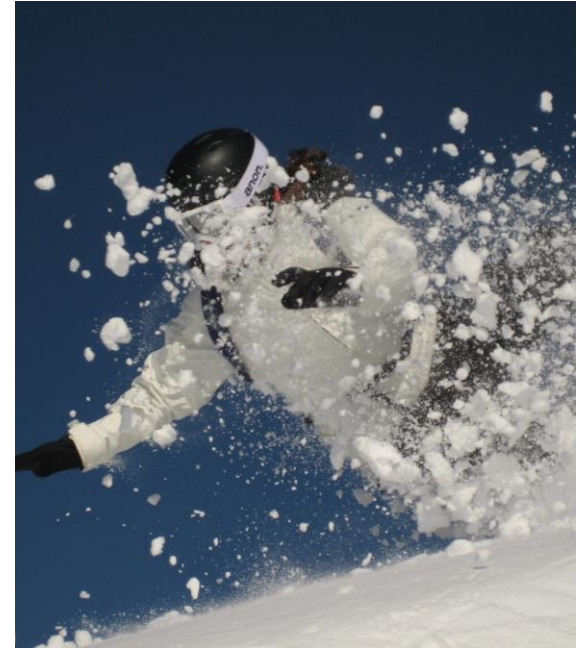
Costs of Snowports Accidents

	Anzahl neu registereder Fälle pro Jahr	Kosten per accident (CHF)*	Cases with compensated days
Ski	26 427	7061	44%
Snowboard	8146	3'974	43%

Quelle: UVG-Statistik, NBUV & UVAL, 2009-2013 Hochrechnung aus Stichprobe
* Regijahre 2005-2009 Stand +4 Jahre

Costs

CH population:	8.2 Mio.
Men/women in snowsports:	2.5 Mio.
Snowsports accidents per season (2014)	66 000
Compulsary insured accidents	34 500
self-inflicted	90%



Costs CHF **265 Mio.**