

Introduction to orthopaedics in ice hockey

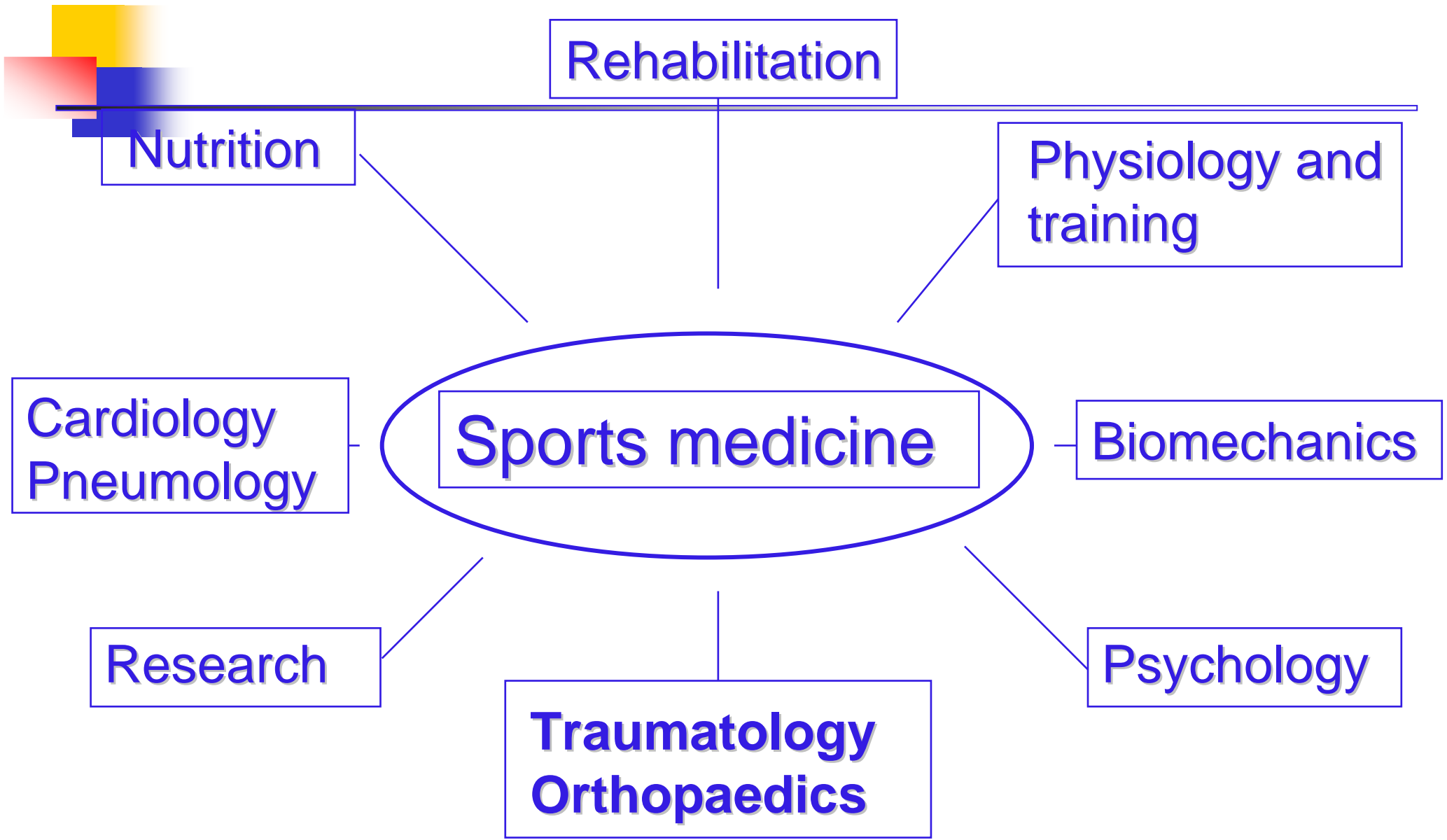


PD Dr med Jacques Menetrey

Unité d'Orthopédie et Traumatologie du Sport (UOTS)

Service de chirurgie orthopédique et traumatologie de l'appareil moteur

*University Hospital of Geneva,
Geneva Switzerland*



Rehabilitation

Nutrition

Physiology and training

Cardiology
Pneumology

Sports medicine

Biomechanics

Research

Traumatology
Orthopaedics

Psychology



Team physician tasks

- Pre-participation examination
- Game coverage
- Injury diagnosis
- First class treatment
- Implementation of injury prevention program



Pre-participation examination

- Clinical examination
 - Flexibility
 - Spine
 - Posture
- Former injuries
 - Joint laxities
 - Muscle dysbalance
 - Groin status



Pre-participation examination

- Functional testing
 - Strength
 - Power
 - Core stability

Ice hockey features

- Fastest team sport:
- Players skating up to 60 km/h
- Puck moving up to 160 km/h
- Aggressive contact between players
- Rigid obstacles (boards, goalposts)
- Solid surface



Filk et al *Am J Sports Med* 2005

**Leading to high energy trauma
and severe injuries despite
protective equipments**



Injuries rate

- All studies show more injuries in game than in practice (6 to 8 folds more frequent)
- No significant difference between forwards and defensemen injury rate

Flik et al *Am J Sports Med* 2005

Jorgensen et al *Br J Sports Med* 1986



Injuries rate

- Incidence rate:

- 10/1000 athletes-exposure: around 15 in game, 2 in practice

Flik et al *Am J Sports Med* 2005

Agel et al *J Athl Train* 2007

- 5/1000 hours/players-: 40 to 80 in game, 2 in practice

Tegner & Lorentzon *Br J Sports Med* 1981

Jorgensen et al *Br J Sports Med* 1986

Petersson et al *Br J Sports Med* 1993



Discussion

Incidence tracks: 5.8 lesions/ 1000 h
(1500m)

Incidence sprint: 5.6 lesions/1000 h

Incidence marathon: 2.5 lesions/1000 h



Discussion

Incidence handball: 8.2 lesions/1000 h

Incidence hockey: 4.7 lésions/1000 h

Incidence football: 4.1 lesions/1000 h



Injuries location

Locations varie among studies but the 3 most frequent part of the injured body (with close rate around 25% each) are:

- **Head/face** (most frequent when no visors or face guards)
- **Knee**
- **Shoulder**



Injuries type

- Contusions are the most frequent type of injuries but in general minor

Tegner & Lorentzon *Br J Sports Med* 1981
Jorgensen et al *Br J Sports Med* 1986
Pettersson et al *Br J Sports Med* 1993

- Top 3 diagnosis leading to time loss:
 - Knee internal derangement
 - Acromioclavicular injury
 - Concussion

Flik et al *Am J Sports Med* 2005
Agel et al *J Athl Train* 2007



Injuries causes

- 1) Contact between players (up to 50%)
 - 2) Contact with boards (20-30%)
 - 3) Others (puck, skate, goalpost)
- Overuse is responsible for 10 to 15% of all injuries

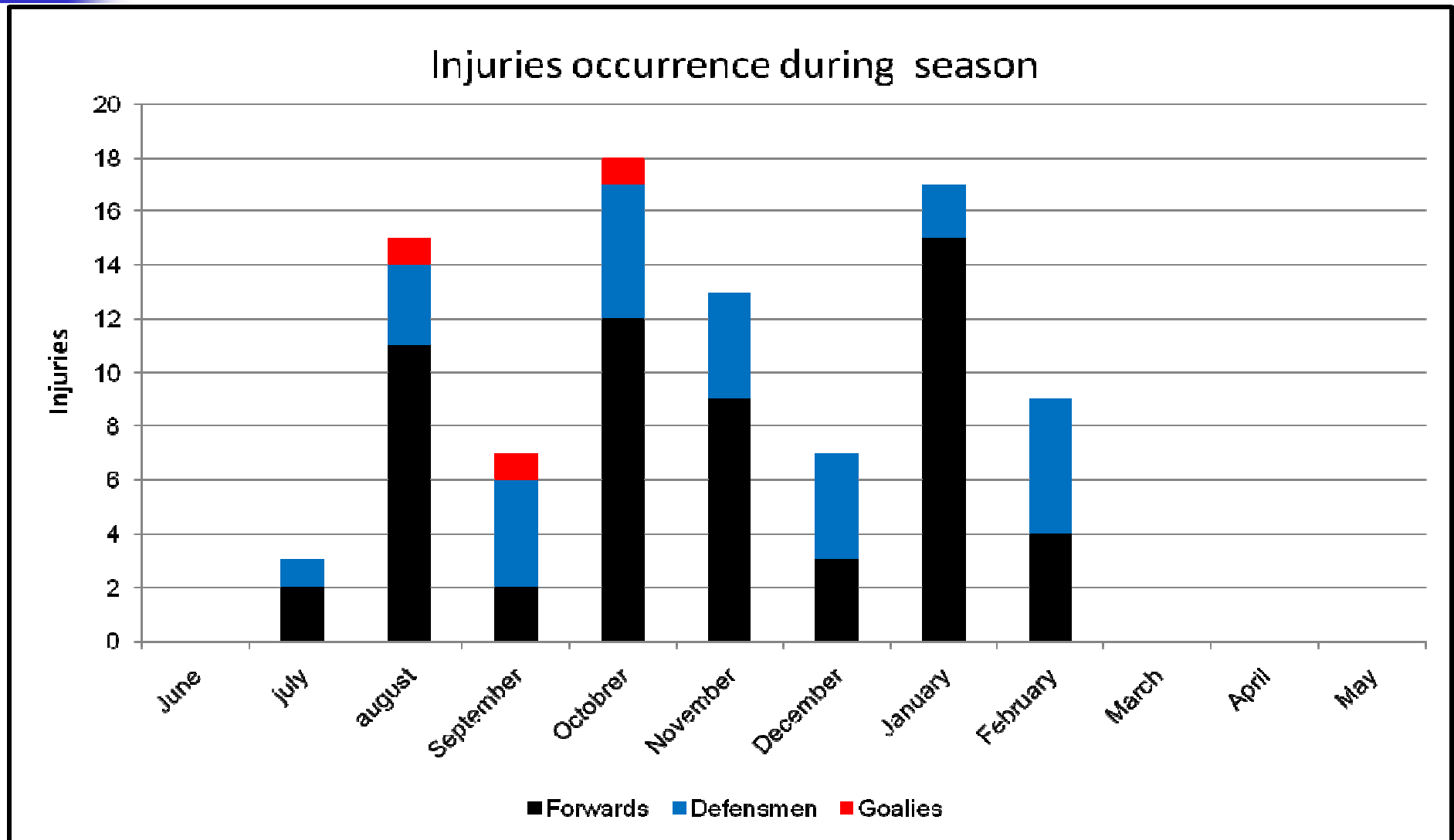
Statistics GSHC

Injuries					
	Forwards	Defenseemen	Goalies	Total	Only Imports
Injuries	58	29	4	91	19
Injuries/ player	3.87	3.63	2.00	3.64	3.8

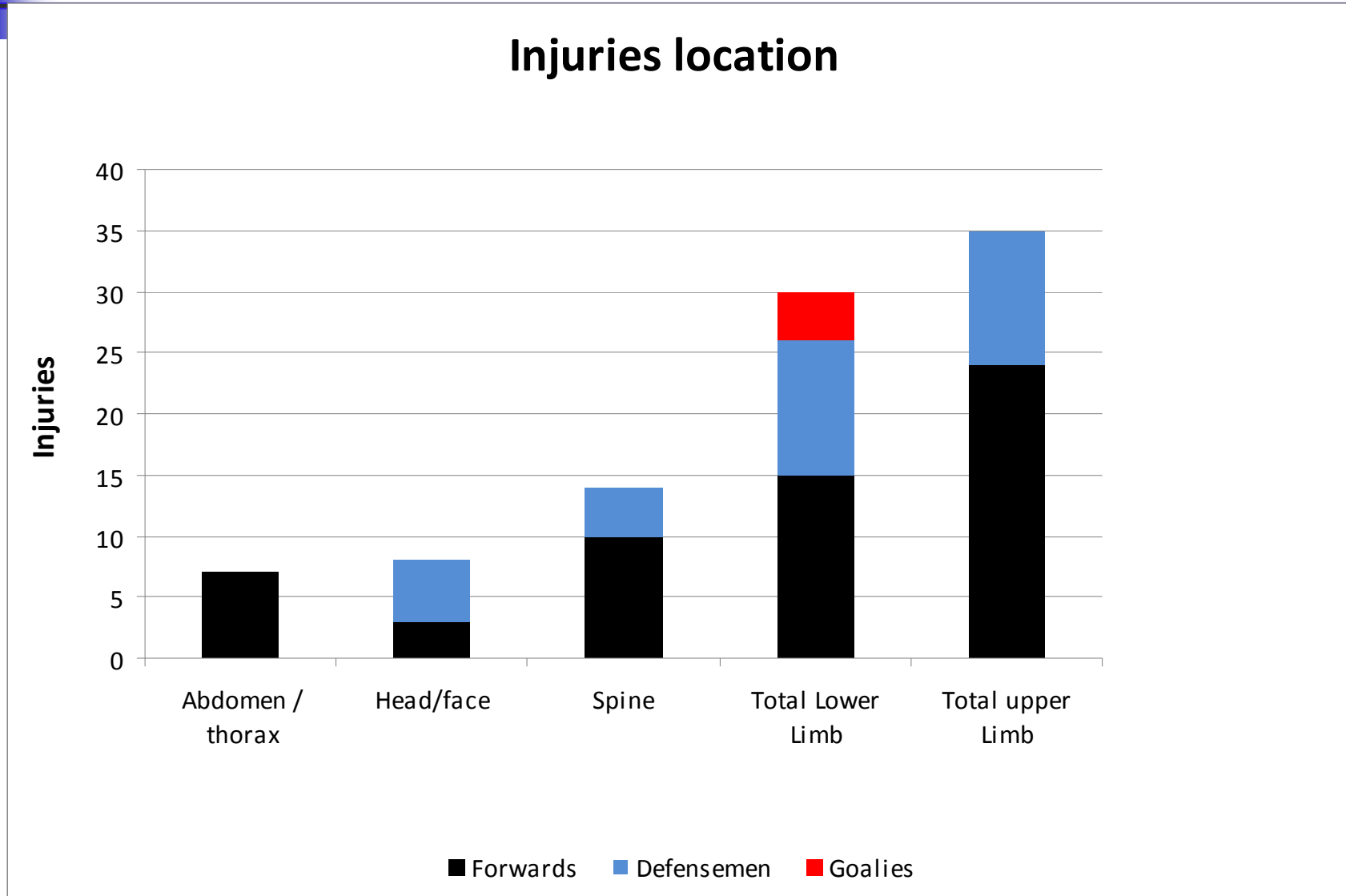
No significant difference between forwards and defenseemen

Playing hours				
Training hours (average 6h/week)	Game hours (2h/game)	Total hours	Injury incidence (1000 hours/ players)	Injury incidence (1000AE)
186	128	314	11,6	14,5

Statistics GSHC

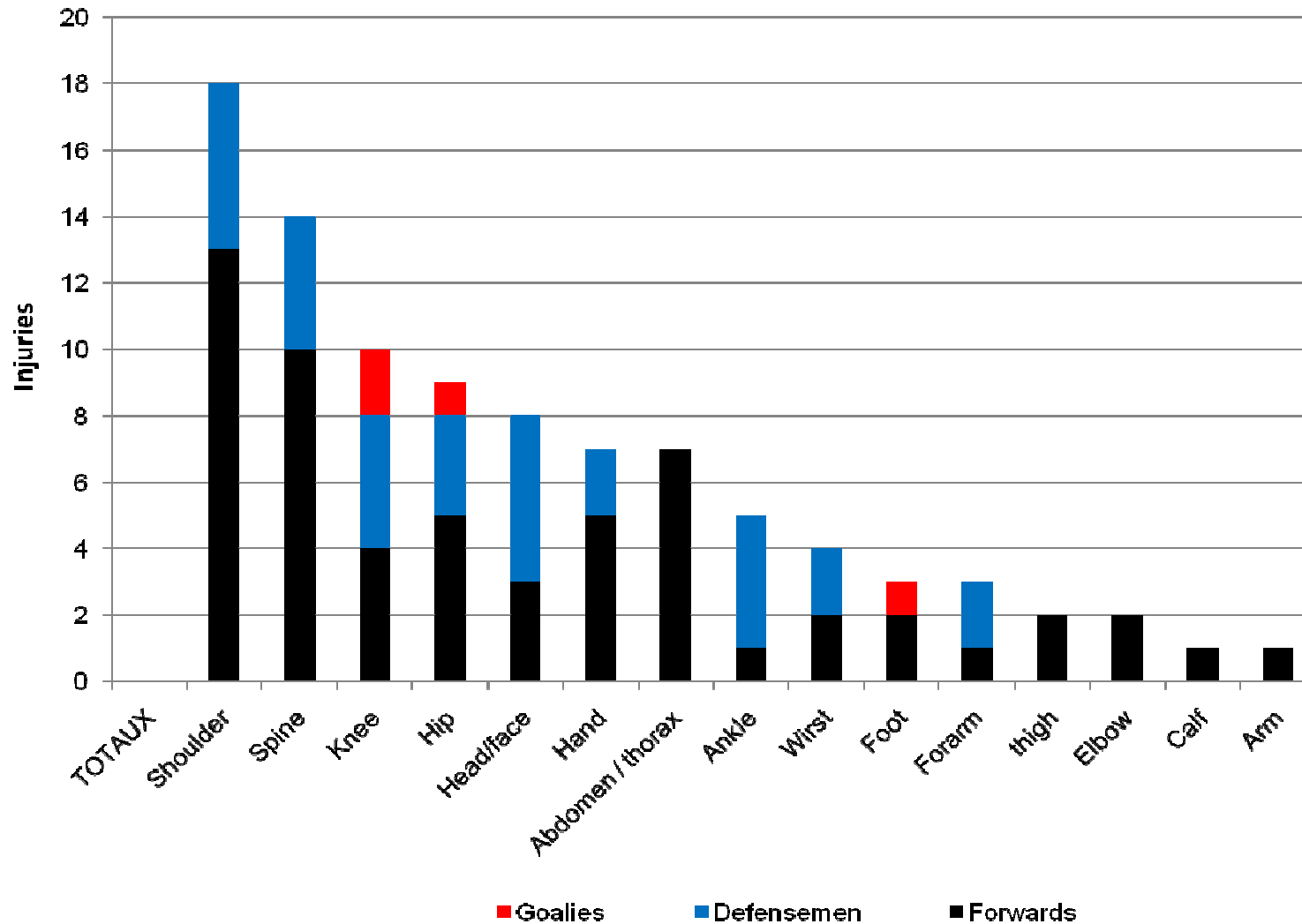


Statistics GSHC



Statistics GSHC

Injuries Localization





Take home message

Ice hockey was played by Native Americans as long ago as the 1600s, but the first recorded match in its modern form took place in Montreal in 1875. Today there are more than 300,000 ice hockey players in North America. It is an extremely fast and tough sport demanding high

...ice hockey can be made a much safer sport only by better enforcement of the rules, and by coaches, players, and spectators not tolerating or promoting intentional violence

armoured gladiators. Nevertheless, ice hockey is still a high-risk sport. It is made even more dangerous by fans who expect fights and violence during a game, and by officials who do not enforce the rules strictly. Ice hockey is regarded by many sports medicine experts to be the most dangerous sport in the USA for non-fatal catastrophic injuries (i.e. injuries that are severely incapacitating). Statistics show that 2.55 non-fatal catastrophic injuries occur per 100,000 player hours in ice hockey, compared with 0.68 per 100,000 player hours for American Football. In recent years there has been an alarming increase in the number of cervical spine injuries. Some neck injuries resulted from players skating head first into the boards or another player, but most resulted from illegal checking from behind. Although the risk of injury can be reduced by strengthening neck muscles, ice hockey can be made a much safer sport only by better enforcement of the rules, and by coaches, players, and spectators not tolerating or promoting intentional violence. Ice hockey is an exciting game demanding high levels of skill and speed; these are the features to emphasize, not violence.

1st World Congress on Sports Injury Prevention Oslo 2005



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Thank you for your attention



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Literature

- Only few studies about injuries (less than 10, from Sweden and USA)
- Mostly about junior and elite team but very few studies about professional team
- Results are difficult to compare:
 - Many different classification and details about injuries type/localisation
 - Different injuries rate(athlete exposure, players/1000 hours)



Statistics GSHC

Team				
Forwards	Defense-ments	Goalies	Total	Imports
15	8	2	25	5

Games			
Friendly	Regular Season	Playoff	Total
15	44	5	64

Playing hours				
Training hours (average 6h/week)	Hours game (2h/match)	Hours total	Injury incidence (1000 hours/ players)	Injury incidence (1000AE)
186	128	314	11,8	14,56