



SPORT INJURY AND OVERUSE SURVEILLANCE IN HANDBALL- REVIEW OF SYSTEMS AND NEW PROPOSAL

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Injuries in handball

- **Overall incidence of an injury in handball is about 2/1000h.**
 - **10x higher in competition**
Wedderkopp 1999,2003, Henke 2005, Olsen 2005, Myklebust 2010
- **Handball has the highest absolute numbers of injuries in women's club sport in Germany**
Henke 2003



Injury and overuse surveillance in handball

Injury prevention

1. identification of the problem (epidemiology)
2. identification of the risk factors contributing to injuries (etiology)
3. introduction a preventive measures (prevention)
4. assessment of prevention and effectiveness

van Mechelen et al., 1992, Finch C. 1999, Aman M at al. 2014

Injury and overuse surveillance in handball



Injury prevention

1. identification of the problem (epidemiology)
2. identification of the risk factors contributing to injuries (aetiology)
3. introduction a preventive measures (prevention)
4. assessment of prevention and effectiveness



sports
injury
surveillance
system

van Mechelen et al., 1992, Finch C. 1999, Aman M at al. 2014



Sport injury surveillance systems

Multiple sports:

- Australian Sports Injury Data Dictionary 1997
- the Fysion Blesreg system 1998
- International Olympic Committee approach 2008
- FIFA injury report form
- Injury Definitions and Data Collection in Rugby Union 2007
- OSTRC Overuse Injury Questionnaire 2012

Handball:

- IHF injury and illness report from
- Injury monitoring by Olsen at al. 2006
- Standardized form by Leig & Henke 2010
- SMS approach by Moller at al. 2012
- Injury report system by Sharma at al. 2013

Daily injury report for the Olympic Games

Nation _____ Physician's name _____ Date of report _____
 Contact details: _____ tel./fax or e-mail _____

Please report: All injuries (traumatic and overuse) newly incurred in competition or training during the Olympic Games regardless of the consequences with respect to absence from competition or training. The information provided is for medical and research purposes and will be treated confidentially.

Example:

Athlete's accreditation number	Sport and event	Round/heat or training	Date and time of injury			
123456789	Athletics, 100 m (women)	Quarter final/1st heat	12.8./2:35 pm			
Injured body part	Code	Type of injury	Code	Cause of injury	Code	Absence in days
wrist	15	Sprain	10	Slipped and fell	3	10

Athlete's accreditation number _____ Sport and event _____ Round/heat or training _____ Date and time of injury _____
 Injured body part _____ Code _____ Type of injury _____ Code _____ Cause of injury _____ Code _____ Absence in days _____

Athlete's accreditation number _____ Sport and event _____ Round/heat or training _____ Date and time of injury _____
 Injured body part _____ Code _____ Type of injury _____ Code _____ Cause of injury _____ Code _____ Absence in days _____

Athlete's accreditation number _____ Sport and event _____ Round/heat or training _____ Date and time of injury _____
 Injured body part _____ Code _____ Type of injury _____ Code _____ Cause of injury _____ Code _____ Absence in days _____

Athlete's accreditation number _____ Sport and event _____ Round/heat or training _____ Date and time of injury _____
 Injured body part _____ Code _____ Type of injury _____ Code _____ Cause of injury _____ Code _____ Absence in days _____

Athlete's accreditation number _____ Sport and event _____ Round/heat or training _____ Date and time of injury _____
 Injured body part _____ Code _____ Type of injury _____ Code _____ Cause of injury _____ Code _____ Absence in days _____

Athlete's accreditation number _____ Sport and event _____ Round/heat or training _____ Date and time of injury _____
 Injured body part _____ Code _____ Type of injury _____ Code _____ Cause of injury _____ Code _____ Absence in days _____

No injury in any athlete of our team today

Definitions and codes see reverse. Please use additional forms if needed. © F-MARC 2008

Men's World Championship 2015 Injury & Illness Report Form

Team _____ Match _____ / _____
 Date ____/____/____ Team Doctor/Physio _____ Mobile _____ E-mail _____

Any injury? YES NO If "YES", please complete information below
 NOTE: An injury is defined as any musculoskeletal complaint (incl. concussion) incurred during the tournament, regardless of absence from training and/or match play

Player Number	Position (code)	Time of Injury		Injury location		Type of injury		Cause of injury		Severity	
		Training (date)	Match (time)	Description	Code	Description	Code	Description	Code	Returned to game	Absence (code)
Example	L		14:35	Ankle (lateral)	27	Lateral ankle sprain	8	Contact with another player	5	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	7
										Yes <input type="checkbox"/> No <input type="checkbox"/>	
										Yes <input type="checkbox"/> No <input type="checkbox"/>	
										Yes <input type="checkbox"/> No <input type="checkbox"/>	
										Yes <input type="checkbox"/> No <input type="checkbox"/>	
										Yes <input type="checkbox"/> No <input type="checkbox"/>	

Any illness? YES NO If "YES", please complete information below
 NOTE: An illness is defined as any physical complaint (not related to injury) incurred during the tournament, regardless of absence from training and/or match play

Player Number	Position (code)	Time		Affected system		Main symptom(s)		Cause of illness		Diagnosis		Severity Absence (code)
		Mode of onset (sudden/gradual)	Date (of occurrence)	Description	Code	Description	Code	Description	Code	Description	Code	
Example	L	Sudden	14.01.15	Upper resp. tract	1	Fever, pain	1, 2	Infection	2	Yersiniosis, cold	2	

Basic issues

- What data ?
- Where to take the data from ?
- Who should do that ?
- How ?
- When ?

Injury and overuse surveillance in handball



Sport injury surveillance systems

Australian Sports Injury Data Dictionary

- standardised guidelines for injury data collection

- Finch et al. 1997

Administration Items	Person recording case information Immediate source of injury record Date of injury Time of injury Date of injury record
Demographics	Age Gender Area of usual residence
Place of Injury Occurrence	Name of injury place - text Place of injury - type Sport and recreation places - specific Part of specific injury place
Activity When Injured	Activity when injured - broad areas Activity when injured - name of sport or activity Phase or aspect of involvement in activity or event
Major Injury Factors	Injury Factors Equipment used with intent to protect against injury
Mechanism of Injury	Mechanism of injury Narrative of mechanism of injury
Body Region Injured	Body region and body chart Specific structure injured
Nature of Injury - Pathology	Nature of injury Provisional diagnosis text
Treatment Factors	Date of presentation Time of presentation Reason for presentation
Treatment	Treatment Advice given to injured person Referral Treating person

Sport injury surveillance systems

Sports injury registration: the Fysion Blesreg system

- *de Bruijn J. V. & Keizers S. 1991*
- 2 forms
 - registration form (zero)
 - competition form (injury)
 - team card- sport activity
 - player card- cause, nature and treatment of the injury
- trainers, masseurs, physiotherapists and physicians

Sport injury surveillance systems

Fysion Blesreg Zero-form Player number.....

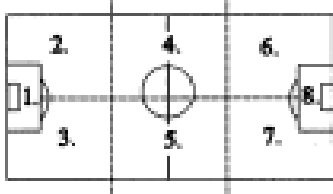
© 1991 Fysion Advice Bureau Injury Prevention Maarsse

Name :	Phone :-.....	Height : m.	Fatpercentage :....%
Address :	Date of birth : ... - ... - 19....	Weight : kg.	Date of measurement ... - ... - 19
Zcode/City :	Profession :	M / F :	

Player position	Training (duration)	Training (frequency)	Players experience	Protection
<input type="checkbox"/> keeper	<input type="checkbox"/> < 1 <input type="checkbox"/> 3,5	<input type="checkbox"/> less than 1x	<input type="checkbox"/> 0-2 years	<input type="checkbox"/> none
<input type="checkbox"/> fieldplayer	<input type="checkbox"/> 1 <input type="checkbox"/> 4	<input type="checkbox"/> 1 x pro week	<input type="checkbox"/> 2-4 years	<input type="checkbox"/> shin protector
	<input type="checkbox"/> 1,5 <input type="checkbox"/> 4,5	<input type="checkbox"/> 2 x pro week	<input type="checkbox"/> 4-6 years	<input type="checkbox"/> ankle brace
Level	<input type="checkbox"/> 2 <input type="checkbox"/> 5	<input type="checkbox"/> 3 x pro week	<input type="checkbox"/> more than 6 years	<input type="checkbox"/> knee brace
.....	<input type="checkbox"/> 2,5 <input type="checkbox"/> > 5	<input type="checkbox"/> 4 x pro week		
	<input type="checkbox"/> 3 hour	<input type="checkbox"/> more than 4 x		<input type="checkbox"/> other :.....

Name :	Team :	Date :-.....-19.....
--------------	--------------	----------------------------

Field position injury occurred <input type="checkbox"/> none <input type="checkbox"/> 1 (keeper) <input type="checkbox"/> 2 (defence left) <input type="checkbox"/> 3 (defence right) <input type="checkbox"/> 4 (midfield left) <input type="checkbox"/> 5 (midfield right) <input type="checkbox"/> 6 (attack left) <input type="checkbox"/> 7 (attack right) <input type="checkbox"/> 8 (penalty area)	Event <input type="checkbox"/> practice <input type="checkbox"/> competition match <input type="checkbox"/> trial match <input type="checkbox"/> selection match <input type="checkbox"/> cup match <input type="checkbox"/> tournament	Time injury occurred <input type="checkbox"/> warming up <input type="checkbox"/> first half <input type="checkbox"/> second half <input type="checkbox"/> extra time <input type="checkbox"/> cooling down	Consequence of injury <input type="checkbox"/> discontinued playing <input type="checkbox"/> after treatment continued to play
---	--	---	---



Floor surface <input type="checkbox"/> grass <input type="checkbox"/> artificial grass <input type="checkbox"/> gravel <input type="checkbox"/> synthetic <input type="checkbox"/> concrete	Conditions floor surface <input type="checkbox"/> no comments <input type="checkbox"/> uneven <input type="checkbox"/> wet <input type="checkbox"/> dry <input type="checkbox"/> frozen	Temperature <input type="checkbox"/> less than 0 °C <input type="checkbox"/> between 0 and 10 °C <input type="checkbox"/> between 10 and 20 °C <input type="checkbox"/> more than 20 °C	Shoe type <input type="checkbox"/> studs screw-on <input type="checkbox"/> studs permanent <input type="checkbox"/> no studs Number of studs <input type="checkbox"/> 6 <input type="checkbox"/> 10 <input type="checkbox"/> 13 <input type="checkbox"/> 8 <input type="checkbox"/> 12 <input type="checkbox"/> 14
---	---	--	--

<input type="checkbox"/> other:.....	<input type="checkbox"/> other :.....	<input type="checkbox"/> other :.....
--------------------------------------	---------------------------------------	---------------------------------------

Tape, bandage of brace in injured area <input type="checkbox"/> none <input type="checkbox"/> tape <input type="checkbox"/> bandage <input type="checkbox"/> brace	Injury occurred before <input type="checkbox"/> no <input type="checkbox"/> < 1 month ago <input type="checkbox"/> 1-3 month ago <input type="checkbox"/> 3-6 month ago <input type="checkbox"/> 6-12 month ago <input type="checkbox"/> > 12 month ago	Injury mechanism with contact <input type="checkbox"/> opponent <input type="checkbox"/> own player <input type="checkbox"/> player material <input type="checkbox"/> accomodation <input type="checkbox"/> other :.....	Injury mechanism without contact <input type="checkbox"/> twist/turn <input type="checkbox"/> stumble/fall <input type="checkbox"/> overuse <input type="checkbox"/> unknown <input type="checkbox"/> other :.....
---	--	--	--

Nature of injury <input type="checkbox"/> wound <input type="checkbox"/> contusion <input type="checkbox"/> sprain <input type="checkbox"/> rupture <input type="checkbox"/> inflammation <input type="checkbox"/> fracture <input type="checkbox"/> luxation <input type="checkbox"/> other :.....	Location of injury <input type="checkbox"/> head <input type="checkbox"/> upper arm <input type="checkbox"/> wrist <input type="checkbox"/> thorax/ribs <input type="checkbox"/> hip/buttock/groin <input type="checkbox"/> neck <input type="checkbox"/> elbow <input type="checkbox"/> hand <input type="checkbox"/> stomach <input type="checkbox"/> upper leg <input type="checkbox"/> lower leg <input type="checkbox"/> shoulder <input type="checkbox"/> lower arm <input type="checkbox"/> fingers <input type="checkbox"/> back <input type="checkbox"/> knee <input type="checkbox"/> ankle <input type="checkbox"/> foot <input type="checkbox"/> other :..... <input type="checkbox"/> right <input type="checkbox"/> left
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First aid <input type="checkbox"/> I.C.E. <input type="checkbox"/> cold	Further care (person) <input type="checkbox"/> no further care <input type="checkbox"/> selftreatment sportsmen <input type="checkbox"/> surgeon <input type="checkbox"/> physician <input type="checkbox"/> physiotherapist <input type="checkbox"/> sportsmasseur <input type="checkbox"/> trainer <input type="checkbox"/> other :.....	Further care (instance) <input type="checkbox"/> no further care <input type="checkbox"/> club <input type="checkbox"/> doctors office <input type="checkbox"/> fysiotherapeutic office <input type="checkbox"/> hospital <input type="checkbox"/> other :.....	Absence of training <input type="checkbox"/> none <input type="checkbox"/> 1 day <input type="checkbox"/> 2-7 days <input type="checkbox"/> 1 week until 1 month <input type="checkbox"/> 1-3 month <input type="checkbox"/> 3-6 month <input type="checkbox"/> more than 6 month
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Fysion Blesreg General (Team-card)

© 1991 Fysion Advice Bureau Injury Prevention Maarsse

Team	Event <input type="checkbox"/> practice <input type="checkbox"/> competition match <input type="checkbox"/> trial match <input type="checkbox"/> selection match <input type="checkbox"/> cup match <input type="checkbox"/> tournament	Date event : (from)-.....-19..... (until).....-.....-19..... City :	Assistance <input type="checkbox"/> (sport)physician <input type="checkbox"/> (sport)fysiotherapist <input type="checkbox"/> (sport)masseur <input type="checkbox"/> name:
		Opponent :	
		Number of injuries :	

Injury and overuse surveillance in handb

Sport injury surveillance systems

Aman M at al. 2014

- ☐ - high-quality sports injury data from insurance data-base
 - sports activity, age, gender, residence at time of injury, date of injury
 - type of injury, injured body part
- type of financial compensation
- disability assessment

- ☹☐ - only injuries, no overuse, no illness
- relies on third party and insurance system



- **Overuse results in**
 - **pain**
 - **decreased sport performance**

How to measure overuse?

- **4 questions related to any anatomical area**
- **comparing to standard injury reporting**
- **10x more**
- **64% overuse injuries missed**

Question 1

Have you had any difficulties participating in normal training and competition due to knee problems during the past week?

- Full participation without knee problems
- Full participation, but with knee problems
- Reduced participation due to knee problems
- Cannot participate due to knee problems

*Oslo Sports Trauma Research Centre (OSTRC) Overuse Injury Questionnaire
- Clarsen B. et al. 2012*

IHF- Injury & Illness Report Form (World Championship 2015)

injury

Player		Time of injury		Injury location		Type of injury		Cause of injury		Severity	
Number	Position (code)	Training (date)	Match (time)	Description	Code	Description	Code	Description	Code	Returned to game	Absence (code)
Example	L	-	14:35	Ankle (lateral)	27	Lateral ankle sprain	8	Contact with another player	5	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	7
										Yes <input type="checkbox"/> No <input type="checkbox"/>	
										Yes <input type="checkbox"/> No <input type="checkbox"/>	
										Yes <input type="checkbox"/> No <input type="checkbox"/>	
										Yes <input type="checkbox"/> No <input type="checkbox"/>	
										Yes <input type="checkbox"/> No <input type="checkbox"/>	
										Yes <input type="checkbox"/> No <input type="checkbox"/>	

illness

Player		Time		Affected system		Main symptom(s)		Cause of illness		Diagnosis	Severity
Number	Position (code)	Mode of onset (sudden/gradual)	Date (of occurrence)	Description	Code	Description	Code	Description	Code	Description	Absence (code)
Example	L	Sudden	14.01.15	Upper resp. tract	1	Fever, pain	1, 2	Infection	2	Tonsillitis, cold	2

Sport injury surveillance systems in handball

- **Moller M. et al 2012**
 - **SMS system**
 - **3 messages: injury last week?**
 - **If yes, then player contacted with the interview form**
 - **Response rate 85%-90%**
- **Olsen et al. 2006, Leig P & Henke T. 2010, Sharma et al. 2013**
 - **circumstances, sports career and personal background, sociodemographic**
 - **coach report vs. match report**
 - **73% response rate (Sharma), 70% (Olsen)**

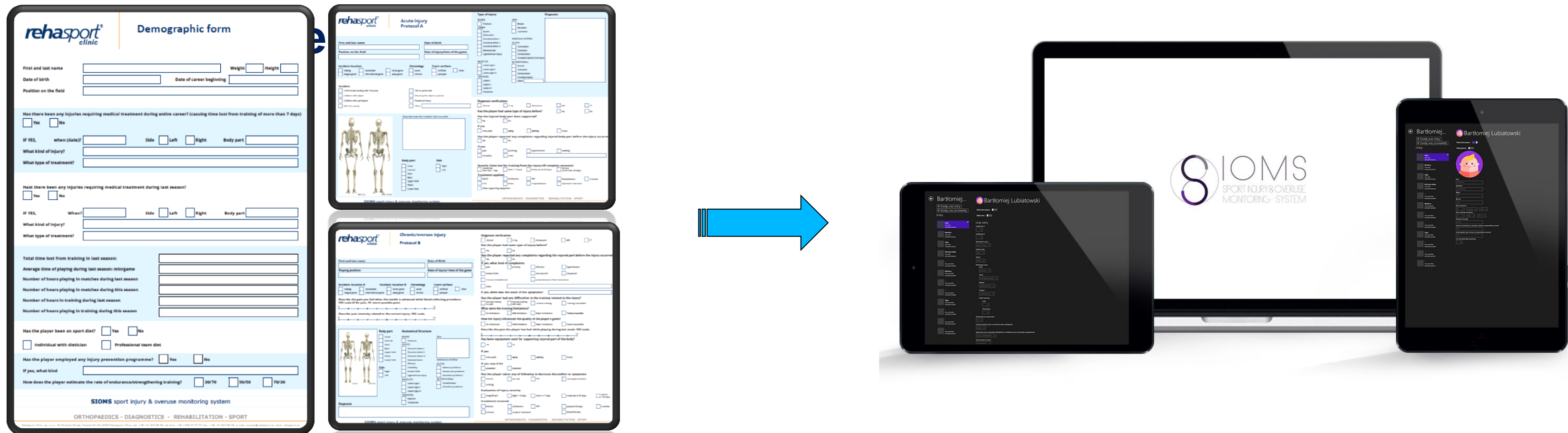
- 1 Date of injury
- 2 injury was acute/overuse/not handball related?
- 3 injury was new/re-injury/exacerbation?
- 4 The location of the injury
- 5 match or training?
- 6 Type of training
- 7 injury during warm up, after warm up, after training?
- 8 Type of match
- 9 injury during warm up/1.half/2.half?
- 10 Field position when occurred
- 11 Was related with any contact with another player or object, during side cutting, during run?
- 12 Severity of the injury in the first week after registration
- 13 Medical attention?
- 14 If medical attention, sought a doctor/ physiotherapist/ chiropract or other
- 15 consent to collect medical records

Major issues with reporting

- **definitions**
- **all injuries, or time-loss injuries**
- **overuse, illness**
- **diet**
- **efficacy of reporting**
 - **missed injuries**
 - **underreporting by personel**
 - **inconvenience**
 - **not included in the study, no incentive, not informed**
 - **underreporting by athlete (hiding the injury)**
- **errors in calculations of time of play or training**
- **to simple vs. to complex**

Purpose

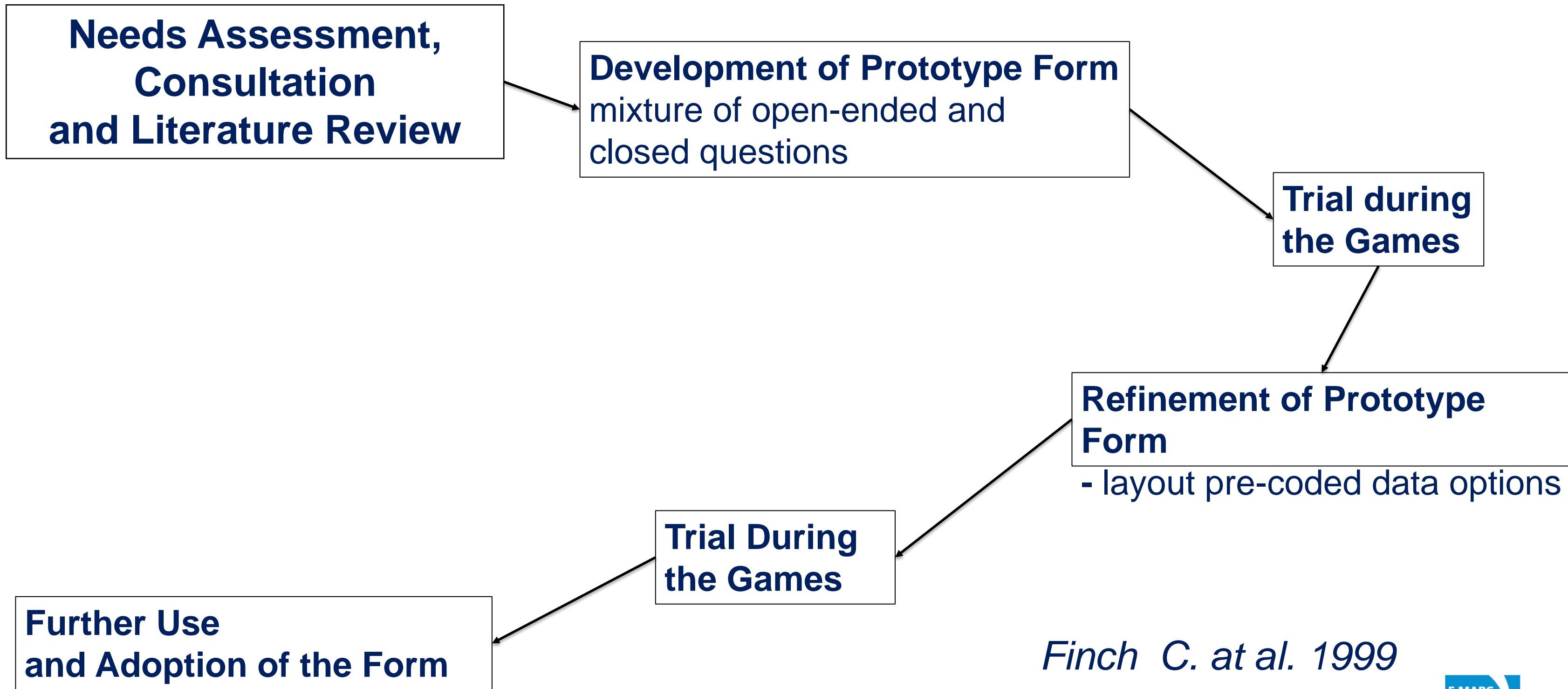
- to develop sport injury and overuse surveillance system for handball



SIOMS sport injury & overuse monitoring system

Injury and overuse surveillance in handball

How to develop sport injury surveillance?



Finch C. at al. 1999

SIOMS sport injury & overuse monitoring system in HB

profile form

acute injury form

overuse form

rehasport clinic Demographic form

First and last name: _____ Weight: _____ Height: _____
Date of birth: _____ Date of career beginning: _____
Position on the field: _____

Has there been any injuries requiring medical treatment during entire career? (casualty time lost from training of more than 7 days)
 Yes No

IF YES, when (date)? _____ Side Left Right Body part _____
What kind of injury? _____
What type of treatment? _____

Has there been any injuries requiring medical treatment during last season?
 Yes No

IF YES, When? _____ Side Left Right Body part _____
What kind of injury? _____
What type of treatment? _____

Total time lost from training in last season: _____
Average time of playing during last season: min/game _____
Number of hours playing in matches during last season: _____
Number of hours playing in matches during this season: _____
Number of hours in training during last season: _____
Number of hours playing in training during this season: _____

Has the player been on sport diet? Yes No
 Individual with dietician Professional team diet

Has the player employed any injury prevention programme? Yes No
If yes, what kind _____
How does the player estimate the rate of endurance/strengthening training? 30/70 50/50 70/30

SIOMS sport injury & overuse monitoring system
ORTHOPAEDICS - DIAGNOSTICS - REHABILITATION - SPORT

rehasport clinic Acute Injury Protocol A

First and last name: _____ Date of birth: _____
Position on the field: _____ Date of injury/time of the game: _____

Incident location: training tournament home game away game
 league game international game

Chronology: acute chronic
Court surface: artificial parquet other

Incident: Unfortunate landing after the jump Fall on same level
 Collision with object Struck by the object or person
 Collision with participant Situational injury
 fall from a jump Other _____

Describe how the incident that occurred: _____

Body part: Head Right Left
 Internal Neck Back Upper limb Pelvis Lower limb

Time of injury: _____
Diagnosis: _____

BONES: Fracture
STAWY: Sprain Dislocation Chondral defect I Chondral defect II Meniscal tear Ligamentous injury

NERVOUS SYSTEM: A) CNS: Concussion Contusion Compression Complete Spinal Cord Injury

MUSCLES: Lesion type I Lesion type II Lesion type III

TENDONS: Lesion I Lesion II Lesion III Tendinitis

SKIN: Bruise Abrasion Laceration

Diagnosis verification: Clinical X-ray Ultrasound MRI CT

Has the player had same type of injury before? Yes No

Has the injured body part been supported? Yes No
If yes: knee pads taping splinting brace

Has the player reported any complaints regarding injured body part before the injury occurred? Yes No
If yes: pain pinching hypertension swelling instability other _____

Severity (time lost for training from the injury till complete recovery):
 Insignificant (less than 1 day) Mild (1-7 days) Moderate (8-28 days) Serious (more than 28 days)

Treatment applied: NSAID Analgesics RICE Brace Other supporting equipment PEP Hospitalization Rehabilitation Crutches Operative treatment

SIOMS sport injury & overuse monitoring system
ORTHOPAEDICS - DIAGNOSTICS - REHABILITATION - SPORT

rehasport clinic Chronic/overuse injury Protocol B

First and last name: _____ Date of Birth: _____
Playing position: _____ Date of injury/ time of the game: _____

Incident location A: training tournament home game away game
 league game international game

Incident location B: _____
Chronology: acute chronic
Court surface: artificial parquet other

Describe the pain you feel when the needle is advanced while blood collecting procedure. VAS scale (0-No pain, 10- worst possible pain)
0 _____ 10

Describe pain intensity related to the current injury. VAS scale.
0 _____ 10

Diagnosis: _____

Body part: Head Internal Neck Back Upper limb Pelvis Lower limb

Side: Right Left

Anatomical Structure: BONES: Fractures
JOINTS: Chondral defect I Chondral defect II Chondral defect III Meniscal lesion Effusion Ligamentous injury

NERVOUS SYSTEM: A) CNS: Balance problems Muscle tone problems Sensation problems

B) PERIPHERAL: Paraesthesia Sensation problems

MUSCLES: Lesion type I Lesion type II Lesion type III

TENDONS: Rupture Tendinitis

Skin: _____

Diagnosis verification: clinical X-ray Ultrasound MRI CT

Has the player had same type of injury before? Yes No

Has the player reported any complaints regarding the injured part before the injury occurred? Yes No
If yes, what kind of complaints: pain pinching effusion hypertension limited ROM skin warmth sztywność uczucie niestabilności przeskakiwania w/ub trzeszczenia

Has the player had any difficulties in the training related to the injury?
 Normal training with pain limited training Training impossible

What were the training limitations?
 No limitations Mild limitations Major limitations Training impossible

How the injury influenced the quality of the player's game?
 No influence Mild limitations Major limitations Game impossible

Describe the pain the player has had while playing during last week. VAS scale.
0 _____ 10

Has been equipment used for supporting injured part of the body?
 Yes No

If yes: knee pads taping splinting brace

If yes, was it for: prevention treatment

Has the player taken any of following to decrease discomfort or symptoms
 NSAIDs steroids PEP Microsupplementation nothing

Evaluation of injury severity: insignificant slight 1-3 days minor 4-7 days moderate 8-29 days severe >28 days

treatment received: NSAIDs antibiotics PEP physical therapy crutches orthosis surgical treatment physiotherapy

SIOMS sport injury & overuse monitoring system
ORTHOPAEDICS - DIAGNOSTICS - REHABILITATION - SPORT

Injury and overuse surveillance in handball



demographic form- player profile

rehasport[®] clinic Demographic form

First and last name Weight Height

Date of birth Date of career beginning

Position on the field

Has there been any injuries requiring medical treatment during entire career? (casualty time lost from training of more than 7 days)
 Yes No

IF YES, when (date)? Side Left Right Body part

What kind of Injury?

What type of treatment?

Has there been any injuries requiring medical treatment during last season?
 Yes No

IF YES, When? Side Left Right Body part

What kind of Injury?

What type of treatment?

Total time lost from training in last season:

Average time of playing during last season: min/game

Number of hours playing in matches during last season

Number of hours playing in matches during this season

Number of hours in training during last season

Number of hours playing in training during this season

Has the player been on sport diet? Yes No

Individual with dietician Professional team diet

Has the player employed any injury prevention programme? Yes No

If yes, what kind

How does the player estimate the rate of endurance/strengthening training? 30/70 50/50 70/30

SIOMS sport injury & overuse monitoring system

acute injury

First and last name

Date of birth

Position on the field

Date of injury/time of the game

Incident location

training tournament home game
 league game international game away game

Chronology

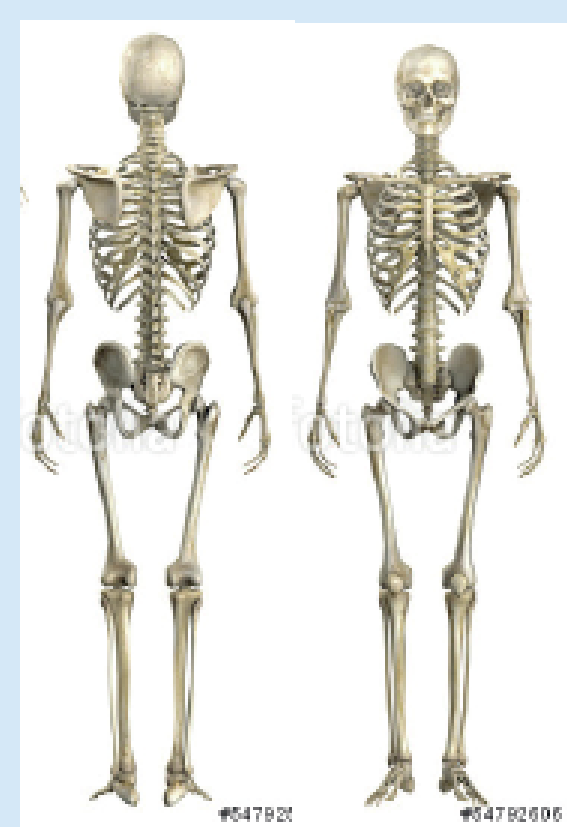
acute chronic

Court surface:

artificial parquet other

Incident

Unfortunate landing after the jump Fall on same level
 Collision with object Struck by the object or person
 Collision with participant Rotational injury
 fall from a jump Other



Describe how the incident that occurred:

Body part

Head
 Internal
 Neck
 Back
 Upper limb
 Pelvis
 Lower limb

Side

Right
 Left

Type of injury

BONES

Fracture

STAWY

Sprain
 Dislocation
 Chondral defect I
 Chondral defect II
 Chondral defect III
 Meniscal tear
 Ligamentous Injury

MUSCLES

Lesion type I
 Lesion type II
 Lesion type III

TENDONS

Lesion I
 Lesion II
 Lesion III
 Tendinitis

SKIN

Bruise
 Abrasion
 Laceration

NERVOUS SYSTEM

A) CNS

Concussion
 Contusion
 Compression
 Complete Spinal Cord Injury

B) PERIPHERAL

Stretch
 Contusion
 Compression
 Complete lesion
 Other

Diagnosis

Diagnosis verification:

Clinical X-ray Ultrasound MRI CT

Has the player had same type of injury before?

Yes No

Has the injured body part been supported?

Yes No

If yes

knee pads taping splinting brace

Has the player reported any complaints regarding injured body part before the injury occurred?

Yes No

If yes:

pain pinching hypertension swelling
 instability other

Severity (time lost for training from the injury till complete recovery):

Inessential (less than 1 day) Mild (1-7 days) Moderate (8-28 days) Serious (more than 28 days)

Treatment applied:

NSAID Antibiotics PRP Rehabilitation Crutches
 RICE Brace Hospitalization Operative treatment
 Other supporting equipment

overuse injury

First and last name **Date of Birth**

Playing position **Date of injury/ time of the game**

Incident location A training tournament home game acute artificial other
 league game international game away game chronic parquet

Describe the pain you feel when the needle is advanced while blood collecting procedure. VAS scale (0-No pain, 10- worst possible pain)

0 10

Describe pain intensity related to the current injury. VAS scale.

0 10

Body part

Head
 Internal
 Neck
 Back
 Upper limb
 Pelvis
 Lower limb

Side

Right
 Left

Anatomical Structure

BONES

fractures

JOINTS

Chondral defect I
 Chondral defect II
 Chondral defect III
 Meniscal lesion
 Effusion
 instability
 limited ROM
 Ligamentous injury

MUSCLES

Lesion type I
 Lesion type II
 Lesion type III

TENDONS

Rupture
 Tendinosis

Skin

NERVOUS SYSTEM

A) CNS

Balance problems
 Muscle tone problems
 Sensation problems

B) PERIPHERAL

Paraesthesias
 Sensation problems

Diagnosis

Diagnosis verification

clinical X-ray Ultrasound MRI CT

Has the player had same type of injury before?

Yes No

Has the player reported any complaints regarding the injured part before the injury occurred?

Yes No

If yes, what kind of complaints:

pain pricking effusion hypertension
 limited ROM skin warmth Szttywność
 Uczucie niestabilności przeskakiwania i/lub trzeszczenia

other

If yes, when was the onset of the symptoms?

Has the player had any difficulties in the training related to the injury?

Normal training no pain Normal training with pain Limited training Training impossible

What were the training limitations?

No limitations Mild limitations Major limitations Training impossible

How the injury influenced the quality of the player's game?

No influenced Mild limitations Major limitations Game impossible

Describe the pain the player has had while playing during last week. VAS scale.

0 10

Has been equipment used for supporting injured part of the body?

Yes No

If yes

knee pads taping splinting brace

If yes, was it for

prevention treatment

Has the player taken any of following to decrease discomfort or symptoms

NSAIDs steroids PRP viscosupplementation
 nothing

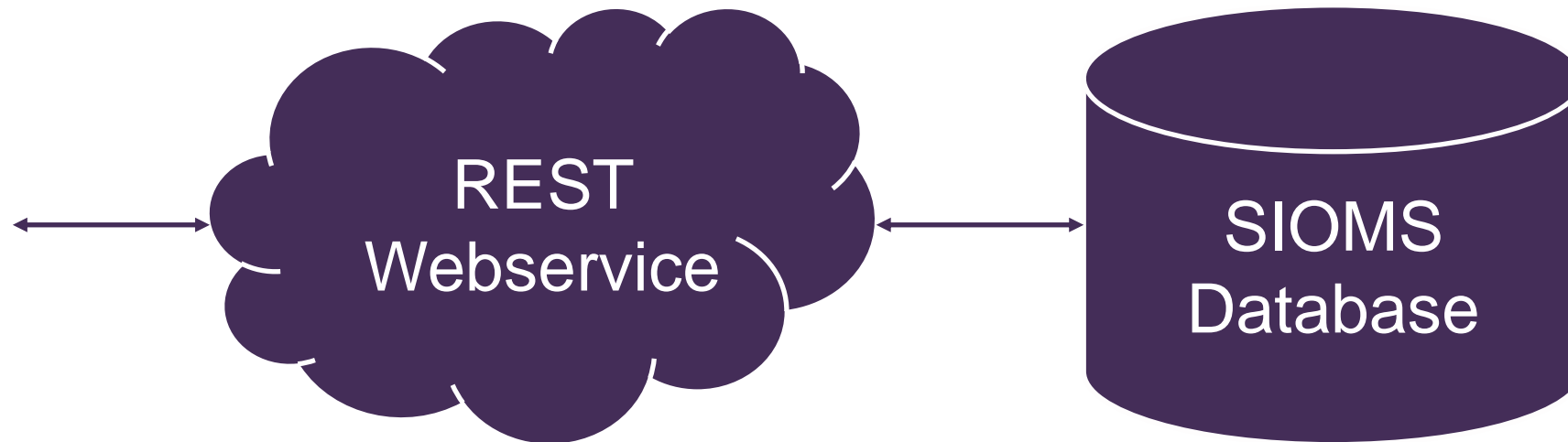
Evaluation of injury severity

insignificant slight 1-3 days minor 4-7 days moderate 8-39 days severe >28 days

treatment received

NSAIDs antibiotics PRP physical therapy crutches
 orthosis surgical treatment physiotherapy

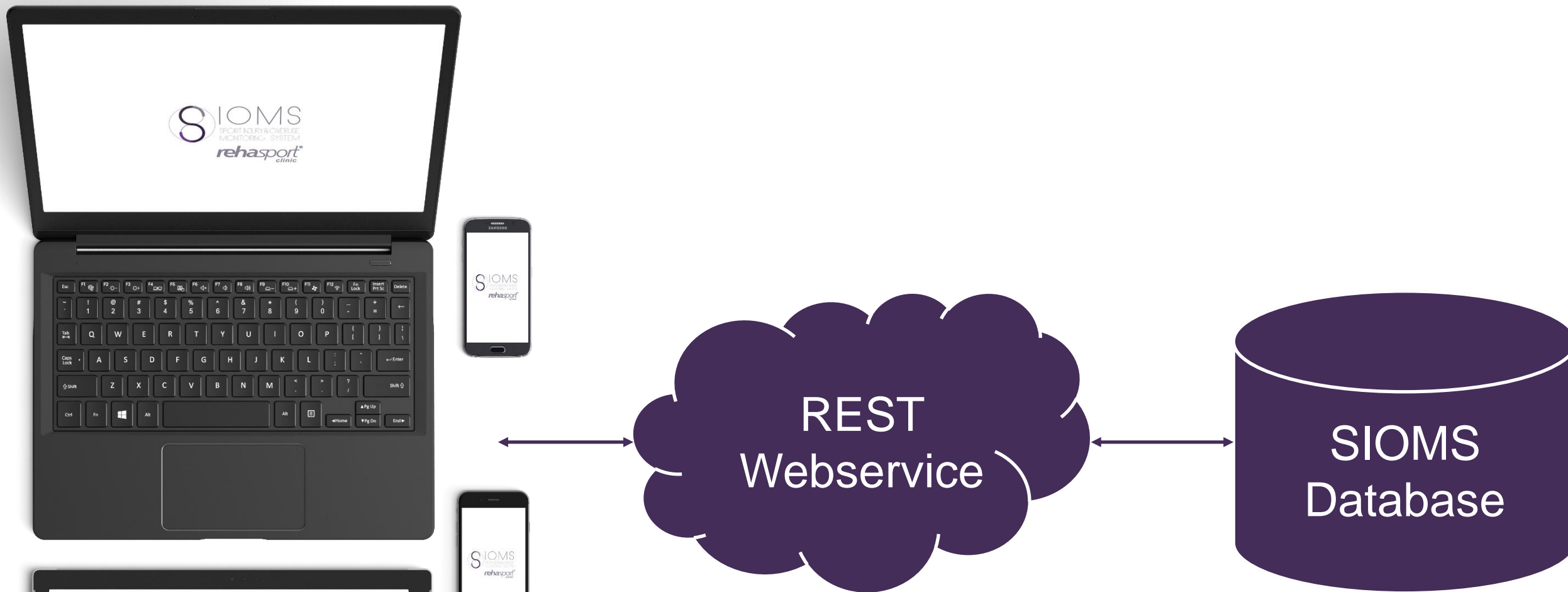
SIOMS sport injury & overuse monitoring system in HB



**windows based app
Tablet, PC**



SIOMS sport injury & overuse monitoring system in HB



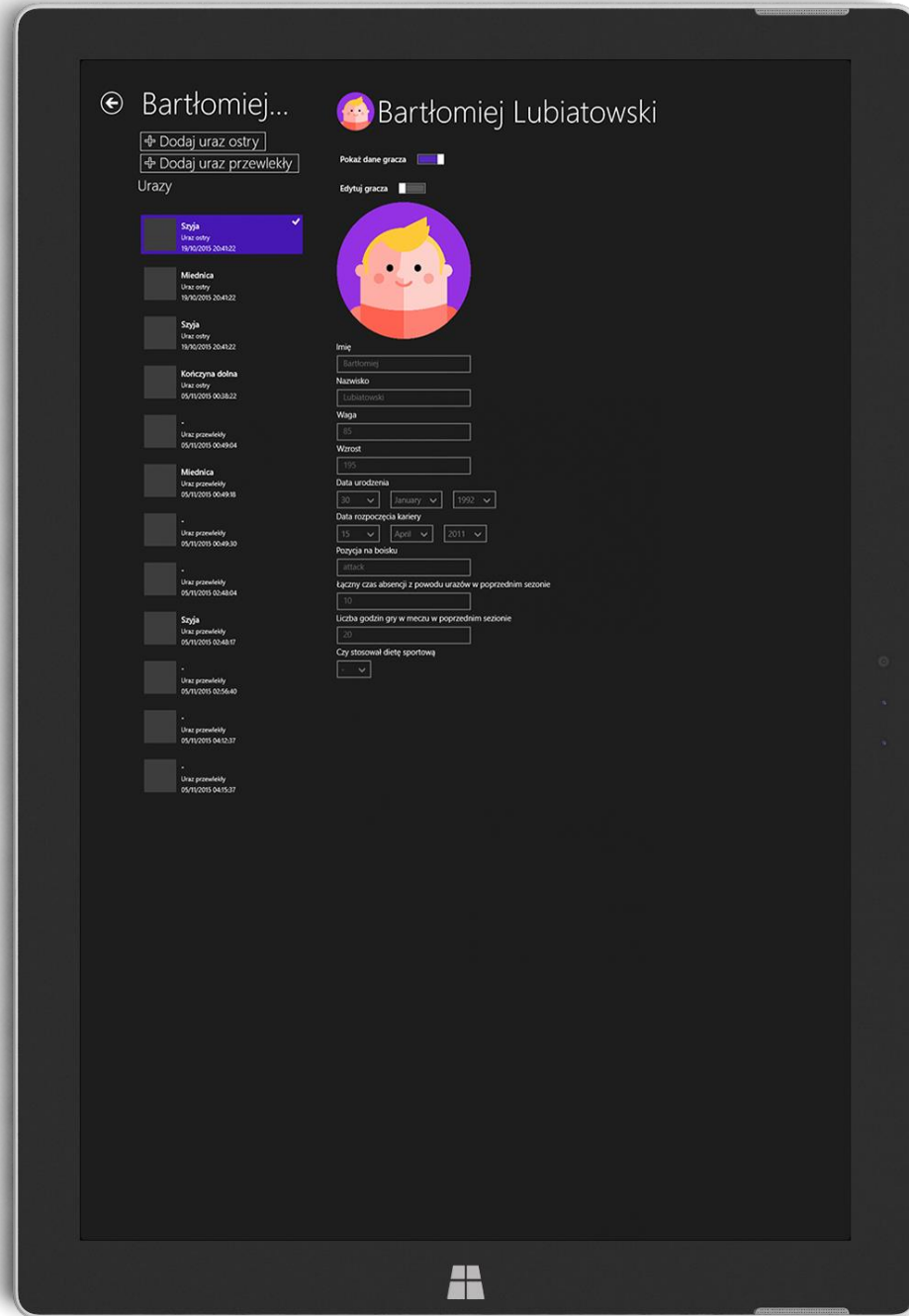
**windows based app
Tablet, PC**



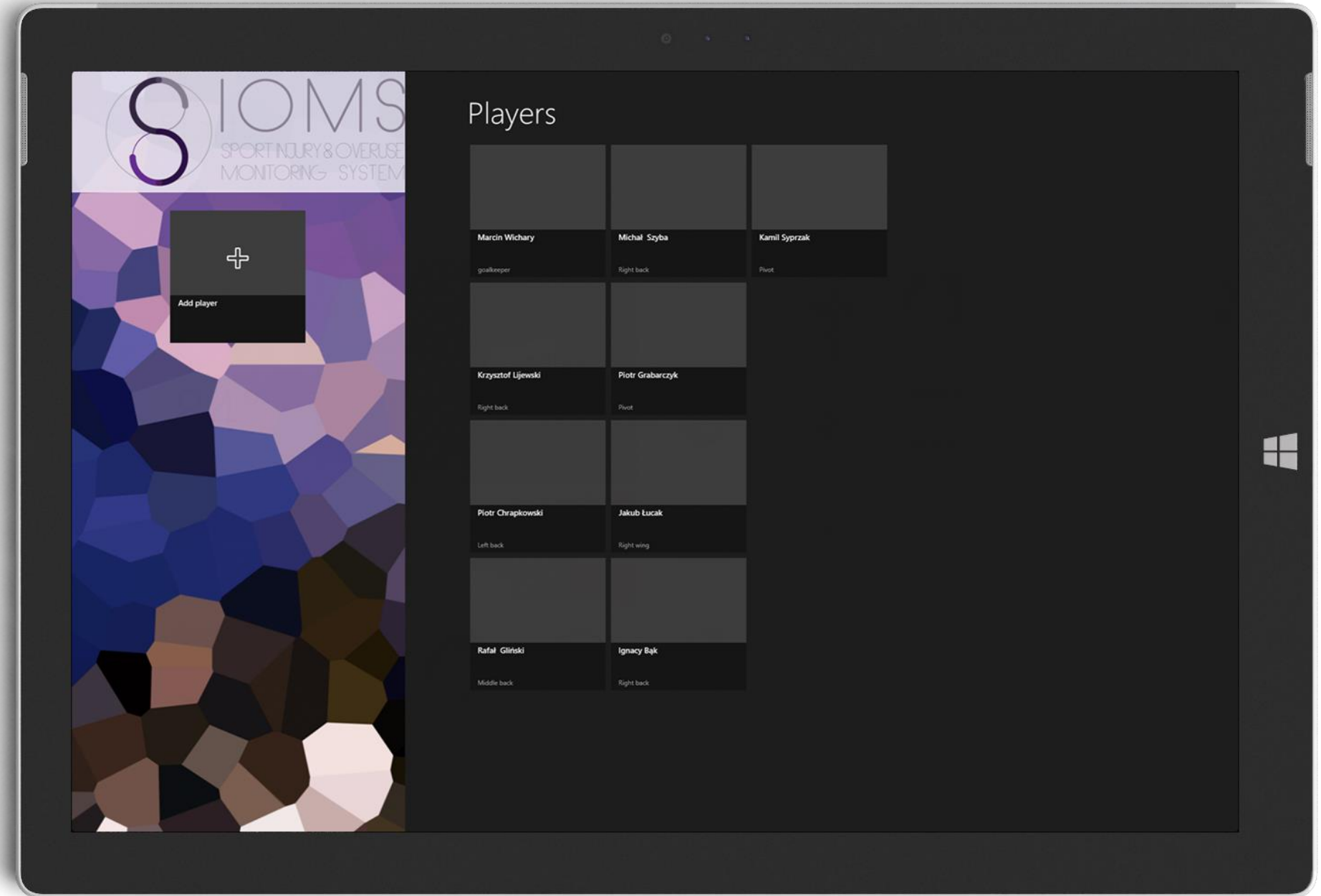
Injury and overuse surveillance in handball

SIOMS sport injury & overuse monitoring system in HB

App



player's profile



team

Injury and overuse surveillance in handball

App

Reporting injury

- Acute
- Overuse

The screenshot shows the SIOMS app interface for reporting an injury. The user is logged in as 'Marcin Wic...'. The interface includes a header with a back arrow and the user's name. Below the header, there are two buttons: 'Dodaj uraz ostry' and 'Dodaj uraz przewlekły'. A list of injuries is shown, with one entry 'Kończyna dolna' (Lower limb) selected, showing 'Uraz przewlekły' (Chronic injury) and the date '09/11/2015 16:13:01'. The main form is for reporting a 'Uraz przewlekły' (Chronic injury). It includes fields for 'Lokalizacja A' (Training) and 'Lokalizacja B' (None). There are two progress bars for 'Poziom odczuwanego bólu dla ułkućcia igłą przy pobraniu krwi' and 'Poziom bólu związany z urazem/przeciążeniem'. The form also includes dropdown menus for 'Okolica ciała' (Lower limb), 'Strona' (Left), 'Morfologia urazu' (Bone, Joints, Muscles, Tendons), 'Układ nerwowy' (CUN), and 'Obwodowy'. There is a 'Potwierdzenie rozpoznania' (NMR) dropdown and a 'Zakośnienie przez zawodnika dolegliwości w lokalizacji urazu przed jego wstąpieniem' checkbox.

Preliminary results

2 friendly matches international tournament

- 7 acute injuries
- 3 overuse
- 3 hospital
- 3 training
- 7 match

ID	InjuryProfileID	DietTypeID	Name	Surname	Creation Date	Photo	PlayerWeight	PlayerHeight	CareerStart	PlayerPosition	PreviousSeasonInjuryAbsence	PreviousSeasonAverageFieldTime	BirthDate
80	NULL	NULL			09.11.2015	NULL	100	193	01.01.1915	goalkeeper	NULL	NULL	17.02.1980
81	NULL	NULL			09.11.2015	NULL	101	199	01.01.1915	Right back	NULL	NULL	07.07.1983
82	NULL	NULL			09.11.2015	NULL	100	203	01.01.1915	Left back	NULL	NULL	24.03.1988
83	NULL	NULL			09.11.2015	NULL	78	181	01.01.1915	Middle back	NULL	NULL	29.12.1982
84	NULL	NULL			09.11.2015	NULL	97	196	01.01.1915	Right back	NULL	NULL	18.03.1988
85	NULL	NULL			10.11.2015	NULL	100	200	01.01.1915	Pivot	NULL	NULL	31.10.1982
86	NULL	NULL			10.11.2015	NULL	80	184	01.01.1915	Right wing	NULL	NULL	18.09.1989
87	NULL	NULL			10.11.2015	NULL	95	195	01.01.1915	Right back	NULL	NULL	11.08.1995
88	NULL	NULL			10.11.2015	NULL	116	208	01.01.1915	Pivot	NULL	NULL	23.07.1991

ID	PlayerID	Creation Date	Game Time	LocationA	LocationB	InjuryMechanism	BodyArea	Side	InjuryMorphology	Bone	Joint	Muscle	Tendon	Skin	Central Nervous System	Peripheral Nervous System	InjuryConfirmation ID	InjuryProtection	AilmentID	Treatment	InjurySeverity
69	81	09.11.2015	0	league match	home match	unfortunate landing after jump	lower limb	R	108	-	-	I	-	-	-	-	USG	-	-	physiotherapy	NULL
70	82	09.11.2015	0	league match	home match	colision with object	upper limb	L	109	-	-	dislocation	-	-	-	-	clinical	-	-	physiotherapy	NULL
71	83	09.11.2015	0	international match	home match	unfortunate loading	lower limb	L	110	-	-	I	-	-	-	-	USG	-	-	physiotherapy	NULL
72	84	09.11.2015	0	league match	away match	unfortunate loading	lower limb	L	111	-	-	IIA	-	-	-	-	USG	-	-	physiotherapy	NULL
73	86	10.11.2015	0	league match	away match	unfortunate loading	lower limb	R	114	-	-	sprain	-	-	-	-	MR	orthosis	-	physiotherapy	NULL
74	87	10.11.2015	0	training	-	-	upper limb	L	115	-	-	-	tendonitis	-	-	-	MR	-	-	physiotherapy	NULL
75	88	10.11.2015	0	training	-	-	upper limb	L	116	-	-	-	tendonitis	-	-	-	MR	-	-	physical therapy	NULL

ID	PlayerID	Creation Date	Game Time	LocationA	LocationB	Pain	InjuryPain	BodyArea	Side	InjuryMorphology	Bone	Joint	Muscle	Tendon	Skin	Central Nervous System	Peripheral Nervous System	InjuryConfirmation	AilmentID	TrainingDifficulties	TrainingReduction	TrainingQuality	TrainingIntensity	InjuryProtection	InjuryPainReduction	Treatment
65	80	09.11.2015	0	training	-	4	7	lower limb	L	107	-	-	tendonitis	-	-	-	-	NMR	-	training limitation	major limitation	-	7	-	1	physiotherapy
66	84	09.11.2015	0	league match	home match	4	4	lower limb	R	112	-	-	tendonitis	-	-	-	-	USG	-	training limitation	mild limitation	-	4	-	1	physiotherapy
67	85	10.11.2015	0	training	away match	5	3	lower limb	L	113	-	-	tendonitis	-	-	-	-	USG	-	normal training with pain	mild limitation	-	4	-	1	physical therapy

Injury and overuse surveillance in handball



Surveillance of sport injuries in handball is critical for sports injury prevention

SIOMS allows for

- collecting the acute and overuse injury data
- constant monitoring of players' injury profile
- event, training, season
- web/mobile application
- database and data analysis

Further development necessary

Part of “athlete’s passport” project in Rehasport Clinic

Injury and overuse surveillance in handball

rehasport
clinic[®]



Thank you!

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