



# The 60th Anniversary of the Swedish Association for Physical Activity and Sports Medicine:



**Karolinska  
Institutet**

## Sixty years of Sports Medicine in Sweden

**By Per Renström, MD, PhD**

*Professor emeritus*

*Karolinska Institutet*

*Stockholm , Sweden*

**Talk at The Scandinavian  
Congress of Medicine and Science in  
Sports in Malmö September 20, 2012**





# Goals with this lecture

## I plan to present to you

- Some landmarks in the history of the Swedish Association for Physical Activity and Sports Medicine (SFAIM – brief in Swedish)
- Some major Paradigm shifts during these 60 years in
  - ✓ *Physical activity and exercise, Patient care. Clinical science and research, Education, Some great moments in SFAIM*
- Will end up with some Personal reflections



Some has given me ideas but this talk is my story of SFAIM!!

- I have tried to cover major events and do apologize if I have forgotten somebody and/or something!!!!



# "Sixty years of Sports Medicine in Sweden"



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## Content

- *What is Sports Medicine ?*
- Historic landmarks of the Swedish Association for Physical Activity and Sports Medicine -SFAIM
- Paradigm shifts + great achievements in
  - ✓ Physical activity and exercise
  - ✓ Patient care
  - ✓ Clinical science and research
  - ✓ Sports Specific activities
  - ✓ SFAIM
- Sports Science and Sport
- Where are we going?





# "Sixty years of Sports Medicine in Sweden" Remember – Sports is fun!!!

"Sport activities are so much fun, that it is odd that they are not forbidden!!"

**Bengt Sevelius**

- Past General Secretary of the Swedish Sports Confederation
- Honorary member IMF





# Sports Medicine started in Sweden in the 1940s and is multidisciplinary

## Internal Medicine and Physiology-Biomechanics

- Performance enhancing
- Benefits of physical activity
- Health issues

## Orthopedics and rehabilitation

- Management of injuries/trauma
- Rehabilitation and return to sport
- Prevention

Orthopedic Sports  
Medicine  
- Injury in sport

Physiology- Medicine  
-Health benefits by  
physical activity



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  - ✓ **SFAIM**
- **Sports Science and Sport**
- **Where are we going?**



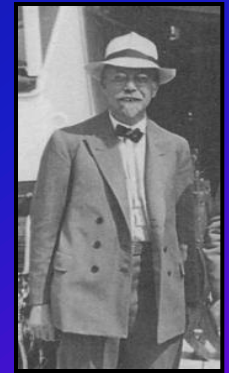
# The founders of Exercise Science in Scandinavia and the world

## Groundmaking research in Scandinavia

- **August Krogh**, Copenhagen -Nobel prize 1919 for  
✓ *“for the discovery of the mechanism of regulation of the capillaries in skeletal muscle”*

Krogh had a couple of outstanding students.

- One of them was **Erik Howu Christensen**  
✓ *Moved to GCI (GIH) in Stockholm 1940*  
✓ *He changed belief into evidence-based!!*  
✓ *He made sports scientific –He was a pioneer!!*



**August Krogh**  
Courtesy of  
**Bengt Saltin**



# Sixty years of Sports Medicine in Sweden”

## Important years in Sports Medicine in Sweden

- 1941 Erik Howu Christensen to GIH in Stockholm
- 1952 Swedish Society of Sports Medicine (now SFAIM) was founded
- 1970 The Sports Research Council (Idrottens forskningsråd --IFR) was created
- 1972 First regular scientific meeting in Sports Medicine
- 1987 First Swedish professorship in Sports Medicine
- 1990 Skandinavian Scientific Journal
- 1988 /1992 Centrum för Idrottsforskning (CIF)
- 1990 Four new Professorships in Sports Medicine
- 2000 SCIF awards the first prize in Sports Science
- 2000 FYSS



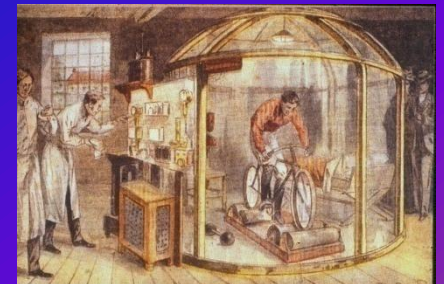


# The Swedish Association for Physical Activity and Sports Medicine -SFAIM was founded on March 5, 1952

- **A call was made by Erik Howu Christensson**
- ✓ Ragnar Gårdstam, Lennart Hult, Sten Insulander, Gunnar Malmström, Sture Röden, Torgny Sjöstrand och Per Strömbäck came
- **The group met Sept 9, 1952 at Svenska Läkarsällskapet and founded the Section of Sports Medicine**
- The board included Sten Insulander, chair, Gunnar Malmström sekr. and Sture Röden.
- ***The first year there were 62 members***



Courtesy of  
Bengt Saltin





# Sixty years of Sports Medicine in Sweden”

## The first 20 years 1952-1972

- **Occasional scientific meetings**
- ✓ During the 1960s there was one day of education with Rolf Ljungqvist och Per Strömbäck
- *Bengt Eriksson was a member of the board 1962-1987 i.e. 20 years. Longest of anybody!!!!*



### Presidents during this time:

- **Sten Insulander 1952-1957,**
- **Rudolf Ullmark 1957-1968,**
- **Sten-Otto "Battis" Liljedahl 1968-1971**



With courtesy  
of Ejnar Eriksson



# **“Sixty years of Sports Medicine in Sweden”**

## **The years 1972-1978**

### **Paradigms shifts**

- **In 1972 SFAIM started to have regular scientific meetings promoted by our secretary Bengt Saltin**



**The first meeting was held in Linköping under the chair of Olof “Gurkan” Lindahl**

- Present were eg. : Bengt Eriksson, Bengt Saltin, Gunnar Grimby, Björn Ekblom, Arthur Forsberg, Sten-Otto Liljedahl, Bertil Stener, Lars Peterson, Nils Rydell , Tönu Saartok, Per Renström etc.
- We were 32 at the dinner

- **1977 The SFAIM had only 79 members**

### **President**

- **Nils Rydell 1971-1978**



**With courtesy of  
Ejnar Eriksson**



# Paradigm shift In the activities in the Swedish Sports Medicine society

## Paradigm shift at the spring meeting in Karlstad 1977

- *Physiotherapist (PTs) could be full members and be on the board*
- *PTs could take part in Riksstämman*



Many PTs have made outstanding  
Contributions to the SFAIM

Remember also that

- *Since 1977 > 550 PTs have defended their PhD thesis in Sweden with honor*





# Eva Faxén, Göteborg 1936-2012

It is sad week.

**Eva Faxén , Göteborg has left us!!**

- *Eva has made great contributions to Swedish Sports Medicine and to our Society*
- *She was treasurer of SFAIM most of the time during the fantastic 1980s*

Because of her dedicated work to the Society

- *Eva was elected Honorary member*

*Eva was good friend to many of us and will be dearly missed*

Thanks for giving us all so much!





# Increasing cooperation RF and SFAIM

During the 1970's an increased cooperation between RF and SFAIM started with lots of courses and other education

- **Nationally** with the Sports Federations
- **Regionally** with the district organizations
- **Locally** with the clubs and other local associations



This was a Win-Win situation

- *These courses resulted in publications such as Injuries in Sports*
- *first published in 1977*

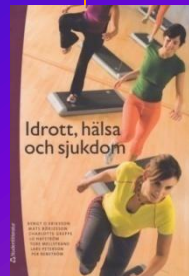
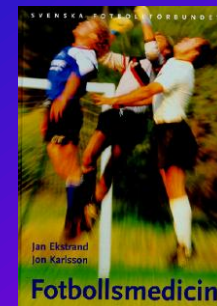
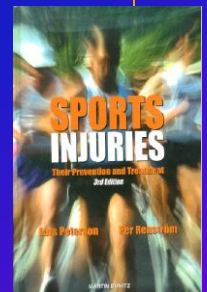
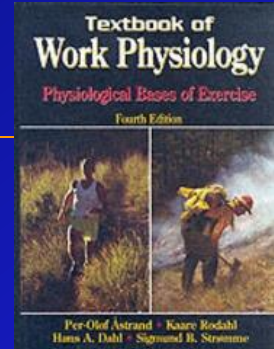




# Paradigm shift

## World wide spread books initiated at this time

- **Per-Olof Åstrand, Kåre Rodahl**
- ✓ **Textbook of Work physiology** 1970, 1986, 2003
- ✓ **Standard around the world.** Translated to 8 languages
- **Lars Peterson, Per Renström**
- ✓ **Injuries in Sport** 1977, 1985, 2000, 2013
- ✓ The "Bible" in Sports Medicine. 13 languages
- **Bengt Eriksson et al**
- ✓ **Sports, Health and Illness** 1983, 2011
- **Jan Ekstrand, Jon Karlsson**
- ✓ **Football Medicine** 1998







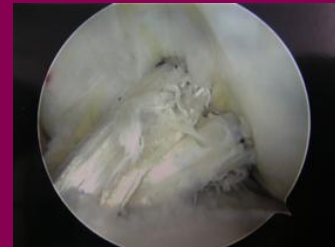
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## Paradigm shifts In education





# The Golden years 1978-1988

- The first own scientific meeting at Riksstämman was in 1978
- ✓ These became very popular with full houses
- They were combined with running to Karlberg
- ✓ A fantastic party in the evening.
- *Our own journal "Idrottsmedicin" started in 1982*
- *Cooperation with Astra-Syntex started 1983*



## Presidents

- Ejnar Eriksson 1978-1981
- Lennart Kaijser 1981-83
- Bengt Eriksson 1983-85
- Lars Peterson 1985-87
- Per Renström 1987-89



Courtesy of  
Ejnar Eriksson



**“Sixty years of Sports Medicine in Sweden”**

**The “Spring meetings” were during the 1980s and into the 1990s very popular**

- **Great chance for the young to present papers!!**
- **The social aspects have always been very important**





# Paradigm shift

## Sports Medicine education in Vålådalen

After 30 years of Winter Medicine education in Storlien it was time for a change



- *Bengt Saltin and Bengt Sevelius took the initiative to Sports Medicine education*
- **Started 1978 and moved to Vålådalen 1982**
- *Bengt Eriksson, Lars Peterson and Per Renström were appointed to take the lead*







# Paradigm shift

## Sports Medicine education in Vålådalen

- The new indoor sports arena was used extensively
- *The most active in Swedish sports medicine got to know each other rather well during these courses*
- *A whole generation of future leaders active in sports medicine got their basic education here*
- Social activities were important



Some dinosaurs 2012





# Education in arthroscopy exploded in the 1970s and 1980s

## Courses in arthroscopy

- *Ejnar Eriksson, Jan Gillqvist, Nils Oretorp et al organized courses in arthroscopy for all kinds of orthopedists both*
  - ✓ in Sweden and
  - ✓ for the world in eg. Hawaii, China
- **NLV courses i.e. Courses for physicians in continued education were given in Göteborg 1978 – 1982 with Lars Peterson as head**





# SAFIMs own journal "Idrottsmedicin" etc.

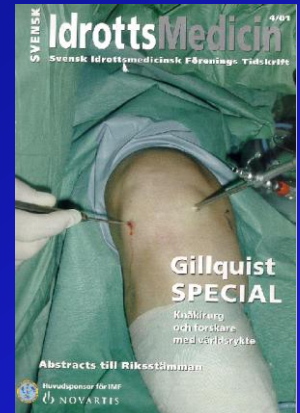
SFAIM started 1981 its own journal

- **Christian Åkermark** editor 1981-1992.

✓ *He worked hard to establish the journal and was very successful*

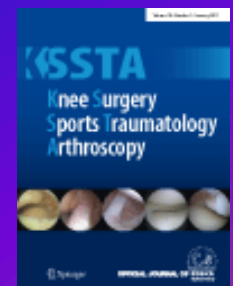
- Thereafter followed

- ✓ **Jan Lexell** 1992-1997, **Tõnu Saartok** (1997- 2009) and **Anna Nylén** (2009- )



Journal of ESSKA- European Society of Sports  
Traumatology Knee Surgery and Arthroscopy 1993

- ✓ *Editors 1993- 2010 Ejnar Eriksson , Founder*  
*2010- Jon Karlsson*





# Scandinavian Journal och Sports Medicine and Exercise

1988 a group with Lars Engebretsen, Erik Darre, Paavo Komi, Lars Peterson, Bengt Eriksson and Per Renström was formed

- *with the task to start an international scientific journal of high quality.*
- *The first editor in chief was Bengt Saltin, then Henrik Galbo and Michael Kjaer. Steve Harridge, King's College in London is new editor*
- **The Impact Factor is now 2.867    Top 10!!!!**
- ✓ Compare BJSM 4.144, AJSM 3.792, KSSKA 2,209 and Clin. J.Sports Med 2.119,





# “Sixty years of Sports Medicine in Sweden”

## The years 1989-1998

Consensus reports were created

- *Under Christer Rolf's energetic leadership*



Paradigm shift

SFAIM created in 1993 their own office

- *Ann-Christin "Anki" Andersson has guided the Society with great commitment*



Presidents

- Åke Andrén Sandberg 1990-1991
- Bo Berglund 1991-1992
- Christer Rolf 1993-1994
- Sven Anders Sölveborn 1995-1996
- Jan Henriksson 1997-1998







# “Sixty years of Sports Medicine in Sweden”

## The years 1998-2012

### Paradigm shift

- *The greatest achievements was creating the successful FYSS , which required extensive work*



### Presidents

- Jon Karlsson 1999-2000
- Per Herbertsson 2001-2002
- Carl-Johan Sundberg 2003-2004
- Harald Roos 2005-2008
- Karin Henriksson-Larsén 2008-2010
- Tomas Movin 2011-2013





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# Paradigm shift

## The development of the cycle ergometer

Erik Hohwu-Christensen had a very talented student: **P-O Åstrand**, who presented his classic dissertation in 1952



- *On measurements of the oxygen uptake, which laid the foundation of the development of the Åstrand Rhyming cycle ergometer test,*
- ✓ which is a submaximal cycle ergometer aerobic fitness test
- *These cycle tests became the standard for the whole world*





## Paradigm shift

# Sports science used in Swedish Sports for the first time!!

The Swedish team experienced a fiasco with 4 bronze medals in Oslo Olympic Winter Games 1952.

- Sigge Bergman contacted Erik Howu-Christensen and P-O Åstrand: *"How can Swedish sports science and medicine help us?"*
- 1954-55 P-O tested the Swedish team including Sixten Jernberg.
- Sweden then took a couple of gold in Cortina 1956.
- *First example where Medical Science directly supported top athletes*







## Paradigm shift

# The development of the muscle biopsy needle

**Jonas Bergström and Eric Hultman.** Karolinska Institutet developed the muscle biopsy needle technique in middle of the 1960s *Bergstrom et al 1966*



Courtesy of  
Bengt Saltin

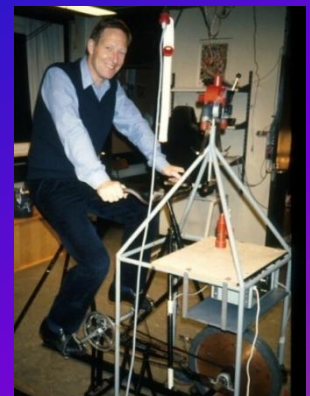
- *This started a revolution in Integrated Physiology and Sports Medicine research*

**This has increased our understanding that**

- *Carbohydrate is the main and really the crucial substrate used for long distance work.*

**Bengt Saltin et al** has refined this technique

- *It was now possible to precisely describe why carbohydrate has this role in the muscle*

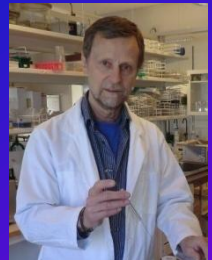




## Great achievements

# In Physiology and Sports Medicine

- **Bengt Eriksson** was first to study girl swimmers  
*Acta Paediatr. Suppl 147:1-75. 1963*
- **The development of isokinetic machines** combined with muscle biopsies resulted in many great muscle strength studies by **Gunnar Grimby, Per Tesch, Alf Thorstensson** etc.
- **Great works on exercise** have been produced by eg **Lennart Kaijser, Eva Jansson, Karin Piehl-Aulin, Jan Henrikson, Carl-Johan Sundberg** etc.
- **Eva Blomstrand and Kent Sahlin** have studied  
✓ *how physical activity and nutrition improves muscular performance and protects the health.*

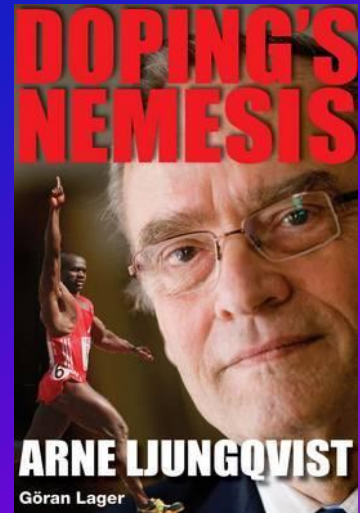


# Great achievements

## The fight against doping

### Great Swedish contributions

- *Blood-doping was described by Björn Ekblom and co-workers 1972*  
*Ekblom et al J Appl Phys 1972*
- *EPO doping was described by Björn Ekblom and Bo Berglund and others*  
*Scand J. Med Sci Sports 1991*
- **Arne Ljungqvist is known as the Nemesis of Doping**
- *Arne is vice president of WADA which was founded in 1999*
- *Bengt O Eriksson member of RF's Doping Commission since 1973 has done major work*







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# Fact for all of us Top athletes often have injuries and we have to treat them!!



## Message

- *The management of top athlete's has driven the medical care forward for everybody !!!*
- ✓ *Compare what formula 1 racing for cars have done for all other cars!!*

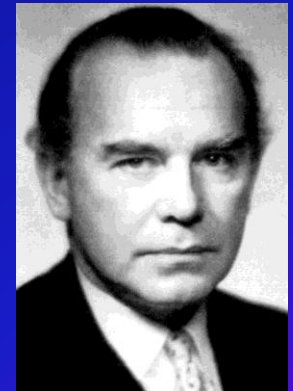




# Achievements in Swedish Sports Medicine

## Patient care in clinics was a major step forward during the 1940-60s

A Sports Medicine clinic opened at the Stockholm Olympic Stadion already in 1944 on the initiative by Sten Insulander and Torgny Sjöstrand



- *These personal clinics were the mainstay at this time.*

The pioneers included also:

- Lennart Hult
- Per Strömbäck
- Rolf "Lammet" Ljungqvist
- Sten-Otto "Battis" Liljedahl



# Paradigm shift

## Changing role of the medical teams

The physician(s) and the physiotherapist(s) /naprapat(s) belonging to a sports team are

- *today regarded as important and self-evident members of the team by the players and the coaches*



These are today also aware of the importance of

- *pre-participation testing, follow-ups, rehabilitation, prevention activities, nutrition as an integrated part of the training.*







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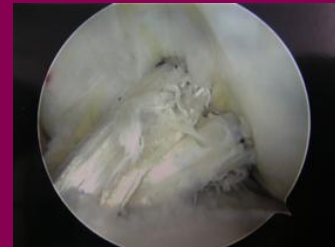
# "Sixty years of Sports Medicine in Sweden"



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## Paradigm shift Knee injuries



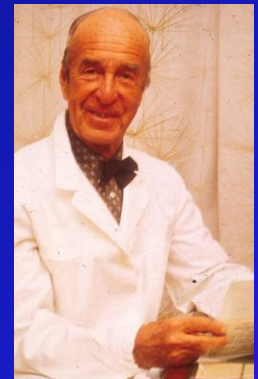
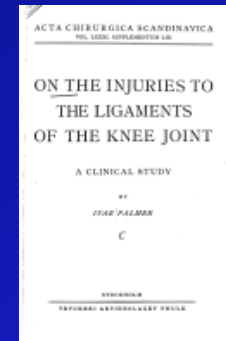


## Paradigm shift

# Ivar Palmer – The first giant in knee ligament injury

Ivar Palmer, Stockholm defended his PhD thesis on ACL injury mechanisms, biomechanics, management etc. in 1938

- *His ideas were verified during the 1970 s ie. He was 40 years ahead of his time.*



A great group was working at the Karolinska during the 1960s and beginning 1970s including

- *Sten-Otto Liljedahl, Lennart Broström, Ejnar Eriksson, and Jan Gillqvist*



*With courtesy of  
Ejnar Eriksson*



# Paradigm shift

## The Linköping school

**Sten-Otto Liljedahl became head in Linköping in 1971**

- Physician Swedish football team 1957 -1970
- Olympic team 1960-72
- *Initiated Vättern runt 1966*
- *Stands now statue in Stadsparken, Motala*
- *Created a world famous knee research team*



**Many students set their own successful mark**

**Nils Oretorp** (PhD 1978)

- was the the genial developer of arthroscopy instruments and techniques



**Sten-Otto Liljedahls  
plats, Stadsparken,  
Motala**





## Paradigm shift

# The scientist of the Linköping school

Jan Gillqvist – the ultimate PhD thesis advisor

- *Became the leader of a world renowned knee research team*
- *Advisor to 29 Sports Medicine PhD theses*
- *Only person who has been the president in both International Society of the Knee (ISK) and International Association of Arthroscopy (IAA)*
- Jan is now cultivating roses together with his wife Carola Messner in their garden







## Paradigm shift

# Surgery or non-surgery of ACL tear

**Only three Level I studies = RCT  
studies are available through the years!!!**

▪ ***All 3 comes from Sweden***

I. Sandberg R. et al; JBJS, Am. Oct;69(8):1120-6, 1987

II. Andersson C. et al Clin Orthop Relat Res.;(264):255-63. 1991

**Cochran's conclusions of I and II (2002)**

- *There is insufficient evidence from these randomized trials to inform about current practice.*
- *Good quality randomized trials are required to remedy this*





# Paradigm shift

## III. The Kanon Trial –



III. Frobell R, Roos E, Roos H, Ranstam L, Lohmander S

A randomized trial of treatment for acute anterior cruciate ligament tears.

*N Engl J Med. Jul 22;363(4):331-42. 2010*

### Conclusions:

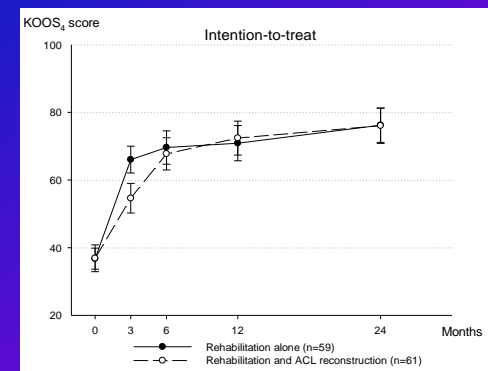
In young active adults with acute ACL tear

- *An early ACL reconstruction followed by structured rehab provided **no better outcome** than early rehabilitation alone.*

This study has generated lots of debate!



Courtesy of Harald Roos





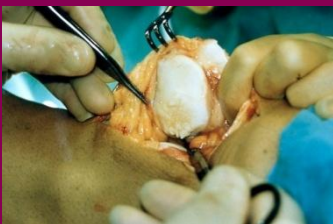
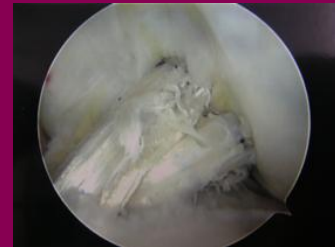
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## Paradigm shift Cartilage injury and arthritis







# Paradigm shift

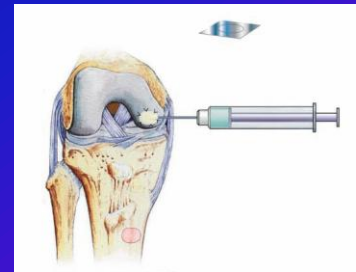
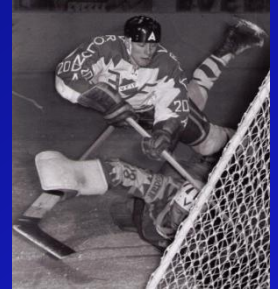
## Cartilage injury

**Lars Peterson's** ground breaking research on cartilage injury started in 1982

- *This is the first successful "Bioengineering" for sports related problems.*
- *Started a world-wide research revolution with the article on autologous chondrocyte transplantation.*

*Brittberg. Peterson et al in N.Engl. J. Med. 1994*

- There are data indicating that the composition of the articular cartilage is changed up to 1-2 years after the ACL injury *Dahlberg, Tiderius et al 2010*







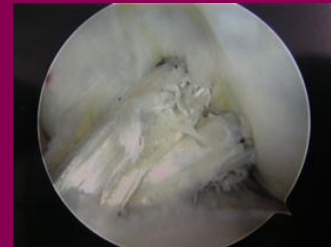
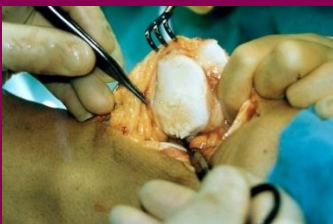
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## Paradigm shift Tendon injury Tendinopathy





# Great achievements

## Tendon overuse injury

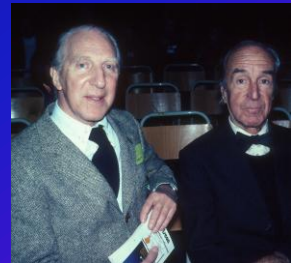
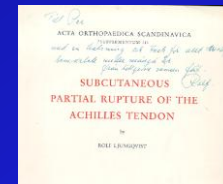
**Historical note:** **Arne Ljungqvist** got a knee tendon injury at a student carnival 1951. Not until 15 years later could the correct diagnosis be made.



Courtesy of  
**Arne Ljungqvist**

### **Rolf "Lammet" Ljungqvist**

- *defended the first "Sports Medicine" PhD thesis in Sweden after Ivar Palmer in 1968*



**Curwin and Stanish, Canada introduced in 1984**

- *Eccentric exercise in treating tendinopathy*
- *Effect verified in prospective randomized studies*  
*Alfredson et al Am J Sports Med. ;26(3):360-6, 1998*





# Great achievements

## Tendinopathy management

### Other great achievements

- *Tendon structure via biopsies*

*Tomas Movin et al 1999 etc*

- *Tendon healing* *Aspenberg et al 1990s and 2000s*

- *Presence of neuropeptides in tendons*

*Ackermann et al :J Orth. Res. ;20(4):849-56. 2002*

- *Developed sclerosing injections*

*Ohberg et al KSSTA ;11(5):339-43, 2003*

- *Developing new training regimes*

*Karin Grävare-Silbernagel et al 2008*

- *Ultrasound guided arthroscopic shaving*

*Willberg et al BJSM. ;45(5):411-5. 2011*





# Great achievements

## Complete Achilles tendon tear

**Silfverskiöld** described 1940 a method, with the flap rotated 180 degrees

*Silfverskiöld N. Acta Chir Scand 84:393–413, 1940*

**Arner and Lindholm 1959** used two flaps

*Arner, Lindholm, Acta Chir Scand Suppl 116:1–51, 1959*



## Great achievements in Göteborg:

- *Surgical and non-surgical treatment of Achilles tendon rupture in prospective randomized studies.*

*Nistor L J. Bone. Joint Surg. 63: 394-399, 1981*

*Möller et al, Scand J Med Sci Sports. ;12(1):9-16, 2002*

*Nilsson-Helander K et al AJSM ;8(11):2186-93, 2010*





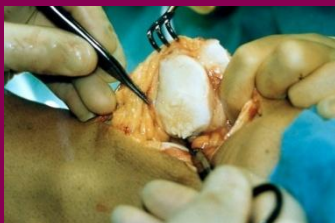
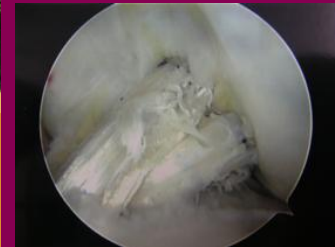
# "Sixty years of Sports Medicine in Sweden"



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## Paradigm shifts Ankle injuries





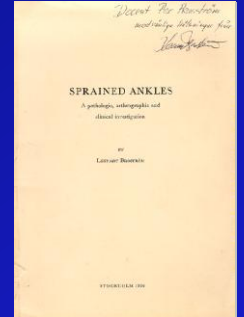
# Paradigm shifts

## Ankle injuries



### Lennart Broströms classic dissertation 1966

- *Functional treatment should be the treatment of choice*
- **New surgical technique "Broström repair"**
- *Broström is Sweden's most cited sports orthopedist*



### Anders Lindstrand (1976)

- *Verified Broström's results*



### Jon Karlsson (1988) described

- *A modified surgical technique (Peterson- Karlsson)*
- *A new way to measure stress x-rays.*







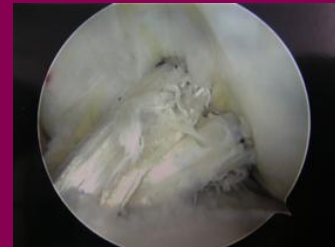
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## Great achievements Shoulder injury





# Great achievements

## Shoulder dislocations

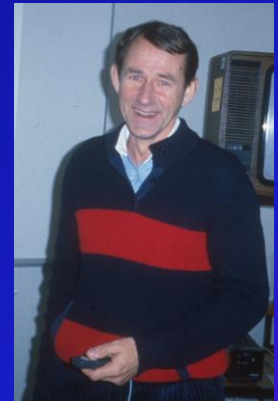


### Lennart Hovelius

- *25 year follow up of shoulder dislocations is a landmark study*

- It gave him the Neer award 2010

*Hovelius et al: J Shoulder Elbow Surg.;18(3):339-47, 2009*



### Karin Johansson et al

- *Strengthening eccentric exercises for the rotator cuff and scapula stabilisers, is effective in improving shoulder function*
- *This reduces the need for arthroscopic subacromial decompression*

*BMJ: Feb 20;344:e787. 2012*







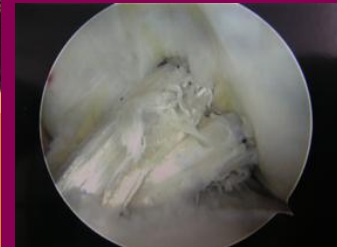
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## Great achievements Other injuries







# Paradigm shift

## Typical sport injuries

### Mechanisms behind hamstring injuries decide injury time

#### I. High speed velocity running *Biceps femoris* tear

- Return to sport in median 16 weeks

*Askling et al: Am J Sports Med. Feb;35(2):197-206, 2007*



#### II. Slow hip flexion eg dancers *Tears at ischial tuberosity*

- ✓ Return to sport in median 50 weeks

*Askling et al : Am J Sports Med. Sep;36(9):1799-804, 2008*



### Overload on the spine in growing individuals

- Athletes in sports with demands on the back run a
- ✓ Risk of developing disc degeneration and back pain.

*Swärd, Baranto et al KSSTA ;17(9):1125-34. 2009*





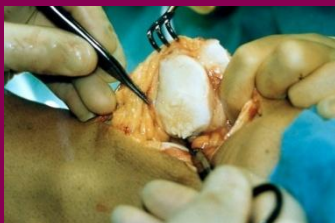
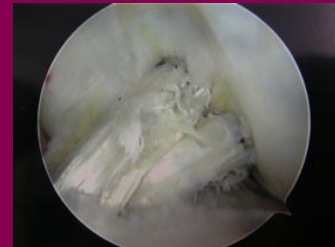
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## Paradigm shifts Rehabilitation Return to sport





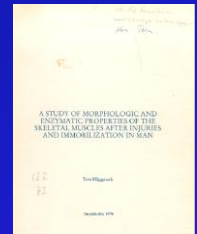
## Paradigm shift

# Early and safe motion after injury

Early motion after ACL surgery was advocated by Ejnar Eriksson and Tom Häggmark in 1978

- *This was done well before anyone else!!*

*Häggmark T, Eriksson E. AJSM ;7(3):169-711979*



How safe is bicycling and stair climbing etc. following ACL surgery?

Mean peak ACL strain was 1.7%,

**Conclusion:**

- *An ACL reconstructed patient can start bicycling very early*

*Fleming et al, AJSM 26(1):109-18, 1998*







# Great achievements

## Some example on great PT work

### Anette Heijne PhD thesis 2007

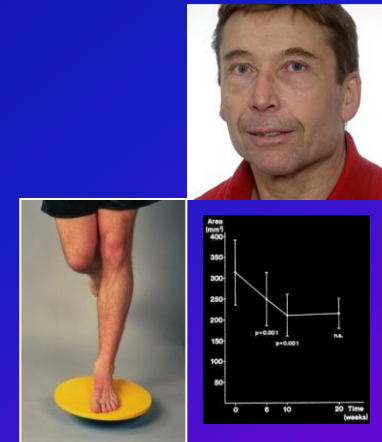
Maximal individual ACL strain during eg lunge  
*Heijne et al Med Sci Sports Ex.;36(6):935-41, 2004*



### Hans Tropp's PhD thesis 1985 Classic

- *Ankle functional instability improved by balance training 10 weeks as measured by stabilometry*

*Tropp H, Int J Sports Med. ;6(3):180-2. 1985*



### Pia Thomee's PhD thesis 2010

- *Clinical rehabilitation model with strategies to enhance self-efficacy was effective*

*Thomeé P et al J Sport Rehabil. 19(2):200-13 2010*





# Great achievements

## Early return to sport after ACL injury



- *Top level football/soccer is a major risk factor for knee arthritis after an ACL injury*  
*Roos et al. Acta Orthop. Scand. 66(2):107-12, 1995*
- **Players in Champion League did**
  - ✓ *not return to full training until 10 months*
  - ✓ *to match play after 12 months despite*  
*having the best surgeons, daily rehabilitation etc.*

*Waldén et al. KSSTA 19:11-19, 2011*

- **The muscle function tests commonly used**
  - ✓ *are not demanding or sensitive enough to identify differences between injured and non-injured sides.*  
*Thomee, Werner et al KSSTA; 19(11):1798-805, 2011*





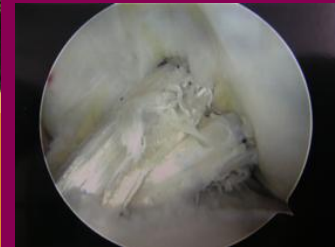
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## Paradigm shifts Outcome measures Registries





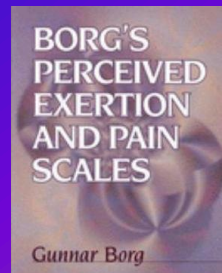
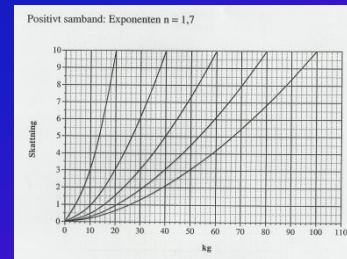


## Paradigm shift

# Gunnar Borg – en gigant on scales

**Gunnar Borg, Stockholm University created**

- The original scale in 1962
- This rated exertion on a scale of 6-20.
- Borg then constructed a category (C) ratio (R) scale, the Borg CR10 Scale.
- *This is especially used in clinical diagnostics of chest pain, angina and musculo-skeletal pain.*
- The Borg scale is used around the whole world!!





## Paradigm shift

# The students of the Linköping school created scores

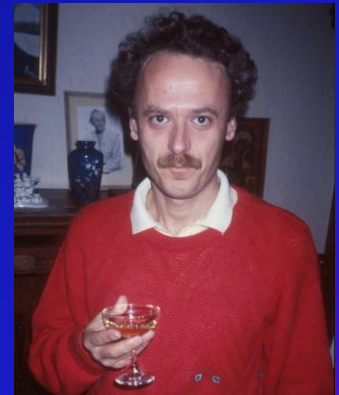
Some students set their own successful mark

**Jack Lysholm** (PhD 1981)

- *developed the Lysholm Score for evaluation of knee ligament surgery.*

✓ This test is used world wide

*Am J Sports Med. May-Jun;10(3):150-4, 1982*



**Yelverton Tegner** (PhD 1986)

- *Developed the Tegner activity scale for evaluation of knee ligament injuries.*

*Clin Orthop Relat Res. Sep;(198):43-9, 1985*





## Paradigm shift

# Patient reported outcomes started to be used



**Landbreaking development during the 1990s!!**

- **1990 we finally asked athletes how they really felt!!**
- *At the end of the 1990s we had a paradigm shift concerning outcomes in ACL surgery*



**Ewa Roos and Bruce Beynnon found that:  
The primary outcome instrument must**

- **Reflect the patient's perspective**
- **Be valid and relevant for the patients rather than the knee pathology**



✓ *Example on this is the KOOS score*



*Roos EM, Beynnon et al J.Orthop. Sports Phys. Ther.;28(2):88-96, 1998*





# Paradigm shift

## Sweden has been ground-breaking concerning registries

**The Swedish National Hip Arthroplasty (THA) Registry was established in 1979**

- The number of patients by 2004 was 242.393
- Total number 2011 was 15.935



**To manage ACL injured patients everybody must analyze and report their outcome**

- *The worlds first national knee ligament registry was established in Norway on June 7, 2004*
- *Soon after in Sweden and Denmark*



- **This is a question of quality care!!!!**



# "Sixty years of Sports Medicine in Sweden"



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## Content

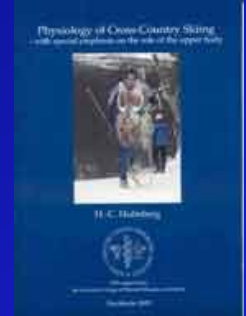
- What is Sports Medicine ?
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  - ✓ *Sports Specific activities*
  - ✓ SFAIM
- Sports Science and Sport
- Where are we going?



# Research in some sports have been very succesful

Cross-country skiing research under the leadership of HC Holmberg, resulted in the PHD thesis:

- *"Physiology of Cross-Country Skiing - with special emphasis on the role of the upper body."*



## Implications for sport

- This research resulted in a more effective double pooling when skiing, which
- ✓ *Helped Sweden winning three gold medals in sprint in Torino 2006*
- *A successful Winter research center has been established at Mitt universitetet, Östersund*







# Great achievement Injuries in Athletics

Osaka World Championship in athletics 2007 showed

- *An incidence of 97 injuries per 1000 registered athletes*

*Alonso et al Clin. J. Sports Med. ;19(1):26-32. 2009*



Jenny Jacobsson's PhD study is

- *A prospective clinical epidemiological study of injuries among athletics athletes;*

✓ *It studies 1-year prevalence, point prevalence and incidence of injuries*

*Jacobsson et al, AJSM ;40(1):163-9, 2012*

- ✓ *Pinpoint the risk indicators and factors*



**First comprehensive injury study in an individual sport**



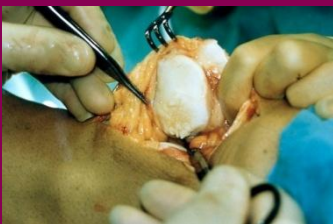
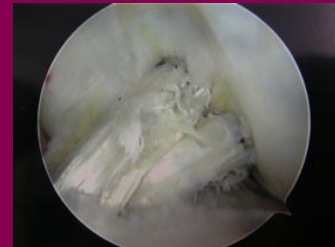
# "Sixty years of Sports Medicine in Sweden"



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## Great achievements Research in football





# Great achievements

## Injuries in football



**Jan Ekstrand** presented his Ph.D. Thesis

- *on prevention of football injuries 1982*

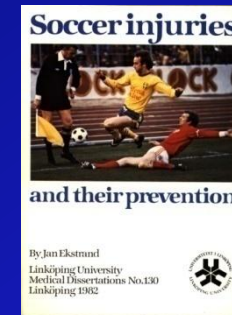
**FIFA (F-MARC) supported research**

- *Incidence of football injuries, risk factor analysis, prevention programs etc.*

*AJSM 28(5 Suppl):S69-74. 2000*

**UEFA supported research**

- *Definition of football / soccer injury*  
*Fuller, Ekstrand et al, BJSM 2006*
- **An elite level male team can expect about**  
✓ **50 injuries/season, 9 of them severe**







## Prevention



# The Swedish "Knee control program"

## A program supported by the Swedish Football Association and Folksam



Knee Control CD by RF, SISU, GIH etc. include exercises for improving moving pattern, balance, core strength etc

*Anette von Porat et al*

- *Modified for football by Annica Näsmark*

**Study:** In total 341 teams with more than 4.500 girl players of age 11-17 years completed the study

### Results

- The players using the program
  - ✓ *Decreased the risk for an ACL injury by 2/3*
  - ✓ *Decreased the risk a serious knee injury*

*Waldén, Hägglund et al BMJ. 3;344, 2012*





## Prevention



# Does Prevention of Injuries in football / soccer really work?

*The answer is Yes*

**Providing that the compliance is maintained at a high level!!**

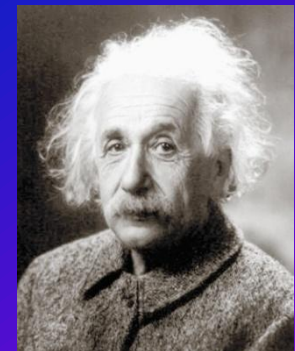
## Message Tõnu Saartok

- *We should develop a “zero tolerance” concept for sports injury* like drunken driving, car accidents, doping



## Message Albert Einstein

*"Intellectuals solve problems;  
geniuses prevent them."*



*Albert Einstein*



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# Paradigm shift

## Physical activity and health

**Jeremy Morris et al studied 60 years ago:**

- *Coronary heart disease in London busmen*  
*Lancet 1;265(6795):1053-7; 1111-20; 1953*
- *The first paper showing effects of physical activity*

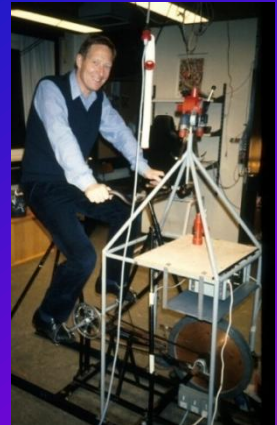


**The classic Dallas Bed Rest and Training Study:**

*Saltin et al: Circulation Nov;38-78, 1968*

*McGuire et al; Circulation;104;1350-1357; 2001*

- *3 weeks of bed rest for these same men at 20 years of age (1966) had a more profound impact on physical work capacity than did 3 decades of aging.*

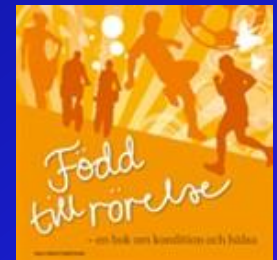


**Message: Inactivity is dangerous for the health!!**

# Effects of physical activity

Widely spread books by Åstrand, Ekblom et al

- Kondition och Hälsa 1967, 1979,
- Bättre Kondition 1981
- Född till rörelse 2011



## Research projects

- Bunkeflo- project.
  - Skola – idrott – hälsa (SIH) project
- ✓ *Children and adolescents do less physical activity and are over-weight*

*Sundberg et al Pain. ;136(3):239-49. 2008*





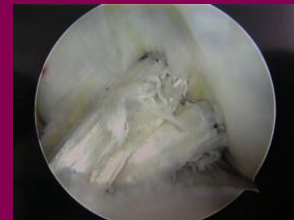
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## Paradigm shift FYSS -Physical activity in prevention and treatment of disease







# Paradigm shift

## FYSS --Physical activity in prevention and treatment of disease

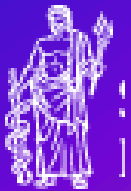
**SFAIM has played a pivotal role in this development**

- **SFAIM founded YFA (Professional Associations for Physical Activity) as a subgroup of SFAIM**
- **FYSS is a joint project between YFA and Statens Folkhälsoinstitut (SFI)**



**FaR® stands for Fysisk aktivitet på recept**

- **National recommendations have been worked out by**
  - ✓ **Swedish Society of Medicine (Läkaresällskapet)**
  - ✓ **The National Board of Health and Welfare (Socialstyrelsen)**





# Paradigm shift

## The FYSS handbook



The FYSS handbook summarizes

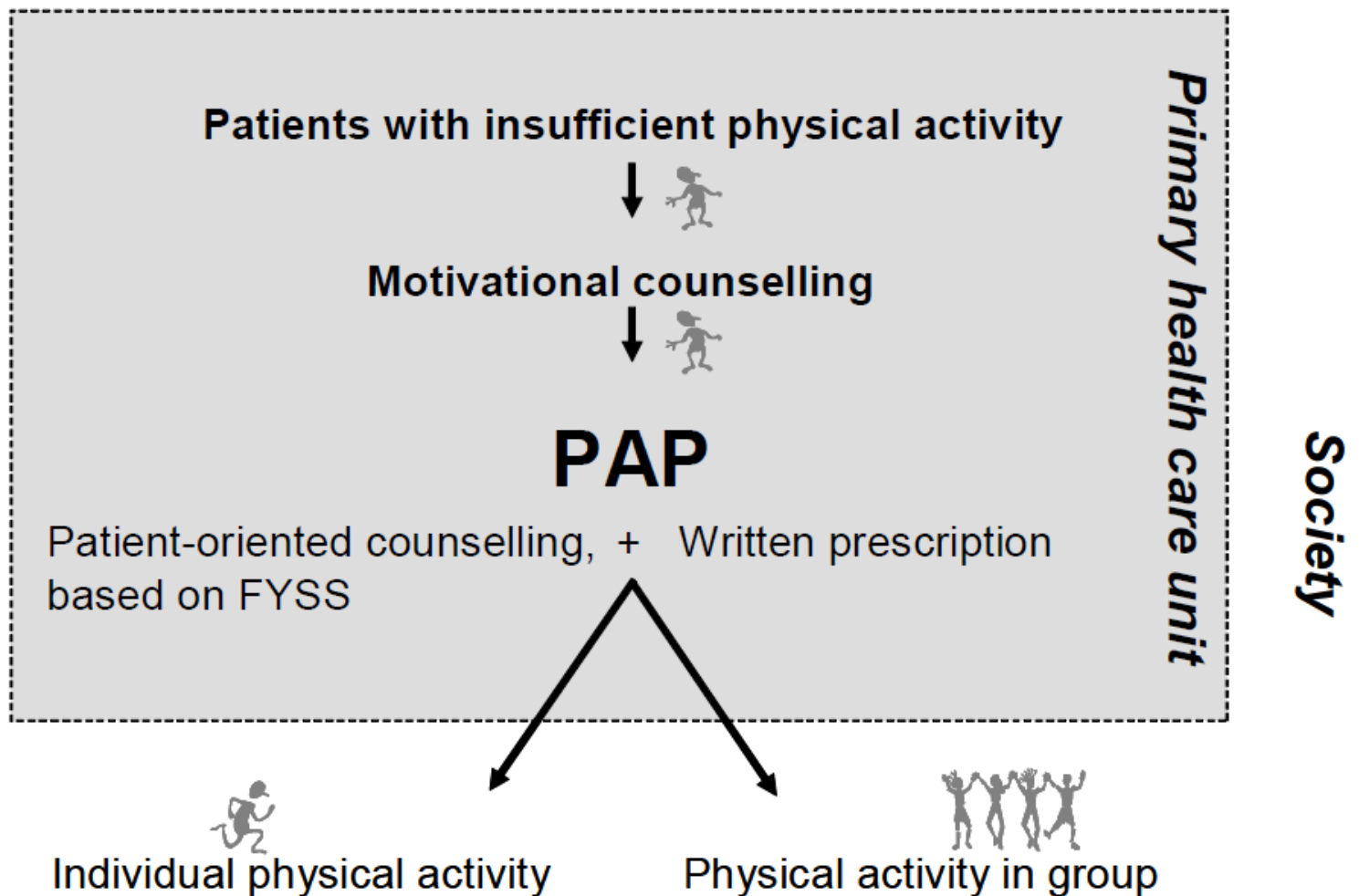
- The up-to date scientific knowledge on how  
✓ *to prevent and treat various diseases and conditions using physical activity.*
- The handbook is tailored to be a tool for licensed healthcare staff when prescribing physical activity
- *Today FYSS is available in Swedish (2003 & 2008). Norwegian, English, Vietnamese. Soon Turkish etc.*



**Message:** FYSS is a great revolution!!!

FYSS in Vietnam  
Courtesy of C-J Sundberg

# Prescribing physical activity







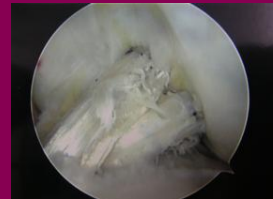
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## Inspirational international cooperation is vital





# FIMS – International Federation of Sports Medicine

**FIMS – International Federation of Sports Medicine was founded in 1928**

- *Ejnar Eriksson President 1980 -1986*
- *Per Renström Vice president 1990-1998*



**North Western Chapter of FIMS**

- **Founded in Ystad 1980**
- *Was a valuable discussion forum for >15 years*
- ✓ *Sven-Anders Sölveborn was very active*





# Strengthen international cooperation

## World-wide Sports Medicine organization

**ISAKOS – International Society of arthroscopy, Knee surgery and Orthopedic Sports Medicine**

- *Per Renström, President 2003-2005*
- *Jon Karlsson, member of board 2009-*



## Specialist society

**ISSS - International Society of Ski Safety**

- *Ejnar Eriksson, Founder 1974, President*



## Regional societies

- **ESSKA** *Ejnar Eriksson, Founder, President 1988-92*
- **ECSS** *Bengt Saltin, Founder, President 1995-97*







# Work in International Federations is important

## International Olympic Committee- Medical Commission

- Arne Ljunqvist, chair
- Per Renström, member Games Group
- C-J Sundberg, member Scientific Group



## International Sports Federations Medical Commissions

- **Wrestling** Per Strömbäck
- **Swimming** Bengt Eriksson, FINA+LEN
- **Athletics** Arne Ljungqvist, IAAF
- **Football** Lars Peterson, FIFA, Jan Ekstrand, UEFA
- **Tennis** Per Renström, ITF + ATP
- **Ice hockey** Ronny Lorentzon, IIHF



# Hall of Fame in Orthopedic Sports Medicine

In 2001 the American Society of Orthopedic Sports Medicine - AOSSM established the Hall of Fame to

- “Honor members of orthopaedic sports medicine community  
✓ *who have contributed significantly to the specialty and set themselves apart.”*



Inducted are two groups:

I. **Americans** such as Don O'Donoghue, Jack C. Hughston, etc

II. **International members**. A total of 12. **4/12 from Sweden**

- **Ejnar Eriksson, Jan Gillquist, Werner Mueller, Lars Peterson, Albert Trillat, Masaki Watanabe, Paolo Aglietti, Giancarlo Puddu, Per Renstrom** + 3 more





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# A Swedish PhD thesis – a great tradition

It has been a tradition among Swedish physicians for > 100 years to defend a PhD thesis

Patrick Haglund, Karolinska was the first in 1908

- *During 1908-1999 > 531 thesis were published and publically defended in orthopedics*
- 55 / 531 (> 9%) can be called "Orthopedic Sports Medicine oriented" and 15 "strongly "Sports Medicine" oriented.
- *Since 1977 also >550 PTs have defended their PhD thesis, many in sports related topics.*



This strong relation to research resulted in

- *Sweden was for many years ranked among the top 3-5 nations in the world in Sports Medicine.*





# Landmarks

## Research Councils

In 1970 "Idrottens forskningsråd (IFR)" ie  
The Sports Research Council was founded by RF

- *The researchers can apply for financial support*

Centrum for Idrottsforskning (CIF) was

initiated 1988 and got today's functions 1995

- *CIFs task is to initiate, coordinate, support  
and inform about research on sport*

**New:** *CIF analyses the activities generated by the  
financial support to RF by the Parliament*

- *In my opinion CIF must soon get a substantially  
increased financial support --Tripled!!!*



*Johan Norberg*



## Landmark



# Award in Sports Science by SCIF

- Sveriges Centralförening för Idrottens Främjande



SCIF gives annually since year 2000 out awards for

- *Quality research in Sports Science, which is considered to be of great value for Swedish sport.*
- **One large prize to an experienced scientist, who receives 100.000 SEK**



- ✓ Among the winners Bengt Saltin 2000, Lars Peterson 2001, Gunnar Borg, and Jan Lindroth 2002, Ronny Lorenzon/Håkan Alfredson 2003, Björn Ekblom 2004 etc.



- ***One prize to an young scientist -50.000 SEK***

- ✓ Håkan Larsson 2001, Michail Tonkonogi 2002, Juleen Zierath 2003, Johan Norberg 2004 etc.







# Professors in Physiology and Sports Medicine

1939 Erik Hohwü Christensen became the

- *First "modern" professor in Sports" physiology.*

Per-Olof Åstrand, Bengt Saltin, Björn Ekblom



In 1980s Ulf Lönnqvist , minister of sports created

- *professorships in Sports Medicine supported by Bengt Sevelius and Bengt Eriksson*
- *1987 Ejnar Eriksson became the first professor in "Clinical " Sports Medicine in Sweden*
- *1990 Jan Gillqvist and Ronny Lorentzon became professors*





# Paradigm shift Sports Medicine education at our universities

During the last 10-20 years Sports Medicine has become

- *An increasingly integral part of the education at our universities, which is the correct path to go.*
- *This is due to great work by SFAIM*



## Remaining issues

- *It has been a start but much more Sports Medicine/ Physiology must be part of the university education*
- *This has made parts of SFAIM education superfluous*

**Message:** *It is vital with more education and research positions in Sports Medicine at our universities*



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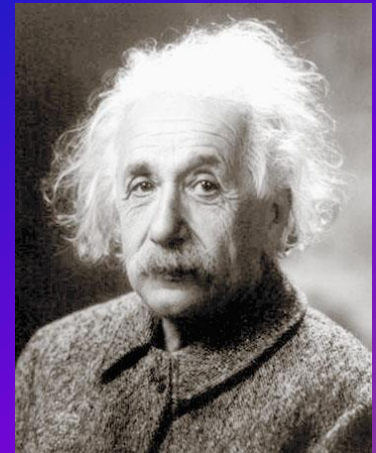
# 1905 was annus mirabilis or miracle year

A rare historical moment in which key flashes of insight suddenly made the field of physics take off in new directions.

**Albert Einstein presented 1905**

- Four papers that redefined time, space, matter and energy.
- **Einstein and a handful of other brilliant scientists**  
**went on to shape the 20th century and**  
✓ ***laid the foundation for all its technological accomplishments***

**Physics dominated the 20th century**

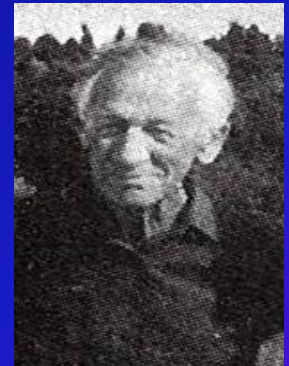


# The future

## Where should we go??

Erik Hohwü-Christensen's closing statement at the Biochemistry of Exercise conference in Magglingen, 1974

- *"I envy you! My generation of researchers have described several of the responses to exercise.*
- *You, have the tools, the methods and the knowledge to unravel the mechanisms by which these processes are regulated."*



Courtesy of  
Bengt Saltin

### Message:

- *"The new and valuable in future research*
- *Must be a concentration on mechanisms and understanding"*

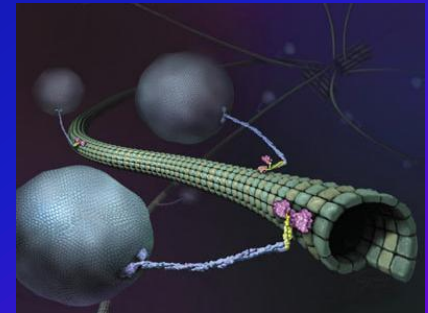




# Just as physics shocked the 20th century **life sciences** will shake up the world in the 21st.

**We are getting there!!!!**

- Last week M. Sheetz, J. Spudis and R. Vale received the Lasker Prize
- *"For discoveries concerning cyto-skeletal motor proteins, machines that move cargoes within cells, contract muscles, and enable cell movements."*



**The years up to 2012 have been shaping up to be anni mirabilis**

- *Biology is the field of transition*

**Biology and genetics will rule the 21 st century**





# Some final words on a personal level

**Swedish Sports Medicine has in my mind**

- **Made an outstanding and fascinating journey and**  
✓ *for many years been ranked as one of best in the world*

**This success is in my view due to hard work by  
many incredibly dedicated individuals in SFAIM**

- **It has been a privilege to be part of this journey**  
✓ *Thanks for your dedication and friendship*

**Any Problems left?? Bet you!!! There is quite a challenge!!**

- *Some say that the other Scandinavian countries  
in some aspects have passed us.*



**What should be done to continue a succesful road map?**



# Some final words on a personal level

## Sports Medicine in Sweden should in my mind

- *Be an integrated part of basic medical education*
- *"Kraftsamla" –build up a strong national center*
- *Strongly advocate the important role science and research has in most sports*
- ✓ *Not the least to the sports community eg. RF, SFs, SOK etc.*



## The challenge for Sports Medicine community now is

- To make some hard choices of what direction to take!

This is well illustrated in the wonderful poem by  
Robert Frost, Vermont



Maybe we should look  
for new directions?

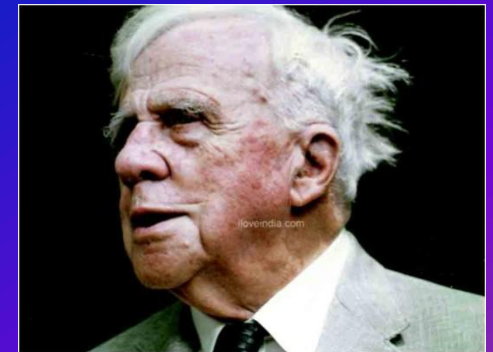
## The Road Not Taken (1916)

Two roads diverged in a yellow wood,  
And sorry I could not travel both  
And be one traveler, long I stood  
And looked down one as far as I could  
To where it bent in the undergrowth;

I shall be telling this with a sigh  
Somewhere ages and ages hence:

**Two roads diverged in a wood, and I,  
I took the one less traveled by,  
And that has made all the difference**

By Robert Frost,  
Vermont, USA







# Thank you for your attention!

- *Thanks for inviting me to give this talk which I really appreciated*
- *Congratulations to a great program*
- *Wish You all a wonderful conference!!*

