



PROHEALTH ASIA
PHYSIOTHERAPY &
REHAB CENTRE

LOAD MANAGEMENT AND INJURY PREVENTION IN ADOLESCENT ATHLETES

Presented by:

SHRIKANT IYENGAR

DIRECTOR OF EDUCATION; ACADEMY MEMBER PROHEALTH ASIA



THE RISE OF EARLY SPECIALISATION

eastern Europe in the 1950's to 1980's, behind 'Iron Curtain'.

High- profile successes of young performers in gymnastics, swimming and figure skating

The success/ legacy left both positive/negative- on the character and scope of sports training

Year round training in specific sport, excluding other activities, from an early age

The phenomenon has lead to, production of 'baby champions'



LOGIC OF STARTING EARLY

Early years lays a foundation for values, attitudes, beliefs and success

Mind set of future champions starts to be shaped.

Beliefs that delay may lead to poor skill development, negatively influencing future success.

Leads to the theory that athletes with early start, have the greatest chance of success.

Acquisition of expert performance. Result of minimum of 10 years or 10,000 hours- K. Anders Ericsson.

Particular sort of practise, called 'Deliberate practise' crucial.



LIST OF CHAMPIONS

Tiger woods was introduced to Golf before his second birthday.

Martina Hingis entered her first tournament at the age of 4.

Sarah Hughes began serious skating at the age of 3 years.

Often done at the cost of healthy, well- balanced childhood.



RISK OF EARLY SPECIALISATION

Athletes reached the peak earlier, performed less consistently and quit sooner.

Can lead to muscle imbalances and extreme stresses on the joints.

Greater risk of overuse injuries/ burn out following early specialization.

Child's physical, psychological, and social well-being resulting from intensive early training.

Early specialization can inhibit, overall motor skill development.



ADOLESCENT PARTICIPATION IN SPORTS

- Participation in youth sports is getting increasingly popular.
- Initiation of year- round training and early specialization.
- Attaining early peak performance- competing Nationally and Internationally.
- Imperative to understand the specific physiological characters and individual needs.
- Essential to recognize injury prevention guidelines.

UNIQUENESS OF YOUNG ATHLETE

Engaging in sports in adolescence has numerous health benefits.

Vulnerable for injuries due to physical and physiological growth processes.

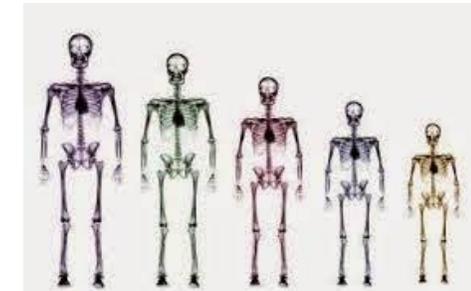
Injury risk factors unique to this age group.





THE UNIQUENESS OF YOUNG ATHLETE

- Nonlinearity of growth
- Maturity-associated variation
- Adolescent growth spurt.
- Unique response to skeletal injury.
- Immature or underdeveloped coordination.
- Poor skills and perception.
- More frequent and intense training/ competition.





EPIDEMIOLOGY

More than **50% of all registered football** players are younger than **18 years** of age

This equates to approximately **150 million players**

2 injuries/ year = **300 million football- related injuries/ year**

Overall rate of injury reported, between 2- 7 injuries/ 1000 hours of football

By the age of 17-19 years, the risk of injury reaches the same as in adults.



LOCATION AND TYPE OF INJURY

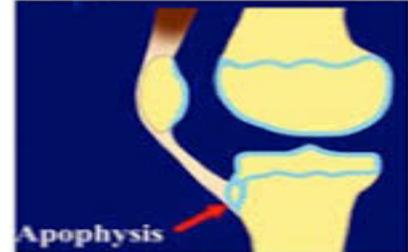
The most common types are strains, sprains and contusions.

Adolescents: majority of injuries involved are lower extremity.

Children have higher rates of injuries to the upper extremities.

Average absence from training due to an injury was 15 days.

No significant differences in young male and female players.





A MATTER OF CONCERN

77% of parents express concern over children's sports injury risk.

47% of coaches say they cannot focus enough on injury prevention.

Overtraining, concussion and knee injury = **82,260** Google searches/month
(U.S. only).





MONITORING TRAINING AND WELL-BEING IS CRITICAL TO SUCCESS 'INJURIES ARE NOT JUST BAD LUCK'

- Majority of the overuse injuries, viral infections and burnouts are associated with overtraining, an individual "training-competition > recovery imbalance"
- Fatigue directly contributes to the Anterior cruciate ligament (ACL) Injuries).
- The average playing time per game is a significant predictor of concussion.
- An unusual increase in training load during the week prior to the injury compared to that of the 4 preceding weeks.
- Player rating of fatigue and sleep quality- strong predictors of injuries.
- Football players are 3.19 times more prone to injuries during weeks of high academic stress.



FATIGUE IS A KEY FACTOR

- Impaired decision making ability.
- Reduced coordination.
- Significantly reduced neuromuscular control.
- Reduced physical adaptation to training loads.
- Reduced alertness and reaction time.
- Increased risk of injuries.
- Reduction interest in participating in physical activities.





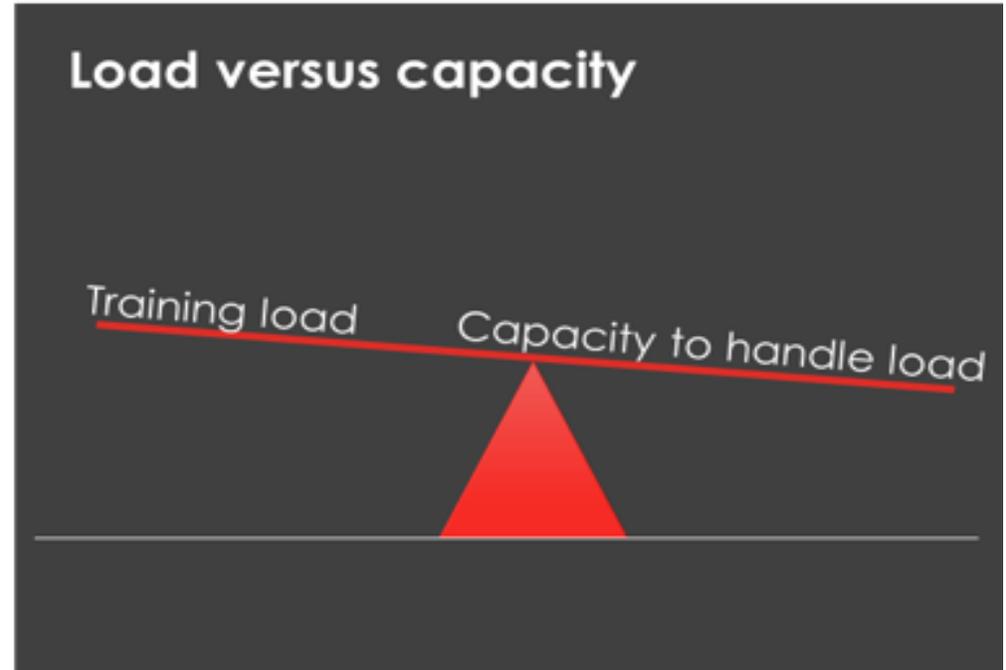
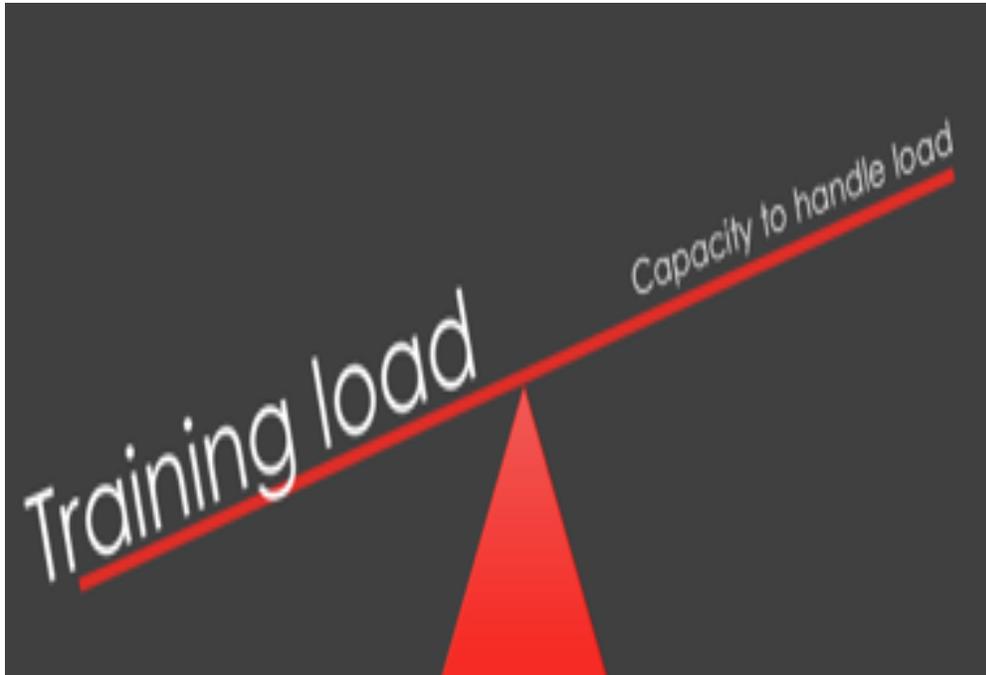
FAIRLY SIMPLE PROBLEM

➤ Load exceeds the capacity of the Athlete.

➤ Two scenarios:

- Athletes are Psychologically/ Physically Unfit to tolerate prescribed workload.
- Simply put- Athletes are physically fit but in 'Need of Rest'.







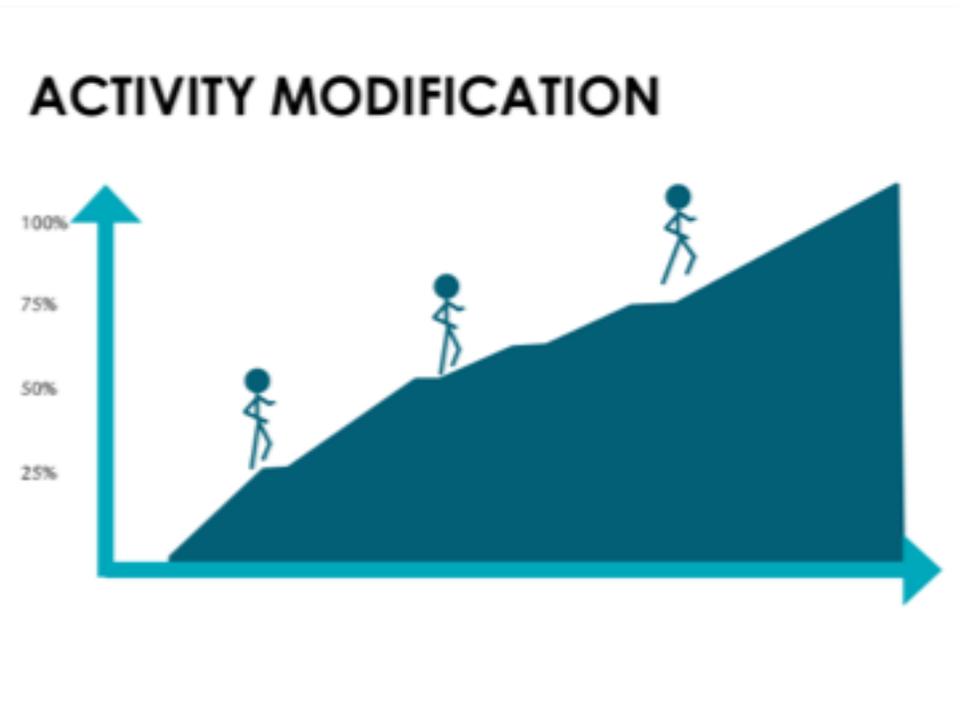
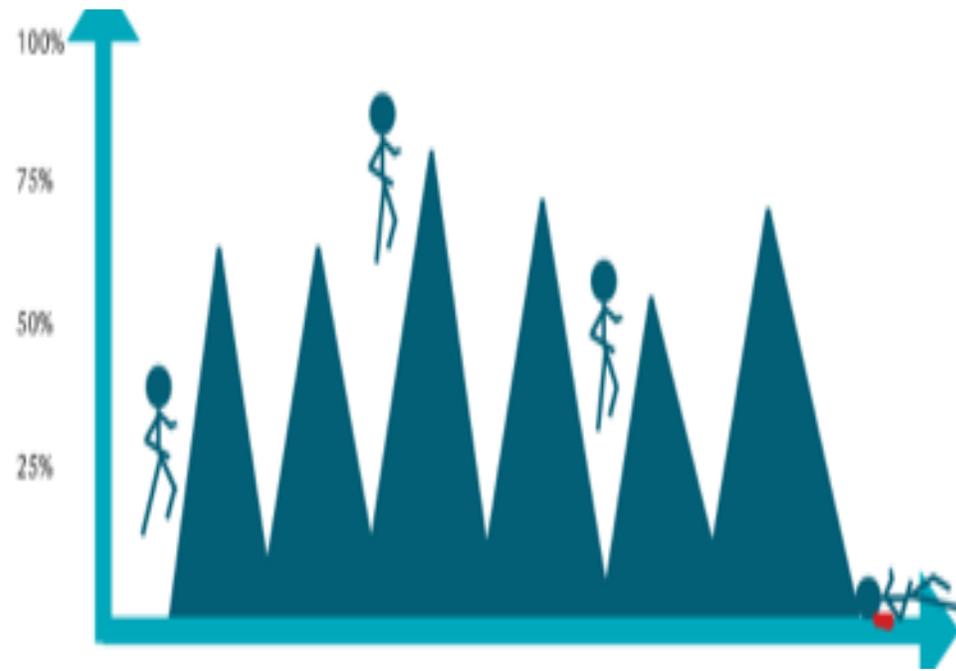
MULTIFACTORIAL REASONS FOR RISK OF INJURIES

- **Training/ competition load**
 - Cumulative load
 - Week to week load increase.
 - High/ low acute: chronic load ratio.
 - Spikes in load.

- **Competition schedule**
 - Game to training ratio.
 - Excess playing time.
 - Fixture congestion.
 - Lots of travel.

- **Training schedule**
 - Number of 'hard days' per week.
 - Weekly training monotony.





"THE ACTIVITY LADDER"

- 1. Walking/bicycling
- 2. Fast walking/medium to hard bicycling
- 3. Slow running
- 4. Stairs
- 5. Running in medium pace
- 6. Running in high pace





MULTIFACTORIAL REASONS FOR RISK OF INJURIES

➤ Lifestyle and well being

- Pre game/ training fatigue.
- Poor sleep quality.
- High level of stress.
- Poor general health.

➤ Other factors:

- Inadequate warm- up.
- Poor fitness.
- Nutrition/ weight loss.
- Type of sport.
- Early sport specific specialization.
- Previous injuries.





HOW LOAD MANAGEMENT WORKS

Goal is to reduce the risk of injury and increase the performance

- Monitor- fatigue- sport and non- sport, physiological and psychological stressors.
- Detect- Inadequate workload (too low/ too high).
- Adapt- Increase or decrease in training program, response of rest and recovery, fatigue, wellness, fitness and health.



SO WHAT IS LOAD?

- **Workload:** combination of sport and non- sport stressors.

Tools- Questionnaires, session- rate of perceived exertion, wearables.

- **External Load:** External stimulus applied to the athlete; distance, weight, power etc.

Tools- Accelerometers, GPS, Dynamometers etc.

- **Internal Load:** Physiological AND psychological response to external loads, in combination with non- sport stressors.

Tools- Physiological: Heart rate monitors, Lactate.

- **Psychological/ Physiological:** session- Rate of perceived exertion.



PLAN WORK LOAD CAREFULLY:

- Increase weekly loads progressively.
- Avoid spikes in weekly load.
- Alternate hard, moderate, easy and rest days.
- Keep a minimum of one rest day/ week.

ADJUST DAILY LOADS BASED ON ATHLETE'S WELLNESS:

- Reduce external loads during stressful periods.
- Life- event and sport related stress.
- Perceived fatigue.
- Quality of sleep.
- General health/ well being.
- Fun and enjoyment with training.



➤ **Ensure Buy- in coaches and athlete**

- Trust athletes and talk with them.
- Discuss with coaches.

➤ **Monitor the key Metrics and use them to adapt the programs.**

- Wellness measures and session- RPE.
- Weekly increase, avoid monotony, strain, individual feedback, make it enjoyable.

➤ **Keep it simple.**

- Only collect Data that really matters.
- Use specialized software whenever and wherever necessary.



SAFETY GUIDELINES FOR CHILDREN'S AND YOUTH SPORTS:

- Clubs, school ensure that they identify, manage, and monitor the risks involved in sporting activity.
- An estimated 50% sports injuries are preventable.
- Coaches should have at least an entry-level qualification from a coaching course.
- A first aider, sport/ athletic trainer should be present at all sporting events with participants under- 16 years of age.
- Appropriate and properly fitted protective equipment, clothing and foot wear, should be used at all times.
- The environment and facilities should be inspected and made safe before participation.
- All the coaches and teachers must be aware of all the medical history. A preseason medical screening and questionnaire should be completed.
- Adequate warm-up and cool down and stretching should be included before and after.
- Activities for children and young athletes should be well planned and should be progressive in nature.
- To reduce the likelihood of the injury, match the physical and mental maturity of the child, to the level of participation, complexity of task and game rules.



OPEN ACCESS

Is there a correlation between coaches' leadership styles and injuries in elite football teams? A study of 36 elite teams in 17 countries

Jan Ekstrand,^{1,2} Daniel Lundqvist,^{1,3} Lars Lagerbäck,² Marc Vouillamoz,⁴
Niki Papadimitiou,⁴ Jon Karlsson^{2,5}

¹Division of Community Medicine, Department of Medical and Health Sciences, Linköping University, Linköping, Sweden

²Football Research Group, Linköping University, Linköping, Sweden

³Division of Education and Sociology, Department of Behavioural Sciences and Learning, Linköping University, Linköping, Sweden

⁴UEFA, Nyon, Switzerland

⁵Department of Orthopaedics, Gothenburg University, Gothenburg, Sweden

Correspondence to
Professor Jan Ekstrand, Health University, Hertzg Karlsgatan 1385-582 21, Linköping, Sweden;
jan.ekstrand@telia.com

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ABSTRACT

Background Do coaches' leadership styles affect injury rates and the availability of players in professional football? Certain types of leadership behaviour may cause stress and have a negative impact on players' health and well-being.

Aim To investigate the transformational leadership styles of head coaches in elite men's football and to evaluate the correlation between leadership styles, injury rates and players' availability.

Methods Medical staff from 36 elite football clubs in 17 European countries produced 77 reports at four postseason meetings with a view to assessing their perception of the type of leadership exhibited by the head coaches of their respective teams using the Global Transformational Leadership scale. At the same time, they also recorded details of individual players' exposure to football and time-loss injuries.

Results There was a negative correlation between the overall level of transformational leadership and the incidence of severe injuries ($\rho = -0.248$; $n = 77$; $p = 0.030$); high levels of transformational leadership were associated with smaller numbers of severe injuries. Global Transformational Leadership only explained 6%

risk factors contributing to injuries, the four most common factors listed were: (1) the workload imposed on players, (2) players' well-being, (3) the quality of internal communication and (4) the head coach's leadership style.^{1,3-5}

Leadership involves influencing others with a view to achieving a common goal and facilitating circumstances and environments that will help to reach that goal.^{6,7} There are various ways of characterising leadership, one of which is to look at it in terms of three major leadership styles: transformational (democratic/participative), transactional (authoritarian/directive) and laissez-faire.⁸ Transformational leadership involves motivating and inspiring followers to go beyond their self-interest for the benefit of collective interests by providing vision, meaning, challenges and stimulation.⁸ Transactional leadership is based on rewarding and disciplining followers on the basis of their achievements or failures, while laissez-faire leadership is, in essence, an absence of leadership.⁸

Research in the area of sports psychology indicates that transformational leadership on the part of coaches is associated with higher levels of motiva-



Thank You
so much!





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