“Exercise, nutrition and recovery; to super compensation in practice nowadays among young athletes - new aspects”.

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Sports Physician and Coach
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"Personal Career"

Athletic career:
- Track & Field, ice hockey, soccer, cross country skiing
- Coaching and Sport administration

Education:
- Doctor of Medicine – Kuopio University (1.5 years in Tartu Ülikooli, Arsti teaduskonnas)
- Master Degree of Sports and Health Sciences (Sport Physiology, -biomechanics and science of coaching) – University of Jyväskylä (prof. P.V. Komi)
- The Highest EU Coaching Diploma 2005 (in Finland 6 persons)

Some points of practical experience:
- Track & Field (Helsinki teams) – long jump and triple jump (1994-2000)
- Oulu Kärpät Ice Hockey Team – Team Doctor and Physical Conditioning Coach
- Physical Conditioning Coach in Moskow, Magnitogorsk, KHL, Russia 2010 – 2012
- Beijing 2008, The Olympic Team Doctor in Track&Field
- Physical Conditioning Coach in Moscow, Magnitogorsk, KHL, Russia 2010 – 2012
- Sochi 2014, The Head Doctor of Team Finland
- Personal Medical Doctor and Physical Conditioning Coach; McLaren F1-team, top level Track and Field athletes, CC skiers and NHL/KHL Ice Hockey players, volley ball World League Team of Finland
- At the moment; The Head of Sport Medicine in Bulevardin Klinikka, Helsinki, Finland

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"Super Compensation-Theory"

Exercise session
Rest / recovery
Nutrition

Performance level

Circadian ( biological clock ) rhythm

Stress
Nutrition regularly

24 h

23

23

Stress

7


Exercise, recovery and nutrition

Rest
Nutrition
Performance level
Exercise session

Is the previous theories still valid in practice among young athletes?

- In many European countries, in the early 2000s, the physical condition of children and young people of school age was noticeably weakened:
  - The most alarming observations were:
    - Physical endurance (e.g. Cooper's test – 2000-3000m – 18 years old boys)
    - Lower muscle strength and control really diminished (back problems with young people?)
  - For upper body muscle - (eg pull-up test in schools - tension and?)
  - A similar trend was also observed in young athletes who aim at the top of the world
    - Ice hockey (test of the national team - 16 year old boys; 10 reps in a 60-second sit-up test)
    - Basketball (Ground Team Test – 14 year old boys; 3 reps 0 reps in a pull-up test)

Tammelin, T., Parkkari, J., Vasankari, T, Hakkarainen, H.
Is the previous theories still valid in practice among young athletes?

- Physical activity of Finnish children has been decreased in last 20 years
- only 30-40% children have daily physical activity enough for their normal growth and maturation
- about 10% children don’t have physical activity at all
- at some time “screen-time” has increased dramatically
- The musculoskeletal problems and over-use syndromes have increased among junior athletes
  - lumbar spine problems
  - stress fractures
  - groin pain syndromes
- ice hockey and football the most popular and have the biggest risks

Methods of survey

- The athletes had to include all physical activity in the exercise diary for two weeks in four different periods of the year; autumn 2007, winter 2008, spring 2008 and summer 2008.
- weeks in the exercise diary they could choose from the time window provided by the sports federation (because the content of the exercise varies in different seasons)
- There were 14 largest (licensed) species associations in Finland
  - football, ice hockey, floorball, track&field, skiing, orienteering, wrestling, judo, gymnastics, figure skating, horse sport, shooting, group gymnastics, volleyball

Diary example

10 yrs old boy, Ice Hockey ("main sports")

<table>
<thead>
<tr>
<th>Day</th>
<th>A)</th>
<th>B)</th>
<th>C)</th>
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</thead>
<tbody>
<tr>
<td>MO</td>
<td>8-00 - 8:30 school</td>
<td>8:30 - 8:45: ice hockey training – coach</td>
<td>8:45 - 9:00: ice hockey training (not attended)</td>
</tr>
<tr>
<td></td>
<td>9:00 - 10:00: school</td>
<td>10:00 - 10:20: ski training in the indoor ski slope</td>
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Methods

- in the beginning, everyone marked the “main sport” where he wanted to succeed
- A) How many minutes (with 10 min accuracy) did you practice your “main sports” - when the coach was present?  
- B) How many minutes (with 10 min accuracy) did you practice in your “main sports” - when the coach was not present (Independently, according to the training program ...)?
- C) How many minutes (with 10 min accuracy) did you get physical activity that did not belong to your “main sports” - school sports, school and back, physically active games with your friends?...?
Main results

- boys 8-11 y: 408, 12-15 y: 502, 16-18 y: 410 = 1320
- girls 8-11 y: 383, 12-15 y: 540, 16-18 y: 406 = 1329
- total: 791, 1042, 816 = 2649
- The biggest survey in Finland

Main results:

- Total physical activity (A + B + C) decreases from 8-11 to over 12 years old junior athletes
- Physical activity in main sport increases in older groups (A and B)
  - boys more
- Physical activity not in main sport training decreases very dramatically after 11 years
  - boys more
- Variation is big:
  - 1 hrs / week - 38 hrs / week

Main results:

- Basic skills (= other than main sport skills) training decreases in older groups
  - older than 12 yrs old juniors do mainly their "main sport"
- Technique (sport specific) training increases in older groups
- Junior athletes don’t do technique training alone as much as expected (by associations)
  - almost always with own coach (good or bad?)

Main results

- Speed type of training was done only once / week
  - under 13-14 years, it should be in every training session
  - (the Finnish recommendation based on the biological maturation of nervous system)
- Speed training was done mainly with own coach
- Speed endurance training was done less than once / week
- Anaerobic metabolism mainly in games
- at least Anaerobic could be done almost daily, but very heavy Lactic can be even harmful before PHV

Main results

- Aerobic - basic endurance training decreases quite strongly after 12-14 yrs
  - was done 4-7 hrs / week and mainly outside sport and not with own coach
  - Cross country skiing and endurance running exceptions
  - when juniors start coach controlled training, aerobic activity seems decrease!!
- AND aerobic endurance is the base of everything in sports!!
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Main results
- Muscle endurance training was done only 1-2 times / week
- The reason for lumbar spine injuries among junior athletes?
- Half of muscle endurance training was done "at home"
- Technique?
- Strength training with heavy weights is started after 15 yrs
- Good and bad
- Strength training was done mainly with coach
  - It is safe

Main results
- Only half of training sessions guided by coach included warm up
  - Reason for increasing overuse injuries in Finland?
- Only 25-30% training sessions included cooling down
  - Reason for increasing traumatic injuries next day in Finland?
- Reason for decreasing of aerobic capability
  - Stretching was done mainly in gymnastics and figure skating, but very rarely in other sports
  - Report error

Main results
- Only half of junior athletes had physical activity more than minimal recommendation for normal growth and maturation (WHO)
  - 8-11 yrs 2 hrs / day
  - 12-15 yrs 1.5 hrs / day
  - 16+ yrs 1 hr / day
- Only 20% of junior athletes had physical activity more than 18 hrs / week (IOC recommendation to reach top level)

30 years ago
- Endurance
  - Basic skills
  - Strength

Nowadays
- Endurance
  - Sport club training
What else happened?

- Observations from other surveys:
  - Time on the computer or other screen increased
  - Sitting increased
  - Food rhythm irregular
  - Circadian rhythm (sleeping) very irregular (also affected up to height growth)

Is the supercompensation theories still valid in practice among young athletes?

- Recent studies seem brighter
- Still, the theory does not happen – or?
- What to do?
- Have you noticed the same thing?