Belasting en Belastbaarheid

Papendal 28/10/17

Wim Vandeven
Belasting en Belastbaarheid
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Topsport
Luipaard: rust!
Pain is an info, not a limit!

thiam_nafi "Pain is an info, not a limit"
#rio2016 #nevergiveup
Pain is an info, not a limit!
Belasting versus Belastbaarheid

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Belasting op:

- Fysiologisch vlak
- Lichamelijk
- Mentaal
- Kracht
- Snelheid
- Uithouding
- Coördinatie
- Botten
- Pezen
- Spieren
- Zenuwstelsel
Hoe monitoren van Belasting?

https://youtu.be/5IOvz7o
en Belastbaarheid?
Monitoren van belasting

Fysiologische eigenschappen:

- Kracht
- Snelheid
- Uithouding
- Coördinatie

via:

- Gewicht: % van max, Bosco-test,…
- m/sec: % van max
- Hartslag/lactaatmeting
Monitoren van belasting
Monitoren van belasting

**Lichaamsstrukturen:**
- Botten
- Pezen
- Spieren

**via:**
- RX, NMR, botscintigrafie
- Echografie
- Spierafbraak enzymes, Echografie

**Mentale belasting**

**Vragenlijst(en)**
Objectiveren van de parameters:

#FACTS  #NOW  #ACCEPTANCE  #SOLUTIONS
Injury (Prevention)

(Meeuwisse et al. 1994)
Overbelasting:

- Repeated postures & movements
- Tissue adaptations
- Micro- & macrostructural traumata
- Pain & Functional limitations

Sahrmann 2011
PERFORMANCE ENHANCEMENT via INJURY PREVENTION

- INTRINSIC risk factors: Individual characteristics
  - MODIFIABLE (test & re---test)
  - NON - MODIFIABLE (test once)

(Bahr & Krosshaug. 2005)
Injury Prevention:

• NON---MODIFIABLE (nature)
  • - Age
  
  • - Gender
  
  • - History
  
  • - Anatomy
Belastbaarheid verhogen = Injury Prevention

- MODIFIABLE
- INTRINSIC risk factors
  - Test
  - Re-test
Injury Prevention:

- MODIFIABLE (nurture)
- Fitness level (Metabolic)
  - VO2max
  - Muscle strength/power
  - Arthro---myofascial aspects (joint ROM, flexibility, …)
- Body composition (fat mass, Body weight, …)
- Skill level (postural stability, sport specific technique, Quality Of Movement)
- Psychological factors (competitiveness, motivation, perception of risk, …)
Injury prevention:
SCREENING: Kinetic chains
Screening Kinetic Chains
Belastbaarheid verhogen = injury prevention!

- Integrative Neuro Muscular Training (5)
INJURY PREVENTION

Integrative Neuro Muscular Training

- 1. Mobility/Flexibility
- 2. Proprioceptive balance
- 3. Core-stability
- 4. Strength/Eccentric–Plyo
- 5. Transfer/Specificity
INJURY PREVENTION

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Integrative Neuro Muscular Training

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Core stability
Core Stability

- **LOW**
  LOAD/SIMPLE/BODY CONTROL

- **MODERATE**
  LOAD/COMPLEX

- **HIGH**
  LOAD/SPECIFIC
Integrative Neuro Muscular Training

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PERFORMANCE ENHANCEMENT

- Specific movement
- Interpretation
- Fragments
- Assessment
- Optimize
- Integration
- Reassess
PARADOX:
TRAINING vs INJURY PREVENTION

- LOAD MANAGEMENT

- Stereotype picture of Doctor & Physiotherapist:

  advocating to reduce training load in order to reduce injury rate
PARADOX: TRAINING vs INJURY PREVENTION

- **Dogma**: Higher Training Load = Higher Injury rate
- Protective effect of training
  Well Developed Physical capacities
- Under-training Increases risk of injury
  Prepare for Training Camp !!
- Reduced Training Load = Reduced injury rate

(Gabbett et al. 2016, Drew et al. 2015)
PERFORMANCE ENHANCEMENT

Load vs. Capacity

Performance
Wrapping athletes in cotton wool will not bring Performance!

(Gabbett Et al. 2016)
Most recent evolutions in the field

• New insights in “Training - Injury paradox” / Training load (work load)

• Training makes the body stronger has a protective effect against injury!!!
"Acute / chronic workload" ratio

- **Acute workload**: workload over the last week
- **Chronic workload**: average workload over the 4 weeks before

**Ratio**: Should be between 0.8 and 1.3
“Acute / chronic workload” ratio
“Acute / chronic workload” ratio

TRAINING LOAD & INJURY
By Jones, Griffiths & Mellalieu, Sports Medicine 2016
Designed by @YLMSportScience

PERIODS OF TRAINING LOAD INTENSIFICATION
e.g. preseason & congested fixtures period

CHANGES IN ACUTE TRAINING LOAD
e.g. return to competition

ACCUMULATED TRAINING LOAD
e.g. intensified training block

Training Intensity
Training volume
Weeks

Training load
Weeks

Training load
Weeks
“Acute / chronic workload” ratio

- Voor het totale volume van een trainingsweek
- Voor de verschillende deelaspecten
  - Voor de verschillende parameters
Conclusions

- Work load & Capacity
- Performance Enhancement!!!
  - Injury prevention
  - Physical Capacity
  - Technique
  - Mental strength
Dank u wel

- https://youtu.be/HMngXj5YmZY
- https://youtu.be/wpuu77QQVwY