



Accelerated healing

(Sport)kinesitherapeutische benadering

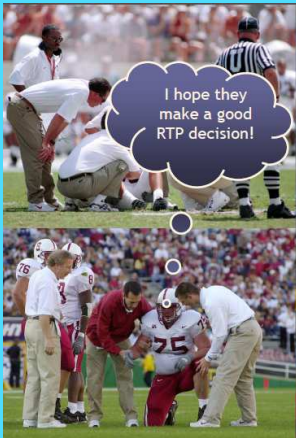
Dr Elke Cumps





SAFE RTP ~ RTP ~ RTP ~ RTP

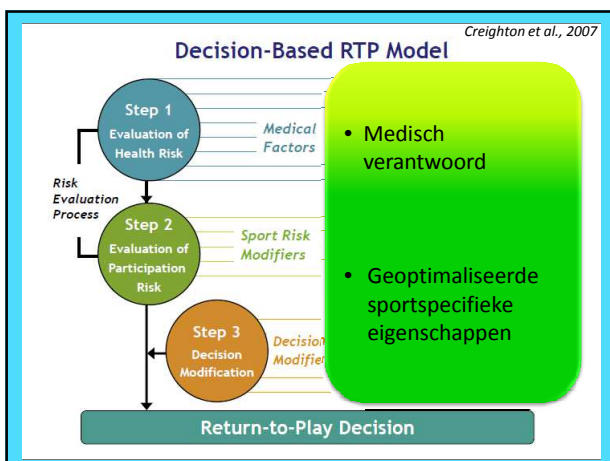
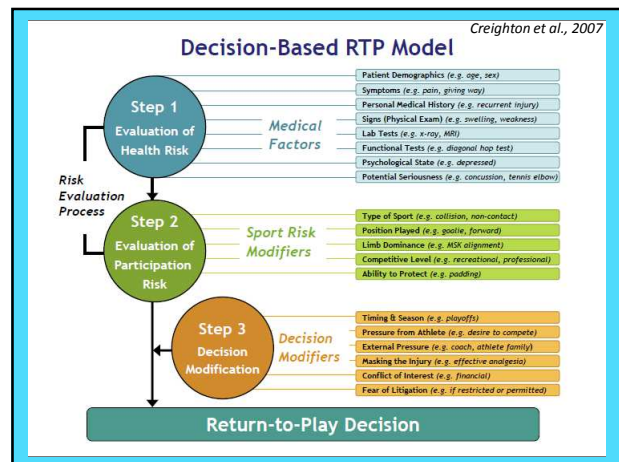
"Good news, I found a doctor who says you can still play!"



I hope they make a good RTP decision!

What is this?

No idea!



- Toepassingen bij sporters
- Inspanningsfysiologie
- Biomechanica
- Praktische richtlijnen

Aquatraining

- Toepassingen bij sporters

Take home messages

Aquatraining

- Onderdeel van de revalidatie
Reilly et al., 2006; Wilcock et al., 2006
- Onderhouden van cardiovasculaire fitheid
Reilly et al., 2006
- Variatie trainingsprogramma
Huff et al., 2008
- Bereikte plateaus in de training
Huff et al., 2008

Toepassingen

- Omgeving

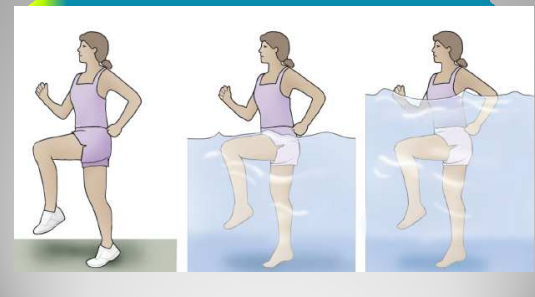
- Watertemperatuur
- Diepte
 - Diep water – Ondiep water

Becker et al., 2008, 2009; Campbell et al., 2003; Gill et al., 2006; Reilly et al., 2003; Rudzki et al., 1999; Wilcock et al., 2006; Sydenhag et al., 1992; Hauptstahl et al., 2010; de Brito Fontana et al., 2012; Triplett et al., 2009

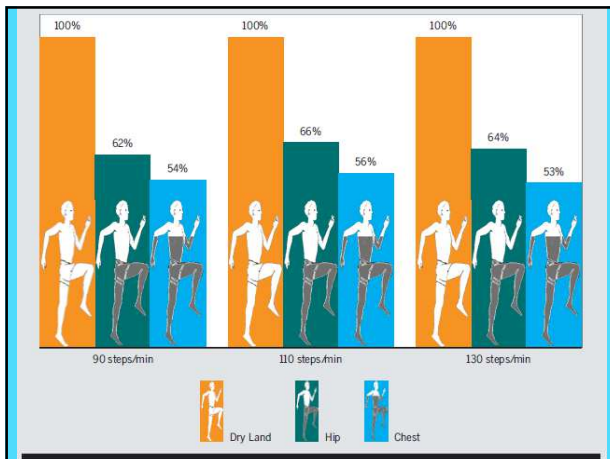
Suitable activities	Aquatic Temperatures				
	Cold (10°-15° C)	Cool (26°-29.5° C)	Neutral (33.5°-35.5° C)	Warm (38°-38.5° C)	Hot (37.5°-41°)
Post-exercional recovery	✓				
Contrast baths	✓				
Vigorous exercise		✓			
Arthritis exercise			✓		
Typical Aquatic Therapy			✓		
Cardiac Rehab			✓		
Multiple Sclerosis exercise		✓			
SCI programs			✓		
Parasports programming			✓		
Relaxation				✓	✓

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- Omgeving



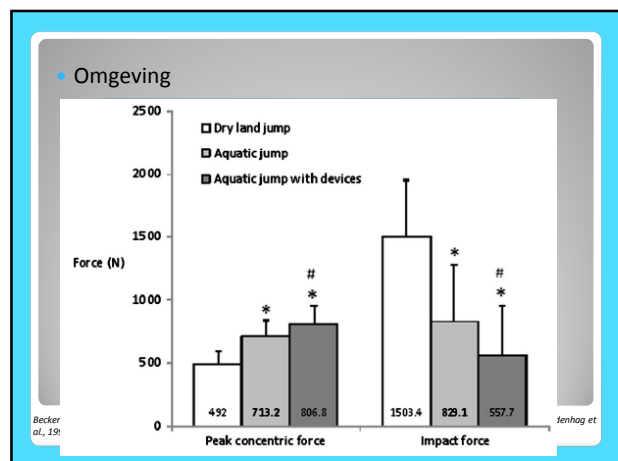
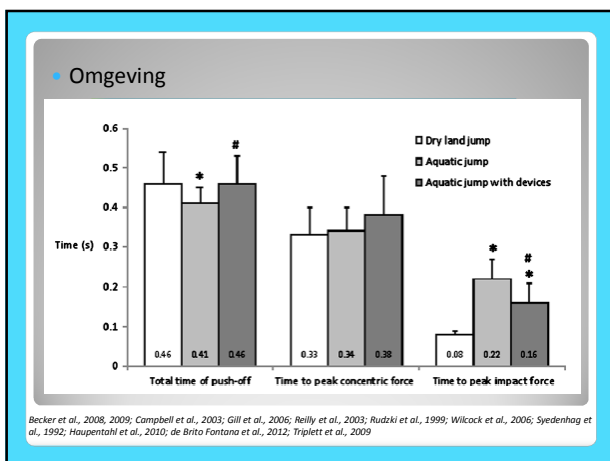
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• Omgeving

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• Duur, Intensiteit en Frequentie trainingssessie/plan

- Reden voor crosstraining
- Fase in de trainingscyclus
- Fase in de revalidatie
- Doel trainingssessie
- Individuele sporter
- Monitoring: adequate training stimulus

• Intensiteit cardiovasculair

- Individuele variabiliteit
- Monitoring:
 - Methode van Karvonen (modified)
 - ✓ $220 - \text{leeftijd} - \text{RHR} = X$
 - ✓ Aquatic target HR = $X (\% \text{max}) + \text{RHR} - 17 \text{bpm}$
 - Inspanningstest in water incl.
 - ✓ $\text{VO}_{2\text{max}}$
 - ✓ Lactaat(drempel)
 - ✓ HR
 - ✓ RPE

Browman et al., 2006; Chu et al., 2001; Hammer et al., 1997; Kaminsky et al., 1993; Sherlock and Sherlock, 2008; Lindle, 2001; Frangolia et al., 1996; Glass et al., 1995; Baretta et al., 1996

• Intensiteit cardiovasculair

HRmax, %	VO ₂ max, %	RPE	Intensity
< 35	< 30	< 9	Very light
35-39	30-49	10-11	Light
60-79	50-74	12-13	Moderate
80-89	75-84	14-16	Heavy
> 90	> 85	> 16	Very heavy

- ✓ Lactaat(drempel)
- ✓ HR
- ✓ RPE

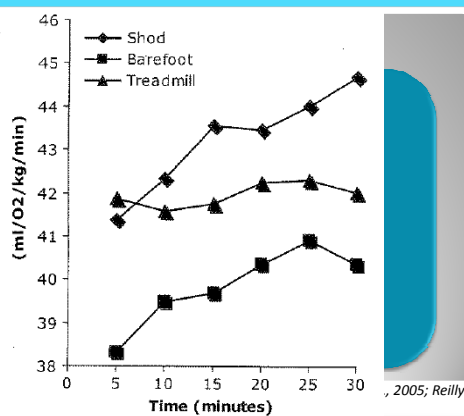
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• Intensiteit cardiovasculair

- Slagvolume en Cardiale output 30-35%↑
- Veneuze terugvloeï ↑
- Eliminatie metabole afvalstoffen
- Oedeem ↓
- Respiratoire capaciteit ↑
- Muscle soreness ↓ - Recovery ↑
- Shod: 9% ↑ energieverbruik en 7,6%↑ VO₂

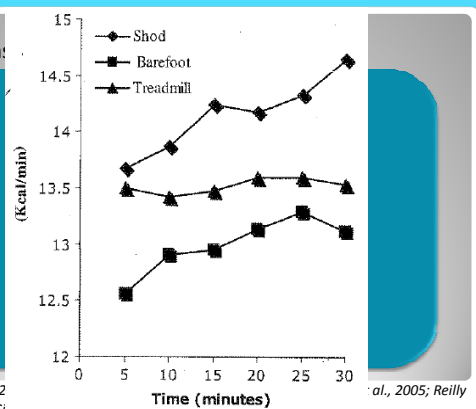
Becker et al., 2008; Robinson et al., 2004; Robinson et al., 2004; Martel et al., 2005; Reilly et al., 2003; Gill et al., 2006; Wilcock et al., 2006

• Inter



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• Intens



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• Intensiteit krachttraining

- Grootte en vorm van 'drag' of 'buoyancy'
- Snelheid van beweging
- Consistent herhalen van een beweging is moeilijk
- Weerstand is multidirectioneel

Huff et al., 2008

• Techniek en familiariteit met oefenen in water

- 2 technieken: High-Knee en Cross Country
- ✓ Water op schouderhoogte, onder kin, hoofd neutraal
- ✓ 5' voorwaarts t.o.v. de verticale
- ✓ Armhouding en -beweging identiek
- ✓ Clenched vuist positie
- ✓ Looptechniek vergelijkbaar met snel lopen (interval)

Killgore et al., 2003, 2006, 2010, 2011, 2012; Masumoto et al., 2009; McKenzie et al., 1986; Bressel et al., 2011

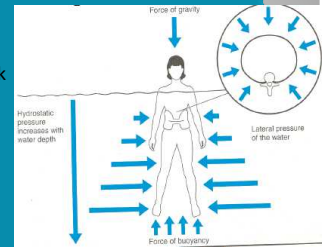
- Andere voordelen

- Sports specifieke training
- Variatie in training
- Unloading & tractie → joint strain ↓
- Compressie ↓ t.h.v. wervelkolom

Huff et al., 2008; Dowzer et al., 1998

- Fysische eigenschappen van water

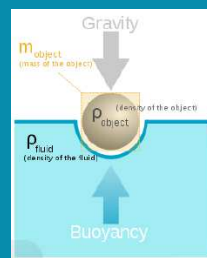
- Densiteit
- Hydrostatische druk
- Buoyancy
- Viscositeit
- Thermodynamica
- Refractie



Becker et al., 2009

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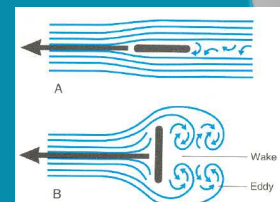
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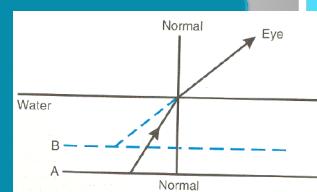
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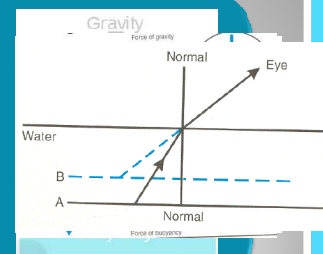
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Becker et al., 2009



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