



Alexander Ferrauti, Ruhr University Bochum: VTV Coaches workshop, Belgium 15.-16.12. 2006

Diagnostics of endurance in tennis



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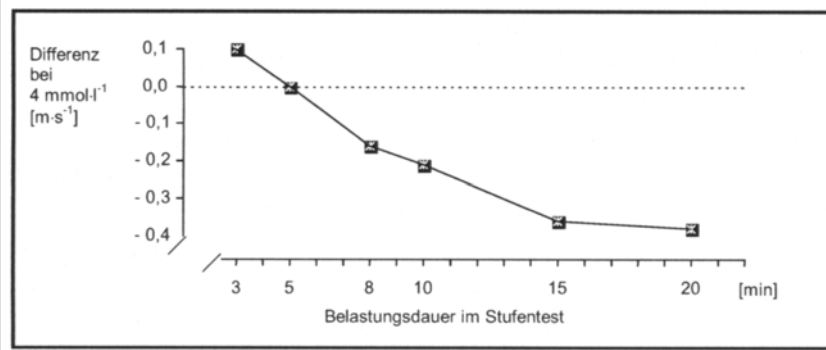
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- 1 Selected tests and parameters
- 2 Comparative discussion
- 3 Recommendations for practice



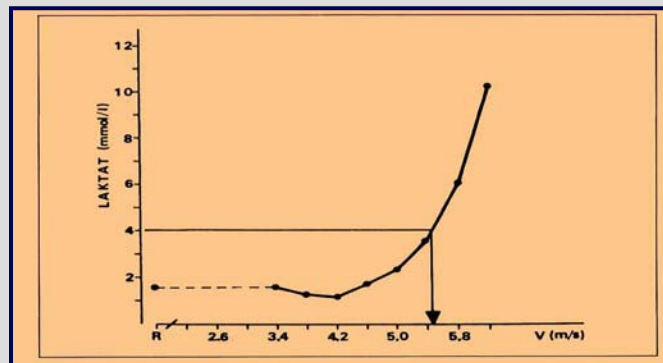
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Threadmill/ Field- Step Tests Heck et al. 1982 Gerisch/Weber 1992	Video	Running specific max. aerobic capacity running basic endurance	place: threadmill, 400 m track Performance: m/s, km/h Start: 8-10 km/h, 2-2,8 m/s Steps: 2 km/h, 0,4-0,5 m/s Step duration: 2-5 (10) min	aaT [m/s/4 mmol/l] (Mader et al. 1976) IAT (Stegmann et al. 1981)	$\dot{V}O_2$ max [ml/min] [ml/min/kg] V, HR, LMax



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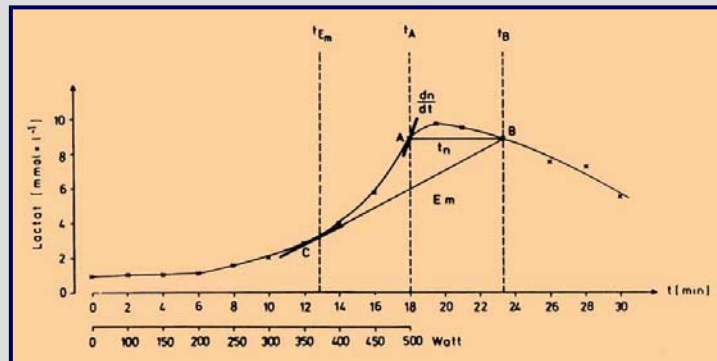
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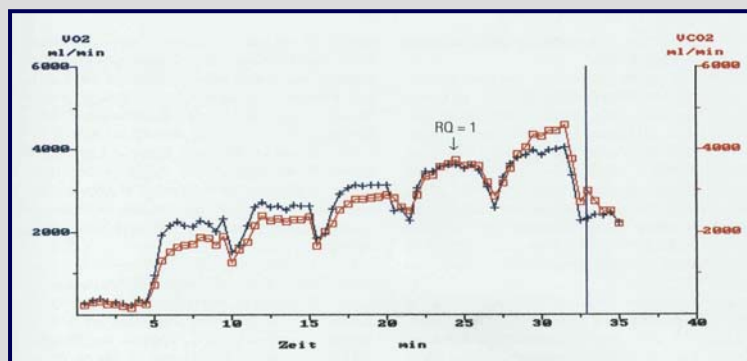
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Ballmaschine test Weber 1987	Video	tennispecific endurance	place: Clay, Carpet, HC Performance: balls/min, total [n] Mode: one or multiple steps	Balls/min [4 mmol/l]	Max ball frequency VO ₂ max LA max HR max

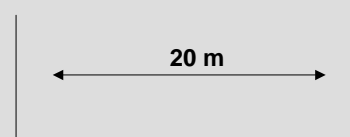
Limiting factors for tennispecific endurance:

- stroke energy
- stroke economy
- body height
- body weight
- running economy
- coordination in change of direction
- local endurance in working muscles
- local power and reactive force in working muscles

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Multistage Fitness Test [Beep Test] Léger et al. 1988	Video	Semispecific max. aerobic capacity	place: Clay, carpet, Center	/	Level, Shuttle VO ₂ max-est.





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additional:
Cooper Test (Maksud & Coutts 1971), **Conconi-Test** (Conconi et al. 1982), **Wingate Anaerobic Test** (Bar-Or 1987)

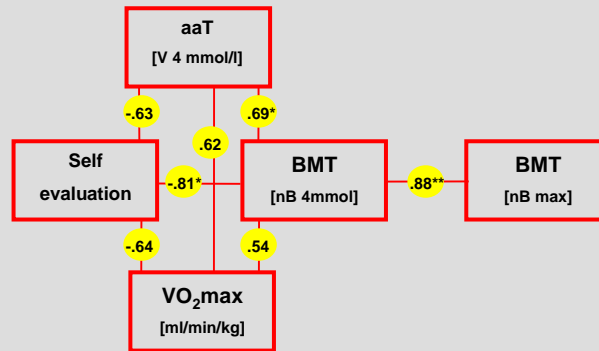
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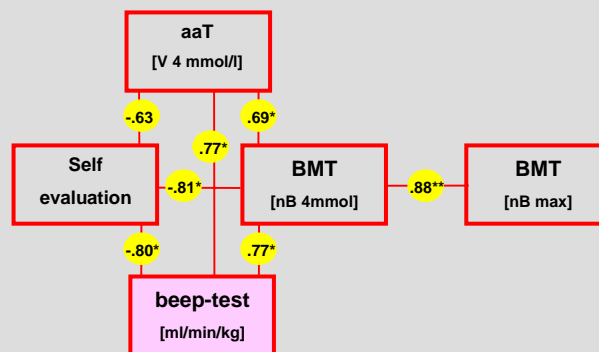
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Pilot study:
n = 8 male regional players



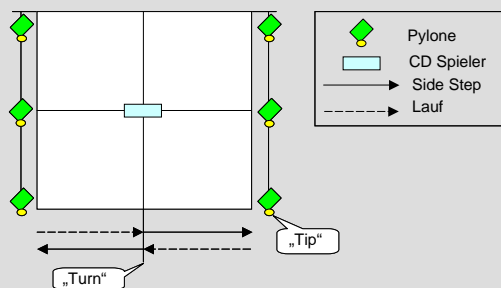
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Project (ITF, DTB): „Tip and Turn Tennis Test“

Development of a adapted tennisspecific beep test



Parameter	validity	reliability	norm values	practicity
$\dot{V}O_2$max Threadmill test	+/-	(++)	(++)	---
Lactate threshold Treadmill Step Test	+	(++)	(++)	--
$\dot{V}O_2$max - est Multistage Fitness Test	++	??	++	+++
Ball frequency Ballmaschine test	+++	??	---	--



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Age groups	Body composition, Simple Tennis Test	Multistage Fitness Test	Ballmashine test	Treadmill or field step test
U 12 (spring, autumn)	✓	(✓)		
> U 14 (low level) (spring pre-post, autumn)	✓	✓		(✓) Field, no VO ₂ max
> U 14 (high level) (spring pre-post, autumn)			✓	✓ Field, no VO ₂ max
national/ international (2 x /year)			✓	✓ threadmill + VO ₂ max