



A Key to success:

Principles of Training for Climbing

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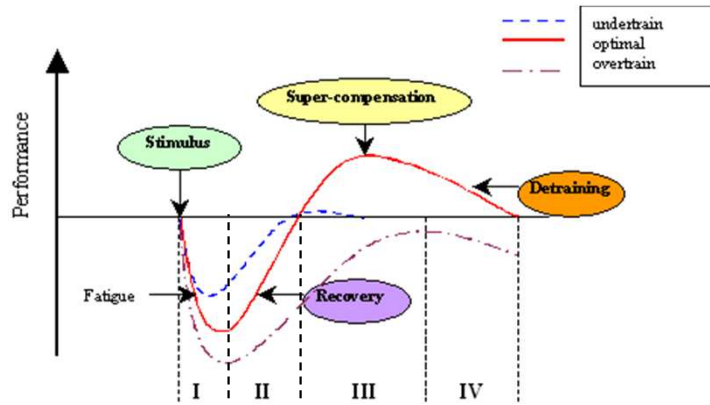
Sheffield
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SHARPENS YOUR THINKING

Objectives

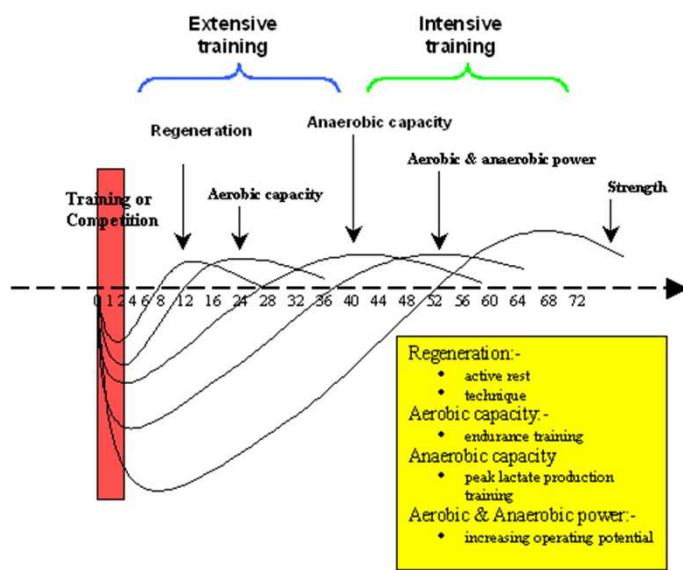
- Super-compensation
- Optimal timing of training
- Micro and mesocycle adaptation
- Muscle fatigue
- Types of training

Super-Compensation



"Rest or regeneration is the most important part in achieving an effective training programme"

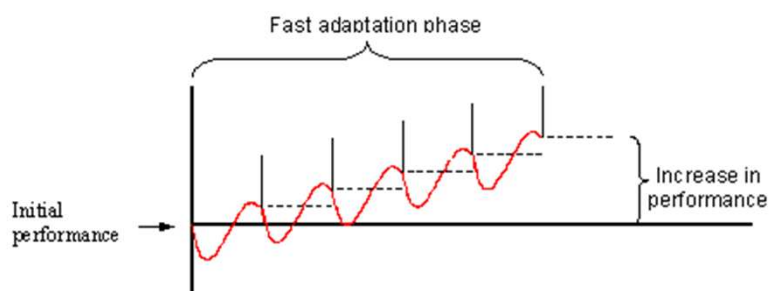
Optimal Timing of Training



Successful Microcycles

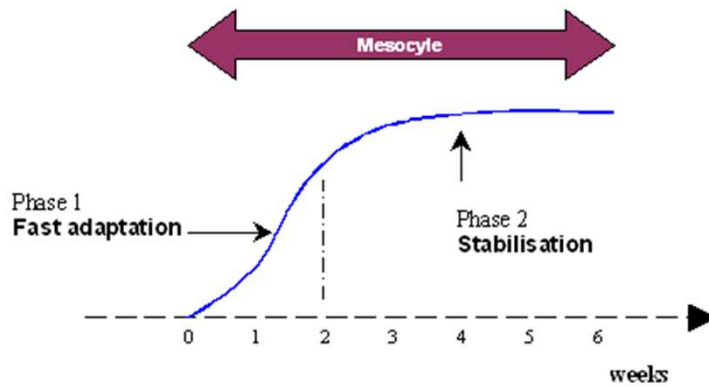
1. The more intensive the session the greater the rest period before another intensive session
2. Intensive (high intensity) days precede extensive (low intensity) days
3. Similarly intensive components precede extensive component in the same training session
4. Regeneration i.e. very easy climbing, following a very intensive training session will facilitate the bodies response to adaptation thus allowing multiple intensive session to run consecutively for a short period.

Timing



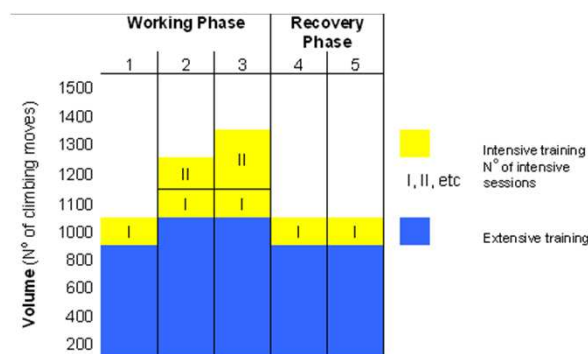
- By timing the next training session to take place at the peak of this super-compensation you can take advantage of this process and make greater gains over successive training sessions

Mid term adaptation period



- First few weeks of a new training cycle the body adapts quickly (fast adaptation phase), followed by a slowing down of the adaptation process, and after a further 3 to 4 weeks will essentially stop (stabilisation phase).
- This mid term adaptation period called the mesocycle is dependent on the intensity and volume of training just like in the acute adaptation phase (single workout).

5 week Mesocycle



- Typical mesocycles of 2-8 weeks are split into two parts. The first part is the **working phase (60-80%)**, this typically lasts 2-3 weeks when concentrating on strength improvements, and as much as 7 when focusing on endurance
- Concentrate on improving one category component e.g. endurance, whilst maintaining the others

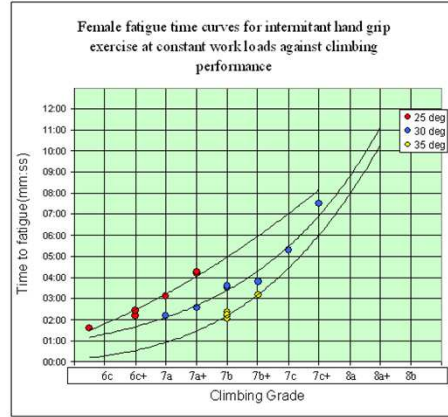
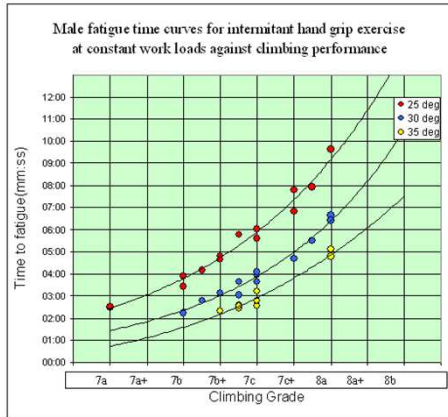
Forearm Fatigue

1. Energy systems in climbing
2. There are three physical manifestations of being pumped. Swelling of the forearm, pain, and a reduced ability to exert enough force to hold on.
3. Blood flow dynamics

Measuring Muscle Fatigue



Measurement Results



	Type of Exercise	Intensity	Rest between intervals	Main Effect	Time for Effect
CAPACITY	Aerobic	Easy	short	Increase muscles ability to use oxygen for energy production ↑ $\dot{V}O_{2max}$	At least 2 months
	Anaerobic	Very hard	Long	Increase lactate production rate ↑ $\dot{V}L_{max}$	At least 4 months, will be longer the stronger your anerobic capacity
POWER	Aerobic	Hard	Very short	Increase the percentage of aerobic apcacity you can sustain for your climb ↑ %-use $\dot{V}O_{2max}$	About 1-2months
	Anaerobic	Max	Very short	Increase the percentage of anarobic capacity you can sustain for your climb ↑ %-use $\dot{V}L_{max}$	About 1-2 months

Perceived Fatigue Scale

Type of Training		Levels	Pumped Feeling
Endurance	= Aerobic capacity	L1	No pump Climb all day at this intensity
		L2	Slight pump No need to shake out
		L3	Moderate pump Shake out perhaps once
Strength & Power Endurance	= Aerobic Power and Anaerobic capacity	L4	Very pumped Need to shake several times
		L5	Extremely pumped Fully boxed and close to coming off

Essentials of Aerobic Capacity Workouts

1. Warm up - very thoroughly.
2. 'Shock' the system at the beginning of each set with some high intensity climbing – i.e. hard (for you) route on-sight or a few hard boulder problems in quick succession.
3. High volume, low to moderate intensity work. This should be the major part of the exercise. Climb routes well within your ability, always leading (top roping is too fast). Keep rest times between routes short.

Level 2 Aerobic Capacity

- Example 1 – Continuous climbing
- Example 2 – Cascades
- Example 3 – Cycles
- Example 4 – Twenty Tens

Level 3 Anaerobic Capacity

- Following a warm up, you need to start off with a climb at regular on-sight grade, followed immediately by

2 x (4 x 25M)

Rest 60s intervals, 15 min sets

Volume = 225 moves

Interval intensity grade = regular on sight grade - n

Essentials of Anaerobic Capacity Workouts

1. Warm up – very thoroughly
2. Short intervals (5 -15 moves)
3. High intensity for the major part of the exercise, typically climbing close to your maximum (90%)
4. Long rest between intervals, at least as long as the duration of the interval if not twice as long
5. Passive rest between intervals

Essentials of Power Workouts

Aerobic Power - Basics

1. Short repeat intervals (10 -20 moves)
2. Sets are 30-60 moves repeated 2-3 times
3. Intensity needs to be at the level of the climb you are trying to do
4. Short rest between intervals, same number of seconds as number of moves

Anaerobic Power - Basics

1. Very short repeat intervals (5 - 10 moves)
2. Set are 15-30 moves repeated 3-5 times
3. Maximum intensity, pulling brick hard from the start
4. Short rest between intervals, same number of seconds as number of moves

Summary - Forearm Fatigue Resistance Training									
Aerobic Capacity (AEC)		Aerobic Power (AEP)		Anaerobic Capacity (ANC)		Anaerobic Power (ANP)			
Type of climber	Boulderer	Route climber	Boulderer	Route climber	Boulderer	Route climber	Boulderer	Route climber	
Volume/set	Long	Very long	Approx Event/Comp. distance		Moderate	Long	Approx Event/Comp. distance		
Interval volume	Short (20-50 M)	Long (50-300 M)	Short progresses to Long (10-20 M) → (20-60 M)		Short (10-15 M)		Very Short (5-10 M)		
Intensity	Extensive (easy) with intensive short shock interval at the beginning		Event/Comp Difficulty		Intensive nearly all-out		All-out (brick hard)		
Rest between intervals	Short (20-40s)		Short progress to V Short (30-45s)		One to two times greater than exercise time (60s-1:30min)		Very Short (10-20s)		
Training session examples:	8x10M R=20s 1, 3 hard	a) 2x300M @ L2 b) 2x(6x50M) alternating each 50M @ L1, L3	a) 6x10M R=45s to b) 3x20M R=15s	a) 2x(4x10M) @ L4 to b) 3x(4x20M) @ L5	a) 3x(4x15M) @ L5 to b) 6x(3x10M) @ L5	a) 3x(4x20M) @ L3/4 to b) 3x(4x10M) @ L4/5	a) 3x(5x5M) @ L5 b) 4x(4x10M) @ L5		

