

The use of modern diagnostic technology in gymnastic

Jernej Pleša

Diagnostics in physical preparation

- Performance enhancement
- Guiding rehabilitation process and return to sport
- Evaluation of training program = feedback



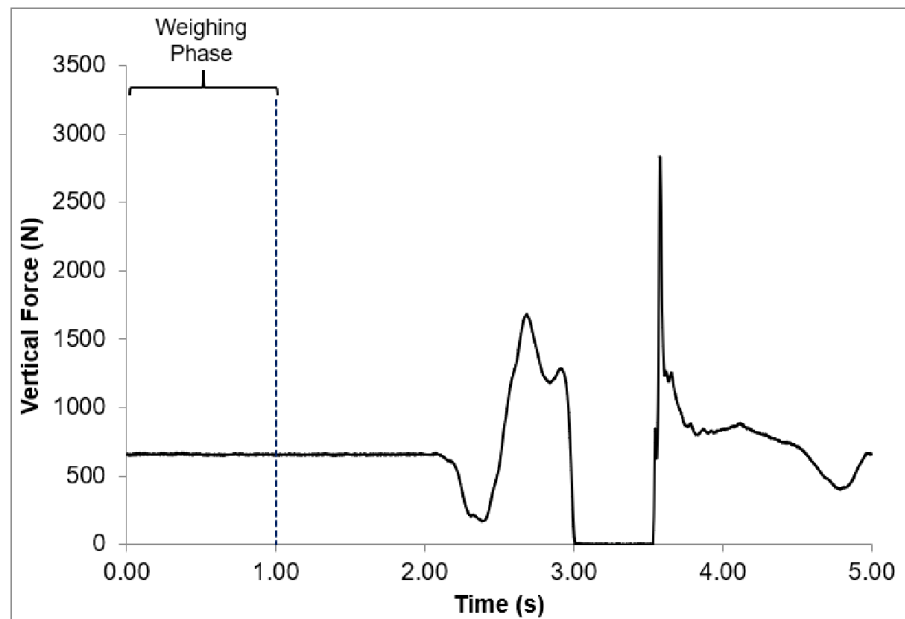
Commonly used technology devices

- Force plate
- TMG – tensiomyography
- EMG – kinesiological electromyography
- Linear encoder – velocity tracker



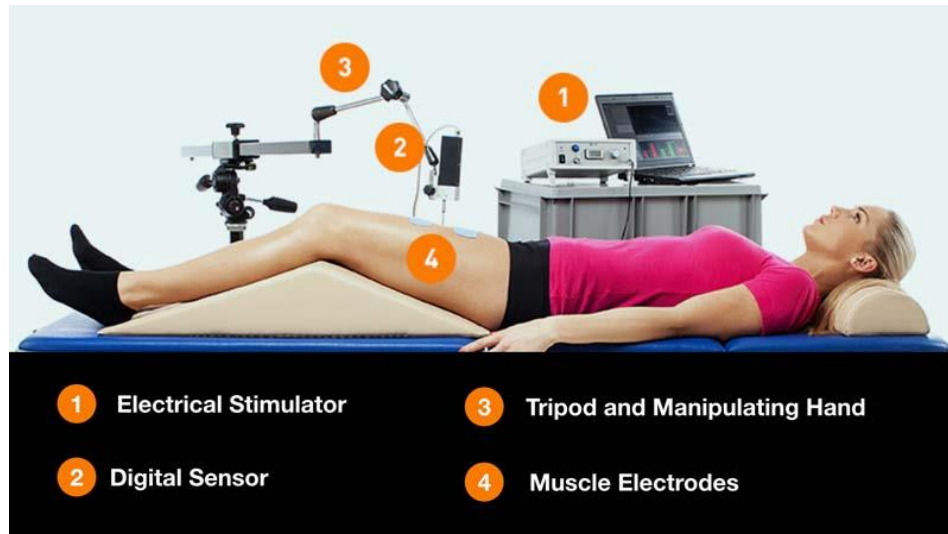
Force plates

- Jumps (CMJ, SJ, DJ)
- Balance
- Force-time curve
- Biomechanical indexes (ASI, EUR, FV, RSI, BLD)



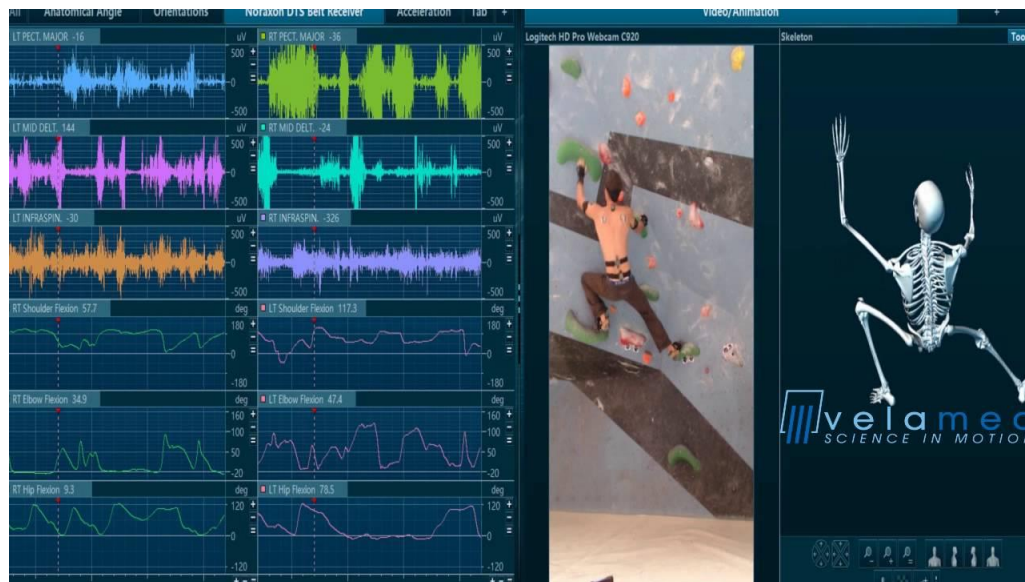
TMG

- Contractile properties of the muscles
- Parameters: Contraction time, radial displacement
- Injuriie risk evaluation, returning to sport after the injuriie, performance training

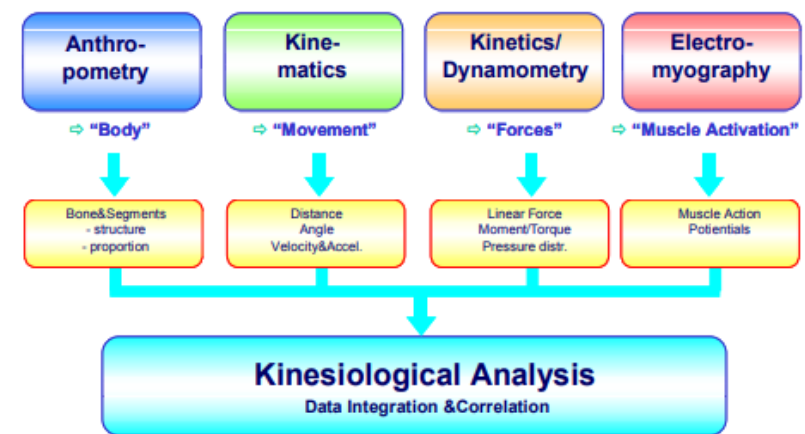


EMG

- Muscle activity
- Rehabilitation – active training therapy
- Sport science – biomechanics, movement analysis

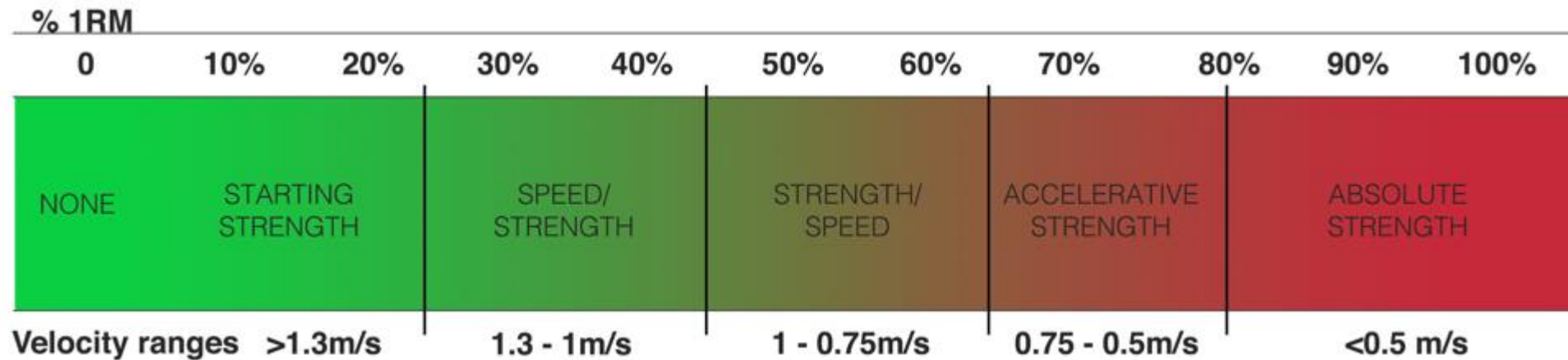


EMG in Biomechanics



Velocity tracker

- Complex movements
- Testing for training intensities (determination of 1 RM)
- Weight training → targeting specific adaptations
- Providing feedback



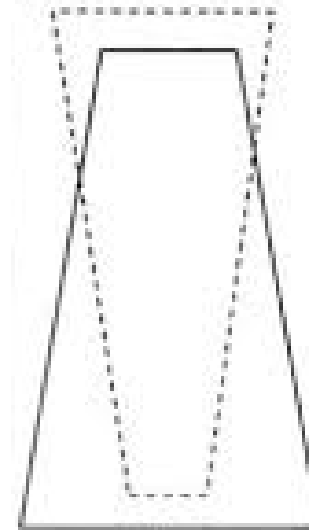
Prevention programs

- Individual warm up or „prep“ before every training (15-20 min)
- Sequence → tendons work – mobility & foam rolling – strength deficits – motor control /learning

Introductory

Fundamental

Specific



Physical preparation

FORCE PLATES




- FV profile → targeting specific qualities
- RSI → optimizing SSC and guiding plyometric training
- BLD → deciding about incorporating unilateral exercises

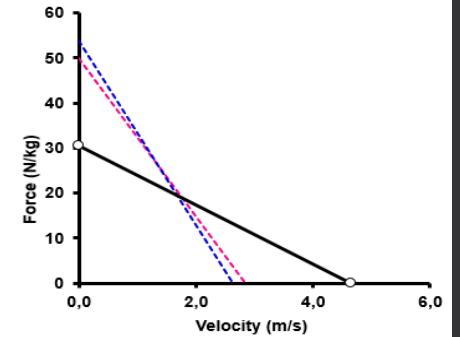
TMG

- PAP → controlling local fatigue and detecting potentiation

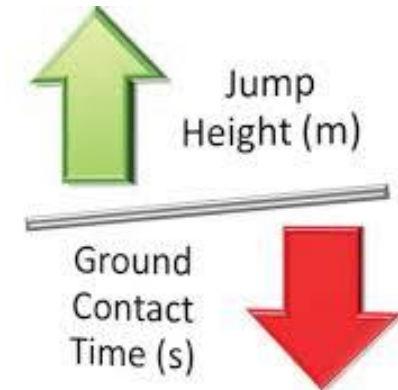
EMG

- Targeting specific muscles

Fo (N/kg)	30,4
Vo (m/s)	4,65
Pmax (W/kg)	35,4
Sfv (N.s/m/kg)	-6,11
	F-v Profile for 30° = 35% of the optimal FORCE is to be developped
	
	F-v Profile for 90° = 30% of the optimal FORCE is to be developped



Reactive
Strength =
Index



What and when

- Rehabilitation → EMG
- Performance → force plates, TMG, velocity tracker
- Prevention & return to sport → all above

