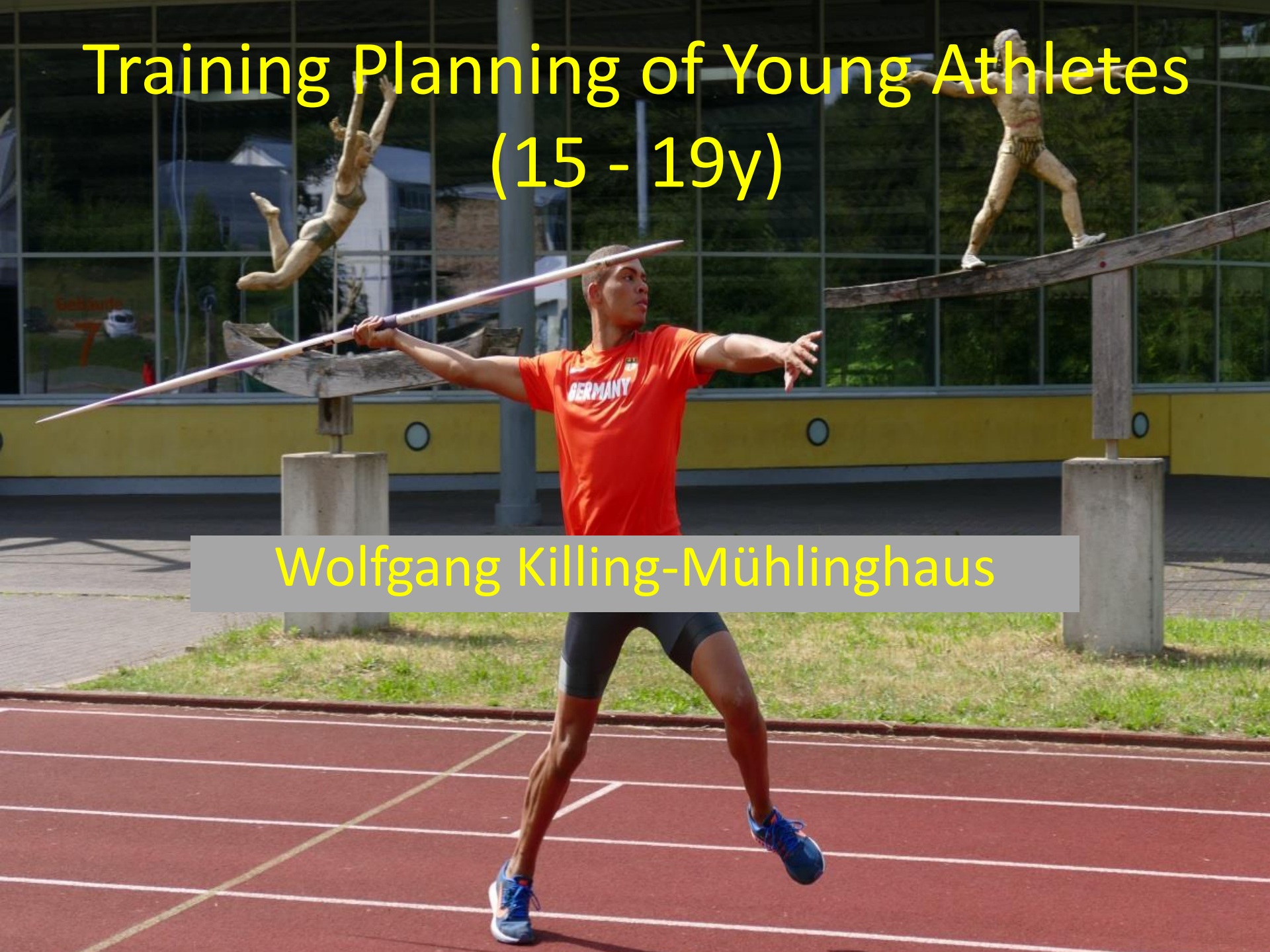




# Training Planning of Young Athletes (15 - 19y)

Wolfgang Killing-Mühlinghaus



# Training Planning of Young Athletes



Overview:

Orientation I.t.d.

Periodisation principles

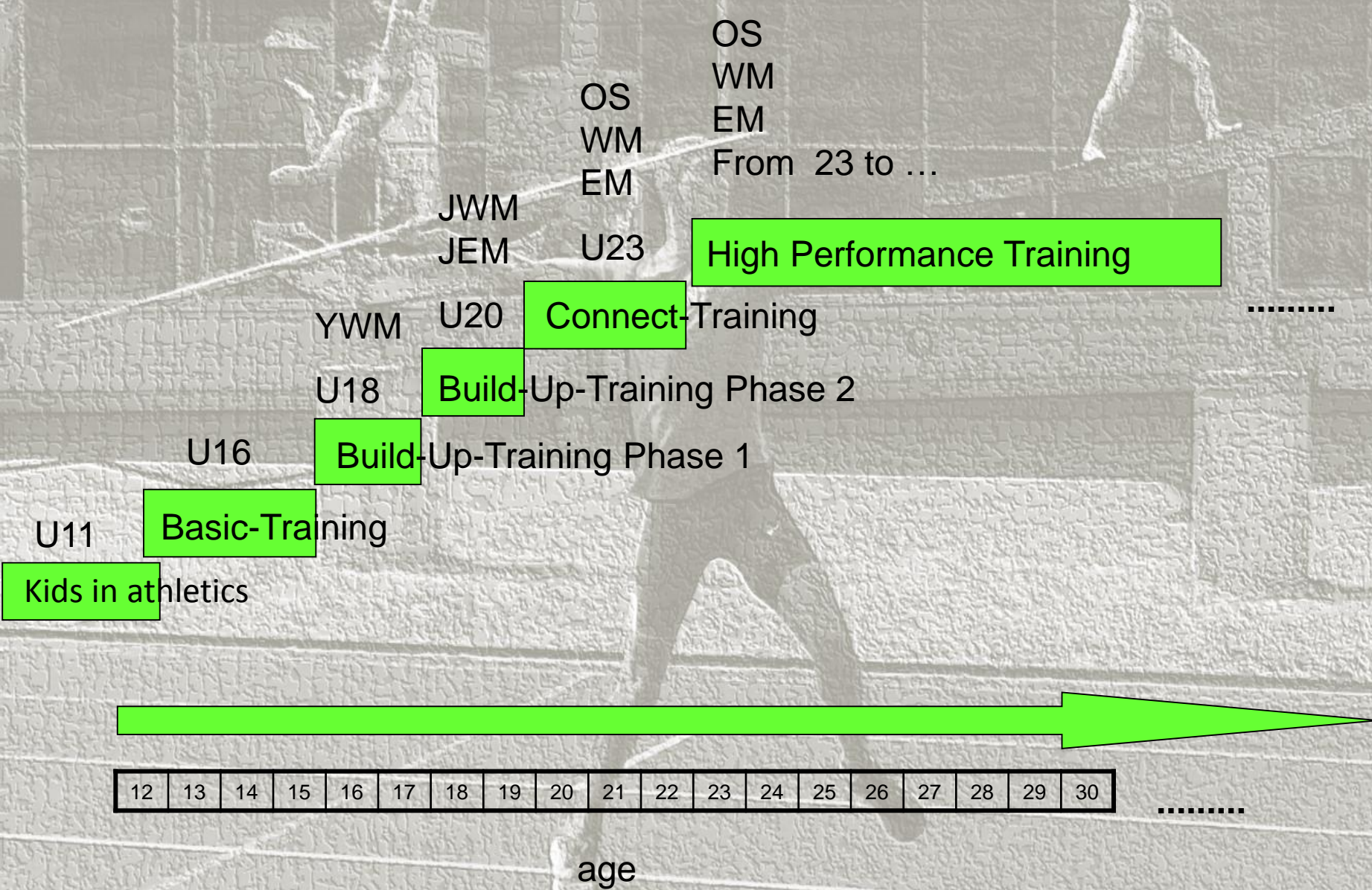
Planning schedules

“Special case” endurance

Individualisation

experiences former top athletes

# Long time training developement



# Take-Home-Message Barcelona 2012

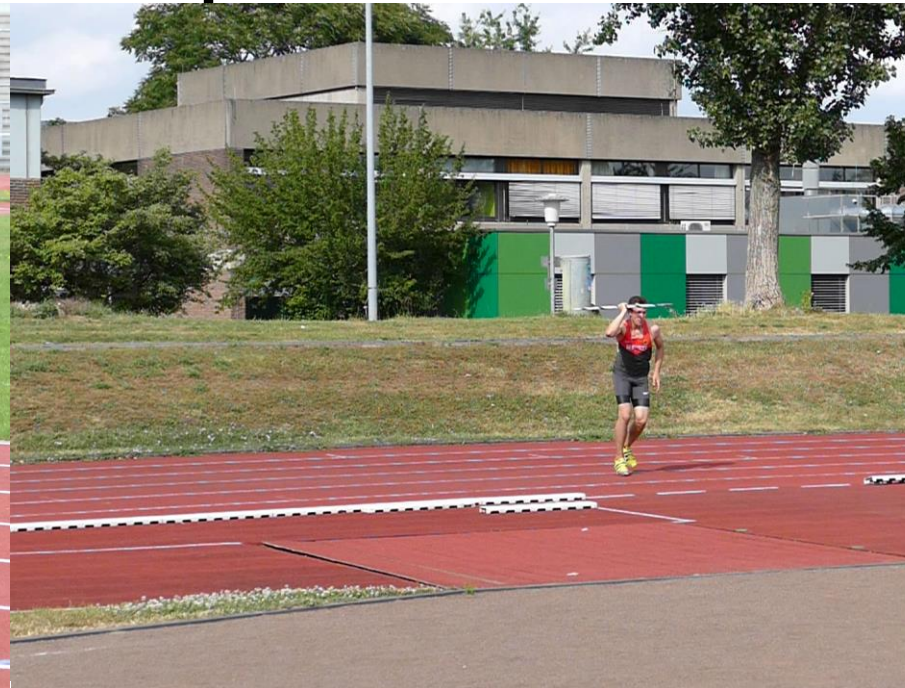
## What should you do U16?

1. Fun and motivation for training / competitions
2. Wide range of coordinative skills
3. Main techniques / coordination in athletics
4. Quickness / velocity in sprint, jumps / throws
5. Techniques in other basic sports
6. First athletic status (body muscles strength)
7. Prophylactic strengthening typical weak points

# Long Time Developement Motor Learning Techniques for Combined Events (var. Korobkow)

1. Year of train.	2. Year of train	3. Year of train.	4. Year of train.	5. Year of train.
Sprint/quickness				
Spezial event				
	Hurdle sprint			
	javelin			
	(pole vault)			
	longjump			
	highjump			
	(Discus throw)			
	Shot put			
				Speed endurance

# Technique-examples 1

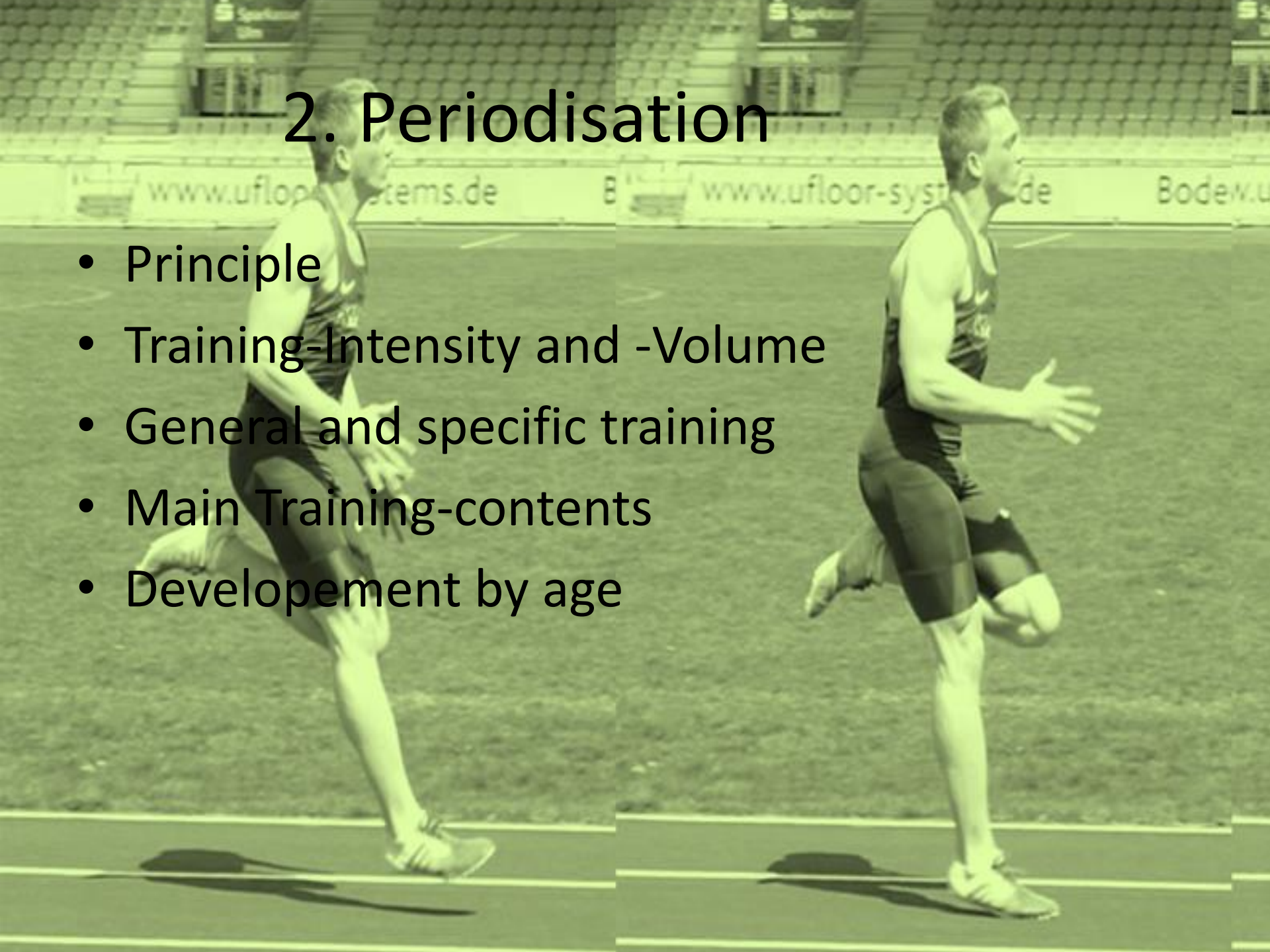


# Technique-examples 2

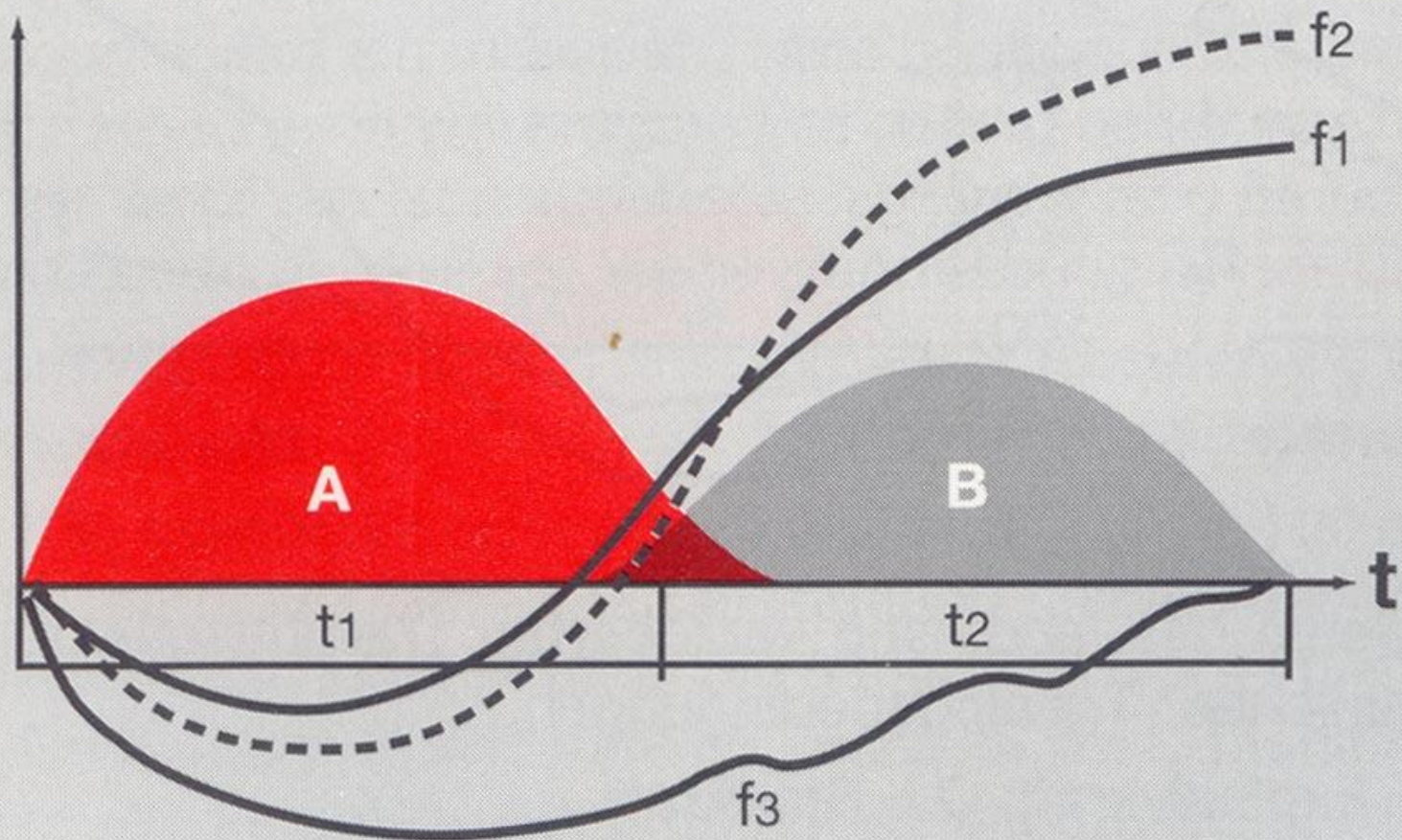


## 2. Periodisation

- Principle
- Training-Intensity and -Volume
- General and specific training
- Main Training-contents
- Developement by age

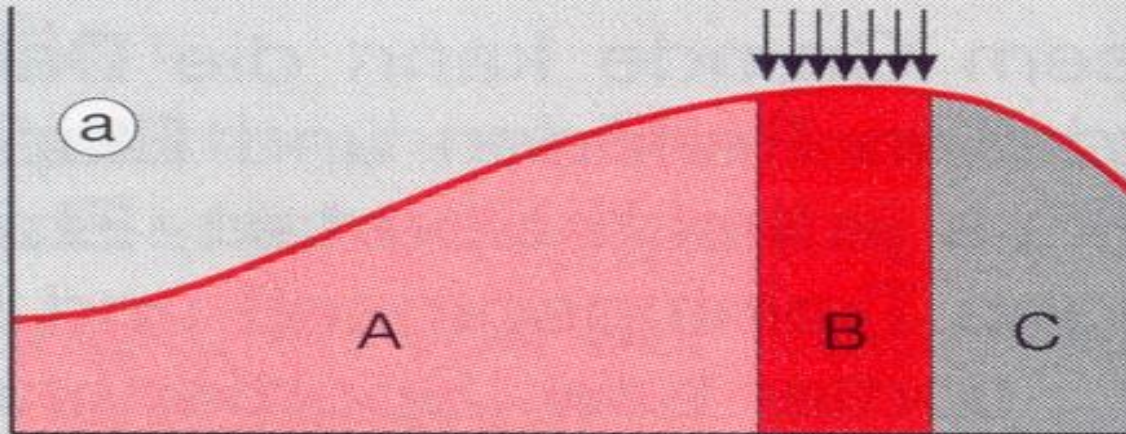


Principle of periodisation:  
high volume in preparation phase A  
low volume in competition phase B

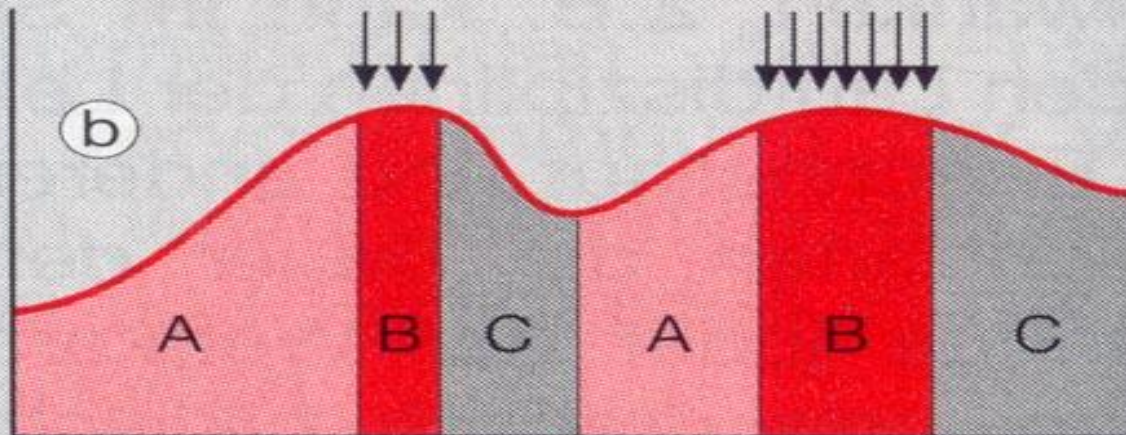


## Simple or double periodisation

shape



shape



# Periodic structure of the training year

MAC	Periods	MEC	weeks	Topics in Training
<b>1. MAC</b>	1. gPP 1. part	1.	8	General preparation training
	1. gPP 2. part	2.	6	Event orientated built up training
	1. sPP	3.	6	Specific preparation training
	1. CP	4.	4	indoor-competition-series
<b>2. MAC</b>	2. gPP	5.	6	General built up training
	2. sPP	6.	6	Specific preparation training
	2. CP 1. part	7.	6	Outdoor competition series
	UWV	8.	4	Preparing the main competition
	2. CP 2. part	9.	3	Outdoor competition series with main comp.
	RP	10.	3	active Regeneration

**MAZ = Macrocycle, MEZ = Mesocycle, MIZ = Mikrocycle (week); PP = Preparationperiode, g = general, s = specific, CP = Competitionperiod, UWV = direct preparing for the main competition (unmittelbare Wettkampf-Vorbereitung), RP = Regenerationperiod**

A photograph of three young men running in a park at sunset. The scene is bathed in a warm, golden light from the setting sun, which is visible through the trees in the background. The runners are in profile, moving from left to right. The man in the foreground is wearing a dark long-sleeved shirt. The background shows a line of trees and a clear sky with some clouds.

# Training volume by age

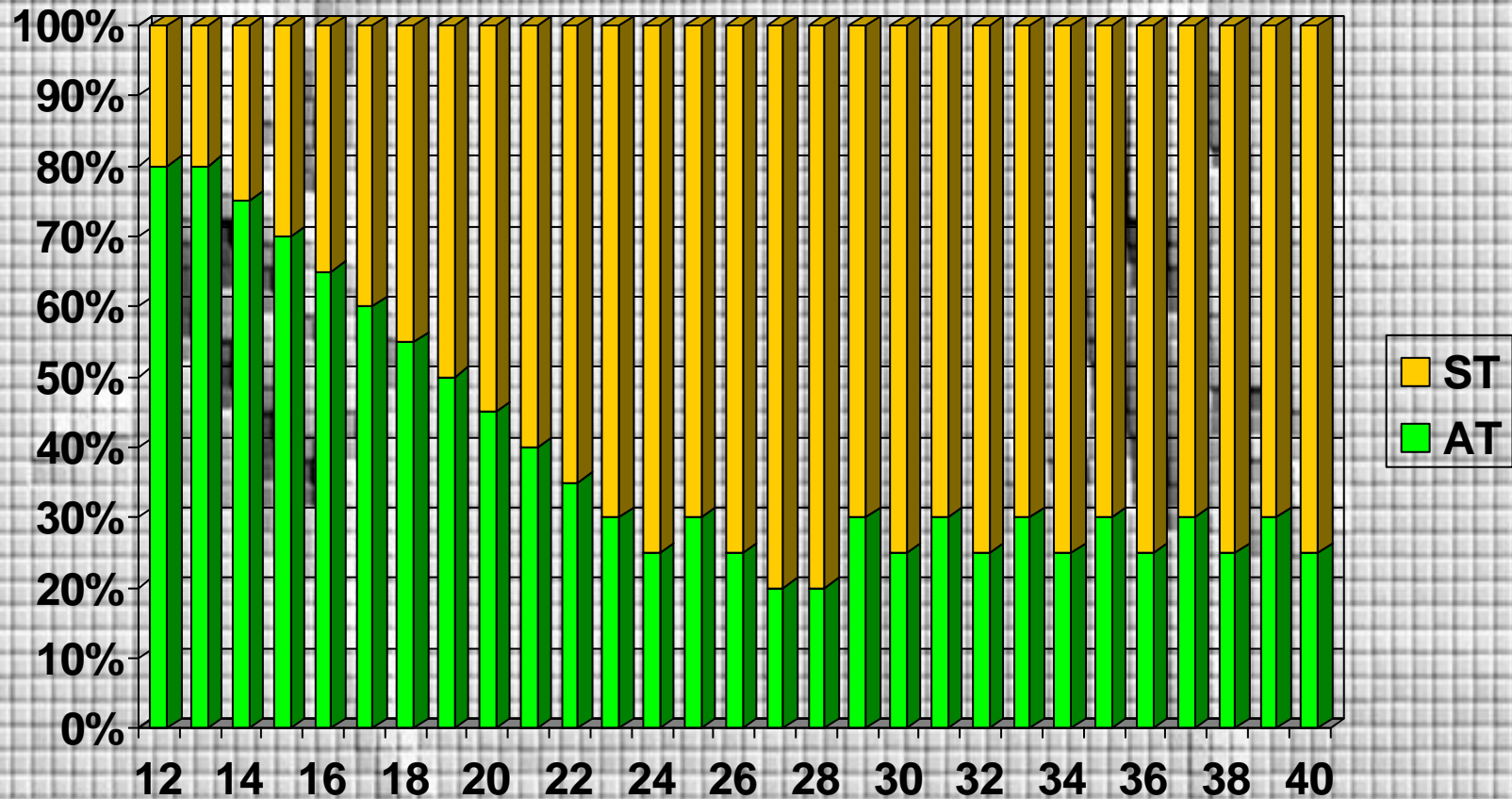
Age	Units / Week	Minutes / Training-Unit	Train.-weeks / year	Training-Units / year	Hours/year
-14	3-4	60-100	40	120-150	150-250
15-17	4-6	90-120	44	160-240	240-360
18-19	5-7	90-120	46	230-300	300-500
20-22	7-8	90-150	48	275-330	400-700
23 +	7-10	90-150	48	300-350	600-800

The background of the slide features a photograph of two runners in motion on a green athletic track. The runners are wearing white singlets and dark shorts. The image is slightly blurred to convey a sense of speed. In the background, there are white lane markings and a blurred crowd of spectators.

# Classes of Intensities

	Low Intensity	I3	I2	I1
Per cent by actual maximum	-70 %	70- 85 %	85-95 %	95 – 100 %

## Relation specific (ST) and general (AT) training means



# **Main training means:**

**All around training**

**General athletic developement**

**Endurance**

**Special endurance 800/1.500**

**Speed-Endurance**

**speed, hurdles**

**General and maximum power**

**Throwing strength**

**Jumping strength**

**Sprinting strength**

**Technical developement**

# Main training means and main contents 1

All around training	Gymnastics Games und acrobatics Prophylactic training
Gen. athletic developement	Power-gymnastics, Core-Training Circuittraining
Endurance	Warm-up- and cool-down-jogging Continues runs – fartlek Extensiv intervalls TL 100-1.000 l. l.
Special endurance 800/1.500	400-600, 600-800, >1.000 m l3 400-600, 600-800, >1.000 m l2
Speed-Endurance	150-300 m, 200-600 m l3 150-300 m, 200-600 m l2 Hurdle- speed runs
speed, hurdles	Frequent-sprints, speed-drills Sprint / hurdles to 80 m l2 Sprint / hurdles to 80 m l1

# Main training means and main contents 2

<b>General and maximum power</b>	General power-training Weight lifting I3 Weight lifting I2
<b>Throwing strength</b>	Medicinball Specific throws and shots
<b>Jumping strength</b>	Skip-jumps and small boundings low I. Alternate leg, one and both leg bound. I2 Alternate leg, one and both leg bound. I1
<b>Sprinting strength</b>	Uphill sprints and jumps Starts and acceleration to 30 m I2 Starts and acceleration to 30 m I1
<b>Technical development</b>	Sprint-, Jump-, Throw-ABC, Rhythm-drills All technique decathlon/heptathlon Technique for main training exercises

# Principles of periodisation, Summary:

## **By age:**

rising volume of training

Higher intensity and specificity of training

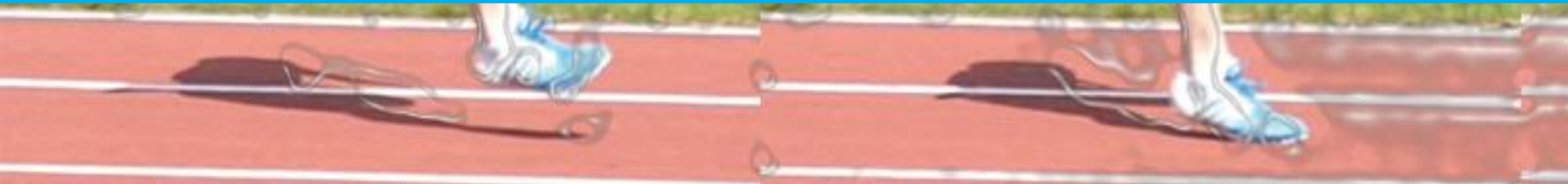
## **In the training year/macro-cycle:**

Start with high amount of general training (gPP 1.p.)

Change to high amount of basic specific training (gPP 2. p.)

Change to middle amount of specific intensiv training (sPP)

Finish with small amount of specific, intensive training (CP)





### 3. Planing schedules

# Training schedule U18 N. Kaul 2014/15 PP

Period	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Gen PP	Warm-up (10 min jogging, gymnastics) 60' Stabli-sation-circle  2*5*10 ball-throws (600g) left and right	Warm-up 60 min Pole-vault  8*300m 48-50'' 3' P; 5' SP	Free	30 min Basketball 30 min hurdle-sprint  30 min shot put 20' Stabli-sation	Warm-up 30 min Highjump o. longjum  45min circletrain. 20 min endurance run	Warm-up 20 min acrobatics 20 min hurdles-co.  30 min discus 3* 1000m 3:20min 3' P; 3:10-	Every two weeks: 60 min javelin (25 throws)  Next week: free
Sp. PP	Warm-up 20 min hurdl. coordination 30 min small boundings 20 min endurance run	Warm-Up 60 min polevault  Runs: 5*120m 13,5-14,0 s 5' P;	Free	30 min Football  30 min hurdles 30 min shot put 20 min Stabilisation	Warm-up 30 min Highjump o. longjum.  45 min Medball 20 min endurance	Warm-up 20 min acrobatics 20 min hurdle-coordination 30 min discus 3*1000 m 2:55-3:05m 3' P;	Every two weeks: 60 min javelin (25 throws)  Next week: free

# Training examples 1



# Training schedule U18 N. Kaul 2015

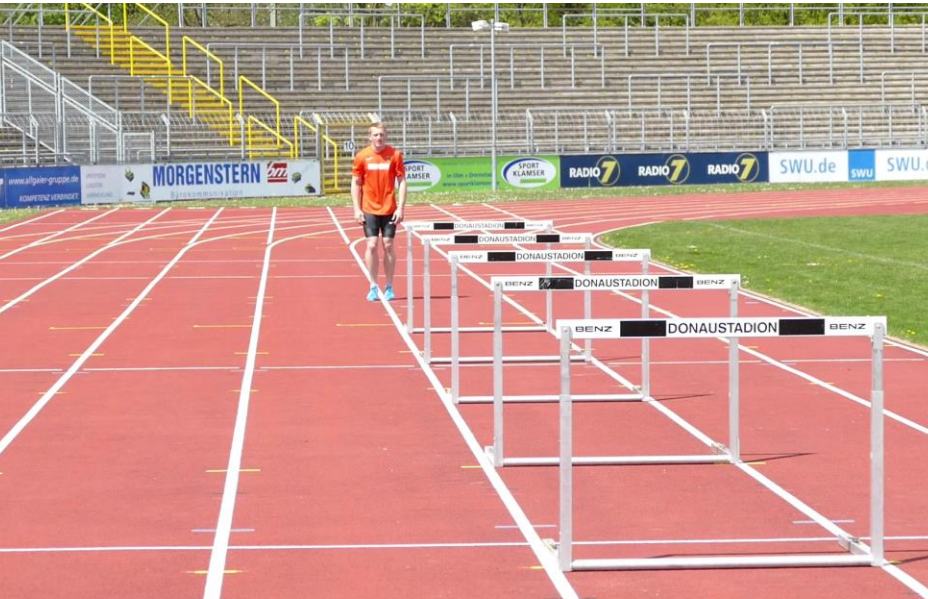
## Competition period week

Monday	Tuesday	Wednes	Thursday	Friday	Saturday	Sunday
<p>Warm-up 30 min highjump</p> <p>30 min discus</p> <p>20 min endurance</p>	<p>Warm-Up 60 min polevault</p> <p>Runs: 60, 80, 120m</p> <p>5* P; 6,8s; 9,5s; 13,5s</p>	<p>free</p>	<p>Compe- tition pole- vault 4,60m (PB)</p>	<p>Warm-Up hurdles</p> <p>5*1.hurdle 3*3. hurdle</p> <p>30 min shot put</p>	<p>travel 20 min jogging gymnastics Stabilisation</p>	<p>Competition javelin 83,94m (NR U18)</p>



Source: Leichtathletiktraining 7/2015

# Training examples 2



# General Training schedule combined events

Period	U16	U18	U20	U23
gPP 1	6 TE Gen. athletics 2 TE Endurance 1 TE Speed 3 TE Techn, Train.	7 TE Gen. athletics 3 TE Endurance 1 TE Speed 4 TE Techn, Train.	9 TE Gen. athletics 4 TE Endurance 1 TE Speed 4 TE Techn, Train. 2 TE Gen. Powertr.	10 TE Gen. athletics 4 TE Endurance 2 TE Speed 4 TE Techn, Train. 4 TE Gen. Powertr.
gPP 2	4 TE Gen. athletics 1 TE Endurance 2 TE Sprint/hurd. 5 TE Techn. Train	4 TE Gen. athletics 2 TE Endurance 2 TE Sprint/hurd. 6 TE Techn. Train 2 TE Gen. Powertr.	5 TE Gen. athletics 3 TE End/Speeden. 3 TE Sprint/hurd. 6 TE Techn, Train. 3 TE Gen. Powertr.	5 TE Gen. athletic 4 TE End/Speeden 3 TE Sprint/hurd. 8 TE Techn, Train. 5 TE Gen. Powertr
sPP	3 TE Gen Athletics 1 TE Endurance 2 TE Sprint/hurd. 7 TE Techn. Train.	3 TE Gen. athletics 2 TE Endurance 2 TE Sprint/hurd. 7 TE Techn. Train 2 TE Gen. Powertr.	4 TE Gen. athletics 3 TE End./Speeden 2 TE Sprint/hurd. 8 TE Techn. Train 2 TE Gen. Powertr. 1 TE Fast Powertr.	4 TE Gen. athletic 3 TE End./Speede 3 TE Sprint/hurd. 8 TE Techn. Train 3 TE Gen. Powertr 4 TE Fast Powertr
CP	1 TE Gen Athletics 2 TE Sprint/hurd. 3 TE Techn. Train.  Competition	1 TE Gen. athletics 1 TE Speed-End. 1 TE Sprint/hurd. 3 TE Techn. Train  Competition	1 TE Gen. athletics 1 TE Speed-End. 1 TE Sprint/hurd. 3 TE Techn. Train  Competition	1 TE Gen. athletic 1 TE Speed-End. 1 TE Sprint/hurd. 3 TE Techn. Train 1 TE Powertr. Competition

# The Throwers Modell

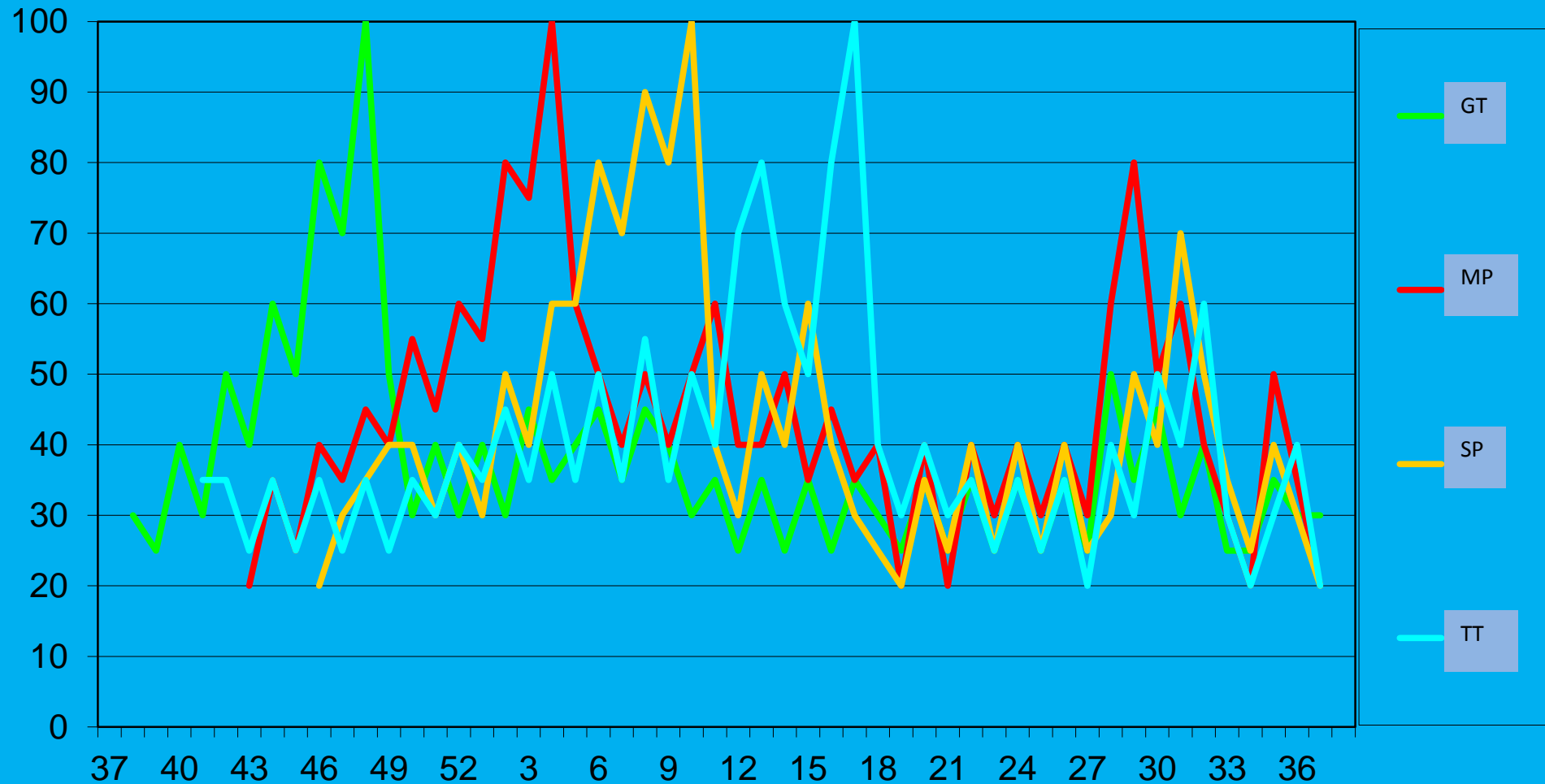


GT-Phase	MP-Phase	SP-Phase	T-Phase		Co-Phase	h/Wo
B-Jugend (U18)						
						1
						2
						3
						4
						5
						6
						7
						8
A-Jugend (U20)						
						1
						2
						3
						4
						5
						6
						7
						8
						9
						10

# Training examples 3



# Throwers Periodisation: Repetition peak modell



# Technique David Storl, actual 22,20 m



Startposition -0,80 s



-0,60 s



-0,40 s



Setzen Druckbein -0,30 s



-0,26 s



-0,22 s



-0,18 s



-0,14 s



-0,10 s



-0,08 s



-0,04 s



0,00 s

Storl, David  
Junioren-Gala

Junioren-Weltrekord

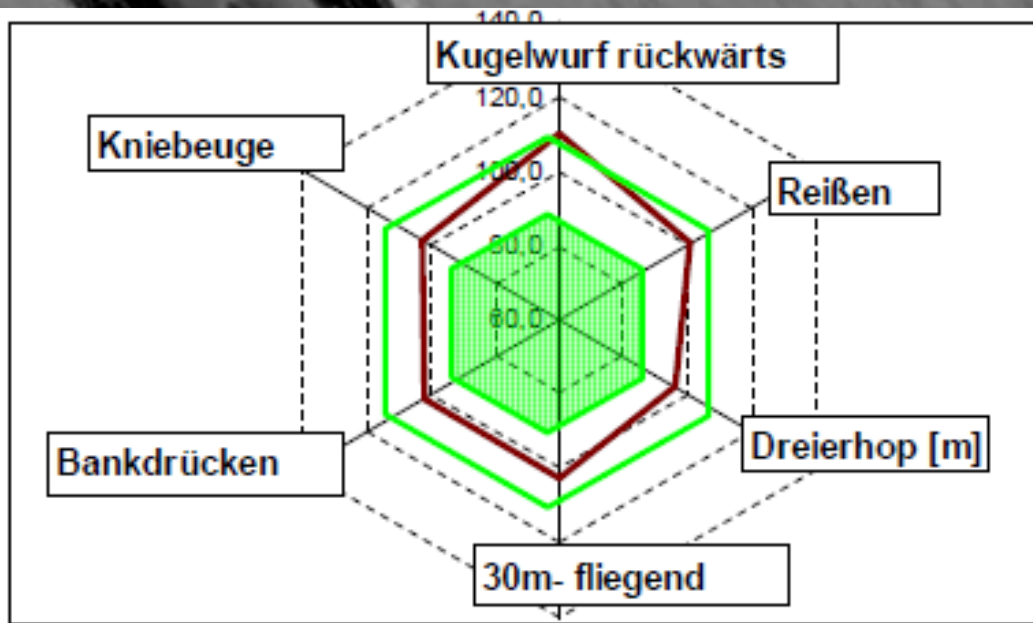
22,34 m  
Mannheim 13.06.09

3. Versuch  
6,00 kg

IAT

# Training Control in the Throwers System

D. Storl 20.44m 2009	Kugel- wurf rückwärts [m]	Reißen [kg]	Dreier- hop [m]	30m fliegend [s]	Bank- drücken [kg]	Knie- beuge [kg]
a- IST	22,30	125,6	9,67	3,02	200,0	210,0
b- IST %	110,3	101,1	95,7	102,6	102,0	102,7
c- SOLL	20,20	124,2	10,10	3,10	196,0	204,5
d- SOLL %	100,0	100,0	100,0	100,0	100,0	100,0



Source: IAT Leipzig

# The Throwers Modell

- Four training phases plus competition phase
- General training (GT), maximum power (MP), special power (SP), technical throws (TT)
- Each block 6-8 weeks
- At the end of each block a repetition peak
- Ca. 6 weeks after the repetition peak in the TT normally is the phase for best performances

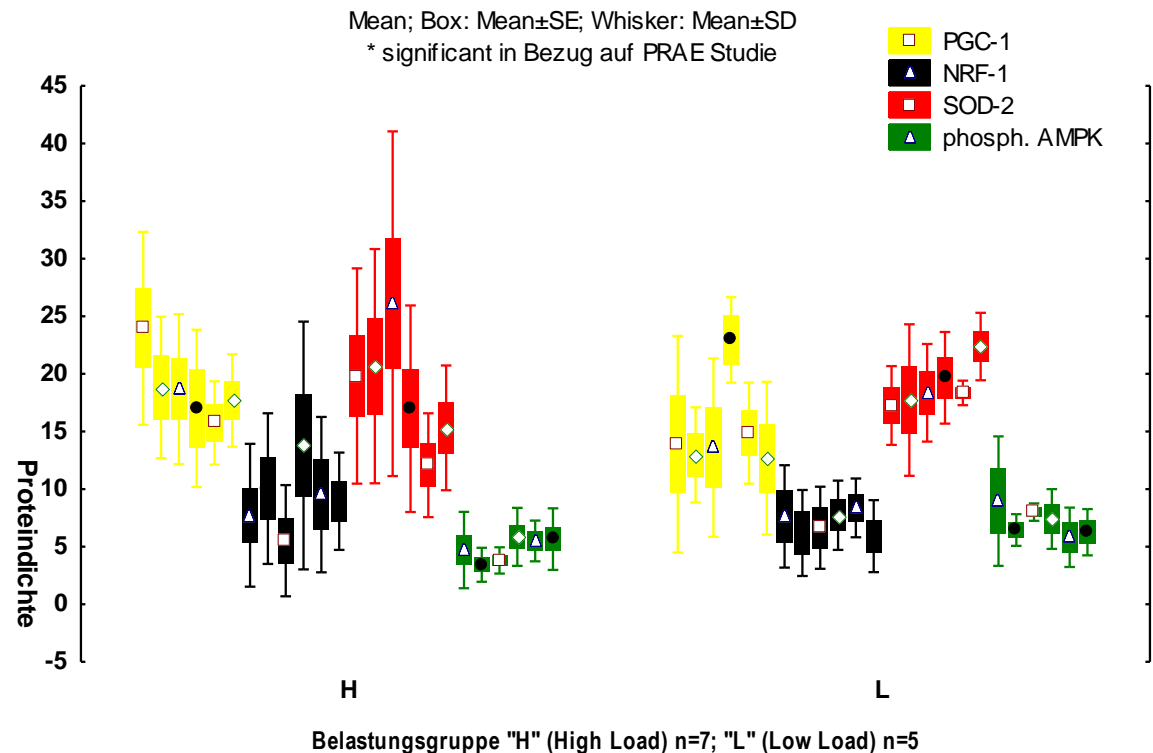
# Discussion about optimal length of the periods

Scientific research shows optimal muscle adaption after four weeks

After six weeks started a re-adaption to normal

So may be, 6-8 weeks with the same stimulus is too long  
See also the actual discussion about Blocktraining

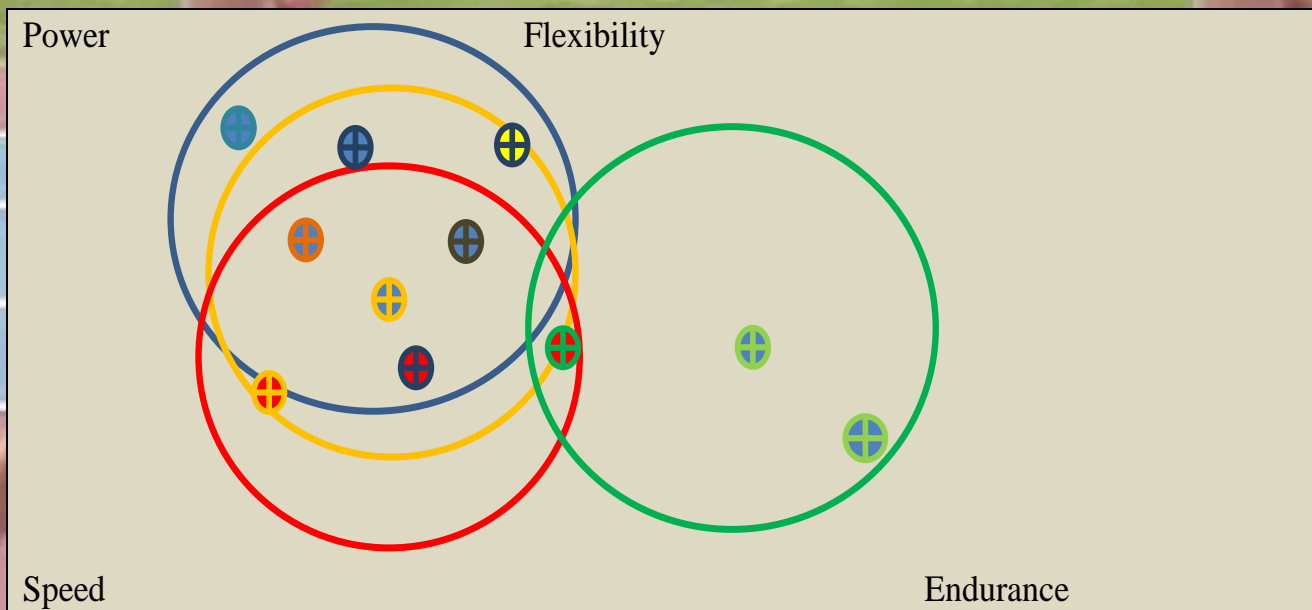
Entwicklung der Dichte für PGC-1@ □, NRF-1 ▲, SOD-2 ● and pAMPK ● über den Studienverlauf





„Special case“ Endurance Events

# Test criteria for endurance differs a lot to all other athletic events



Tab. 6 Typical microcycles A. Reh Silver Youth Olympics 2014 3.000 m							
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
11.-13.7.					Warm-Up Sprint-ABC, Runs: 10 x 150m ( < 23 Sek)	Warm-Up TL BA1 5 x 1030m Forest (3:30) Start all 5:30  35 Min reg DL	BE1 1 10 Km
14.-20.7.	Warm-Up 15 x 300m (51 s, Start every 2 min	BE1 10 Km	Warm-Up BE2 3 x 3 x ca. 9 Min, Break 2:30 min	BE1 10 Km	Warm-Up Sprint-ABC, Sprint: 5 x 80m, 5 x 110m, 5 x 50m	Warm-Up Runs: 10 x 400 (72 s) start every 2:30 Min  35Min easy jog	BE1 10 Km
21.-28.7.	Warm-Up GA2 4x2x1030 forest, start every 7.20 Min	free	CE 800-1000-1200-1000-400, (2.24, 2.59, 3.37, 3.00, 65) Break 4 min+	BE1 10 Km	Warm-Up Sprint-ABC, Sprint-programm	Warm-Up Runs: 10 x 500m (92 s) Start every 3 Min	BE1 10 Km
29.-3.8.	free	BE1 12 Km	Warm-Up Uphill: 7 x 55 s activ break 2 min	CE 500-1000 1000-500 (80,8 - 2.57 3.00 - 81,4) break 4 min+	BE1 10 Km	Warm-Up Sprint-ABC, Grass-runs	Warm-Up Runs 5 x 2.40 min start every 7.30 mi  35 Min easy jog
4.-10.8.	BE1 10 Km	BE1 10 Km	free	Warm-Up	Competition 3000 9.05,15	Leichtathletiktraining 8/2015	

# 4. Individual training for youth athletes



# Criteria for an individual training plan

A grayscale photograph of three sprinters in the middle of a race on a track. They are in a low, powerful starting position, with their arms and legs extended forward. The track has white lane markings. In the background, there are trees and a building under a clear sky.

## Age

- Rising volume
- More specific training

## Biological age

- Can differ at the age of 14 by +/- three years
- Relevant is the biological age

# Criteria for an individual training plan

The background of the slide is a photograph of two male sprinters in red and black uniforms starting a race on a red running track. They are in a low starting crouch, with their arms extended forward and legs pushing off their yellow starting blocks. The track has white lane markings, and a green field and trees are visible in the background under a bright sky.

## Training years

- Which kind of training, which experiences?
- Check coordinative, technical and conditional status
- Continue the long time schedule

## Resilience / physical robustness

- Check health status
- Find out, which training fits / hurts

# Criteria for an individual training plan

A photograph of three male sprinters in the middle of a race on a blue track. They are in a low, powerful starting stance, with their arms and legs extended. The background shows a grassy field and some trees under a clear sky. The entire image has a light blue tint.

## Muscle structure

- Red fibres: more training extension
- White fibres: high intensity, long breaks

## Male vs. female training: For women:

- More stabilisation and athletic training
- More often weighttraining
- More volume, less intensity-training

# I prefer group training for young athletes


- Young people need the peer group
- The group „educates“ the single members
- Middle training intensity allows everybody to join
- The coach learns with the group
- Same training orders have different effects
- Later, there is time enough for individual training



## 5. Experiences by former athletes



# 5. Experiences by former athletes

- 
- „I specified early, but it wasn't necessary. To say the truth, I got healthy problems by it and changed the coach. He started with a lot of new exercises, so I got a new stable platform“.
  - „Luckily I made a wide range of motor experiences, I did different sports till 15 and in athletics I started with a multi event training till I found my final event“.

A survey with 2.400 former Top athletes confirms, that 60 % did different sports till the age of 14-16 years, then they concentrated to their final sport!  
Source: Leistungssport 2008

# Take-Home-Message

**Periodisation is an instrument for conditioning**

**Develop volume and intensity of training step by step**

**Stabilize / improve the techniques parallel to conditioning**

**The general training is the basic for the specific training**

**The more talented your athletes, the more basic training they need!**

Thank you for your interest!  
May be, we make a photo later?

