



**Strength training in
endurance sports**

Case study of Eveliina
Maattanen

Borut Rebolj, MSc

20.11.2023

Endurance seminar,
Pajulahti Finland



Borut Rebolj

- MSc, Faculty of Sport, University of Ljubljana
 - *"Overuse shoulder injuries in handball"*
 - Injury treatment (knee, low back pain, muscle strains)
 - Strength and condition training (basketball, football, tennis, skiing, figure skating, athletics)
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PARIS 2024 prospects coached by me



Jakob Filip Demšar, 110mH
(patellar tendinopathy)



Evelliina Maattanen, 800m
(strength training)



Jan Klobučar, volleyball
(torn ACL)

Neja Kršinar, marathon
strength training

Collaborating with Jan Petrač

- Žan Rudolf (NR, 1:45.15-800m)
 - Beginning in March 2021
 - Basic of strength training
 - Plyometrics, speed strength and semi-maximal strength training
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2016 1:46.93

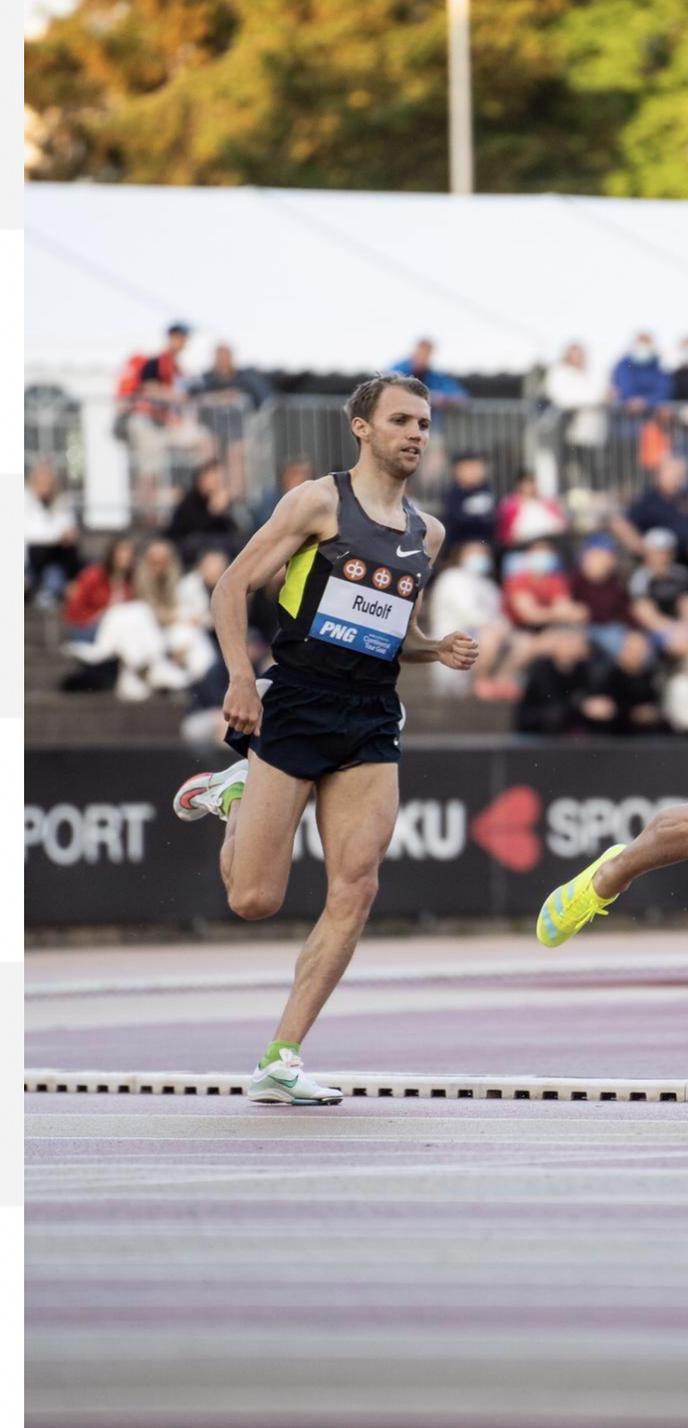
2017 1:46.96

2018 1:46.97

2019 1:47.07

2020 1:47.64

2021 1:45.15



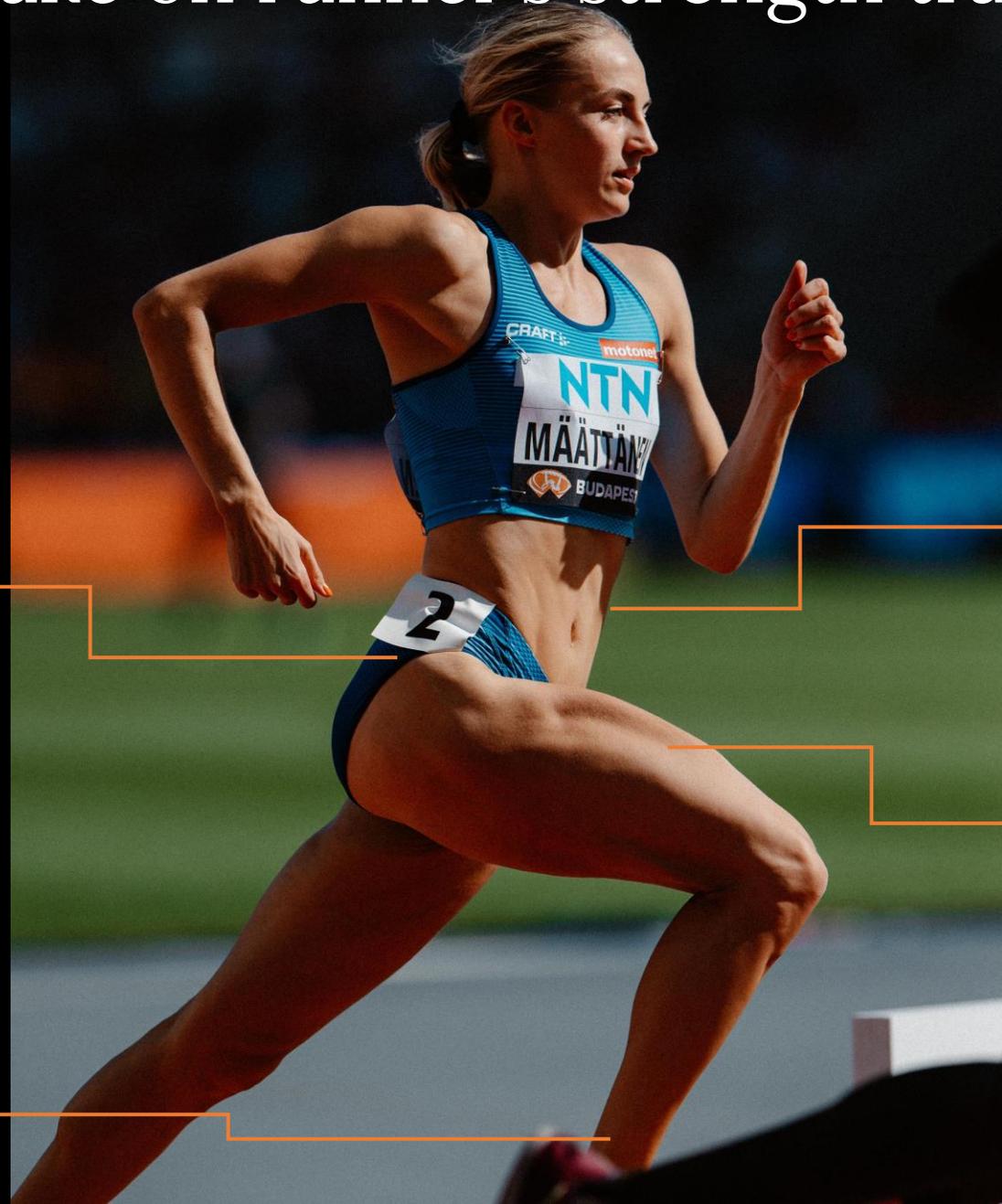


My training philosophy

- 》》》 METHODS OVER EVERYTHING
- 》》》 It's important how you lift, not how much
- 》》》 Exercises that are proven
- 》》》 Progression of exercises through the season
- 》》》 Sports specific exercises??
- 》》》 1RM testing?



My take on runner's strength training



**MOBILE AND
STRONG HIPS**

STRONG CORE

**POTENTIATION AND
STRONG STYMULUS ON
CNS (activation)**

STIFF TENDONS

Complementary exercises

»» Core strength

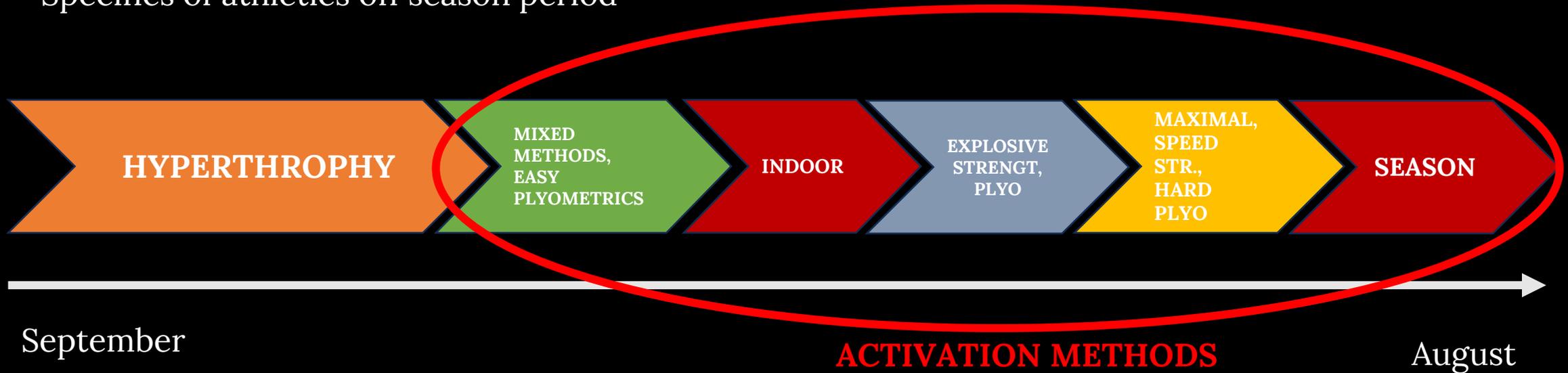
»» Hip exercises

»» Upper body



Types of (strength) periodizations

- Linear model (mostly used in preparation period in 2021 and 2022)
- One strength method at the time
- Specifics of athletics off season period



Preparation period autumn 2021- summer 2022

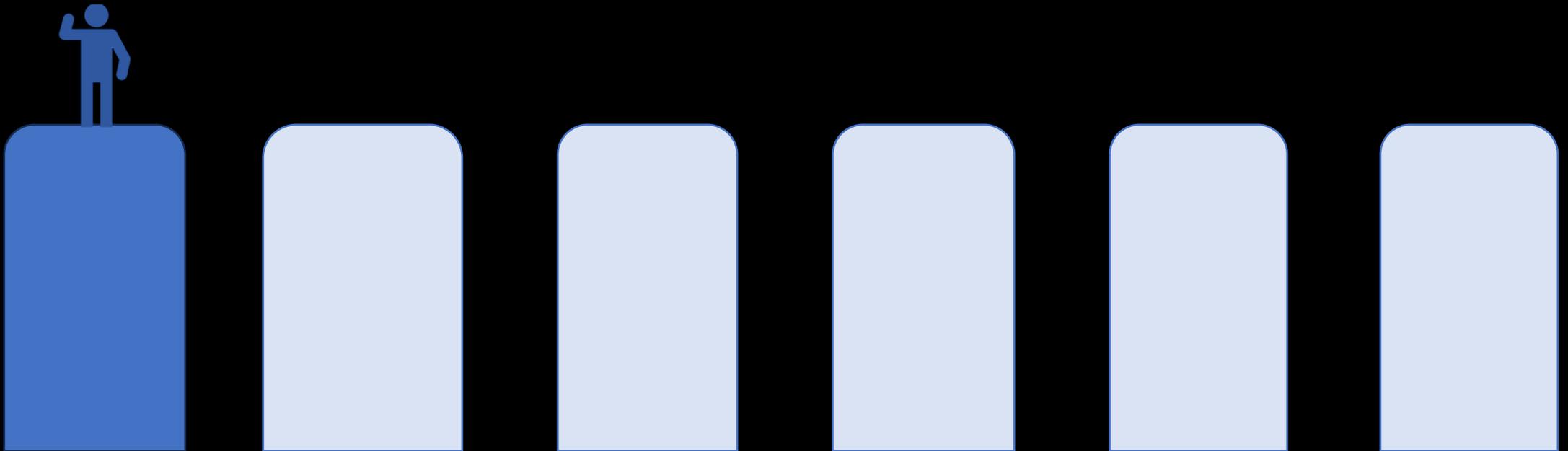
- Hamstring injury
 - 2 years without competition
 - New team
-



First block: September–December 2021

Goals:

- Treat hamstring injury
- Set a strong foundation of basic strength training
- 5 weeks of “introduction training”, 10 weeks hard
- 2 times per week (whole preparation period)





Massage and rest = rehab



Treating the hamstring injury

Train around the pain (load the posterior chain)



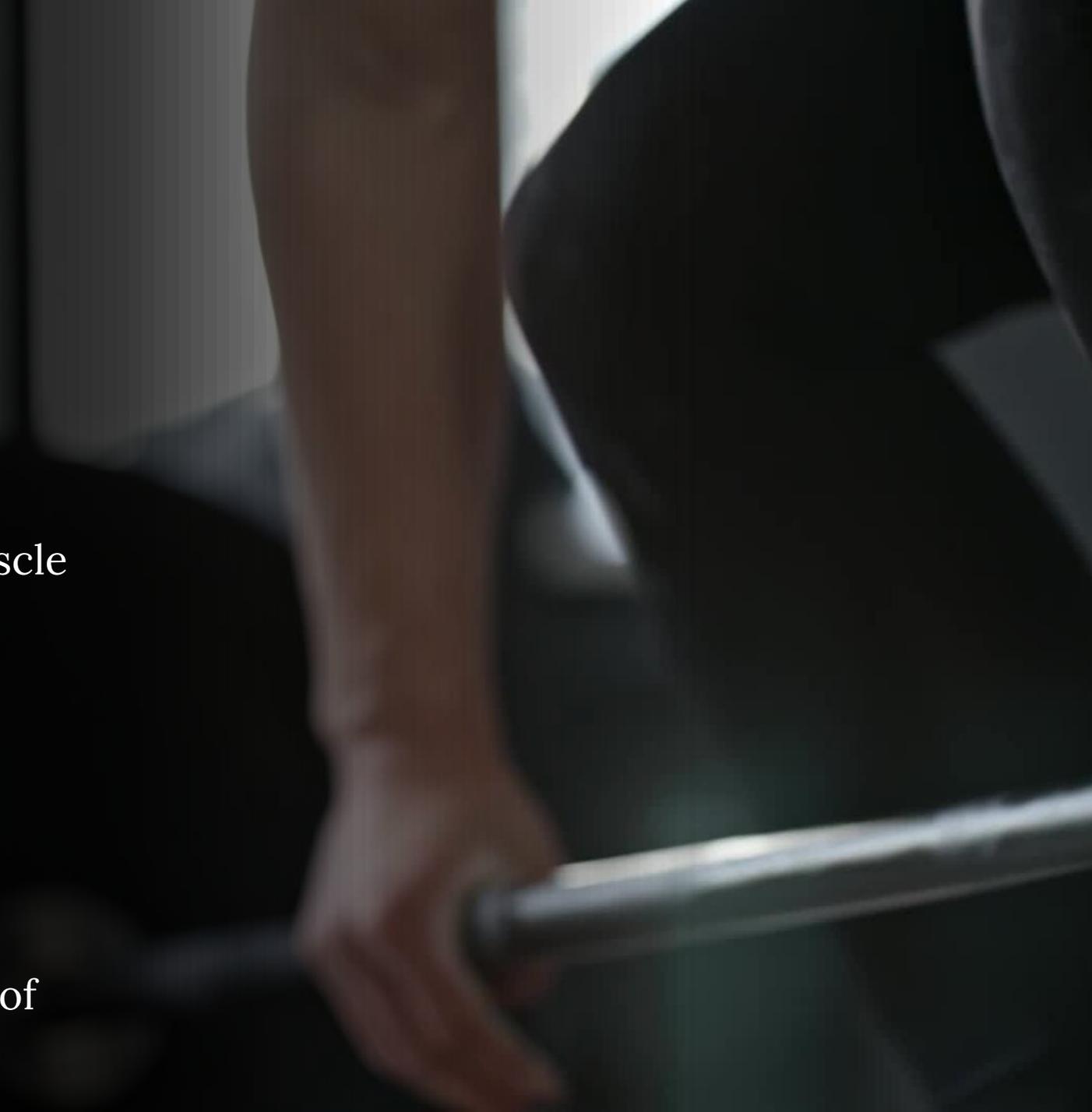
»» Implementing deadlift and hip thrust in the program.

»» Isolation of hamstring muscle and eccentric load at the end.



Strength foundation

- »» Methods of hypertrophy training
- »» Strengthen the muscle fibers and muscle and tendons junctions
- »» **INJURY PREVENTION**
- »» Minimal muscle mass gains
- »» Fast strength gains, due to low levels of strength





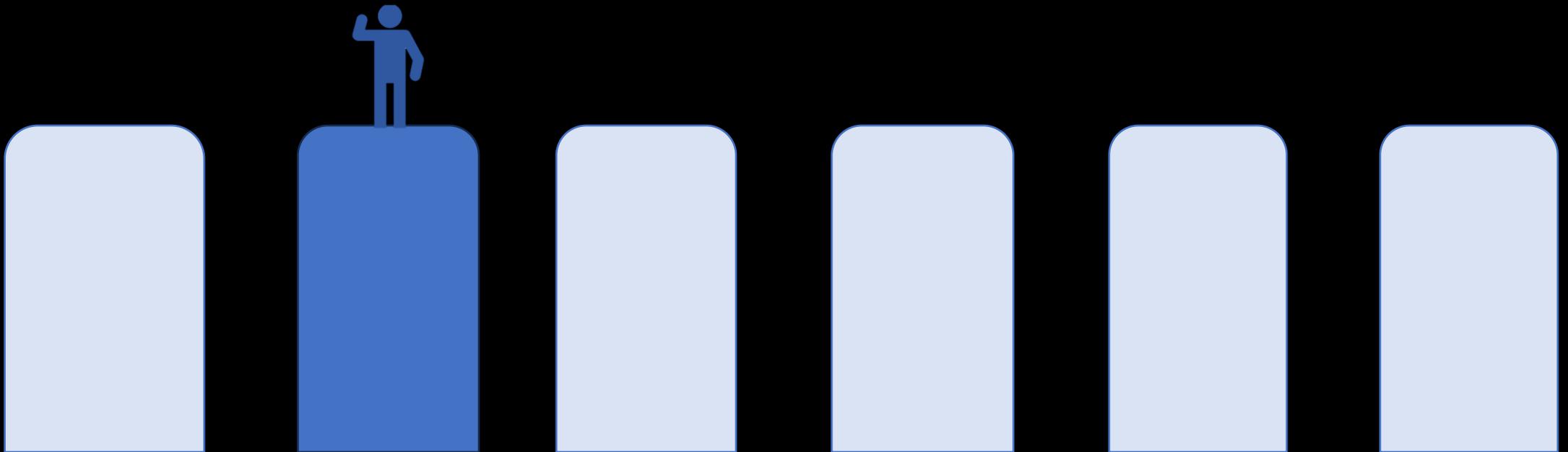
Exercises and method

3-4 sets, 8-15 reps, 40-60% 1RM, slow and controlled movement, burn at the end

Second block: December 2021-January 2022

Goals:

- Indoor season (low-mid importance)
- Start of (low load) jumping
- Increasing the intensity and methods of weight lifting
- Exercises are logically progressed from previous block



»» Low intensity pogo jumps (tendon stiffness), 15 reps, 70% max



»» CMJ on the box (soft landing)



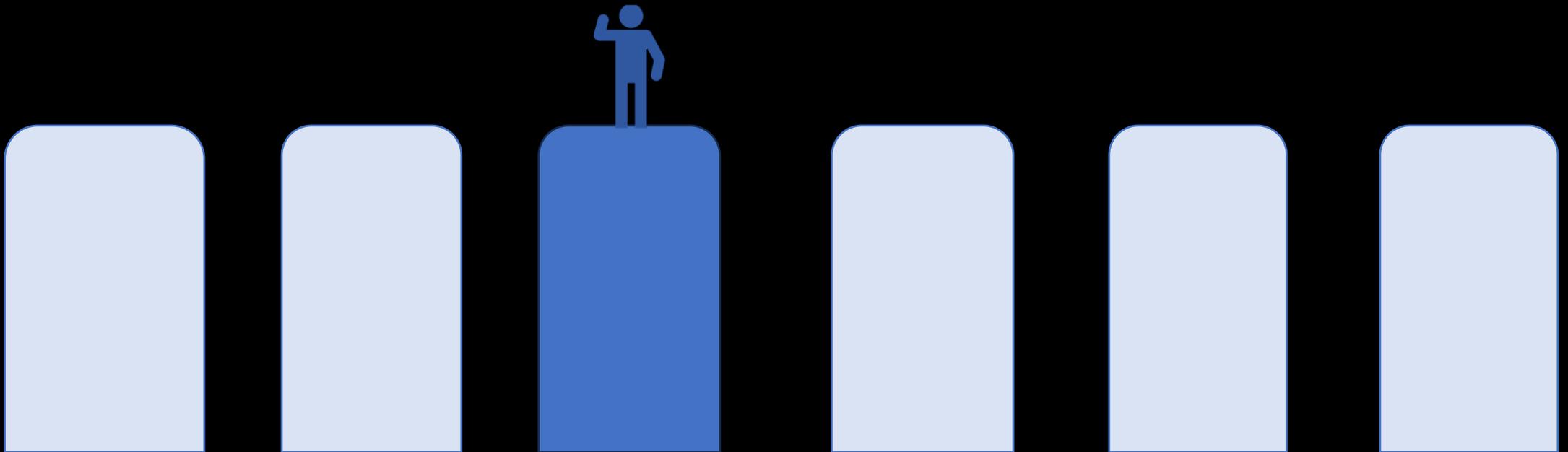
»» “Mixed methods”,
5,6-8 reps, quite
fast, around 75%
1RM



Third block: Indoor season

Goals:

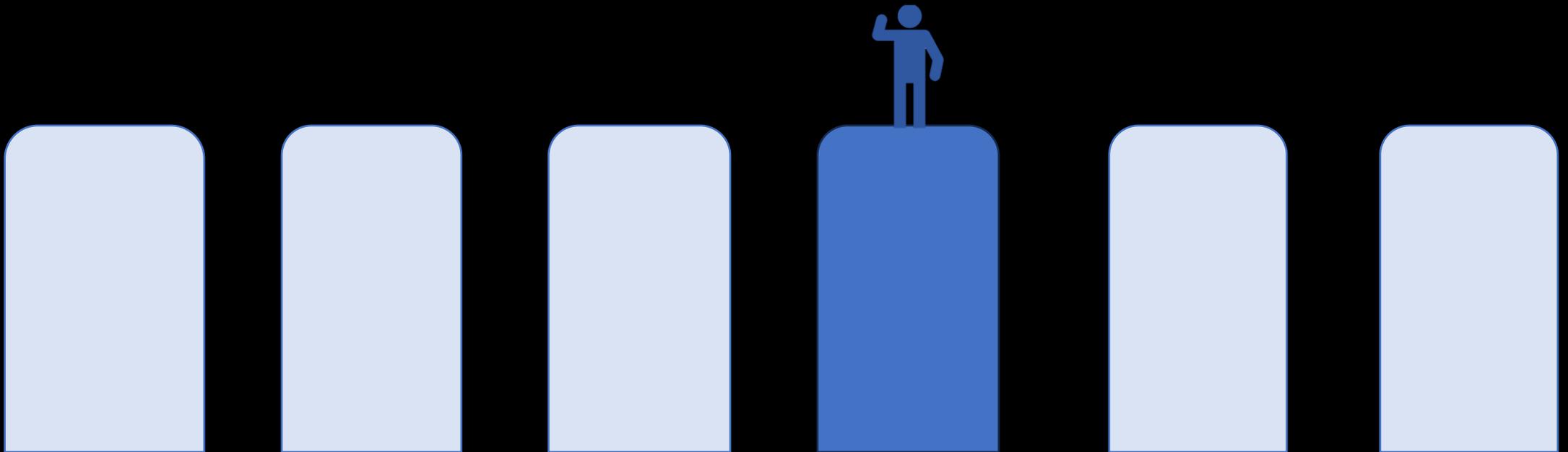
- Trying to maintain strength
- Activation before the races
- Volume is reduced by 30%
- 2:06.78 (800m)



Fourth block: March- April

Goals:

- Improving explosive strength
- Start with high intensity plyometrics
- “Building a base” of strength training before the summer



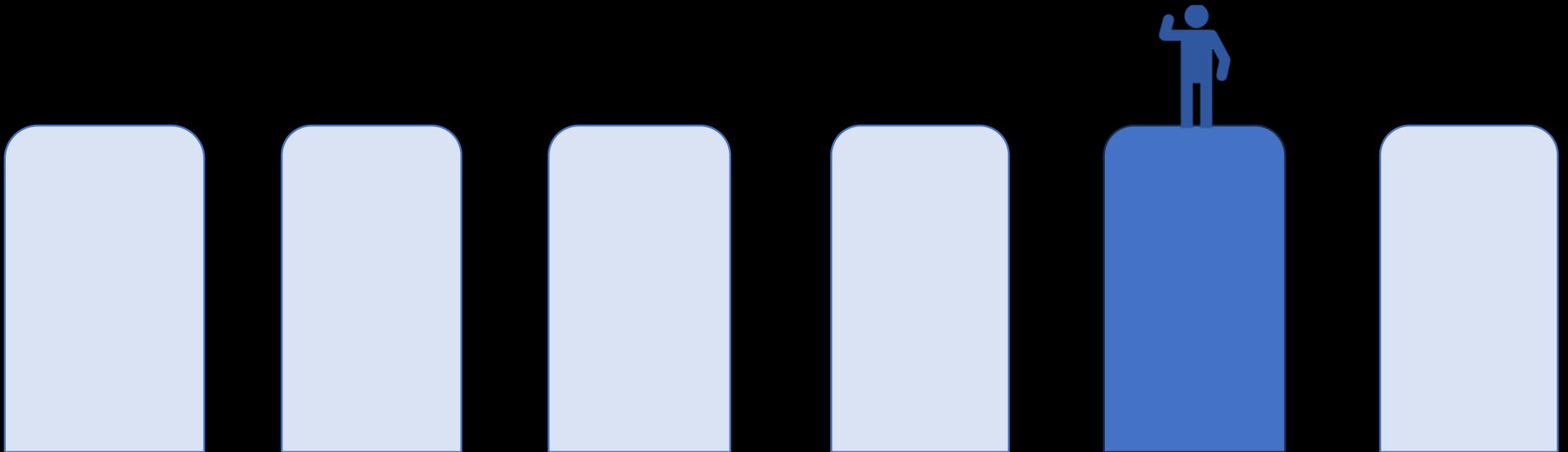
- Activation methods: explosive strength, 85-90% 1RM, 4-6 reps, 4 sets, maximal speed and effort
- Accelerate at the start of the movement not at the end
- Slightly bigger volume



Fifth block: May- June

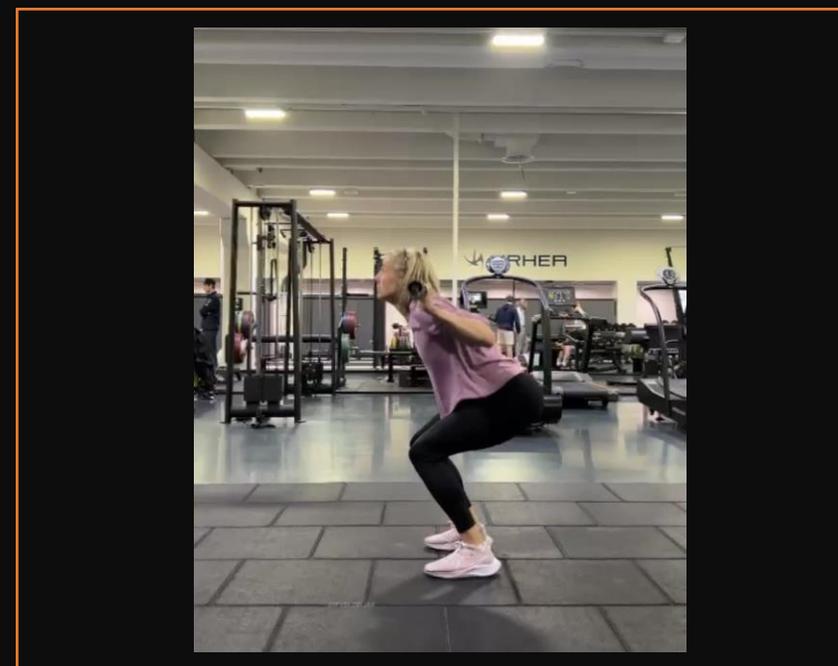
Goals:

- Maximal strength
- Progression of plyometrics
- Speed strength.



(Very) hard plyo, weighed CMJ, and drop pogo jumps, maximal effort, 4-6 jumps, 3 sets

Smaller volume, maximal intensity



- Speed strength (as contrast training); low weights, very high speed, improving elasticity in whole kinetic chain, 50% 1RM, 6 reps, 3 sets

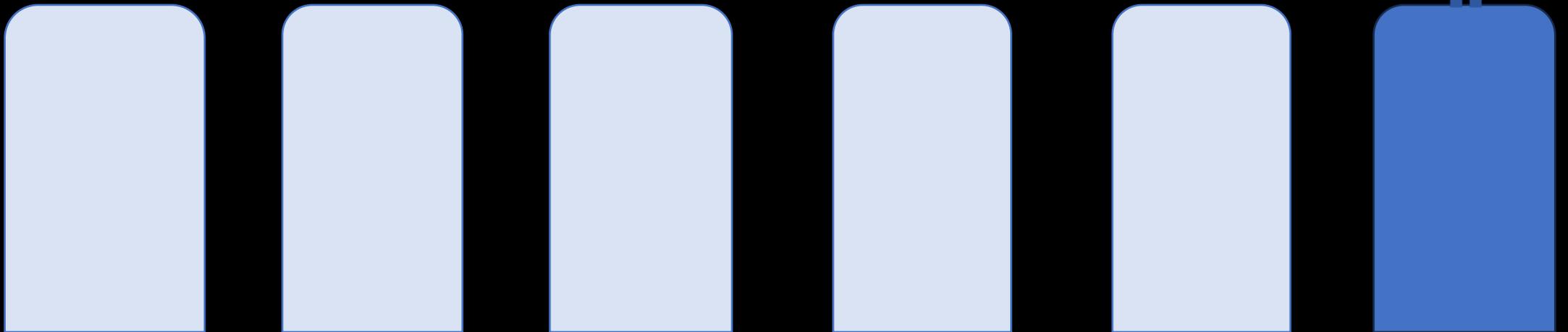


Sixth block: Main season

Goals:

- Maintenance of strength as much
- 2:01.14 (800m)

**Difficulties of planning due to WC*



Preparation period 2022-2023

Very similar as
the year before.

Easier to plan.

Focus on
improving
explosive
strength.

»» 2022-2:01.14
2023-1:59.81

»» Around 5-10%
increase in
strength

»» Little to no
changes in
selection of the
exercises

»» Faster flying 20m
and higher CMJ



Road to PARIS 2024

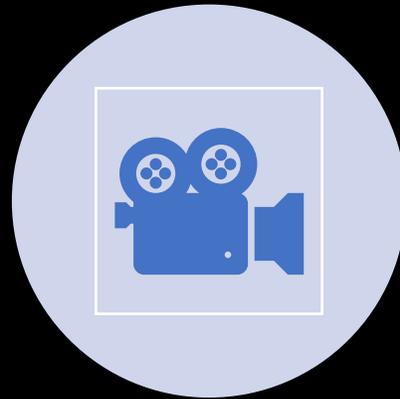
- More aggressive approach than previous years
- Activation and plyometrics training a lot sooner
- Exercises stay mostly the same



On-line collaboration



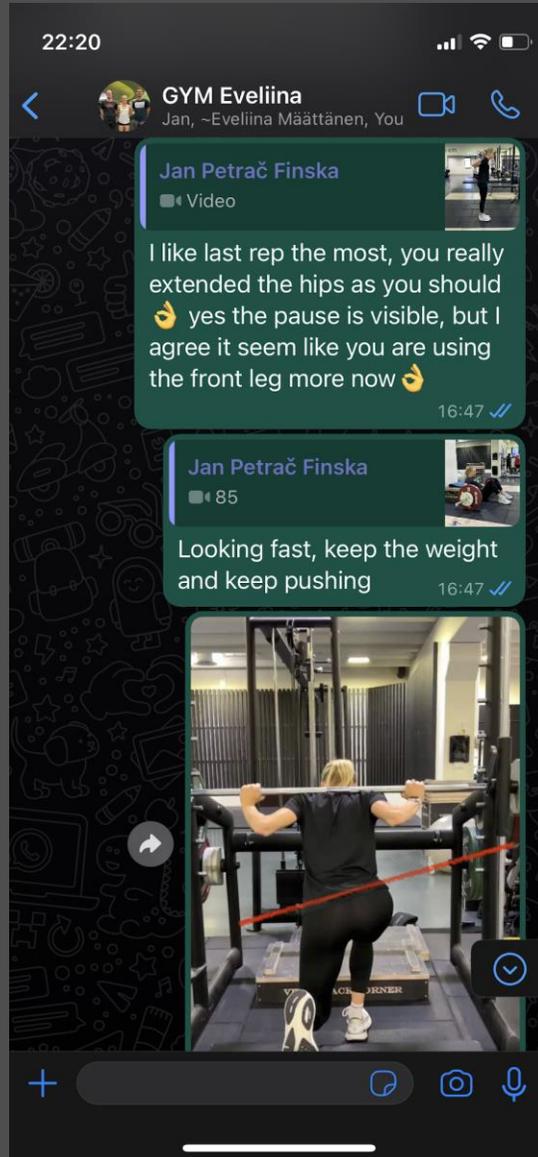
TRADITIONAL MEETING
EVERY SEPTEMBER



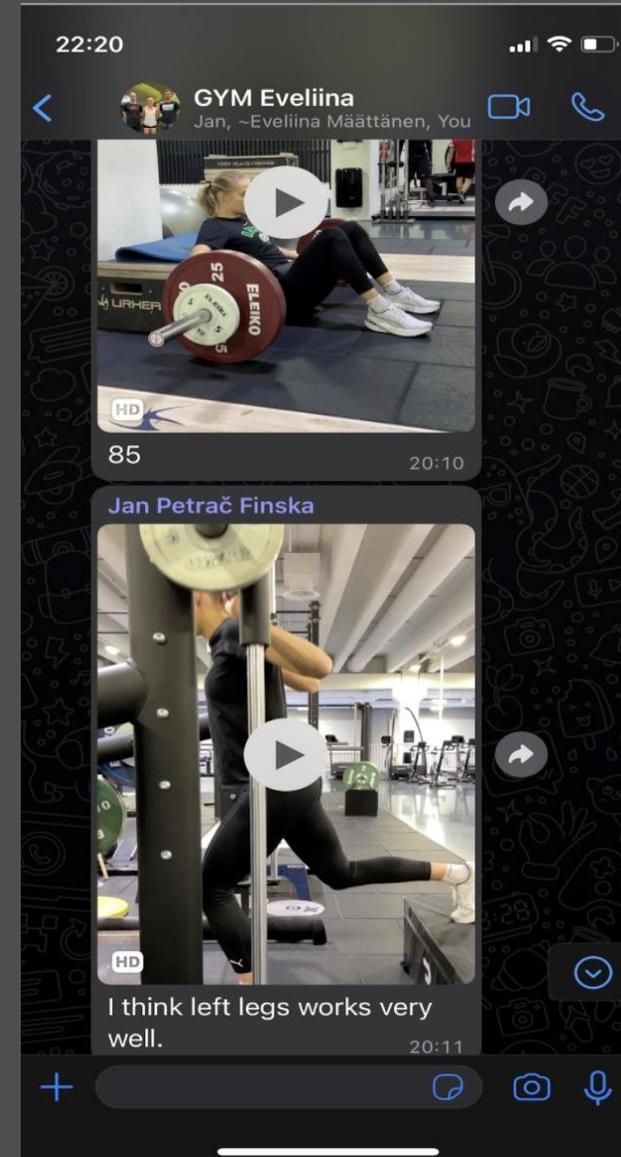
VIDEO OF EXERCISES
AND VIDEO FEEDBACK



TRUST AND OPEN
DIALOG



Examples of on-line collaboration

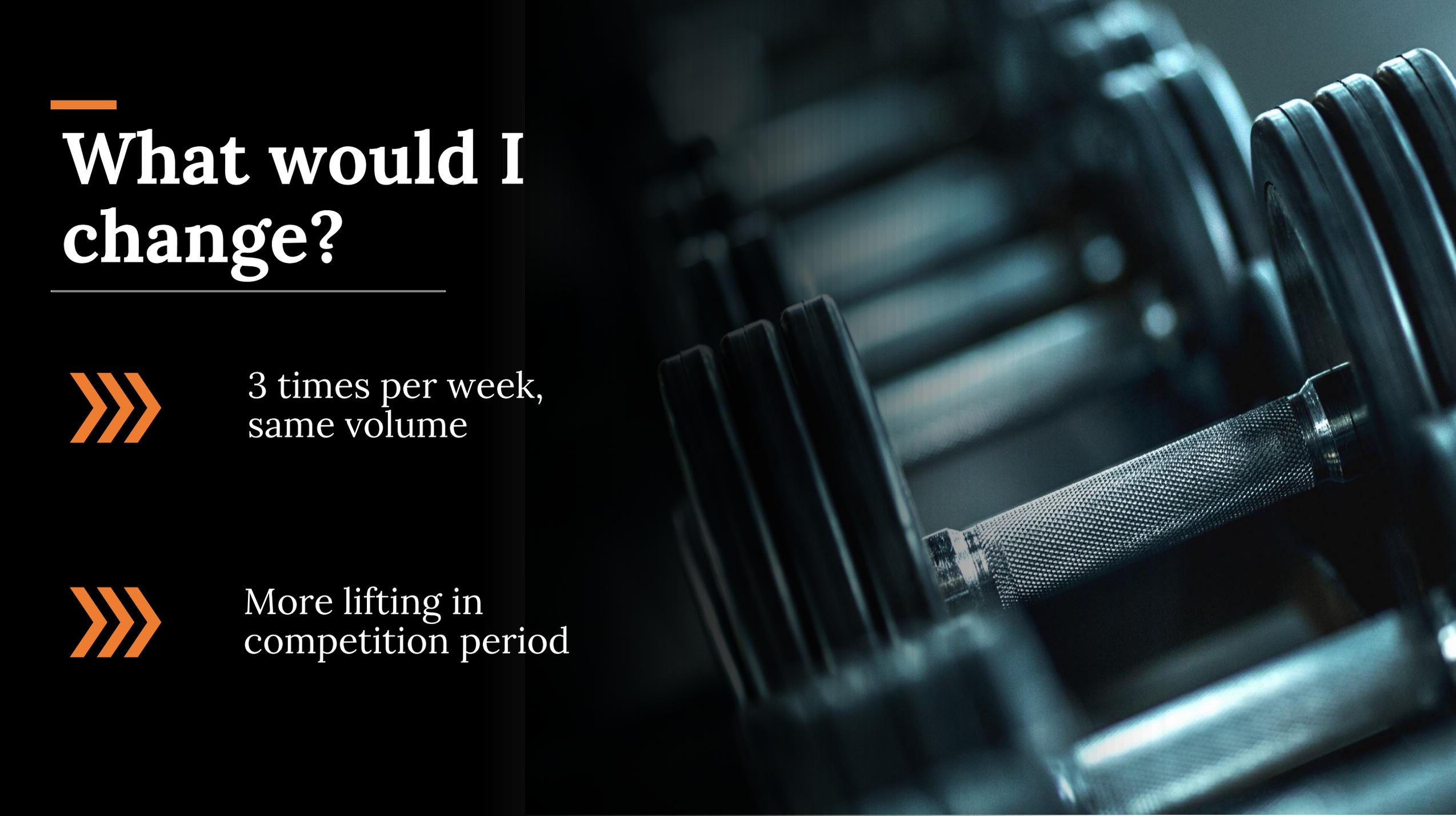


“Everything works in Finland, including Slovenian running team.”



“Between us there is a 100% trust. Complete strength program is in Borut’s hands, I just mark the days in a week’s program, devoted to the gym. Why would I interfere with that, if that is Borut’s expertise. Of course, we discuss it, but main decisions is on him.”

»Med nami vlada stooostotno zaupanje. Ko pripravim tedenski urnik treningov, samo označim, kdaj je na sporedu fitnes. Preostalo prepustim Borutu. Seveda sva na zvezi, a spet ne preveč: kaj mu bom jaz predaval o fitnesu, če pa je strokovnjak za to področje?«



What would I change?



3 times per week,
same volume



More lifting in
competition period



Thank you for your attention.

Questions?



reboljborut@gmail.com



Borut Rebolj



borut_rebolj