REPEATED-SPRINT TRAINING: WHAT IT IMPROVES AND WHY IT WORKS



Evidence-based applications for team sport performance

Repeated Sprint Training (RST) is a highly specific training method aimed at improving repeated sprint ability (RSA) and high-intensity intermittent performance.

THEME OF WORKSHOP: Repeated Sprint Training

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Method

REPEATED SPRINT TRAINING (RST) THE PHYSIOLOGY & THE PURPOSE



The term *sprint* refers to efforts of ~6 seconds or less, whereby peak power/velocity could be maintained throughout the repetition. This sprint duration is considered valid as a review of RSA by Spencer et al. found that field-based team sports are consistent in mean sprint time and distance, 2–3 seconds and 10–20 m, respectively.

EACH SPRINT RELIES PRIMARILY ON:

- ATP-PC system
- Anaerobic glycolysis

REPEATED EFFORTS ALSO PLACE STRESS ON:

- Aerobic recovery processes
- Phosphocreatine (PCr) resynthesis

RST INVOLVES:

- Multiple maximal or near-maximal sprints
- Short recovery periods (<60 s)
- Typically 10–40 m sprint distances
- Repeated over several sets

WHY USE IT?

Team sports require athletes to repeatedly:

- Accelerate
- Sprint
- Decelerate
- Change direction
- Recover quickly and repeat

RST IS DESIGNED TO DIRECTLY TARGET THESE DEMANDS.

WHAT DOES REPEATED-SPRINT TRAINING IMPROVE?

A RECENT SYSTEMATIC REVIEW & MULTILEVEL META-ANALYSIS FOUND THAT FIELD-BASED REPEATED-SPRINT TRAINING (RST) SIGNIFICANTLY IMPROVES:

SHORT SPRINT PERFORMANCE (10–20 m)	g = -0.26 95% CI [-0.50, -0.03]	SMALL
REPEATED SPRINT ABILITY (RSA)	g = -0.37 95% CI [-0.67, -0.08]	SMALL
CHANGE OF DIRECTION (CoD) ABILITY	g = -0.70 95% CI [-1.14, -0.25]	MODERATE
HIGH-INTENSITY RUNNING (HIR) PERFORMANCE	g = 0.97 95% CI [0.50, 1.43]	LARGE

NO MEANINGFUL IMPROVEMENT FOUND

VERTICAL JUMP (VJ) PERFORMANCE	g = -0.07 95% CI [-0.40, 0.25]	✕ NOT SIGNIFICANT
AEROBIC CAPACITY (VO_2max)	g = 0.02 95% CI [-0.45, 0.50]	✕ NOT SIGNIFICANT

Field-based RST improves sprint speed, repeated sprint ability, change of direction ability and high-intensity running performance in soccer players, but does not meaningfully improve jump performance or aerobic capacity.

h = Hedges' g values



Source: Chen et al. (2026)

The effects of field-based repeated-sprint training on physical performance in soccer players: a systematic review and multilevel meta-analysis.

Frontiers in Physiology, 17:1745959

n = 17 RCTs | 386 soccer players

OPTIMISING EXERCISE PRESCRIPTION

What does the evidence suggest?

EVIDENCE-BASED RST PRESCRIPTION

VARIABLE	RECOMMENDATION
Duration	2–6 weeks
Frequency	1–2 sessions·week
Sprint Distance	20–40 m
Repetitions	4–6 per set
Sets	2–4 per session*
Intra-set Recovery	20–30 s
Inter-set Recovery	2–4 min
Modality	Linear, CoD, or Multi-directional

Based on the moderating analysis of 40 publications and 48 RST groups (19 control groups) involving 754 athletes.

KEY FINDING

Increasing programme duration, frequency, sprint distance, repetitions, sets, or weekly volume **did not consistently produce greater performance adaptations.**

Effective adaptations appear achievable across a broad range of training prescriptions.

PRACTICAL IMPLICATIONS

- ✓ Prioritise quality over quantity
- ✓ Progress exposure according to athlete readiness
- ✓ Use RST as a flexible training tool
- ✓ Select the lowest effective dose that fits the environment
- ✓ Focus on implementation rather than chasing volume

MORE IS NOT NECESSARILY BETTER.

Well-designed RST programmes appear effective across a broad range of training prescriptions.

Thurlow et al., 2024.

Repeated-Sprint Training Programming Variables and Physical Adaptation: A Systematic Review and Meta-Analysis.

40 publications • 48 RST groups (19 CON) • 754 athletes

DOI: 10.1007/s40279-023-01959-1

EXAMPLE PROGRAM:

PRE-SEASON VS IN-SEASON



PRE-SEASON REPEATED SPRINT TRAINING PLAN

WEEK	MODE	SETS	REPS	SPRINT DISTANCE (m)	INTRA-SET REST (s)	RECOVERY (min)	SESSION VOLUME (m)	TRAINING EMPHASIS
1	S1–2: Straight Line S3–4: Shuttle	4	4	20	20	3	320	Build Tolerance to Repeated Efforts
2	S1–2: Straight Line S3–4: Shuttle	4	5	20	20	3	400	Increase Work Capacity
3	S1–2: Straight Line S3–4: Shuttle	3	6	30	30	3	540	Optimise Repeated Sprint
4	S1–2: Straight Line S3–4: Shuttle	3	6	30	30	3	540	Consolidate Adaptations
5	S1–2: Straight Line S3–4: Shuttle	3	4	40	30	3	480	Increase Sprint Speed Exposure
6	S1–2: Straight Line S3–4: Shuttle	3	5	40	30	3	600	Maximise RST Exposure

IN-SEASON REPEATED SPRINT TRAINING PLAN

WEEK	MODE	SETS	REPS	SPRINT DISTANCE (m)	INTRA-SET REST (s)	RECOVERY (min)	SESSION VOLUME (m)	TRAINING EMPHASIS	MICRO-DOSE (ACUTE STIMULUS)
1	Straight Line	2	5	20	20	3	200	Maintain Speed & Support	Low
2	Straight Line	2	5	20	20	3	200	Maintain Speed & Support	Low
3	Straight Line	2	5	30	30	3	300	Maintain Speed & Support	Low
4	Straight Line	2	5	30	30	3	300	Maintain Speed & Support	Low

Week Training week	Mode S1–2 / S3–4 refers to set grouping	Sets Number of sets per session	Reps Number of sprints per set	Sprint Distance (m) Distance of each sprint	Intra-set Rest (s) Rest between sprints	Recovery (min) Rest between sets	Session Volume (m) Total sprint meters per session	Training Emphasis Primary training objective	Acute Demand / Micro-dose Relative training stress of the session

RST PROGRAMMING SHOULD BE INDIVIDUALISED BASED ON PLAYER PROFILE, TRAINING AGE & COMPETITIVE DEMANDS

KEY TAKEAWAYS

1. RST IS MORE THAN CONDITIONING

RST can improve:

- ✓ Sprint performance
- ✓ Repeated sprint ability
- ✓ Change-of-direction ability
- ✓ High-intensity running performance

in trained team-sport athletes.

2. ONE METHOD, MULTIPLE OUTCOMES

RST can simultaneously target:

- Sprinting
- RSA
- CoD ability
- High-intensity running performance

without requiring separate conditioning sessions.

3. DOSE ACCORDING TO THE SEASON

PRE-SEASON

- Build tolerance
- Increase exposure
- Maximise adaptation

IN-SEASON

- Maintain adaptations
- Micro-dose sprint exposure
- Minimise fatigue

4. KEEP IT PRACTICAL

- 20–40 m efforts
- 4–6 repetitions
- 2–4 sets
- Can be performed after the warm-up before team training

SMALL DISTANCES. BIG ADAPTATIONS.

RST is one of the most time-efficient methods available for improving multiple performance qualities in team-sport athletes.



Repeated-Sprint Training (RST) Practical

The aim of this practical is to: 1) Understand the rationale for prescribing RST and its application for team sport athletes, 2) Demonstrate how RST can be programmed across pre-season and in-season training phases to target adaptation and maintenance, and 3) Explore strategies for integrating RST into dense training schedules using both dedicated sessions as well as micro-dose approaches.