

Research Alerts

MARCH EDITION: ISSUE #6

Your monthly roundup of the **LATEST RESEARCH** across the following topics.
(click a heading to jump straight to the topic)

1 STRENGTH & CONDITIONING

2 TECHNOLOGY & MONITORING

3 FATIGUE & RECOVERY

4 YOUTHS

5 NUTRITION

6 TEAM SPORTS



FOOTBALL (SOCCER)



RUGBY



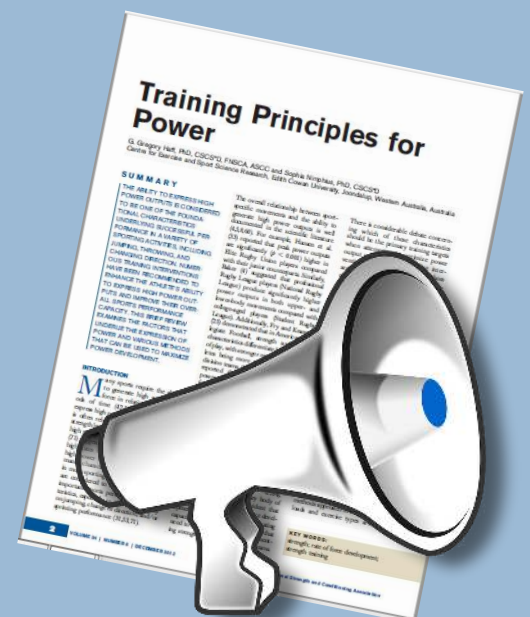
CRICKET



AMERICAN FOOTBALL



AUSTRALIAN RULES FOOTBALL



Foreword

An introductory word from the chief editor.

Issue #6 - March 2017

Welcome to Science for Sport's monthly *Research Alerts*. These monthly issues are a gathering of the latest, and best, research published in that month from peer-reviewed journals. For example, research published within October 2016 will be included within the October 2016 issue - this ensures you're up-to-date with the most recent and talked about research. When there is not enough relevant research published in that month, studies published in the preceding month(s) will be used to supplement the topic. Each new issue will be published on the last day of the month (e.g. April 2017 issue will be published on the 30th April 2017).

With hundreds of studies published every month across the realms of sports science, the primary motivation of the *Research Alerts* is to help students, practitioners, researchers and educators alike keep up-to-date with the latest peer-reviewed research—which otherwise is a seemingly impossible task. The secondary motivation is to facilitate education within the global sports science community by critiquing the studies and displaying the information in a refreshingly digestible format.

With so much positive feedback from the Science for Sport members regarding all the content (i.e. articles, videos, jobs, research and so much more) currently delivered, we felt these *Research Alerts* were a very important addition—and one we hope will be well received.

I would also like to take this opportunity to sincerely thank all the editors for their contributions and reviewing of these documents, as for without them, these would not be so valuable. It is an absolute pleasure working alongside such fantastic practitioners and academics, and I hope to see these relationships continue to develop and prosper.

Last, but by no means least, I hope you find these *Research Alerts* very helpful in your daily practice, and I'm sure you can appreciate just how much work goes into them every month. As a matter of courtesy, though we cannot always prevent you distributing these documents with other professionals, we kindly ask and hope for you to respect our work and refrain from sharing them freely.

Yours Sincerely,

Owen Walker



Owen Walker MSc*D CSCS

Founder, author and director of Science for Sport

SCIENCE for
SPORT



Strength & Conditioning

This month's top research in strength & conditioning.

FEATURE

THE EFFECTS OF ECCENTRIC CONTRACTION DURATION ON MUSCLE STRENGTH, POWER PRODUCTION, VERTICAL JUMP, AND SORENESS

Mike, JN, Cole, N, Herrera, C, VanDusseldorp, T, Kravitz, L, and Kerksick, CM. *J Strength Cond Res* 31(3): 773–786, 2017

2

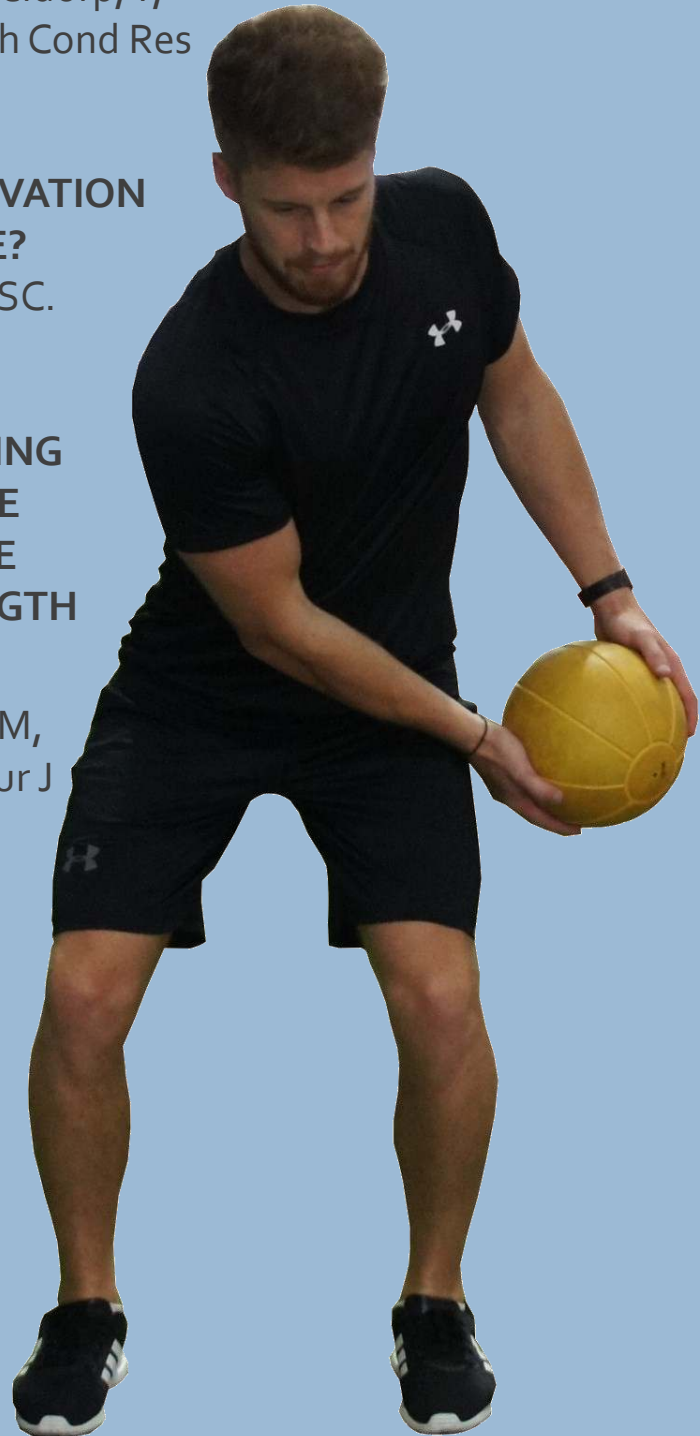
DOES SHORT-TERM GLUTEAL ACTIVATION ENHANCE MUSCLE PERFORMANCE?

Cochrane DJ, Harnett MC and Pinfold SC. *Research in Sports Medicine*.

3

EFFECT OF THE FLEXIBILITY TRAINING PERFORMED IMMEDIATELY BEFORE RESISTANCE TRAINING ON MUSCLE HYPERTROPHY, MAXIMUM STRENGTH AND FLEXIBILITY

Junior RM, Berton R, Frota de Souza TM, Chacon-Mikahil MPT, Cavaglieri CR. *Eur J Appl Physiol*.



THE EFFECTS OF ECCENTRIC CONTRACTION DURATION ON MUSCLE STRENGTH, POWER PRODUCTION, VERTICAL JUMP, AND SORENESS

OBJECTIVE: The aim of this study was to determine which eccentric contraction duration (i.e., 2-second, 4-second vs. 6-second) had the greatest effects on muscle strength, power production, vertical jump, and muscle soreness using a plate-loaded barbell Smith squat exercise.

WHAT THEY DID:

30 young males (age: 23 ± 3.5 years) with resistance training experience (3.0 ± 1.0 years) and a training frequency of 4.3 ± 0.9 days per week performed one of three eccentric training protocols for a period of 4-weeks. The control group (2S) performed 2-second eccentric contractions, another group performed 4-second eccentric contractions (4S), whilst the other performed 6-second eccentric contractions (6S). During the 4-week programme, participants completed 2 sessions per week consisting of 4 sets of 6 repetitions at 80-85% of their relative 1RM.

MEASUREMENTS:

- Strength (1RM)
- Peak and average power (loaded jump squats)
- Peak velocity (loaded jump squats)
- Vertical jump (Vertec)
- Muscle soreness (VAS scale)

WHAT THEY FOUND:

- There was significant Group x Time (G x T) interactions found for average power production across all 3 sets of a squat jump protocol ($p = 0.04$), however, although vertical jump did not reach significance there was a trend toward a difference (G x T, $p = 0.07$).
- No other significant G x T interaction effects were found for any of the variables.
- Significant improvements in 1RM ($p = 0.001$), vertical jump ($p = 0.004$), peak power ($p = 0.001$), and average power ($p = 0.001$) were observed in all groups.
- Group 6S experienced a significant reduction in peak velocity ($p = 0.03$), groups 2S and 4S did not.
- Group 2S experienced significant reductions in muscle soreness at 24, 48 and 72 hours post-exercise during week 4 compared to week 0. Group 4S experienced significant reductions in muscle soreness at 24 and 48 hours post-exercise during week 4 compared to week 0, whilst 6S only experienced a significant reduction at 48 hours post-exercise.

WHAT THIS MEANS:

Firstly, this is more evidence that supports the performance enhancing effects of eccentric training. Secondly, if gains in movement velocity are the training block objective, then short duration eccentrics (e.g. 2-4 seconds) may be more effective than longer durations (6-seconds); which were actually shown to reduce velocity. It also shows that short duration eccentrics may increase muscle soreness more than longer duration contractions during the early phases of the training block.

Lastly, the findings from this study are closely matched with a previous investigation which found that 4-second eccentric contractions were better than 1-second eccentrics for improving muscular hypertrophy in trained adults.

LIMITATIONS:

Despite being a well-controlled study, there still a couple of key weakness: 1) because of the unfamiliarity of the training type and high-volume, participants in groups 4S and 6S had struggled to complete prescribed sets and reps and had to have the load reduced in order to complete to routine—thus leading to unplanned advantage/disadvantage; and 2) the short-duration of the intervention (4-weeks).

FUTURE RESEARCH:

Future research should aim to continue this work but perhaps use an isolated exercise, such as the leg extension rather than a squat, to gain a more accurate representation of how eccentric duration effects neuromuscular performance. It should also aim to increase the intervention duration.

Mike, JN, Cole, N, Herrera, C, Van Dusseldorp, T, Kravitz, L, and Kerksick, CM. The effects of eccentric contraction duration on muscle strength, power production, vertical jump, and soreness. *J Strength Cond Res* 31(3): 773–786, 2017 [\[Link\]](#)

ARTICLE TITLE

DOES SHORT-TERM GLUTEAL ACTIVATION ENHANCE MUSCLE PERFORMANCE?



OBJECTIVE:

The purpose of this study was to determine if a 6-week gluteal activation programme could improve neuromuscular activation and muscular performance in elite rugby players.

WHAT THEY DID:

24 semi-professional male rugby players were randomly assigned to either a gluteal activation group (GLUTE) or a control group (CON). The GLUTE group performed seven gluteal activation exercises three times per week for six weeks, whilst the CON performed no gluteal activation exercises. Electromyography (EMG) was measured during a maximal isometric unilateral squat (MVIC) and unilateral hip extension force from the left and right vastus lateralis, gluteus maximus, and biceps femoris.

WHAT THEY FOUND:

After six weeks of training, the results showed no significant improvement in either muscle activity (i.e. EMG) or peak force between the GLUTE and CON groups. Therefore, the targeted gluteal programme appeared to have no effect on muscle performance.

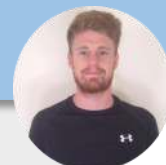
Reference:

Cochrane DJ, Harnett MC and Pinfold SC. Does short-term gluteal activation enhance muscle performance? Research in Sports Medicine. [\[Link\]](#)

EDITORS COMMENTS:

"Glute 'activation' routines have almost become a cornerstone in some exercise preparation circles, particularly in European football. But to what value does this add? Well unfortunately this is the only real study which has investigated this practice, and the results showed no improvement.

My current view: Of course warm-up — this includes dynamic contractions and stretching — the glutes before exercise as you would any other body part, but ideally the strengthening and movement work (e.g. landing) should be done during training and perhaps with loads which are capable of providing enough stimulus for improvement. I'm yet to be convinced that mini-band glute routines before a game or competition will improve performance or reduce injury risk."



Owen Walker

Reference:

Junior RM, Berton R, Frota de Souza TM, Chacon-Mikahil MPT, Cavaglieri CR. Effect of the flexibility training performed immediately before resistance training on muscle hypertrophy, maximum strength and flexibility. Eur J Appl Physiol. [\[Link\]](#)

ARTICLE TITLE

EFFECT OF THE FLEXIBILITY TRAINING PERFORMED IMMEDIATELY BEFORE RESISTANCE TRAINING ON MUSCLE HYPERTROPHY, MAXIMUM STRENGTH AND FLEXIBILITY



EDITORS COMMENTS:

"These results almost come at no surprise to people who are up-to-date with what is currently known about pre-exercise static stretching. But it should be noted that this applies to static stretching, and not dynamic.

However, the real question is yet to be answered. Which is: would we still get these results if a typical dynamic warm-up was performed immediately after the static stretching? This is the real world question, simply because dynamic warm-ups very often follow any form of static stretching."



Owen Walker

OBJECTIVE:

The aim of this study was to compare the effect of flexibility training performed immediately before resistance training (FLEX-RT) versus resistance training without flexibility training (RT) on muscle hypertrophy, maximum strength, and flexibility.

WHAT THEY DID:

9 healthy males (age: 25.4 ± 5.3 years) had each leg randomly assigned to either the FLEX-RT or RT protocol. Both groups performed four sets of leg extensions to voluntary failure using 80% of their pre-determined 1RM. The only difference was the FLEX-RT performed two sets of 25-second static stretching before resistance training. Total repetitions and total volume were calculated during weeks 1–5 and 6–10. The vastus lateralis muscle cross-sectional area (CSA), 1RM, and flexibility were assessed at before and after the 10-week intervention.

WHAT THEY FOUND:

The results showed that the total repetitions and total volume were lower for FLEX-RT than for RT during both weeks 1-5 and 6-10. Greater increases in vastus lateralis CSA was observed for RT than FLEX-RT (12.7 and 7.4%, respectively). Similar changes in 1RM were observed between RT and FLEX-RT (12.7 and 12.9%, respectively). Greater increases in flexibility were observed for FLEX-RT (10.1%) than for RT (2.1%). The results suggest that performing flexibility training before resistance training can lead to larger improvements in flexibility, but a lower number of total repetitions, total volume, and muscle hypertrophy.

Technology & Monitoring

This month's top sports science research on technology and monitoring.

FEATURE

EVENING ELECTRONIC DEVICE USE: THE EFFECTS ON ALERTNESS, SLEEP AND NEXT-DAY PHYSICAL PERFORMANCE IN ATHLETES

Jones MJ, Peeling P, Dawson B, Halson S, Miller J, Dunican I, Clarke M, Goodman C & Eastwood P (2017): Journal of Sports Sciences.

2

RELIABILITY, VALIDITY, AND INJURY PREDICTIVE VALUE OF THE FUNCTIONAL MOVEMENT SCREEN: A SYSTEMATIC REVIEW AND META-ANALYSIS

Bonazza NA, Smuin D, Onks CA, Silvis ML and Dhawan A. Am J Sports Med.

3

INTERDAY RELIABILITY OF THE REACTIVE STRENGTH INDEX AND OPTIMAL DROP HEIGHT

Byrne, DJ, Browne, DT, Byrne, PJ, and Richardson, N. J Strength Cond Res 31(3): 721–726, 2017.



EVENING ELECTRONIC DEVICE USE: THE EFFECTS ON ALERTNESS, SLEEP AND NEXT-DAY PHYSICAL PERFORMANCE IN ATHLETES

OBJECTIVE: The purpose of this study was to investigate the influence of different tasks (i.e. puzzles and reading) performed on electronic devices in the evening and before sleep on pre-sleep alertness, subsequent sleep quality and next-day athletic performance.

WHAT THEY DID:

8 highly-trained female netball players (age: 18 ± 1 years) attended a sleep laboratory for pre-sleep testing, polysomnographic sleep monitoring and next-day physical performance testing on 5 separate occasions (1 familiarisation and 4 experimental sessions). For 2-hours prior to bedtime, athletes completed cognitively stimulating tasks (puzzles) or passive tasks (reading) either on paper or on a tablet in a randomised counter-balanced design.

MEASUREMENTS

- Melatonin
- Cortisol
- Sleepiness
- VAS predicted ease of onset of sleep
- VAS alertness
- Tympanic temperature
- Brunel Mood Scale
- Polysomnographic measures
- Star Excursion Balance Test
- Reactive agility test
- Yo-Yo intermittent recovery test level 1

WHAT THEY FOUND:

- Sleepiness was greater after reading from paper compared to completing puzzles on paper ($d = 0.80$), but not with a tablet.
- Melatonin concentrations were higher after reading on a tablet compared to completing puzzles on a tablet ($p = 0.02$).
- There were no significant differences in sleep quality, sleep quantity or next-day athletic performance between any of the conditions.

WHAT THIS MEANS:

The results from this study suggest that using a tablet for 2-hours prior to sleep does not negatively affect subsequent sleep or next-day athletic performance in highly-trained athletes.

In addition, this study not only analysed the effect of electronic devices on sleep and performance, but also whether the type of activity (i.e. reading or puzzles) had any effect. And although melatonin concentrations were lower after the tablet-based puzzles than tablet-based reading, this had no significant impact on alertness, sleep or athletic performance.

LIMITATIONS:

Sleep was only monitored for 1 evening; it is possible that multiple nights of altered melatonin levels and feelings of sleepiness may lead to a reduction in sleep, sleep quality and athletic performance.

Secondly, although individual reports were provided in this study, it is possible that individuals may, and likely do, respond differently to the same tasks; therefore providing the same stimulus for all participants may be too simplistic.

FUTURE RESEARCH:

Future studies should perhaps attempt to individualise the stimulus. They should also investigate the effects of other types of electronic devices (e.g., smartphones and laptops) and in different populations (e.g., non-athletes, adults, males and youths).

ARTICLE TITLE

RELIABILITY, VALIDITY, AND INJURY PREDICTIVE VALUE OF THE FUNCTIONAL MOVEMENT SCREEN: A SYSTEMATIC REVIEW AND META-ANALYSIS



OBJECTIVE:

The purpose of this systematic review and meta-analysis was to determine whether: 1) the functional movement screen (FMS) is a reliable screening tool; 2) the FMS is a valid tool to identify functional asymmetries; and 3) if a lower score, and what specific score, on the FMS correlates with a higher risk of musculoskeletal injuries.

WHAT THEY DID:

Two electronic databases MEDLINE and ScienceDirect were searched for relevant studies. From the search, 6 studies for reliability, 5 studies for validity and 9 studies for the injury predictive value which met the inclusion-exclusion criteria were used for the quantitative analysis.

WHAT THEY FOUND:

The results showed that the FMS has excellent inter-rater (ICC = 0.81) and intra-rater (ICC = 0.81) reliability. With regards to the injury predictive value, it also suggested that participants with composite scores of ≤ 14 have a higher likelihood of injury compared with those with higher scores. Due to a lack of required data, the validity of the FMS could not be performed.

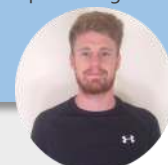
Reference:

Bonazza NA, Smuin D, Onks CA, Silvis ML and Dhawan A. Reliability, Validity, and Injury Predictive Value of the Functional Movement Screen: A Systematic Review and Meta-analysis. Am J Sports Med. [\[Link\]](#)

EDITORS COMMENTS:

"This is a good example of a poor article—i.e. just because it's published, doesn't mean it's accurate.

The FMS may have good rater reliability, but tell an athlete how they can improve their score and they've been shown to do so. This shows the test lacks participant reliability and also validity. In fact, the FMS lacks many forms of validity which you can read about [HERE](#). Also, the injury predictive value of this test is based on 'grouped' data, not individual. There are simply too many confounding factors (e.g. strength and reaction time) which can contribute to injury, thus the FMS should not be seen as a useful tool for predicting injury—you can read more [HERE](#)."



Owen Walker

Reference:

Byrne, DJ, Browne, DT, Byrne, PJ, and Richardson, N. Interday reliability of the reactive strength index and optimal drop height. J Strength Cond Res 31(3): 721–726, 2017. [\[Link\]](#)

EDITORS COMMENTS:

"With so many elite environments using the incremental depth jump test to measure their athletes fitness and fatigue on a daily basis, it's easy to see how analysing its inter-day reliability across various heights was an important task—though perhaps they should've tested more than just two days.

Regardless, this test has now been shown to have excellent intra- and inter-day test-retest reliability as well as inter-day reliability using various drop heights. Now the work just needs to be conducted on the other RSI tests (e.g. 10/5 test)."



Owen Walker

ARTICLE TITLE

INTERDAY RELIABILITY OF THE REACTIVE STRENGTH INDEX AND OPTIMAL DROP HEIGHT



OBJECTIVE:

The aim of this study was to determine the inter-day reliability of the reactive strength index (RSI) and optimal drop height (ODH) from multiple drop heights.

WHAT THEY DID:

19 trained male athletes (23.1 ± 2.9 years) performed two maximal effort depth jumps from four incremental drop heights (30, 40, 50, and 60 cm), on two separate testing sessions scheduled 48-hours apart. The reliability of the RSI and ODH were assessed using an intraclass correlation coefficient (ICC) and coefficient of variation (CV).

WHAT THEY FOUND:

The results demonstrated that the RSI and ODH both produced acceptable levels of inter-day reliability with ICC ≥ 0.80 (0.87 and 0.81) and CV $\leq 10\%$ (4.2 and 2.98), respectively. These findings suggest that daily RSI and ODH can be accurately determined using the incremental depth jump test.

Fatigue & Recovery

This month's top sports science research on fatigue and recovery.

FEATURE

ACUTE EFFECTS OF KINESIO TAPING ON MUSCLE FUNCTION AND SELF-PERCEIVED FATIGUE LEVEL IN HEALTHY ADULTS

Lee NH, Jung HC, Ok G & Lee S (2017)
European Journal of Sport Science.

2

EFFECT OF SWEDISH MASSAGE ON DOMS AFTER STRENUOUS EXERCISE

Holub C and Smith JD. International
Journal of Exercise Science 10(2): 258-265,
2017.

3

EFFECTIVENESS OF USING WEARABLE VIBRATION THERAPY TO ALLEVIATE MUSCLE SORENESS

Cochrane DJ. Eur J Appl Physiol (2017)
117:501-509.



ACUTE EFFECTS OF KINESIO TAPING ON MUSCLE FUNCTION AND SELF-PERCEIVED FATIGUE LEVEL IN HEALTHY ADULTS

OBJECTIVE: The aim of this study was to investigate the acute effects of Kinesio taping (KT) on muscular power, strength, endurance, and self-perceived fatigue.

WHAT THEY DID:

18 healthy adults (7 males [23.86 ± 1.68 years] and 11 females [24.82 ± 3.71 years]) underwent three different trials which included no tape (NT), a placebo tape (PT), and KT in a randomised, partial double-blind, crossover trial. Measures of peak and mean power, muscular strength and endurance, and self-perceived fatigue after each condition.

MEASUREMENTS:

- Peak power
- Mean power
- Muscular strength
- Muscular endurance
- Self-perceived fatigue

WHAT THEY FOUND:

- No significant differences were found in any of the measures ($p > 0.05$) except for muscular endurance ($F = 5.775$, $p = 0.007$).
- Muscular endurance in the NT (58.28 ± 12.18 reps/min) condition was significantly higher than that in the KT (52.83 ± 11.76 reps/min) condition.

WHAT THIS MEANS:

The results from this study indicate that KT has no significant positive effects on muscular power, strength, endurance, or self-perceived fatigue level in healthy adults.

Despite previous research reporting positive effects on performance when using KT, this is one of the only studies to have used a high-quality design; that being, a randomised, partial double-blind, crossover trial with a placebo control. As a result, many of the other studies 'may' be finding inaccurate results and be suggesting that KT is effective for improving performance when in fact it 'may' not be. However, this study is also not perfect, but it is one of the highest-quality studies conducted on this alleged ergogenic aid.

LIMITATIONS:

One key limitation to this study was the use of a hand-held dynamometer to assess improvements in isometric strength despite the tape being applied to the ankle and thigh. The second limitation: despite the participants being blinded during the application of the tape and having it covered during testing, they were still able to differentiate between NT and the taping conditions.

FUTURE RESEARCH:

Future research should firstly look to improve the double-blind methods associated with KT research. Using similar methodologies, researchers should also attempt to examine if KT can effect intra-session performance and recovery during resistance training or sport-specific tasks.

ARTICLE TITLE

EFFECT OF SWEDISH MASSAGE ON DOMS AFTER STRENUOUS EXERCISE



OBJECTIVE:

The aim of this study was to examine the effects of massage on the delayed onset of muscle soreness (DOMS) after a bout of DOMS-inducing exercise.

WHAT THEY DID:

20 untrained college students (males = 13; females = 7) aged between 18-40 years performed two sets of a squatting exercise to fatigue. Immediately after exercise (~3 mins), a 20 minute massage consisting of effleurage, petrissage, friction and compression manual techniques was administered to the participants right or left leg. Participants rated their DOMS at 24 and 48 hours post-exercise with a single-digit incremental numeric rating scale between 0-10.

WHAT THEY FOUND:

The results showed that the DOMS in the massaged leg was significantly lower than the non-massaged leg after 24-hours ($p = .019$, $d = .56$). It also showed no significant difference between either legs at 48-hours ($p = .097$, $d = .49$). Additionally, there was a significant increase in DOMS between 24- and 48-hours in the massaged leg ($p = .043$, $d = .83$, $p = .067$, $d = .49$), but not the non-massaged leg.

The results suggest that 20-minutes of massage is effective for reducing DOMS for 24-hours post-exercise, but not 48-hours.

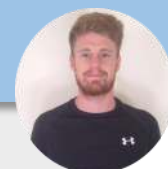
Reference:

Holub C and Smith JD. Effect of Swedish Massage on DOMS after Strenuous Exercise. International Journal of Exercise Science 10(2): 258-265, 2017. [\[Link\]](#)

EDITORS COMMENTS:

"Though this is not a high-quality study—had no control group, exercise protocol was not individualised, massage protocol was not consistent and also lacked statistical precision—it is however yet another report, to add to the many, which supports the effectiveness of massage for reducing post-exercise DOMS.

This also adds to last months Research Alerts issue (#5) which showed massage can reduce hypertonic muscles. If you wish to know more about post-exercise massage, check out my article [HERE](#).



Owen Walker

Reference:

Cochrane DJ. Effectiveness of using wearable vibration therapy to alleviate muscle soreness. Eur J Appl Physiol (2017) 117:501–509. [\[Link\]](#)

EDITORS COMMENTS:

"In conclusion, VT reduced muscle soreness, creatine kinase and improved range of motion; however, it did not improve muscle strength recovery or EMG activity.

To my knowledge, this is the first study to assess the effects of a truly portable and wearable VT device on performance and recovery—other than the one conducted on master athletes. As such, whilst this technology may look promising, it is still very early days and I would suggest you wait until further research supports or discredits the use of this technology before investing—we'll keep you posted. If you wish to view this technology, then check out MyoVolt [HERE](#)."



Owen Walker

ARTICLE TITLE

EFFECTIVENESS OF USING WEARABLE VIBRATION THERAPY TO ALLEVIATE MUSCLE SORENESS



OBJECTIVE:

The aim of this study was to examine the short-term effect of a wearable vibration device following strenuous eccentric exercise of the elbow flexors.

WHAT THEY DID:

13 resistance-trained males (age: 21.7 ± 2.6 years) used passive rest (control) or vibration therapy (VT) on their arms after eccentric exercise. The arms selected for each protocol (VT or control) were chosen using a randomised and counterbalanced design, separated by 14 days. VT was applied for 15-minutes immediately and 24, 48, and 72 h after eccentric exercise, while the contralateral arm performed no VT (control). Muscle strength (isometric and concentric), range of motion, electromyography (EMG), muscle soreness and creatine kinase were taken pre-exercise, immediately and 24, 48, and 72 h post-eccentric exercise. Additionally, the acute effect of VT of muscle strength, range of motion, EMG, muscle soreness was also investigated immediately after VT.

WHAT THEY FOUND:

Following VT, participants experienced a significant improvement in muscle pain and range of motion at 24, 48 and 72 h post-exercise, but experienced no significant changes in muscle strength and EMG. Participants also experienced significant reduction in creatine kinase at 72 h post-exercise.

Youths

This month's top sports science research on youth populations.

FEATURE

THE ASSOCIATION OF SPORT SPECIALIZATION AND TRAINING VOLUME WITH INJURY HISTORY IN YOUTH ATHLETES

Post EG, Trigsted SM, Riekena JW, Hetzel S, McGuine TA, Brooks MA, Bell DR. *Am J Sports Med.*

2

INDIVIDUAL RESPONSE TO DIFFERENT FORMS OF RESISTANCE TRAINING IN SCHOOL-AGED BOYS

Radnor, JM, Lloyd, RS, and Oliver, JL. *J Strength Cond Res* 31(3): 787–797, 2017.

3

BACK PAIN PREVALENCE IN ADOLESCENT ATHLETES

Muller J, Muller S, Stoll J, Frohlich K, Otto C, and Mayer F. *Scand J Med Sci Sports* 2016.



THE ASSOCIATION OF **SPORT SPECIALIZATION AND TRAINING VOLUME WITH INJURY HISTORY** IN YOUTH ATHLETES

OBJECTIVE: The aims of this study were twofold: 1) to determine the association between sport specialization and injury history in adolescent athletes; and 2) to determine the association between sport volume recommendations and injury history.

WHAT THEY DID:

2011 youth athletes (female = 989; male = 1022) aged between 12-18 years completed a questionnaire regarding their specialisation status, yearly and weekly sport participation volume, and injury history. Using a 3-point scale, sport specialisation was classified as low, moderate or high. Based on the current training volume recommendations (limiting participation to less than 8 months per year, and limiting participation to fewer hours per week than a child's age), athletes were categorised into various groups. Odds ratios and confidence intervals were used to calculate associations between specialisation and volume of participation with a history of sport-related injuries in the past year.

MEASUREMENTS:

- Demographic information
- Specialisation classification
- Injury history

WHAT THEY FOUND:

- Compared to the low specialisation athletes, the high specialisation group were more likely to report a previous injury of any kind (including an overuse injury) in the previous year.
- Athletes who played their primary sport for more than 8 months of the year were more likely to report an overuse injury in both the lower- and upper-extremity.
- Athletes who participated in their primary sport for more hours per week than their age (i.e., a 12-year-old athlete who participated in their primary sport for more than 12 h/wk) were more likely to report an injury of any type in the previous year.

WHAT THIS MEANS:

The results of this study suggest that high levels of sport specialisation are associated with a history of injuries, independent of age, sex, and weekly organised sport volume.

These findings may support the current recommendations which suggest that those athletes who exceed the volume recommendations are more likely to experience injuries. Having said this, it is important to understand that this research is retrospective, meaning the training volumes were analysed against previous injury history.

LIMITATIONS:

The injury recall bias is a significant limitation with this retrospective study. This is simply because the researchers had to ask the participants (aged 12-18) to recall their injury history—this could pose issues for a number of obvious reasons. Also, the age of specialisation (only participating in 1 sport) was not determined, meaning it is impossible to understand when the athletes specialised and the associated injury risk with doing so.

FUTURE RESEARCH:

Although this retrospective investigation is very useful, future research should prospectively monitor athletes from a wide variety of regions and background demographics to objectively quantify sport volume and the injury risk.

ARTICLE TITLE

INDIVIDUAL RESPONSE TO DIFFERENT FORMS OF RESISTANCE TRAINING IN SCHOOL-AGED BOYS



OBJECTIVE:

The purpose of this study was to determine the individual responses to different forms of training (plyometric, resistance or combined) on jump and sprint performance in male youths.

WHAT THEY DID:

80 young males aged between 12 and 16 were evenly categorised into two maturity groups (pre- or post-peak height velocity [PHV]) and randomly assigned to a plyometric training, resistance training, combined training, or control group. Each group, bar the control, trained twice weekly for six weeks. Measures of acceleration, maximal running velocity, squat jump height, and reactive strength index (RSI) were collected pre- and post-intervention.

WHAT THEY FOUND:

Plyometric training and combined training resulted in significantly more improvements in sprint performance in the pre-PHV group. However, in the post-PHV group, whilst strength training and combined training led to significantly more improvements in acceleration and squat jump height, plyometric training and combined training resulted in more improvements in maximal velocity and RSI. Also, very few of the control participants improved any of their performances.

Irrespective of maturation, the results suggest that combined training provides the greatest opportunity for most individuals to make short-term improvements in jump and sprint performance. When considering maturation, plyometric training appears to be important for pre-PHV individuals, whether as a standalone method or in combination with traditional strength training, when attempting to improve jumping and sprinting ability. However, post-PHV individuals may require a more specific training stimulus depending on the performance objective (e.g. speed).

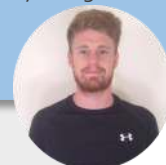
Reference:

Radnor, JM, Lloyd, RS, and Oliver, JL. Individual response to different forms of resistance training in school-aged boys. *J Strength Cond Res* 31(3): 787–797, 2017. [\[Link\]](#)

EDITORS COMMENTS:

“As we all know everybody responds differently, so the design of this study should carve the way for future research; that being, the reporting of individual responses to a group-based intervention.

The results from this study suggest that: 1) plyometric training is an important training stimulus for pre-PHV individuals, whether that’s using them on their own or in combination with the likes of strength training; and 2) post-PHV individuals may require a training stimulus which is more specific to the performance quality being targeted (e.g. acceleration).”



Owen Walker

Reference:

Muller J, Muller S, Stoll J, Frohlich K, Otto C, and Mayer F. Back pain prevalence in adolescent athletes. *Scand J Med Sci Sports* 2016. [\[Link\]](#)

ARTICLE TITLE

BACK PAIN PREVALENCE IN ADOLESCENT ATHLETES



EDITORS COMMENTS:

“Interestingly, but perhaps not surprisingly, the high rates of BP in canoeing and rowing agree with previous research.

The significant ‘spike’ in BP prevalence at 14 years and above should not only drive future research to understand why, but should also prompt practitioners to take action by closely monitoring these issues and providing effective prevention/treatment strategies. One treatment repeatedly shown to reduce BP is a well-constructed and tailored exercise programme. It should also be noted that general and core-targeted exercises both appear to be effective for reducing BP.”



Owen Walker

OBJECTIVE:

The aim of this study was to identify the prevalence of back pain (BP) in a large cohort of young athletes with respect to their age, gender, and sport.

WHAT THEY DID:

BP (within the last 7 days) was assessed with a face scale (face 1–2 = no pain; face 3–5 = pain) in 2116 athletes (m/f 61%/39%; 13.3 ± 1.7 years; 163.0 ± 11.8 cm; 52.6 ± 13.9 kg; 4.9 ± 2.7 training years; 8.4 ± 5.7 training h/week). Four different sports categories were devised (a: combat sports, b: game sports; c: explosive strength sport; d: endurance sport).

WHAT THEY FOUND:

8% of all athletes (168) presented with BP, equating to 7% of males and 9% of females. Athletes between the ages of 11–13 years showed a prevalence of 2–4%, with these numbers rising to 12–20% in the 14–17 year olds. With regards to sports, soccer had the lowest prevalence (3%), whilst canoeing presented the highest (14%). The prevalence of BP in weight lifting, judo, wrestling, rowing, and shooting were ≥10%, and in boxing, soccer, handball, cycling, and horse riding it was ≤6%. Overall, this report showed no gender differences, but prevalence appears to increase significantly after the age of 14.

Nutrition

This month's top research on nutrition.

FEATURE

TIME-RESTRICTED FEEDING IN YOUNG MEN PERFORMING RESISTANCE TRAINING: A RANDOMIZED CONTROLLED TRIAL

Tinsley G, Forsse J and Butler N et al. (2017)
European Journal of Sport Science, 17(2), 200-207.

2

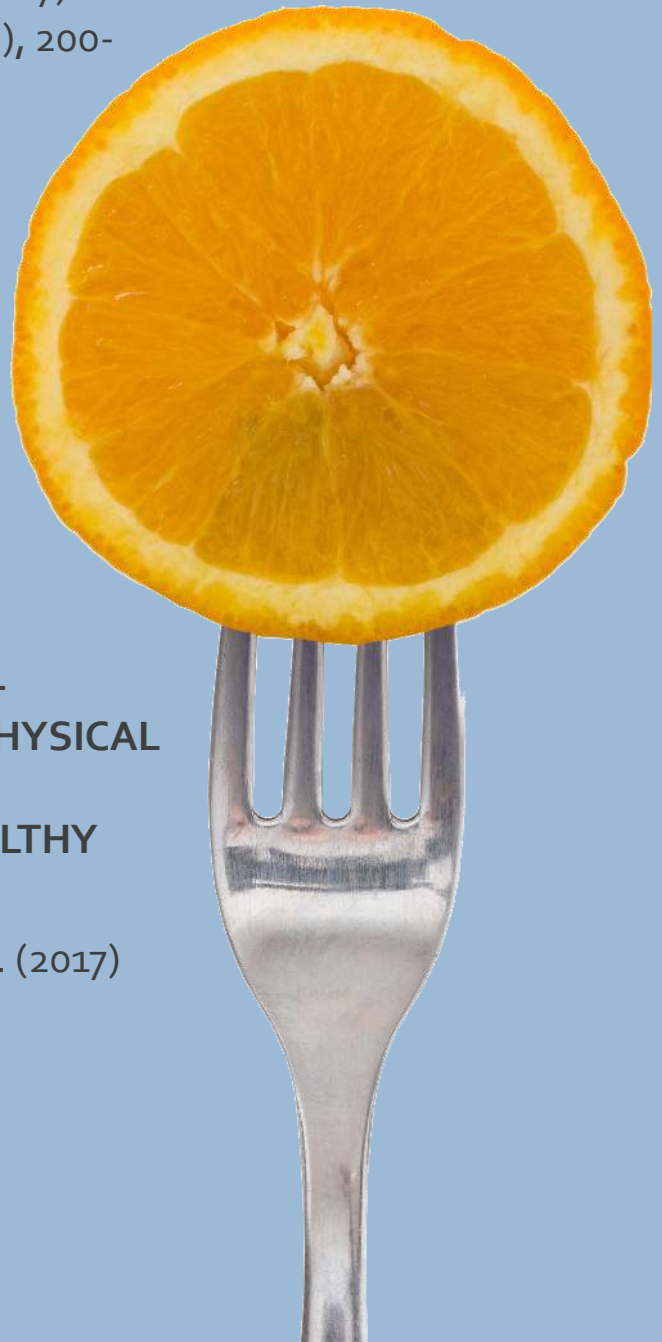
EFFECT OF AN ACUTE DOSE OF OMEGA-3 FISH OIL FOLLOWING EXERCISE-INDUCED MUSCLE DAMAGE

Jakeman J, Lambrick D, Wooley B, Babraj J, Faulkner J (2017) Eur J Appl Physiol, 117(3), 575-582.

3

IMPACT OF A 6-WEEK NON-ENERGY-RESTRICTED KETOGENIC DIET ON PHYSICAL FITNESS, BODY COMPOSITION AND BIOCHEMICAL PARAMETERS IN HEALTHY ADULTS

Urbain P, Strom L and Morawski L et al. (2017)
Nutrition & Metabolism, 14(1).



TIME-RESTRICTED FEEDING IN YOUNG MEN PERFORMING RESISTANCE TRAINING: A RANDOMIZED CONTROLLED TRIAL

OBJECTIVE: To examine the effects of a modified time-restricted feeding (TRF) programme (a type of intermittent fasting) and resistance training on nutrient intake, body composition and strength.

WHAT THEY DID:

18 young, active males (av. 87kg) were randomised to 8-weeks of resistance training and normal diet (RT-ND) or resistance training plus TRF (RT-TRF). The TRF programme required participants to consume all calories in any 4-hour window between 4pm and midnight on non-workout days only (4 days per week). The number of calories and specific foods were not limited. Both groups performed progressive resistance training three times per week consisting of alternating upper- and lower-body workouts. Dietary analysis and assessment of body composition and muscular performance were completed at baseline, and again at 4 and 8 weeks after commencement of the study.

MEASUREMENTS:

- Total body composition (by dual-energy X-ray absorptiometry)
- Muscle cross-sectional area (by ultrasound)
- Upper- and lower-body strength and endurance
- Four-day dietary records

WHAT THEY FOUND:

- TRF reduced energy intake by ~650 kcal per day of TRF (~30g fewer protein, 75g fewer carbohydrate, and 25g fewer fat).
- The TRF group lost 1kg on average over the course of the study, while the non-TRF group gained 3kg on average.
- While the TRF group did not lose any lean soft tissue, effect size data indicated a gain of 2.3kg in lean soft tissue in the non-TRF group. However, substantial inter-individual variability in body composition outcomes was observed in both groups.
- Upper- and lower-body strength and lower body muscular endurance increased in both groups, but effect sizes demonstrated greater improvements in the TRF group.

WHAT THIS MEANS:

This study is important because the effects of TRF on nutrient intake, body composition and muscular performance have not been examined previously in combination with resistance training. On the whole, while TRF appeared to have a positive effect on performance, it clearly limited muscle growth. This may have been due to inadequate protein intake, as the average daily protein intake of the TRF group was 1.0g/kg bodyweight compared to 1.4g in the non-TRF group.

Interestingly, while the TRF group consumed significantly less calories on their restricted days, they didn't compensate this deficit by eating more on normal days. Finally, participants rated TRF 3.6 out of 10 in terms of difficulty, which means that it should be a feasible diet approach for most people.

LIMITATIONS:

- Self-reported food intake
- Unsupervised resistance training
- Small sample size
- Lack of dietary control
- Measuring dietary intake on only 12 days over the course of the study

FUTURE RESEARCH:

Future studies should examine TRF in populations of differing activity levels and ages. It should also examine the impact of total caloric and macronutrient intake during TRF days on resistance training performance. Finally, future studies should employ higher protein intakes to determine if this promotes greater lean mass accretion, and ideally use matched protein intakes between groups at optimal levels for muscular hypertrophy.

Tinsley G, Forsse J and Butler N et al. (2017) Time-restricted feeding in young men performing resistance training: A randomized controlled trial. *European Journal of Sport Science*, 17(2), 200-207. [\[Link\]](#)

ARTICLE TITLE

EFFECT OF AN ACUTE DOSE OF OMEGA-3 FISH OIL FOLLOWING EXERCISE-INDUCED MUSCLE DAMAGE



OBJECTIVE:

To examine the efficacy of an acute dose of omega-3 fish oil on recovery following exercise-induced muscle damage (EIMD).

WHAT THEY DID:

27 physically active males (>3hr per week of vigorous training; age = 26 ± 4 yrs) completed 100 plyometric drop jumps to induce muscle damage. Perceptual (perceived soreness) and functional (isokinetic muscle strength at 60° and 180°/s, squat jump performance and countermovement jump performance) indices of EIMD were recorded before, and 1, 24, 48, 72, and 96 hrs after the damaging protocol. Immediately after the damaging protocol, volunteers ingested either a placebo, a low-EPA fish oil (150mg EPA, 100mg DHA) or a high-EPA fish oil (750mg EPA, 50mg DHA) at a dose of 1g fish oil capsule per 10 kg body mass.

WHAT THEY FOUND:

For the squat jump, the high-EPA fish oil group only saw a performance decrement of 2.1%, compared to a decrement of 8.3 and 9.8% in the placebo and low-EPA fish oil, respectively. Similar findings were observed for countermovement jump performance (average performance decrement of 1.7% in the high-EPA group vs 6.8 and 6.8% in the placebo and low-EPA group). There were no differences between the groups for isokinetic muscle strength or perceived muscle soreness.

Reference:

Jakeman J, Lambrick D, Wooley B, Babraj J, Faulkner J (2017) Effect of an acute dose of omega-3 fish oil following exercise-induced muscle damage. *Eur J Appl Physiol*, 117(3), 575-582. [\[Link\]](#)

EDITORS COMMENTS:

"This study shows that an acute dose of high-EPA fish oil may ameliorate some of the functional changes following EIMD.

Therefore, athletes wanting to maximise their recovery should consider including high-EPA fish oil supplements as part of their recovery strategy. This is a case where supplementation is likely necessary as the vast majority of people do not consume enough fatty fish to reach anywhere near this level of EPA intake.



Tim Rowland

Reference:

Urban P, Strom L and Morawski L et al. (2017) Impact of a 6-week non-energy-restricted ketogenic diet on physical fitness, body composition and biochemical parameters in healthy adults. *Nutrition & Metabolism*, 14 (1). [\[Link\]](#)

EDITORS COMMENTS:

"This study showed that keto diets mildly impair various measures of physical performance. While these decrements are likely not relevant for the general population, they may be of concern for competitive athletes.

Additionally, this study provided adequate time for the subjects to adapt to this diet, which is a common complaint about studies on ketogenic diets from proponents of keto. In line with other studies, this study shows that while ketogenic diets probably don't hinder lower intensity, submaximal endurance performance, they very likely impair the ability to perform high-intensity work."



Tim Rowland

ARTICLE TITLE

IMPACT OF A 6-WEEK NON-ENERGY-RESTRICTED KETOGENIC DIET ON PHYSICAL FITNESS, BODY COMPOSITION AND BIOCHEMICAL PARAMETERS IN HEALTHY ADULTS

Nutrition & Metabolism



OBJECTIVE:

To assess the impact of a 6-week non-energy-restricted ketogenic diet in healthy adults on physical performance (endurance capacity and muscle strength), body composition, and a range of blood parameters.

WHAT THEY DID:

Forty-two healthy adults aged 37 ± 12 years with an average BMI of 23.9kg/m² completed the study. Subjects were tested both before and after undertaking the 6-week ketogenic diet. All tests were performed after an overnight fast, and testing included cardiopulmonary exercise testing via cycle spirometry, blood samples, body composition, indirect calorimetry, and handgrip strength. Compliance with the dietary regimen was monitored by measuring urinary ketones daily, and 7-day food records.

WHAT THEY FOUND:

Urinary ketosis measurements showed very good compliance to the ketogenic diet (97%). VO₂ max and peak power decreased by 2.4% and 4.1% respectively, whereas handgrip strength rose slightly by 2.5%.

Subjects lost 2kg on average over the course of the study, with an even loss of fat free mass and fat mass.

Team Sports

This month's top sports science research in team sports.

FEATURE

PROXIMAL NEURO-MUSCULAR CONTROL PROTECTS AGAINST HAMSTRING INJURIES IN MALE SOCCER PLAYERS

Schuermans, J, Danneels, L, Van Tiggelen, D, Palmans, T, Witvrouw, E. American Journal of Sports Medicine 2017.

2

RESPONSES OF LOWER-BODY POWER AND MATCH RUNNING DEMANDS FOLLOWING LONG-HAUL TRAVEL IN INTERNATIONAL RUGBY SEVENS PLAYERS

Mitchell, JA, Pumpa, KL, and Pyne, DB. (2017) J Strength Cond Res 31(3): 686-695.

3

ASSESSMENT OF WORKLOAD AND ITS EFFECTS ON PERFORMANCE AND INJURY IN ELITE CRICKET FAST BOWLERS

McNamara, D., Gabbett, T., & Naughton, G. (2017). Sports Medicine, 47(3), 503-515.

4

ASSESSMENT AND TRAINING OF VISUOMOTOR REACTION TIME FOR FOOTBALL INJURY PREVENTION

Wilkerson, G. B., Simpson, K. A., & Clark, R. A. J Sport Rehabil 26(1): 26 – 34, 2017.

5

SUBSEQUENT INJURIES ARE MORE COMMON THAN INJURY RECURRENCES

Finch CF, Cook J, Kunstler BE, Akram M, Orchar J. Am J Sports Med. 2017.



PROXIMAL NEUROMUSCULAR CONTROL (“CORE STABILITY”) PROTECTS AGAINST HAMSTRING INJURIES IN MALE SOCCER PLAYERS



OBJECTIVE: The aim of this study was to assess whether the muscle activation patterns of the “core” during acceleration and full-speed sprinting are linked to hamstring injuries in male soccer players.

WHAT THEY DID:

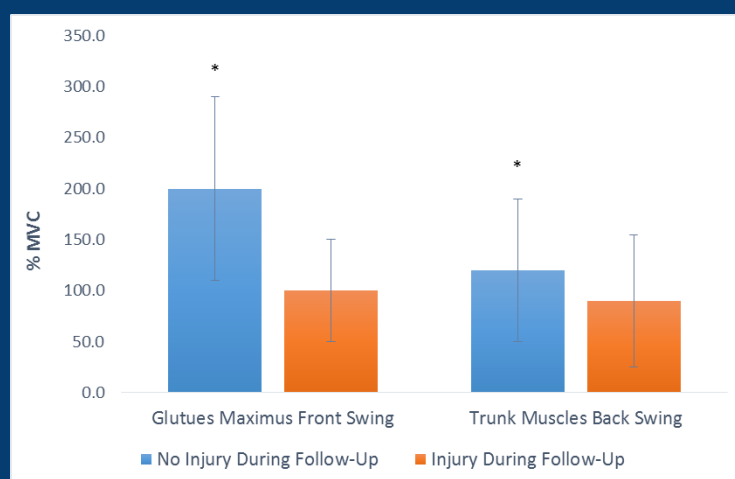
60 amateur male soccer players participated in this study. Muscle activity of the hamstring, gluteal and trunk musculature were monitored using surface electromyography (sEMG) during maximal acceleration and full-speed sprinting. Hamstring injury (HI) incidence was recorded during a 1.5 season follow-up period, and then statistically explored for causal associations.

MEASUREMENTS:

- sEMG
- 1.5 season follow-up

WHAT THEY FOUND:

- Players who *did not* experience a HI during follow-up had significantly higher amounts of gluteal activity during the front swing phase ($p = 0.27$) and also displayed higher amounts of trunk muscle activity during the back-swing phase of sprinting ($p = 0.42$).
- A 10% increment in normalised muscle activity of the gluteus maximus during the front swing phase resulted in a 20% lower risk of sustaining a HI.
- Also, a 10% increment in normalised muscle activity of the trunk muscles during the backswing phase resulted in a 6% lower risk of sustaining a HI.



WHAT THIS MEANS:

Muscle activity of the core during explosive running appears to be associated with hamstring injury occurrence in male soccer players. Higher amounts of gluteal and trunk muscle activity during the airborne phases of sprinting were associated with a lower risk of hamstring injuries.

The findings from this paper support the use of increasing neuromuscular control of the gluteal and trunk muscles during sprinting in order to reduce the risk of hamstring injuries. Therefore, practitioners should perhaps attempt to improve core activation and stability during explosive running.

LIMITATIONS:

- As most clubs didn't have medical staff, injury occurrence was based on participants self-report.
- Given the prospective nature of the study, the sample size is certainly another limitation.
- The multifactorial nature of hamstrings strains, combined with the small sample size and lack of assessing other cofounders (e.g. hamstring strength or fascicle length) suggests that these results may be misleading.

FUTURE RESEARCH:

Whilst the current paper is very insightful, and to my knowledge is the first to examine the relationship between “core stability” and HI in during maximal acceleration and top-speed running, it does have several significant weaknesses. Regardless, future research should continue exploring this relationship, but do so by controlling more cofounding factors (e.g. hamstring strength or fascicle length).

ARTICLE TITLE

RESPONSES OF LOWER-BODY POWER AND MATCH RUNNING DEMANDS FOLLOWING LONG-HAUL TRAVEL IN INTERNATIONAL RUGBY SEVENS PLAYERS



OBJECTIVE:

This study determined the effect of long-haul (>5 hours) travel on lower-body power and match running demands in international rugby sevens players.

WHAT THEY DID:

22 male international sevens players were assessed in the countermovement jump (peak and mean power) over 17 sevens tournaments. Testing was performed pre-travel (4-5 days pre-departure), post-travel (day 2 after arriving) and post-tournament (day 2 or 3 post-tournament). GPS data was used to quantify match running demands.

WHAT THEY FOUND:

After the long haul travel, players exhibited small reductions in lower body power and a large reduction after tournaments. Players covered a greater total distance per tournament (approx. 13%) and greater average distance >5m/s per game (approx. 11%) after long haul travel. Diving a little deeper, greater reductions in lower body power were observed after travel >5 hours compared with travel for <5 hours.

Reference:

Mitchell, JA, Pumpa, KL, and Pyne, DB. (2017) Responses of Lower-Body Power and Match Running Demands Following Long-Haul Travel in International Rugby Sevens Players. *J Strength Cond Res* 31(3): 686-695. [\[Link\]](#)

EDITORS COMMENTS:

"This study quantifies some of the negative impacts on performance from travel. Certain management strategies can be employed to potentially minimise decrements in lower body power.

Athletes pre-travel should start to adjust their sleep and eating patterns to the new time zone. During travel, athletes should wear compression garments, adjust their meals and sleep patterns to the destination. On arrival, athletes should comply with the destination time zone and perform a 30-40min recovery session comprising of low-intensity games/skills along with a hydrotherapy format. In terms of travel timing, if possible grant 12-24 hours per time zone crossed once landed to allow athletes circadian rhythms to adjust."



James de Lacey

Reference:

McNamara, D., Gabbett, T., & Naughton, G. (2017). Assessment of workload and its effects on performance and injury in elite cricket fast bowlers. *Sports Medicine*, 47 (3), 503-515. [\[Link\]](#)

EDITORS COMMENTS:

"Practitioners must ensure a minimum volume of bowling is undertaken to increase injury resilience, while avoiding excessive or 'spikes' in bowling loads, as this will increase the likelihood of injury.

However, it should be acknowledged that the current means of monitoring bowling workload (i.e. balls bowled) are limited and fail to take into consideration such crucial factors as relative intensity, and the individual's technique and strength characteristics. Substantially more longitudinal research is required to provide practitioners with the necessary information regarding fast bowling workloads and injury and performance."



Sam Callaghan

ARTICLE TITLE

ASSESSMENT OF WORKLOAD AND ITS EFFECTS ON PERFORMANCE AND INJURY IN ELITE CRICKET FAST BOWLERS



OBJECTIVE:

The primary aim of this systematic review was to demonstrate the extent to which workload is related to injury and/or performance in elite cricket fast bowlers since the introduction of the T20 cricket format.

WHAT THEY DID:

Numerous search strategies were implemented to find all available literature which meet the inclusion criteria. This entailed articles published from 2005 onwards with male participants, high performing or elite, and cricket fast bowlers. In addition, articles were required to provide data on injuries, fast bowling performance, cricket workload, or measures of cricket workload. A total of 17 articles were found which met the inclusion criteria and were subsequently evaluated for quality.

WHAT THEY FOUND:

Results from the review suggested that when a fast bowler's acute load (i.e. 7-day workload, typically measured by number of deliveries bowled) exceeds chronic load (28-day rolling average), there is a significant increase in the likelihood of injury, particularly in the following 21 days. However, when chronic loads are appropriately increased, the likelihood of injury is decreased. Ensuring appropriate bowling loads among fast bowlers is made more complex due to the conditions of the various match formats and schedule design. Fast bowlers are expected to quickly transition from bowling four overs (24 deliveries) in T20 cricket to in excess of 40 overs (240 deliveries) in multi-day formats. To date, there is insufficient research to draw any conclusions between workload and fast bowling performance (i.e. accuracy and ball release velocity).

ARTICLE TITLE

ASSESSMENT AND TRAINING OF VISUOMOTOR REACTION TIME FOR FOOTBALL INJURY PREVENTION



OBJECTIVE:

The aims of this study were split into two phases. Phase 1 investigated visuomotor reaction time (VMRT) as a predictor of injury and phase 2 assessed the effectiveness of VMRT training in NCAA Division I American football athletes.

WHAT THEY DID:

Phase 1 – The visuomotor performance of 76 participants was quantified from a Dynavision D2 System at the beginning of preseason and at end of the regular season. The number of target hits and the average time between target hits for a 60-second trial were used as performance indicators. Injury was defined as a joint sprain or muscle strain that limited football participation for at least 1 day.

Phase 2 – VMRT performance followed the same procedures to establish baseline. Players that achieved >85 hits (group median) were assigned the control group whilst players with <85 hits were assigned to a training group for 16 sessions.

WHAT THEY FOUND:

Phase 1 – An optimal cut point of <85 hits (>705 milliseconds) discriminated injured players from non-injured players with 67% sensitivity, 54% specificity and OR = 2.30. An injury was sustained by 52% of slow players and 32% of fast players.

Phase 2 – The average number of targets hit for those that completed all 16 sessions increased by 29 which resulted in decrease in average VMRT of 201 milliseconds (28%).

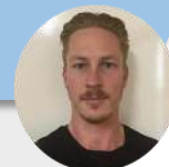
Reference:

Wilkerson, G. B., Simpson, K. A., & Clark, R. A. Assessment and training of visuomotor reaction time for football injury prevention. *J Sport Rehabil* 26(1): 26–34, 2017. [\[Link\]](#)

EDITORS COMMENTS:

"This is one of the first investigations into the relationship between visuomotor performance and musculoskeletal injury. Whilst neurocognitive reaction time has previously been associated with injury risk, VMRT embodies different qualities that may relate to the ability of an athlete to recognise and react to an external stimulus.

Given the association between visuomotor performance and subsequent musculoskeletal injury, it may be worthwhile to include visuomotor performance in a testing battery to screen athletes to identify those that may be more susceptible to injury. Phase 2 of this study suggests that this quality can be modified with appropriate training, however, future work is needed to identify whether changes in visuomotor performance can actually reduce injury occurrence."



Toby Edwards

Reference:

Finch CF, Cook J, Kunstler BE, Akram M, Orchar J. Subsequent Injuries Are More Common Than Injury Recurrences. *Am J Sports Med.* 2017. [\[Link\]](#)

EDITORS COMMENTS:

"By no means is this a ground breaking paper, and appears to do nothing but support previous injury research that states 'the number one predictor for injury is previous injury', but I think it does give us a good insight into where the industry still sits.

The need for not only return to play, but return to pre-injury performance in relation to any injury is absolutely critical. Too many times players are forgotten about once they are back playing, ongoing resilience and injury specific training needs to be maintained."



Lachlan Wilmot

ARTICLE TITLE

SUBSEQUENT INJURIES ARE MORE COMMON THAN INJURY RECURRENCES



OBJECTIVE:

The aim of this study was to describe the subsequent injuries sustained by Australian Football League (AFL) players over 1 season, including their most common injury diagnoses.

WHAT THEY DID:

Within-player linked injury data on all date-ordered match-loss injuries sustained by AFL players during 1 full season were obtained. The total number of injuries per player was determined, and in those with >1 injury, the Subsequent Injury Classification (SIC) model was used to code all subsequent injuries based on their Orchard Sports Injury Classification System (OSICS) codes and the dates of injury.

WHAT THEY FOUND:

There were 860 newly recorded injuries in 543 players; 247 players (45.5%) sustained ≥1 subsequent injuries after an earlier injury, with 317 subsequent injuries (36.9% of all injuries) recorded overall. A subsequent injury generally occurred to a different body region and was therefore superficially unrelated to an index injury. However, 32.2% of all subsequent injuries were related to a previous injury in the same season. Hamstring injuries were the most common subsequent injury. The mean time between injuries decreased with an increasing number of subsequent injuries.

Editors

The column editors for the Science for Sport monthly Research Alerts.



Owen Walker MSc*D CSCS

Owen is the founder, author and director of Science for Sport. He was formerly the Head of Academy Sports Science and Strength & Conditioning at Cardiff City Football Club, and an interim Sports Scientist for the Welsh FA. He also has a master's degree in strength and conditioning and is a NSCA certified strength and conditioning coach.

STRENGTH & CONDITIONING

TECHNOLOGY & MONITORING

FATIGUE & RECOVERY

YOUTHS



Tim Rowland MSc ASCA L2

Tim is the Head Strength and Conditioning Coach at Asquith Rugby League Football Club, and currently assists at the Australian Rugby Sevens. He has a Bachelor of Physiotherapy (1st Class Honours), Master of High Performance Sport and ASCA Level 2.

NUTRITION



Liam Mason BSc CSCS

Liam is currently the Senior Athletic Performance Coach at Blackburn Rovers Football Club for the U23's. He also has a bachelor's degree in sport and exercise science and is a NSCA certified strength and conditioning coach.

FOOTBALL



James de Lacey MSc

James is currently the Head Strength & Conditioning Coach with Austin Huns Rugby. He has previously worked in professional rugby in Romania and with the NZ Women's National Rugby League Team. He is a published author and has completed a MSc in Sport & Exercise Science from AUT, Auckland, NZ.

RUGBY



Samuel Callaghan PhD Candidate

Sam is a PhD Candidate at Edith Cowan University, investigating the influence of strength training upon the biomechanics and performance of cricket fast bowlers. Sam is currently a strength and conditioning coach at the Western Australian Cricket Association.

CRICKET



Lachlan Wilmot BSc ASCA L2

Lachlan is the Head Strength & Power Coach at the GWS Giants and has been for the past 6 years. He is also completing an MSc in High Performance Sport at Australian Catholic University.

AUSTRALIAN FOOTBALL



Toby Edwards PhD Candidate

Toby is PhD candidate at the University of Notre Dame, Australia. His research focus is on quantifying training load and fatigue in collegiate American Football. Toby has bachelor in exercise and sport science with honours and is an ASCA accredited strength and conditioning coach.

AMERICAN FOOTBALL