



SPNZ SPORTS PHYSIOTHERAPY NEW ZEALAND

BULLETIN

ISSUE 6 | DECEMBER 2011

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Welcome to the December 2011 edition of the SPNZ Bulletin.

Welcome to the last issue of the SPNZ Bulletin for 2011. It's been another busy year and one that seems to have gone very fast. Is it true that life seems to speed up when you get older?

One reason cognitive psychologists' believe that this happens is the way we process and record thoughts, experiences, and memories. Remember your experiences at physio school, your summer holidays with your family at the beach, your first big overseas experience away? Why do those experiences seem to have lasted for ages? Well it seems that when we are younger, most things we do are new experiences and we retain them in our memories more. As we get older we have more repetition and routine in our lives. We go to the same places and do the same things, and we don't create distinct memories due to the lack of new experiences, so the perception of time is that it flies by.

Henry David Thoreau (1817-1862) quoted in the film *Dead Poets Society* wrote "I went to the woods because I wanted to live deliberately, I wanted to live deep and suck out all the marrow of life, To put to rout all that was not life and not when I had come to die, discover that I had not lived." So how can we "suck the marrow from life" without chocking on the bone? Try to live more in the present and future than in the past, replacing old memories with new. With past memories, focus on positive, rather than negative experiences. Take time to smell the roses, take a different route to work, start a new hobby, take a holiday somewhere new, challenge yourself at work to assess and manage patients in a different way.

Of course our Sports Physiotherapy Symposium is coming up in March in Tauranga and if you haven't attended previously; do experience this quality conference. If you attended in 2009, I can assure you that this will feel like a new experience, with new speakers, topics, and improved structure and opportunities to network, contribute, and learn. Run over two days this could seem like a week if you let it. See you there!

Tony Schneiders
SPNZ President

The SPNZ Executive wish you and your families a very Merry Christmas and Happy New Year.



**PHYSIOTHERAPY
NEW ZEALAND** | SPORTS
Kōmiri Aotearoa



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LATEST NEWS

Thank You

Nicola Thompson and Wayne Fausett are stepping down and SPNZ thank them for their valuable contributions.

Nicola Thompson (Bulletin Assistant Editor) has been one of the Bulletin Assistant Editors for the last 12 months and is stepping down from her role to focus on a new work role and direction. Nicola has previously served on the Executive of the Sports Physiotherapy Special Interest Group of the UK Chartered Society of Physiotherapists and she has indicated she is still willing to continue to share her experiences with SPNZ despite relinquishing formal involvement in the group.

Wayne Fausett has also made a significant contribution to the SPNZ Bulletin over the last year, providing many of the 'Research Reviews' that can be found in each edition. Unfortunately we are losing Wayne to the profession as he is taking on a role outside physiotherapy.

SPNZ would like to sincerely thank Nicola and Wayne for their contributions and wish them both well for the future.

SPNZ Bulletin Editor - Position Available

Are you interested in being involved in SPNZ? We are looking for a new Bulletin Editor. Job advertisement page 5.

Angela Cadogan is stepping down as Bulletin Editor after 4 years in the job. We are looking for someone to take on the role of coordinating the Bulletin content. This is a great opportunity to be involved in SPNZ without the commitment of an executive position and to work with a great team of people. If you are passionate about sports and orthopaedic physiotherapy, you are organized and dependable, read more on page 5.

Congratulations to the All Blacks!

SPNZ congratulate the All Blacks team and physiotherapist Pete Gallagher on their World Cup win. Hear Pete talk about his experience at the SPNZ 2012 Symposium - details below.

On October 23rd the nation held its collective breath as the All Blacks secured the 2011 Rugby World Cup. The All Blacks campaign was regularly and significantly challenged by a host of injuries to key players. The medical team including Pete Gallagher (physiotherapist) and Dr Deb Robinson must be congratulated for their hard work and professionalism. It is a tribute to the entire team and support staff that they were still able to win the tournament despite these challenges.

In October SPNZ ran a Rugby World Cup special edition featuring an interview with All Black Physiotherapist, Pete Gallagher. This is available online - go to the [SPNZ website](#) and enter your email address and password. We are

also pleased to announce that Pete will be speaking at the SPNZ 2012 Symposium in Tauranga (March 17 and 18). Come along and hear him talk about his experiences - details below.



SPNZ Symposium: Prevention, Practice, Performance.

Sebel Trinity Wharf Hotel, 17th & 18th March 2012.

Speakers include:

- Dr Jill Cook
- Pete Gallagher (All Blacks Physiotherapist)
- Mr Matt Brick (Orthopaedic Surgeon)
- Dr Dale Speedy (Sports Medicine Physician)
- Bryan Stronach (NZ Cricket Strength & Conditioning Coordinator)
- Dr Tony Schneiders (Physiotherapist)
- Dr Lynley Anderson (Bioethics)
- Caryn Zinn (Sports Nutrition)
- Richard van Plateringen (Podiatrist)

Hear from other invited speakers on a range of topics relevant to sports and orthopaedic physiotherapists. Put the date in your diary and we look forward to seeing you in Tauranga next year.

See more information on **Page 4** of this Bulletin or go to [SPNZ Symposium 2012](#).

PLUS...

Bonus FREE Session with Pete Gallagher

(for Symposium Registrants only - details pg 4)

SPNZ is now on Facebook



Check us out at:

www.facebook.com/SportsPhysiotherapyNZ

Website Gems

Links to Video clips

Online interviews of interest

SPNZ Symposium 2012

PREVENTION, PRACTICE, PERFORMANCE

Sebel Trinity Wharf Hotel Tauranga
March 17th and 18th 2012.



KEYNOTE SPEAKER

Dr Jill Cook - Monash University, Australia

- Is clinical presentation of tendinopathy linked to pathology?
- Can we prevent tendon injuries?

INVITED SPEAKERS:

Pete Gallagher - All Blacks Physiotherapist

Dr Dale Speedy - Sports Physician

Mr Matt Brick - Orthopaedic surgeon

Bryan Stronach - NZ Cricket Strength & Conditioning

Dr Lynley Anderson - University of Otago (Bioethics)

David Rice - Physiotherapist

Caryn Zinn - Sports Nutritionist

Richard van Plateringen - Sports Podiatrist

WORKSHOP DETAILS:

<http://www.sportsphysiotherapy.org.nz/workshops.html>

BONUS FREE SESSION *(Symposium registrants only)*

Pete Gallagher
 All Blacks Physiotherapist

Pete will run a FREE session immediately prior to the start of the Symposium:

9.30-11am

Saturday March 17th.

Topics:

Functional Movement Screening for Elite Athletes

Audience questions and discussion

(Register early to avoid disappointment)

EARLYBIRD REGISTRATION NOW OPEN:

(Earlybird Registration closes January 20th 2012)

SPNZ Members	\$220
Physiotherapy Students	\$220
PNZ Members	\$275
Non-PNZ Members	\$300

[Click here to register](#)

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Bulletin Editor Position

The SPNZ Bulletin is published every two months (6 editions per year) and is one of the most important means of communication between the SPNZ Executive and members. We are looking for someone to take on this role from March 2012, and to develop the Bulletin further in the future.

BULLETIN EDITOR ROLE:

The role of the Bulletin Editor is to plan, coordinate and collate content for each Bulletin. This also involves delegating and coordinating a small team of 'assistants' to provide material for each edition. The SPNZ executive would provide the Bulletin Editor with updates on latest news, awards, and classified advertisements for inclusion in each Bulletin.

At present the position also includes formatting of the Bulletin (desktop publishing) however this aspect of the role can be outsourced if required.

Requirements:

- An interest in sports and orthopaedic physiotherapy
- Access to literature databases would be advantageous
- Good communication skill
- Ability to coordinate a small team of assistants (Assistant Editor and Special Projects Group (n=4))
- Organised and reliable with good time management

Time Required: approximately 4 hours per month (formatting additional: approx. 2-3 hours per month)

The Bulletin Editor would also attend SPNZ Executive meetings (1x per year) and also be involved in regular Skype meetings with the Executive (approx. every 6 weeks).

FORMATTING ROLE:

(NOTE: The 'formatting' role is a paid position and does not necessarily need to be a physiotherapist or a member of SPNZ. Hourly rate to be discussed with suitable applicant).

The formatting role involves electronic formatting of material supplied by the Bulletin Editor in Publisher (or similar programme) that can be converted to a .pdf file for distribution by email to members. The role would require formatting of the Bulletin layout, fonts, pictures (photos including file compression) and website hyperlinks.

Requirements:

- Desktop publishing software (Publisher or similar)
- Experience and proven ability in desktop publishing
- Attention to detail
- Some proof-reading skills beneficial
- Organised and reliable.

Time Required: approximately 2-3 hours per month

If you are a SPNZ member with the necessary skills, or if you know a non-physiotherapist with the required skills who may be interested such as your practice manager, receptionist, friend, colleague etc, please ask them to call or email **Angela Cadogan** to register their interest or for more information (details below). A sample Bulletin can be sent upon request.

Angela Cadogan

phone 0211503731

email acadogan@vodafone.co.nz

CLINICAL SECTION

ARTICLE REVIEW

A systematic review of evidence for anterior cruciate ligament rehabilitation: how much and what type?

May Arna Risberg, Michael Lewek, Lynn Snyder-Mackler

At present there is a lack of consensus regarding the optimal rehabilitation program for these groups. The aim of this systematic literature review is to provide an evidence-based review of the effectiveness of rehabilitation programs for surgically and non-surgically treated ACL injuries.

ABSTRACT

Objective: This paper provides an evidence-based review of the effectiveness of various rehabilitation programs that have been used for surgically or non-surgically treated anterior cruciate ligament (ACL) injuries in adult patients.

Design: Systematic review.

Data sources: Electronic databases

Results: The databases disclosed 33 randomized clinical trials (RCTs). Several of the RCTs in this systematic review have significant flaws, and limited evidence could be derived from them. The review of the literature revealed the following evidence for ACL rehabilitation: Immediate weight-bearing after ACL reconstruction is useful, rehabilitation programs must be monitored by a physical therapist, but continuously monitoring may not be necessary. The literature supports the use of closed kinetic chain exercises at knee joint motions of less than 60 degrees and open kinetic chain exercises with knee flexion angles greater than 40 degrees for quadriceps muscle strength training without increasing the strain on the ACL, and without increased stresses on the patellofemoral joint. There is evidence that high intensity neuromuscular electrical stimulation in addition to volitional exercises significantly improves isometric quadriceps muscle strength compared to volitional exercises alone. There is some evidence for neuromuscular training.

Conclusion: Future studies should focus on high quality RCTs, reporting randomization procedures, power calculations, compliance to intervention programs, and long term follow-up results

Reference: Risberg M A, Lewek M, Snyder-Mackler L, *Physical Therapy in Sport* 2004:125-145

Introduction

Despite years of research, appropriate treatment post anterior cruciate ligament (ACL) injury remains controversial. Rehabilitation programs are necessary for both those with ACL deficiency and those who undergo surgical ACL reconstruction.

Methods:

Thirty three randomised controlled trials (RCTs) assessing the effect of a specific rehabilitation program following ACL injury (n=5) and ACL reconstruction (n=28) were included. Papers were identified from a number of databases and the methodological quality assessed. Study group size ranged from 20 to 110 subjects. Information regarding methods of randomisation, type of exercises and subject compliance were given in only some of the studies. Studies selected for inclusion covered the following areas:

- Rehabilitation protocols
- Supervised versus home-based programs

- Strength training: open kinetic chain (OKC) and closed kinetic chain (CKC) exercises
- Neuromuscular electrical stimulation (NMES)

ACL strain values related to rehabilitation exercises:

Evidence regarding the strain on ACL during various exercises is limited and inconclusive. Both absence of strain and excessive strain are detrimental to the healing of an ACL graft. Historically strenuous rehabilitation exercises were not advocated immediately post-surgery. However more aggressive rehabilitation protocols are now being used due the use of graft materials more similar to the normal ACL, improved fixation strength and clinical evidence that laxity does not increase following aggressive rehabilitation. There are no RCTs directly comparing aggressive versus non-aggressive rehabilitation programs following reconstruction. More information is needed to determine the optimal loading for ACL grafts.

CLINICAL SECTION

ARTICLE REVIEW CONTINUED...

Rehabilitation Protocols

In assessing the duration of a rehabilitation program an extended 8-month program was compared to a 6-month (control group) program following ACL reconstruction. No significant differences were found between the two groups at 12 months post-surgery. The mean time for return to sport was 9 months in the extended group and 6 months in the control group (Ekstrand 1990)..

Significant improvement in function and earlier return to work was found in a more intensive therapy program of 2.5 hours 3-5 times weekly compared with a standard program of 30 minutes 2-3 times weekly (Frosch et al 2001). Comparison of land-based versus hydrotherapy

Rehabilitation Protocols

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Significant improvement in function and earlier return to work was found in a more intensive therapy program of 2.5 hours 3-5 times weekly compared with a standard program of 30 minutes 2-3 times weekly (Frosch et al 2001). Comparison of land-based versus hydrotherapy rehabilitation revealed that the water-based program participants had reduced joint effusion and greater Lysholm scores following the 6-week program. The two groups were equally effective at restoring quadriceps muscle strength, but the land-based program was superior in improving hamstring strength (Tovin et al 1994).

Immediate weight bearing after ACL reconstruction was compared with non-weight bearing for a period of two weeks post-surgery in another study. Follow up at 7.3 month showed less pain in the immediate weight bearing group, indicating that immediate weight bearing following ACL reconstruction did not compromise knee joint stability (Tyler et al 1998).

Supervised and home-based programs

Three RCTs concluded that a monitored home-based program was as effective as a supervised clinic-based program following ACL reconstruction. Home based programs included physical therapy visits for assessment, exercise modification and education. Authors concluded that success of home-based programs relies on the careful selection of compliant patients. An unmonitored home-based program following ACL injury was not as successful, with 49% of subjects requiring supervision after 6 weeks due to reduced ROM and thigh atrophy (Zatterstrom et al 2001). These studies suggest that pa-

tients undergoing ACL rehabilitation may not need to be monitor continuously by a physical therapist.

Strength Training

Studies have shown that quadriceps weakness can persist for up to 2 years after surgery. There is debate regarding preference to OKC or CKC exercises following ACL injury and reconstruction. Five RCTs investigated



the difference between OKC and CKC exercises. Bynum et al (1995) reported that a CKC only group demonstrated lower mean knee joint laxity and greater satisfaction with outcome compared with an OKC only group. In another study a significant improvement in quadriceps strength was reported at 6 months after surgery in a CKC + OKC compared with a CKC only ground (Mikkelsen, Werner and Eriksson 2000). The OKC group included specific range isokinetic concentric and eccentric exercises .

Hooper et al (2001) and Morrissey et al (2002) reported no significant differences between their CKC and OKC groups during walking and stair climbing activities, and in short term joint laxity and anterior knee pain, respectively. These studies may have been influenced by the lack of statistical power.

Overall concerns regarding negative effects of OKC exercises on anterior knee pain and joint laxity were not supported by the studies in this review. Patellofemoral pain outcome measures for these studies were unclear and not well described. In order to minimise the strain on the ACL the knee should be maintained in less than 60 degrees flexion during CKC exercises and greater than 40 degrees in OKC exercises.

Neuromuscular Electrical Stimulation

NMES has been found to recruits a greater percentage of Type II muscle fibres compared with voluntary muscle contraction. Twelve RCTs examining the effect of NMES on quadriceps strength following ACL injury or reconstruction were identified. Delitto et al (1998) reported a higher extension and flexion torque in the NMES group compared with voluntary exercise group. This group carried out either NMES or voluntary exercise 5 days a week for 3 weeks.

Draper and Ballard (1991) reported a greater recovery of isometric peak torque in a group using biofeedback compared with NMES, suggesting biofeedback better facilitates neural



CLINICAL SECTION

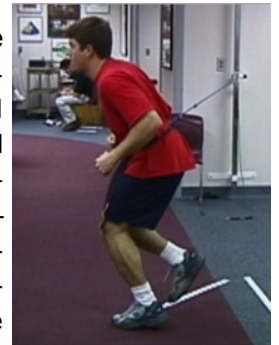
ARTICLE REVIEW CONTINUED...

changes in the recovery of muscle strength. A large study of 110 subjects reported that high intensity NMES and volitional exercises was superior to volitional exercises alone in restoring quadriceps strength (Snyder-Mackler et al 1995).

Overall there was a wide variety of results in the studies examining NMES, which may be reflective of the large range of NMES parameters utilised. Parameters such as frequency, intensity, pulse width, stimulation time and rest periods varied significantly. In summary those that began high level NMES treatments within the first week post operatively showed greater improvements in quadriceps strength compared with volitional exercise alone. However those who waited 2-6 weeks after surgery did not show greater improvements than volitional exercise only group.

Neuromuscular training

Both mechanical stability and neuromuscular control are crucial in long term functional outcome after ACL reconstruction. Three RCTs investigated evidence for neuromuscular trainings. Significant improvements in reflex hamstring latency and knee function (Lysholm) scores were reported in a neuromuscular training group compared with a traditional rehabilitation group (Beard et al 1994). Fitzgerald et al (2000) reported improved return to sport outcomes in combined perturbation training and standard program group compared with standard program only group. Liu-Ambrose et al (2003) compared neuromuscular training with a strength training program on neuromuscular function over a period of 12 weeks after ACL reconstruction. They reported that the neuromuscular training group showed a greater percentage change in isokinetic torques than the strength training group.



Conclusion

Several of the RCTs included in this systematic review have significant methodical flaws and therefore provide only limited evidence. There was a dearth of adequate statistical power calculations in most of the studies. Compliance data was poorly reported throughout despite it being one of the most important variables due to dose-response. Long term follow up is lacking for many studies and this is critical for developing evidence based rehabilitation programs.

CLINICAL SECTION

ASICS SHOE REPORT

Asics GT 2170

The analogy “if it ain’t broke why fix it” holds true for many runners and the Asics 2000 series is no exception.

Improved Comfort and Ride

Over the generations the 2000 series has changed subtly for consistency and kept loyal runners happy. When I look at the 2170, the key changes have **improved the comfort and ride** (the feel of the shoe from heel contact to toe off).

The fit in this category has always been excellent and with gender specific Solyte cushioning in the forefoot and a new larger rearfoot Gel unit cushioning has certainly been enhanced in the latest model.

Guidance Line from Heel Strike to Toe Off

A **Full Length Guidance Line** which is a groove running from heel to toe allows for a consistent line of progression from heel strike to toe off. The guidance line combined with Asics IGS (impact guidance system) completes the components to move the foot from heel strike to toe off with a smooth ride.

The Groove means there is less surface tension in the outsole/midsole making it easier to plantarflex the foot, and reach propulsion with less energy from the ankle flexors, improving performance. The Guidance Line has also shaved approximately 10-15grams off the weight of the shoe improving performance. Guidance Line is used in the current Kayano 17, Nimbus 13, DS Trainer 16, Landreth 7, Cumulus 13.

Rear Gel Unit Enhances “Feel” at Heel Strike

The GT 2170 remains loyal to its runners with another consistent shoe. The new rear Gel unit enhances the feel at heel strike and with the IGS and full guidance line combined with the dynamic gender specific trussic the shoe maintains a great ride and fit with the consistent support it is renowned for.

Who Is The GT2170 Suitable For?

This shoe suits the runner who has a long midstance phase often exhibited by overpronation, greater knee flexion and slow resupination or “toe many toes signs” at propulsion. These runners are often flexed in their gait, may have knocked knees and fatigue their upper body and lower muscles early when running. The GT 2170 continues to be a valuable shoe choice in the clinician's

management of pronation related pain.

Justin Chong- Bigfoot Podiatry

October 2011

“This shoe suits the runner who has a long midstance phase often exhibited by overpronation, greater knee flexion and slow resupination or “toe many toes signs” at propulsion.”



SPNZ PHYSIOTHERAPY RESEARCH REVIEWS

ACL INJURIES

Reviews by Wayne Fausett, Monique Baigent, Nathan Wharerimu and Amanda O'Reilly

www.sportsphysiotherapy.org.nz/resources.html

With touch-rugby season upon us, and a recent speight of ACL injuries to high profile athletes, this edition of the SPNZ Bulletin presents reviews of research regarding ACJ prevention, mechanisms, management and rehabilitation. This complements the article review comparing the effectiveness of various rehabilitation protocols for surgical and conservatively managed ACL injury.



Mechanisms of Non-Contact ACL Injuries

Yu, B., & Garrett, W. E. (2007). *British Journal of Sports Medicine*; 41: i47–i51. doi: 10.1136/bjism.2007.037192

Article Summary

Anterior cruciate ligament (ACL) injuries are one of the most commonly seen injuries in sport. They are more prevalent in females and usually occur through non-contact means. This narrative review summaries the current literature covering ACL loading/injury mechanisms.

The consensus is that an anterior shear force at the proximal end of the tibia generates significant ACL loading, and is a major contributor to ACL injury. Knee valgus-varus moment and internal-external rotation moment alone are not likely to result in isolated ACL injuries without injuring other knee structures.

The three major contributors to anterior shear forces are quadriceps contraction, the patella tendon-tibia shaft angle and small knee bend angle. Anterior shear forces increase as the knee flexion angle decreases. Studies show that a small knee flexion angle between 0-45° is where the quadriceps generate the largest force on the ACL.

Activating the quadriceps muscles increases the anterior shear force at the proximal end of the tibia through the patella tendon. With a given quadriceps muscle force, the greater the patella tendon-tibia shaft angle, the greater the anterior shear force on the tibia.

Another pre-disposing factor is the posterior ground reaction force. This increases ACL loading by eliciting an increased quadriceps muscle contraction. The peak ACL strain occurs shortly after initial contact between the foot and the ground. A hard landing with a great impact posterior



Clinical Significance

Complete ACL rupture can lead to other pathological knee conditions including instability, meniscus damage and osteoarthritis. Knowledge of ACL loading mechanisms can help to aid diagnosis, identify risk factors and develop prevention strategies.

A useful note for rehabilitation is that quadriceps muscle contraction significantly strains the ACL from 0° to 45° of knee flexion, but does not strain the ACL when knee flexion is greater than 60°. Therefore the recommendation is closed chain activities or exercises where the knee is flexed more than 60 degrees.

RESEARCH SECTION

SPNZ PHYSIOTHERAPY RESEARCH REVIEWS CONTINUED.....

Maximizing Quadriceps Strength After ACL Reconstruction.

R.M. Palmieri-Smith, A.C. Thomas, E.M. Wojtys. (2008). *Clinics in Sports Medicine*; 27: 405-424

Article Summary

Restoring knee function to pre-injury levels and promoting long-term joint health are the primary objectives of anterior cruciate ligament (ACL) surgery and rehabilitation. However, current literature suggests that quadriceps strength deficits can exceed twenty percent at six months post-ACL reconstruction. It is suggested that arthrogenic muscle inhibition (AMI) and muscle atrophy are responsible for the decrements in quadriceps strength.

Removing arthrogenic muscle inhibition by targeting the sensory side can be achieved with cryotherapy, transcutaneous electrical nerve stimulation (TENS) and anesthetics. It has been shown that application of ice to the knee joint for thirty minutes was capable of completely reversing AMI of the vastus medialis that resulted from an induced knee joint effusion. TENS diminishes inhibition and allows recruitment of otherwise unrecruitable motoneurons. It is only effective when the stimulator is active.

Removing arthrogenic muscle inhibition by targeting the motor side can be achieved with neuromuscular electrical stimulation (NMES) and biofeedback. Short-term NMES combined with active exercise is more effective than active exercise alone in restoring quadriceps strength and regaining functional status. EMG biofeedback combined with closed kinetic chain exercise was able to reduce quadriceps AMI by 52%.

Gradually introducing eccentric resistance training early after ACL reconstruction is successful in improving quadriceps muscle strength without any detrimental effects to the healing graft; however more research needs to be done to analyse the long term effects of eccentric training. More research needs to be performed to analyse the effect of open kinetic chain exercises on muscle strength post ACL reconstruction.

Clinical Significance

Targeted strategies to retard AMI such as cryotherapy, TENS, NMES and biofeedback need to be incorporated early into a rehabilitation programme post ACL reconstruction. If AMI can be minimized early following ACL injury and reconstruction, its negative consequences can be reduced and likely will lead to a more effective and efficient recovery.

Sagittal alignment of the knee and its relationship to noncontact anterior cruciate ligament injuries.

Terauchi M, Hatayama K, Yanagisawa S, Saito K, Takagishi K. (2011). *American Journal of Sports Medicine*; 39 (5); 1090-94

Article Summary

This study looked at differences in the sagittal alignment of the knee between an anterior cruciate ligament (ACL) deficient group and a control group to identify risk factors that contribute to noncontact ACL injuries. The authors used magnetic resonance images to measure three angles in the knee namely the extension angle, the femoral plateau angle and the tibial posterior slope. Females in the ACL deficient group were found to have a larger femoral plateau angle and a larger tibial posterior slope than the control group. The female ACL deficient group also had a negative correlation between the extension angle and the tibial posterior slope angle suggesting that hyperextension at the knee is associated with a small posterior slope.

Clinical Significance

This study identified a correlation between posterior tibial slope, hyperextension and risk of non contact ACL injury. It is suggested that hyperextension of the knee creates an increased anterior shear force via the pull from the quadriceps. In addition, a large tibial plateau posterior angle forces the tibia anteriorly by the downward pressure through the femur. Interestingly, a large tibial posterior angle actually restricts hyperextension. So although both hyperextension and tibial posterior angle individually are found to be risk factors for ACL injury they actually cancel each other out. So the authors are implying that females with one or the other of these anatomical features are at risk of ACL injury but not those with both. There may be some clinical value to these results in that people who present with these features may be advised not to partake in high ACL injury risk sports such as netball. Unless there is going to be some sort of screening program for female athletes however I struggle to see any real practical clinical value from this studies findings.

RESEARCH SECTION

SPNZ PHYSIOTHERAPY RESEARCH REVIEWS.....

Intrinsic and extrinsic risk factors for anterior cruciate ligament injury in Australian footballers.

J. Orchard, H. Seward, J. McGivern & S. Hood. (2001). American Journal of Sports Medicine; 29(2):196-200.

Article Summary

This paper examined interactions between intrinsic (eg. female sex, biomechanical factors) and extrinsic (eg. shoe-surface interface) risk factors for ACL injury in elite Australian Rules participants. ACL injury was defined as a complete rupture needing reconstruction to allow continued play at the same competitive level. During an 8-year period, 100,820 athlete-exposures (games) were available for analysis. There were 83 surgically proven ACL injuries, of which 63 had a non-contact mechanism. Players were approximately 10 times more likely to suffer an ACL injury if they had an ACL injury within the preceding 12 months, and 4 times more likely if they had a previous ACL injury at anytime. All non-contact ACL injuries within 12 months of the original injury were to the reconstructed knee. After 12 months the risk of non-contact ACL injury to the reconstructed knee or the contralateral knee was the same. Analysis of meteorological data showed if the city the game was played in had less than average rainfall in the past year, or high evaporation in the preceding month, the risk of ACL injury was increased 2-3 times.

Clinical Significance

As with other injuries, eg hamstring strains, the biggest risk factor for ACL injury is a prior history of ACL injury. The high risk of ACL injury within 12 months of the original injury is suggestive of graft immaturity or surgical failure. A previous history of ACL injury at anytime is a significant risk factor for future ACL injury, suggesting there are intrinsic factors (genetic, anatomic) that may predispose to an ACL injury. Unfortunately there was insufficient data to recommend a minimum time for return to sport post-surgery. Data for this study was collected between 1992 and 1999, so it possible, due to advances in surgical techniques and rehabilitation protocols, the risks of ACL re-rupture are less today. Dry field conditions are an important risk factor, and with 'winter' sports codes now beginning pre-season training in mid-late summer, players need to ensure their footwear will not increase shoe-surface traction.



Arthroscopic view of torn anterior cruciate ligament.

AWARDS

ASICS EDUCATION FUND REPORTS

SPNZ's Asics Education Fund supported two delegates to attend two high quality conferences in Australia in October, 2011. Evelyn Tulloch attended and presented at the Australian Physiotherapy Association (APA) 2011 Conference in Brisbane, and Gisela Sole attended the Australian Conference of Science and Medicine in Sport, held in Freemantle. Both Evelyn and Gisela's presentation and conference reports are presented in this section.

AUSTRALIAN PHYSIOTHERAPY ASSOCIATION CONFERENCE

Brisbane, Australia

27th-30th October 2011

Conference Presentation

Evelyn Tulloch

The Australian Physiotherapy Association (APA) Conference was held in Brisbane from 27-30th October 2011. I am grateful to the NZSP for an Education Fund Award that supported my attendance at this conference.

My presentation (abstract below) was the last before lunch on Sunday. I was pleased there were still some people present on this final day following a late night after the conference dinner, while others were desperately finding alternative arrangements to get home as Qantas was on strike. There was only time for one question as the session was running very late, however I subsequently got some positive feedback on my presentation.

ABSTRACT

Clinical Pilates Directional Bias Assessment: Reliability and Predictive Validity

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Question: Is the Clinical Pilates directional bias assessment reliable between raters, and is it valid for predicting immediate changes in dynamic postural stability and muscle performance following directionally-biased exercises? **Design:** Randomised, blinded, repeated measures cross-over design.

Participants: Thirty three participants with a history of more than one unilateral lower limb injury. I

Intervention: Firstly, two researchers independently assessed the participants for directional bias. Participants were then randomly allocated to perform matched bias (MB) or unmatched bias (UB) exercises first, in two crossover groups.

Outcome measures: Inter-rater reliability was evaluated using Kappa (κ), and prevalence-adjusted and bias-adjusted kappa (PABAK) coefficients. Changes in dynamic postural stability and muscle performance were assessed using time to stabilisation (TTS) and rebound hopping (RH), measured on a forceplate, before and after each exercise intervention. Crossover trial data were analysed by *t*-tests for period, interaction and treatment effects, and repeated measure ANOVAs were used to investigate differences between baseline, MB and UB.

Results: Inter-rater reliability of the directional bias assessment was substantial, with $\kappa = 0.75$ and PABAK $\kappa = 0.76$. Following MB exercises, medial-lateral TTS and time on the ground during RH were significantly shorter ($p = 0.02$, $p = 0.05$, respectively) compared with UB exercises. Compared with baseline, pairwise change in anterior-posterior TTS ($p = 0.008$) improved following MB exercises, while time in the air deteriorated following UB ($p = 0.04$) exercises.

Conclusion: Directional bias assessment demonstrates substantial reliability. Results suggest validity for predicting immediate improvements in dynamic postural stability and muscle performance following matched directionally-biased exercises.

AWARDS

AUSTRALIAN PHYSIOTHERAPY ASSOCIATION CONFERENCE, 2011

CONFERENCE REPORT:

Sports Physiotherapy Australia (SPA) and Musculoskeletal Physiotherapy.

By *Evelyn Tulloch*

The Conference

The Brisbane Convention and Exhibition Centre was a superb venue for the over 2,000 delegates who attended (the centre can hold 7000!). The number and quality of presenters was excellent. In fact I was spoilt for choice, often not being able to decide which of sometimes up to 6 concurrent sessions to attend. In this regard, it seems unfortunate that conference abstracts are not more widely available on the web for others to browse.

The main Exhibition Hall where we had lunch, morning and afternoon teas had 122 Sponsors and Trade Displays and still plenty of room to mingle. I would have liked to have seen some research posters as well as the trade displays. The conference was extremely well run apart from registration on the first morning. There appeared to be only two lines which were up to 80m long. They were swamped as the venue was not available to begin registration the previous night. The food was superb and there was a free real coffee outlet. The conference dinner warmed up with a trapeze act, followed by a band after our main course which had most people up dancing.

Conference Programme

The conference program was divided into 12 different groups. I had registered for the Musculoskeletal and Sports Physiotherapy Groups.

Barefoot Running

The opening plenary session was "*How evolution selected for stability and economy rather than speed*" presented by Professor Daniel Lieberman which led into a later session on barefoot running. Due to the early sunrise (no daylight saving) and time difference I was awake early and went for a walk before breakfast. Many others were up out walking, running and cycling as well. While on these walks, following Professors Lieberman's presentations, my new knowledge (not being a runner) helped me analyse running styles more accurately.

His reasons for the 20-80% of runners with repetitive stress injuries are due to the rapid increase in forces at heel strike (400-600 body weights/sec) while the forces with forefoot running produce less than 90 body weights/sec. He reported that there has not been a decline in injury rates during the last 30 years, with no evidence that prescription shoes decrease injuries. His message was running form is more important than what is on your feet. Good runners don't

lean forward or over stride.

Health Benefits of Physical Activity

Professor Leon Straker followed Prof Liebermann in the opening session: "*Sedentary life-barriers to physical activity*". He presented evidence to show that low level activity is most beneficial for health. It didn't matter if you also did moderate or high level activity as well. Sitting for longer than 30 minutes, and especially longer than 60 minutes, is detrimental to your health. Following this opening session there were 5 different musculoskeletal sessions and one sports session to choose from. Some rooms were too small for the numbers wanting to attend some of these sessions. The program was very full for the Thursday and Friday but less so over the weekend which surprised me as I thought more clinicians would have been able to attend during the weekend.

Prevention of ACL Injuries

Unfortunately I couldn't get to Dr Greg Myer's presentation: "The Who, What, When, Where and How of ACL Injury in Female Athletes: Can we prevent it?" But I did manage to get to his work shop: "How we prevent it". There was no new unpublished information but it was good to see him go through examples of assessments and management, visually with both videos and models. We all got a copy of his Tuck Jump Assessment and had to work through this while assessing a patient he had on video.

Is Physiotherapy Research Relevant to Clinical Practice?

Saturday morning's session finished with an entertaining "Great Debate - *Physiotherapy Research Is Not relevant To Clinical Practice*" It was all good fun, but with a worrying undertone of divisions. However, the negative team won.

Physiotherapy Specialist: Complex Case Study

The highlight of the afternoon session for me was Jenny O'Connell presenting in the "*MPA Masterclass - Specialists presenting complex case studies*". Jenny was an excellent presenter. Her case was "What do you do when the surgeon gives up? – a complex case study of bilateral knee and hip pain and patella instability". One of this particular patient's patella sat on the lateral side of her leg when her knee flexed despite numerous surgeries. Jenny went through her treatment protocol with us which consisted of a taping and exercise regime. The results were amazing and this was achieved with very few patient visits as the patient lived too far away for regular visits. The patient obviously worked very hard.

AWARDS

The Role of Transversus Abdominus in Core Control

Sunday morning came around all too soon. A combined musculoskeletal and sports session on “*Cortical control changes acute and chronic*” opened with Professor Gary Allison: “Control of the core during different rotation torques - a motor control assessment of how planned movement alters trunk muscle activation patterns”, where he admitted to getting the role of transversus wrong over the last 10 years.

He suggested that most literature is based on fundamental assumptions that have been assumed to be correct; that the ability of a single muscle that acts submaximally 30ms earlier than other muscles can impact on the mechanical stability of the lumbo-pelvic region. This has led researchers and clinicians to develop interventions, training programs or experimental protocols which he believes to be fundamentally problematic.

Professor Allison raised the question; do these altered patterns reflect a deficit in the mechanics of the spine or are they a marker of altered cognitive processes? He proposed that it is equally likely that so called deficits in the feed forward response of any single or cluster of muscles cannot be separated from the choice of movement strategies that people make under different cognitive and physical settings.

He demonstrated that unilateral TrAb activation is part of a diagonal sling synergy that controls the trunk in response to rotation perturbations and without rotation forces TrAb does not necessarily pre-activate and acts synchronously with other muscles. He suggested that individuals with LBP may choose to move differently or avoid rotation by bracing (increased Ext Oblique activity) and suggested this may be the largest predictor of any latency in delays in TrAb.

His final comment was that altered TrAb activation may be a marker of the presence of LBP, anxiety, fear or other cognitive processing or belief system dysfunction and is much less likely to purely reflect a mechanical basis for segmental instability.

Motor Control Retraining in an Elite Footballer

Professor Julie Hides presented research demonstrating that a motor control retraining program in elite football players resulted in changes in the size of the multifidus muscles and an improved ability to draw in the abdominal wall. Also positive changes resulted in their availability for team selection and in the intensity of LBP.



Physiotherapy Conference 2011

Brisbane Convention & Exhibition Centre
Thursday 27 October to Sunday 30 October



AWARDS

ASICS EDUCATION FUND REPORT

AUSTRALIAN CONFERENCE OF SCIENCE & MEDICINE IN SPORT

Freemantle, Australia
19th-22nd October 2011

Conference Report

Dr Gisela Sole

I had the privilege of attending this conference, which had the overall title of “**Optimising Health and Fitness – Participation, Prevention and Performance**”. Approximately 300 delegates attended, which included medical practitioners, physiotherapists, podiatrist and exercise physiologists. I presented a poster entitled “*Effects of footwear on external knee adduction moments: a systematic review*”, which is related to a current laboratory-based study I am conducting.

Keynote Presenters

Keynote and invited speakers that I was particularly interested in were Dr Mary Magarey and Prof Erik Witvrouw. Magarey, a senior lecturer and physiotherapy specialist at the University of South Australia, has a particular interest in assessment and management of shoulder injuries. I attended one of her morning workshops on conservative management of multi-directional instability of the shoulder, and it was helpful to be updated on finer detail of assessment of functional stability in sportspeople and prescription of appropriate exercises developed in her School.

Shoulder Instability in a Water-Polo Player

For her invited presentation, she presented her clinical reasoning processes while managing a water polo player presenting with shoulder pain. She eloquently presented each step, such as considering all possible sources of symptoms, mechanism of symptoms and contributing factors. Reasons were presented as to why waterpolo shoulder injuries differ to those of swimmers and of throwers.

Her working hypothesis (or “diagnosis”) included pathology of the biceps tendon, based on her clinical findings. However, after treatment did not bring the expected improvements, the patient was referred for an arthroscopy, and no such pathology was found. She highlighted that we needed to remain open minded regarding the presentation as our clinical examination is limited in establishing a “diagnosis” for many of these patients.

Her main points were that when dealing with patients with shoulder injuries, consider the following:

- Consider ALL possible sources
- Never make assumption
- Reflect on non-anticipated findings
- Question unsuccessful management and refer as needed

Reflect on EVERY patient.

Multidisciplinary Management of Shoulder Disorders

The “Shoulder” theme was continued in a “Clinical round” where cases were presented to a panel of experts, including Magarey as the physiotherapist, an orthopaedic surgeon and a radiologist. Interesting discussions developed with good input from the delegates. A similar “Round” was also held on lower limb injuries, which included a podiatrist and conditioning coach. This is a form of presentation that could be presented at New Zealand Physiotherapy conferences

Strengthening Essential for Patellofemoral Pain

Prof Erik Witvrouw presented research from his unit in Belgium relating to patellofemoral pain and also on stretching. These presentations were grounded on very sound research, were very well prepared, interspersed with a healthy touch of humour such as “Doing elite sport is not very healthy”!

One of the issues he raised is that people with patellofemoral pain (PFP) appear to have increased risk for patella osteoarthritis later in life, highlighting the importance of addressing the factors related to syndrome. He also suggested that merely addressing motor control factors in patients with (lower limb) pain is not sufficient: we need to progress towards strengthening using accepted principles of strength training and conditioning. Look out for some of his publications in preparation at the moment.

Sports Medicine Australia Promoting Physical Activity

Sessions on promotion of physical activity received a high profile at this conference, indicating the significance that Sports Medicine Australia is placing on this field. Physical activity benefits many community-related factors, including health, transport, the environment and tourism. It is a pathway for us to lobby for the profession and also to have a valuable contribution to society.

AWARDS

I suggest that SPNZ should consider emphasising this area in addition to prevention/assessment/management of musculoskeletal injuries and on elite performance. Useful websites are www.beactive.wa.gov.au and www.markfenton.com (Mark Fenton was one of the keynote speakers for physical activity).

Additional Benefits of Conference Attendance

Attending international conferences presents opportunities for exchange of ideas, not only by listening to presentations, but also by meeting with various colleagues. I had a discussion with Mary Magarey regarding teaching methods of advancing clinical decision making skills at post-graduate level in the Musculoskeletal field. As a colleague of Mark Jones, she has contributed towards relevant publications and the development of a teaching tool to monitor reasoning skills for their post-graduate students. A detailed form is completed by their post-graduate students for every patient they assess and treat, as a tool to reflect on their thought processes. A similar tool is being used in the post-graduate programme at the University of Otago, specifically for the PHTX540 Musculoskeletal Physiotherapy paper. Clinically relevant information from the conference will be used as updates in that paper.

The Use of Diagnostic Ultrasound in Physiotherapy Practice

A useful workshop I attended was presented by a radiologist on the use of diagnostic ultrasound (US). The complexity of these investigations and considerations for critically reading research reports that use US as dependent variables were highlighted. It brought it home to me that using US as a feedback tool for muscle contractions may be easily acquired, however, to use it fully for diagnostic purposes, far more skill and training is needed.

Combining Research and Clinical Practice

In general, it struck me yet again that researchers and clinicians need to work together to advance our understanding for promotion, prevention and management of health disorders and injuries. Most of the keynote and invited speakers were introduced as “still consulting with patients” (or similar phrases). Although our emphasis may change dependent on our individual workplace requirements, we need to be open to each other and be willing to share information whilst acknowledging each others’ contribution. SPNZ provides a platform to do this, and I would like to thank SPNZ for their support towards my attendance of the conference.

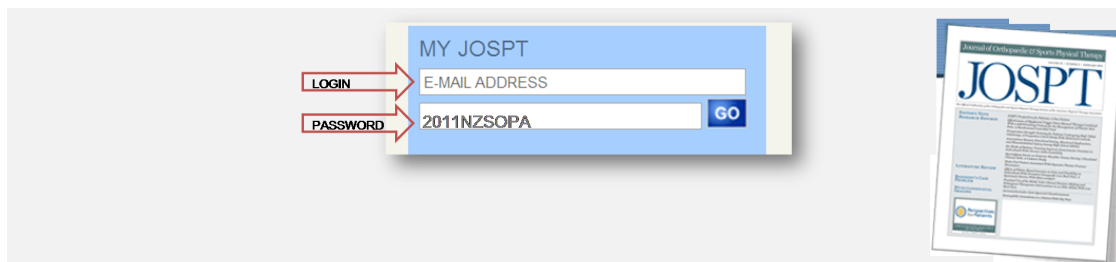
Dr Gisela Sole, PhD, FNZCP

Advanced Practitioner (Sports & Orthopaedics)
Senior Lecturer
School of Physiotherapy
University of Otago.



LATEST RESEARCH

JOURNAL OF ORTHOPAEDIC & SPORTS PHYSICAL THERAPY



December 2011; Volume 41, Issue 12

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[RESEARCH REPORT]

[Interrater and Intrarater Reliability of the Active Hip Abduction Test](#)

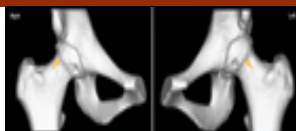
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Michael P. Reiman, Mark Stovak, Bradley R. Dart



[Gait Retraining for Runners: In Search of the Ideal](#)

Bryan C. Heiderscheit

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Julie M. Fritz, Joy C. MacDermid, Lynn Snyder-Mackler

[RESEARCH REPORT]

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[Efficacy of Gait Training With Real-Time Biofeedback in Correcting Knee Hyperextension Patterns in Young Women](#)

Patricia Teran-Yengle, Rebecca Birkhofer, Megan A. Weber, Kimberly Patton, Erin Thatcher, H. John Yack

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Sorin Siegler, Paul Marchetto, Daniel J. Murphy, Hemanth R. Gadikota

[Change in Psychosocial Distress Associated With Pain and Functional Status Outcomes in Patients With Lumbar Impairments Referred to Physical Therapy Services](#)

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[The clinical utility of physical performance tests within one-year post-ACL reconstruction: a systematic review.](#)

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[Comprehensive strength training program for a recreational senior golfer 11-months after rotator cuff repair.](#)

Authors: Brumitt J, Meira EP, Gilpin HE, Brunette M

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[Chest injuries: what the sports physical therapist should know.](#)

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- Bisphosphonate treatment holidays
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- U-shaped association of mortality with serum vitamin D levels



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- Foot orthoses: soft-flat most comfortable
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- Multifaceted podiatry of benefit to elderly with disabling foot pain
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- Injury severity and outcome
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- Effectively engaging frail older adults in exercise
- Mental outlook influences rehabilitation

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When?	What?	Where?	More information
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28-29 January	The Australian Physiotherapy and Pilates Institute - Matwork Level 1	Auckland	appi-healthgroupnz@gmail.com
3 February	Electrophysical Agents Workshop	Wellington	alex.kirk@otago.ac.nz
10-11 February	DMA Clinical Pilates - Matwork/Theraband Level 1	Queenstown	www.clinicalpilates.com
16 February - 25 March	STOTT PILATES Intensive Reformer Course	Auckland	info@corepilates.co.nz
18-19 February	Flawless Motion - Sporting Shoulder	Auckland	steph_winstone@hotmail.com
24 February - 2 March	STOTT PILATES: Intensive Mat Plus Course	Auckland	info@corepilates.co.nz
25-26 February	NZMPA - Cervical Spine	Auckland	www.nzmpa.org.nz
3 - 4 March	Back In Motion Pilates - Mat Level 1		click here
17-18 March	Sports Physiotherapy NZ "Prevention, Practice & Performance"	Sebel Trinity Wharf, Tauranga	www.nzsopa.org.nz

INTERNATIONAL COURSES & CONFERENCES

When?	What?	Where?	More information
2012			
14-15 February	Orthopedics and Sports Medicine Injuries	London, England	Ortho Sports Conference
2-6 July	International Society of Biomechanics in Sport	Melbourne	isbs2012
19 - 21 July	World Congress for the International Society of Electrophysiology and Kinesiology	Brisbane	ISEK2012.com
31 Oct - 2 Nov	Be Active 2012 (Sports Medicine Australia)	Sydney	beactive2012

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- Bench pressers' shoulder—overuse tendinosis of pectoralis minor
- Blood clots and plane flights
- Heat acclimatization guidelines for high school athletes
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