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Editorial



We're approaching the end of another year, and it's been a busy one for Physio First; but then I can't remember one that wasn't! We, as an organisation, continue to exist to champion evidence-based, cost-effective private physiotherapy in the changing healthcare marketplace. We endeavour to always support our members, and *In Touch* is instrumental in that by offering our readers educational content that is evidence based and that nurtures member engagement.

Pursuing quality

Engagement can be measured in our members' participation in any, or all of our Big 5* benefits. The one I have extolled the virtues of on many occasions, and which our articles for *In Touch* are always aimed at supporting, is our Quality Assured Practitioner (QAP) scheme. This measure of quality is unique to Physio First and enables us to demonstrate the efficacy of private physiotherapy intervention to those who purchase our services, and aims to prevent us all competing to work for the lowest price.

From our collected data many of us have been collecting, we are increasingly being able to make evidence-based, and verifiable statements to support our quality. Here are some examples:

- The longer you leave your problem, the longer it will take to improve
- Patients who experience their symptoms for six weeks or less have a greater change in Functional Pain Scale (FPS), i.e. a greater improvement in their condition, with treatment from private physiotherapy.

The latest development in our quality kite mark is the Quality Assured Clinic (QAC). This enables the member practitioner to demonstrate not only their individual quality, but also that of their whole clinic. To facilitate this, Physio First has introduced a part-time subscription** membership category to enable those who work for a Physio First member practice principal, but who do less than 20 hours a week, to still participate in collecting data to prove their quality.

A new role for *In Touch*

From April 2019 *In Touch* will formally be absorbed into our education committee. There will still be an editor post, but we will be able to call on a bigger pool of willing volunteers to help in its production. With the raised awareness of plastic in our oceans, we are also investigating changing the delivery packaging from cellophane to more environmentally friendly envelopes that can be recycled, so watch this space.

Hands on, hands off?

Another major way of engaging as a member of Physio First is to book a place at our annual conference. The subject of our 2019 event is something that most MSK practitioners will know is a hot topic right now. Our excellent line-up of speakers will explore the evidence for physiotherapy intervention (see page 33 for details). I believe that it is a combination of many things that help our patients to achieve their goals. Timely education, advice, mobilisation and manipulation with the right words and support to nurture, nudge and demonstrate our value; the same value that Physio First aims to support in all its many ways.

I hope you enjoy this edition on the lower limb. Thank you to all those who have contributed to it. Please use it as a support towards your own quality as a private physiotherapist, and towards the quality of our profession for the future.

PAUL JOHNSON | MSc BSc MMACP MCSP | EDITOR

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Ankle fractures – an update of the evidence

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The number of ankle fractures in the population is expected to increase significantly due to an ageing population and the increased participation of older people in sporting activities. This will potentially result in a growing demand for physiotherapy services. An understanding of the current evidence relating to this condition is needed to ensure the provision of high-quality patient care. In this article we present an overview of the current research on the assessment, prognosis, and treatment after an ankle fracture. We also offer our thoughts on how the existing evidence can be used to guide clinical practice.

LEARNING OUTCOMES

TO SUPPORT PHYSIO FIRST QAP

- 1 Be aware of clinical prediction rules, supported by clinical guidelines, for the acute assessment of suspected ankle fractures.
- 2 Increase knowledge of the current evidence comparing surgical and non-surgical treatment of ankle fractures.
- 3 Have a greater awareness of the evidence for typical trajectories of recovery after an ankle fracture in different age groups.
- 4 Gain up-to-date understanding of the current evidence for rehabilitation after an ankle fracture.

Introduction

Ankle fractures are defined as fractures of the medial and lateral malleoli. The primary role of the malleoli is to maintain ankle joint alignment and stability. Fractures of the main weight-bearing structures of the ankle, such as tibial plafond (pilon) and talus fractures, are classified separately as these require different management strategies due to their role in bearing load at the ankle joint (Handley & Gandhe 2011). In this

article, only ankle fractures affecting the malleoli will be discussed.

Ankle fractures are a very common traumatic injury, accounting for approximately 9% of all fractures (Court-Brown & Caesar 2006). In the United Kingdom, the estimated incidence of ankle fractures is 75 per 100,000 person years. Peak incidence in adult males is between 18-24 years of age and in adult females it is between 60-64 years of age (Curtis *et al* 2016). This sex difference in peak incidence probably reflects the roles of high energy trauma and reduced bone density in ankle fracture pathogenesis among younger males and older females respectively. Although the rate of ankle fractures among older adults has stabilised in recent years, projections suggest the number of ankle fractures will increase three-fold between 2006 and 2030, as a result of an ageing population (Kannus *et al* 2008) and the increased participation of older people in sporting activities (Baker *et al* 2010). This will likely result in a corresponding increase in patients with ankle fractures presenting to physiotherapy services.

Acute assessment/ differential diagnosis

In the physiotherapy clinic, patients with acute ankle injuries present a

difficult diagnostic challenge. The acute symptoms of pain, swelling and bruising are common to many ankle injuries. This can make it difficult to conduct a physical examination and to ascertain injury severity. The challenge for the clinician is balancing the risks associated with delayed diagnosis and management of serious injuries, with unnecessary onward referral that is inconvenient to the patient and has implications on health resource usage.

The Ottawa Ankle and Foot (OAF) rules (www.theottawarules.ca) can reduce unnecessary onward referral for radiology. Current clinical guidelines recommend using the OAF rules to determine whether an X-ray is needed in patients older than five years of age with a suspected ankle fracture (NICE 2016a). They have a high sensitivity (97%) for ankle and mid-foot fractures, meaning that a false negative (incorrectly deciding there is no fracture when there is) is unlikely (Bachmann *et al* 2003). As a result, fractures are unlikely to be missed, and the negative consequences of delayed fracture diagnosis and management avoided.

However, the OAF rules should be used alongside a comprehensive patient history and clinical examination, and not

// TREATMENT AIMS TO OPTIMISE AND MAINTAIN ANATOMICAL ALIGNMENT WHILE ALLOWING THE FRACTURE TO HEAL //

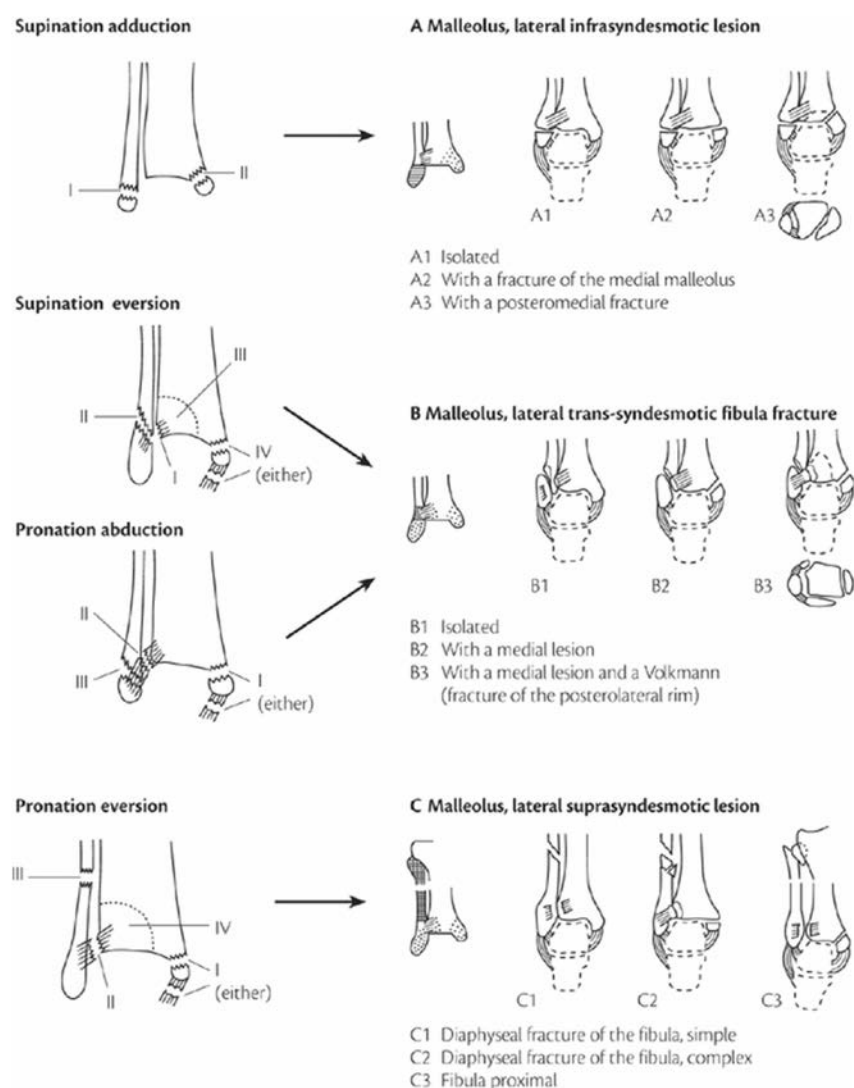


FIGURE 1: Comparison of the Lauge-Hansen (left column) and AO/OTA (right column) fracture classification systems. From *Oxford Textbook of Trauma and Orthopaedics* (2nd edition) edited by Bulstrode (2011) Fig.12.59.4 p.1393 by permission of Oxford University Press

in isolation. Clinicians should remain suspicious for a serious injury if patients are failing to improve as expected or with mechanisms of injury associated with more severe ankle injuries (See Lauge-Hansen classification, figure 1).

Fracture classification

Fractures of the ankle can be described by the number of malleoli affected or using an ankle fracture classification

system. Unimalleolar fractures usually affect the lateral malleolus, bimalleolar fractures the medial and lateral malleoli, and triamalleolar fractures the medial, lateral and posterior malleoli (Donken *et al* 2012).

Physiotherapists are probably most familiar with the Danis-Weber classification system. This describes the location of the fracture relative to

the distal tibiofibular syndesmosis, with type A fractures below the level of the syndesmosis, type B at the level of the syndesmosis, and type C above the level of the syndesmosis. The Danis-Weber system continues to be used as it is simple and easily understood, though its utility in guiding prognosis and treatment is limited (Handley & Gandhe 2011).

A knowledge of the other most commonly used classification systems is therefore useful. The Lauge-Hansen system is based on the position of the ankle at the time of injury whereas the AO/OTA classification system is a more comprehensive system that describes both the affected bone and fracture type (Handley & Gandhe 2011).

Classifications based on anatomical injury are helpful for determining initial fracture management but are not consistently predictive of recovery trajectory (Hancock *et al* 2005; Lin *et al* 2009a) so caution is advised when counselling patients about prognosis on the basis of fracture classification alone.

Fracture management

Once the presence of a fracture has been established, treatment typically aims to optimise anatomical alignment if required and maintain alignment while allowing the fracture to heal. This usually involves a period of immobilisation in a splint or cast and may involve a period of restricted weight-bearing.

Although there is a consensus that stable fractures should be treated non-surgically (BOAST 12: *The Management of Ankle Fractures* 2016 www.boa.ac.uk/wp-content/uploads/2016/09/BOAST-12-Ankle-Fractures.pdf), a Cochrane review (Donken *et al* 2012) was unable to determine whether surgical (figure 2) or conservative management of ankle fractures in adults leads to better outcomes. However, the results of this review were limited by the heterogeneity and poor quality of the included trials.

Since the Cochrane review, several randomised controlled trials (RCTs) have been conducted that provide



FIGURE 2: Ankle radiograph of an ankle fracture managed with open reduction and internal fixation surgery

more evidence to inform acute ankle fracture management. A high-quality trial that compared surgical and non-surgical treatment of stable distal fibular fractures, in adults aged between 18 and 65, showed no difference in self-reported ankle function at 12 months between groups (Mittal *et al* 2017). Surgical management also resulted in longer length of hospital stay, more adverse events and more physiotherapy visits. Similar findings were reported in a smaller, lower quality RCT, comparing

surgical and conservative management of isolated lateral malleolar fractures deemed unstable on stress x-rays only, in skeletally mature participants under 65 years of age. At 12 months, self-reported ankle function was no different between groups, though 20% of the conservative group had radiographic evidence of malalignment (Sanders *et al* 2012).

The Ankle Injury Management (AIM) trial assessed whether close contact casting of unstable fractures in an older cohort of patients, i.e. over 60 years of age, who would normally be offered surgical fixation, was equivalent to surgery in terms of ankle function recovery (Willett *et al* 2016). Close contact casting is a minimally padded cast applied under general or spinal anaesthetic with the aim of maintaining good joint alignment following reduction (figure 3). This showed equivalence in self-reported ankle function and no differences in quality of life or pain between the groups at six months, which was maintained at three-year follow-up (Keene *et al* 2018). It should be noted that participants in both groups with malleolar malunion at six months had worse ankle function, highlighting the importance of maintaining alignment until union is achieved. As the use of close contact casting is now included in the British Orthopaedic Association Standards for

Trauma (www.boa.ac.uk/wp-content/uploads/2016/09/BOAST-12-Ankle-Fractures.pdf) awareness of this initial management approach within physiotherapy is important.

What remains to be determined is the longer-term outcomes of conservative management, compared to surgical management. Surgical interventions are suggested to work by better restoring anatomical alignment compared to conservative interventions, thereby reducing post traumatic osteoarthritis (Donken *et al* 2012). It is widely thought that malunion of weight-bearing joints directly leads to post-traumatic osteoarthritis, which can result in persistent symptoms and disability, and potentially the need for further surgery (Horisberger *et al* 2009; Brown *et al* 2006). These claims, given the inherent risk and costs associated with surgery, require rigorous evaluation. Ultimately longer-term follow-up is needed to determine the comparative efficacy of surgical and conservative management for this condition. However, recent studies suggest that non-surgical management (with the option of proceeding to surgical fixation where alignment is not maintained) is a viable option for many patients following consideration of fracture severity and the patient's age, functional demands and comorbidities.



FIGURE 3: Close contact cast application: (a) moulding the cast to hold reduction of the fracture and (b) a radiograph showing the close contact cast in situ

"OLDER ADULTS WITH UNSTABLE FRACTURES TYPICALLY DO NOT MAKE A FULL RECOVERY"

Prognosis

After an ankle fracture, there is usually a rapid restoration of ankle function in the first six months (approximately 80%), but thereafter further improvement is limited, with ongoing activity limitation at two years that is worse with older age (Beckenkamp *et al* 2014). The results of recent RCTs have enhanced our understanding of how recovery may differ in different patient populations post ankle fracture. Mittal *et al* (2017) embedded an observational cohort into their study design, and also observed a trend of accelerated recovery in the first six months. However, participants (18-65 years of age with stable lateral malleolus fractures) continued to improve beyond this point to make a full recovery at 12 months. These results indicate that younger patients with stable fractures have a favourable prognosis irrespective of surgical or conservative treatment. In contrast, the participants (over 60 years of age with unstable ankle fractures) in both treatment arms of the AIM trial had a persistent deficit in ankle function at three-year follow-up (Keene *et al* 2018), indicating that older adults with unstable fractures typically do not make a full recovery.

Rehabilitation

The main impairments of the ankle, in the early phases of recovery from an ankle fracture, are pain and reduced ankle range of motion (Lin *et al* 2009a), and deficits in muscle strength (Psatha *et al* 2012; Stevens *et al* 2004). This results in difficulty with walking (Lin *et al* 2009a) and altered gait (Keene *et al* 2016). Rehabilitation aims to address these impairments and facilitate a return to the patient's baseline activities and function (Donken *et al* 2012). Patient reported outcome measures (PROMs) are useful to monitor and quantify different aspects of patient recovery and evaluate response to treatment.

The Olerud-Molander Ankle Score (OMAS) (Olerud & Molander 1984) is the most commonly used PROM in studies reporting outcomes on ankle fractures, though its routine use has been questioned due to a lack of studies evaluating its psychometric properties (Ng *et al* 2018). Alternative PROMs that have been recommended (Ng *et al* 2018) to monitor recovery from ankle fracture include the Lower Extremity Functional Scale (LEFS), though this may be inappropriate in higher level patients in the longer term (Lin *et al* 2009b), and the Ankle Fracture Outcome of Rehabilitation Measure (A-FORM) (McPhail *et al* 2014).

Rehabilitation after an ankle fracture commences either during or after immobilisation. During immobilisation treatment is usually restricted to advice, gentle range of movement, and weight-bearing if permissible, to ensure fracture healing is not compromised. Currently, the evidence to inform rehabilitation during this phase is equivocal. In their Cochrane review, Lin *et al* (2012) found no studies investigating early movement after conservative treatment of ankle fractures. In post surgical patients, using a removable splint to allow exercise was associated with reduced activity limitation and pain, and improved ankle dorsiflexion range of movement, but also led to a higher rate of adverse events. However, the methods used to combine and present the results of different studies in this review, and subsequently their relevance to clinicians, have been questioned (Keene *et al* 2014). This led to another review of early ankle movement versus immobilisation after surgical management of ankle fractures that stratified findings into the short, medium and long term, and also distinguished between minor and more serious adverse events. This showed no difference in ankle function at any follow-up point between treatment

groups. However, early ankle movement was associated with an increased risk of deep and superficial surgical site infections, and fixation related complications, but a reduced risk of venous thromboembolism (Keene *et al* 2014).

The findings from these reviews indicate that early ankle movement is usually restricted to surgically managed patients. Its use requires caution in patients who may be more susceptible to surgical site infection and delayed healing but may be encouraged in patients predisposed to venous thromboembolism. Although both reviews were comprehensive and their results broadly consistent, the quality of the studies in both reviews was low. Their findings should therefore be interpreted with caution. Further high-quality research is currently being conducted in the UK to determine the comparative effectiveness of these two treatment strategies (ISRCTN15537280 <https://doi.org/10.1186/ISRCTN15537280>).

After the immobilisation period, treatment strategies can usually be progressed rapidly as the fracture heals and can therefore tolerate more stress and load. To facilitate the transition from immobilisation to walking and normal function, patients are often provided with an ankle support (Keene *et al* 2016). Preliminary research has shown that using a walker boot or ankle stirrup is associated with less pain and gait asymmetry compared to using tubigrip alone immediately following removal of immobilisation, in adults of under 65 years of age with surgically managed type A or B Danis-Weber fractures (Keene *et al* 2016).

However, a Cochrane review found no evidence to support the use of other forms of rehabilitation such as stretching, manual therapy and exercise, after the immobilisation phase (Lin *et al* 2012). The results of the Cochrane review, questioning the role of rehabilitation after ankle fracture, must be considered alongside the quality and design of studies from which ➤

"A COCHRANE REVIEW FOUND NO EVIDENCE TO SUPPORT THE USE OF STRETCHING, MANUAL THERAPY AND EXERCISE AS FORMS OF REHABILITATION AFTER THE IMMOBILISATION PHASE"

these conclusions are drawn. Moseley *et al* (2005) compared the addition of calf stretching and exercise, to exercise alone, while Lin *et al* (2008) compared manual therapy and exercise, to exercise alone. Both studies found no difference between treatment groups. These studies do not support the addition of manual therapy or calf stretching to a general rehabilitation programme, but as participants in all groups were prescribed exercise, it was not possible to infer whether recovery occurred as a result of, or despite, exercise rehabilitation. Nilsson *et al* (2009) was the only study in the Cochrane review that compared physiotherapy to "usual care". There was no difference between groups, however participants in the "usual care" group could be referred to physiotherapy by their doctor if deemed necessary, and participants were permitted to seek physiotherapy themselves. This resulted in an average of seven sessions of physiotherapy in the usual care group compared to 17 in the exercise group. It was, therefore, difficult to draw conclusions about the effects of physiotherapy provision from this study.

The evidence for the rehabilitation after an ankle fracture is not extensive and continues to evolve. The Cochrane review team went on to conduct a high-quality RCT comparing supervised exercise and advice, to advice alone, in patients with uncomplicated isolated ankle fractures managed either non-surgically or surgically (Moseley *et al* 2015). They found no difference in function and quality of life outcomes between groups. However, more than one-third of participants in the advice-only treatment group received out-of-trial private physiotherapy, potentially confounding

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the results. The relatively young age of participants (mean age 42) also suggests that the results may not be applicable to older adults, who tend to have worse outcomes (Beckenkamp *et al* 2014).

These observations led to the development of the AFTER trial, a pilot RCT that will assess the feasibility of conducting a future definitive RCT comparing best practice advice and progressive exercise after ankle fracture in adults aged 50 years or over (<https://doi.org/10.1186/ISRCTN16612336>).

Additional considerations and useful resources

The importance of identifying and addressing psychological factors that may predispose to a poorer treatment outcome is well established in certain musculoskeletal conditions (NICE 2016b). The role of psychological factors in mediating treatment outcome after skeletal trauma is less definitive, but an association between psychological factors, such as catastrophising, and worse treatment outcomes does exist in this cohort of patients (Linton *et al* 2010; Vranceanu *et al* 2014). Identifying and addressing any unhelpful patient beliefs is likely to be important.

The aim of physiotherapy is often to help patients to return to the activities they enjoy. Prescription of an appropriate exercise programme should be a core

component of treatment if this is to be achieved. The success of an exercise programme is dependent on the exercise prescribed being the correct type, of sufficient dose, and ultimately completed by the patient. Alongside many other factors, the type of exercise prescribed should be informed by the physical demands of the patient's activity related goals, relevant impairments identified during the clinical exam, and the patient's preferences.

To ensure the dose of prescribed exercise is sufficient, an awareness of the existing evidence underpinning exercise prescription (Ratamess *et al* 2009; Garber *et al* 2011) is essential. To facilitate patient compliance with an exercise programme, a knowledge of behavioural change strategies shown to be successful in increasing exercise adherence in patients with other musculoskeletal conditions (Meade *et al* 2018) is useful. The *Improving Health: Changing Behaviour. NHS Health Trainer Handbook* (Michie *et al* 2008) is a freely available resource that offers practical tips on how to implement behavioural change strategies and can be applied to the prescription of exercise. We would encourage readers to consult this resource.

Other useful fracture-specific resources we would like to signpost include recent guidelines *Fractures (non-complex): assessment and management* (NICE 2016a) and *BOAST 12: The Management of Ankle Fractures* (www.boa.ac.uk/wp-content/uploads/2016/09/BOAST-12-Ankle-Fractures.pdf)

Conclusion

The evidence we have outlined is not exhaustive but highlights prominent

"IDENTIFYING AND ADDRESSING UNHELPFUL PATIENT BELIEFS IS LIKELY TO BE IMPORTANT"

research relating to ankle fracture assessment, prognosis and treatment. It should be used judiciously and considered alongside individual patient preferences and clinical expertise when providing patient care, in accordance with the principles of evidence-based medicine (Sackett *et al* 1996).

About the authors

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The epidemiology of Achilles tendinopathy in UK runners

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This article is a summary of a research project funded by the Private Physiotherapy Educational Foundation (PPEF); it is not meant to be a formal research report but instead is here to report our findings in a way that is useful for clinicians. This project is the largest completed on the prevalence of Achilles tendinopathy and associated risk factors.



LEARNING OUTCOMES

TO SUPPORT PHYSIO FIRST QAP

- 1 Epidemiology of Achilles tendinopathy.
- 2 Who gets affected and how do patients present.
- 3 What factors appear likely to be important in rehabilitation.

Achilles tendinopathy (AT) is a chronic, debilitating MSK condition. It is known to affect 2.35% of the adult population at any one time point (Albers *et al* 2016; de Jonge *et al* 2011) with sporting activities frequently indicated as important in disease aetiology (Kujala *et al* 2005).

Endurance runners in particular seem to suffer the highest incidence rates (Fordham *et al* 2004; Jarvinen *et al* 2005; Johannessen 1986; Kujala *et al* 2005). Reports vary, but estimates of incidence rates are between 11.6% (Jarvinen 1992) and 42% (Kujala *et al* 2005) with lifetime incidence rates peaking at 52% for middle and long distance runners (Kujala *et al* 2005). Unfortunately, the earlier research is limited to elite or semi elite athletes who are different from the general running population we see in clinical practice (Fordham *et al* 2004; Jarvinen *et al* 2005; Johannessen 1986; Kujala *et al* 2005). It is also possible that the frequency of AT and risk factors identified by Jarvinen (1992) may be country specific and not directly linked across all westernised countries, as the

research is largely Scandinavian. Over recent years, numerous researchers have suggested that the incidence of AT is on the rise (Almekinders *et al* 2003; Langberg *et al* 2007). However, without historic data, this is difficult to determine and such statements are often based on anecdotal evidence, leaving clinical care commissioners unable to plan appropriate services for the population they serve.

In the UK there are an estimated 3.3 million recreational runners (Sports England 2016). Using the lowest active/athletic incidence rates reported in the literature, we can anticipate a potential of 363,000 cases of tendinopathy at any given time point, and a lifetime incidence of 1,650,000 cases. These calculations do not account for the rising popularity of running, with participation having increased by 400,000 in the last two years (Sports England 2016). So, how big a problem is AT in the UK?

Research method

The majority of previous risk factor studies fail to discuss the rationale for any of the factors under examination. We thought it pertinent to try to make our study more robust so we completed a literature search to identify potential risk factors and used this data to inform a Delphi study of world tendon experts to develop a consensus (O'Neill *et al* 2016). This Delphi study further refined important risk factors and these were subsequently used to develop the survey

tool we used for this study. The tool had two parts and included tick boxes and open text answers:

- Part A related to the Achilles tendon and symptoms of tendinopathy
- Part B related to running history and the identified risk factors.

This tool was extensively piloted and reliability checked prior to dissemination via an online survey (emails and social media), and a paper survey via a supplement in *Runners World* magazine. A total of 15,000 paper surveys were disseminated to subscribers in one month.

The inclusion criteria were: UK based runner, over 18 years old, runs at least twice a week and has done so for at least three months, able to complete the questionnaire in English, able to give informed consent.

Data management and analysis

Descriptive analysis was completed for the Part A and statistical analysis for Part B, this analysis used a logistic regression to determine the relationship of exposure variables to the outcome.

Incomplete datasets (surveys), defined as missing data to more than four appropriate questions, were excluded from the study as it was unclear whether the information that had been given could be considered accurate. This decision was made as there were a large number of responders and the

"THE LITERATURE SUGGESTS THAT, WITH AN ESTIMATED 3.3 MILLION RECREATIONAL RUNNERS IN THE UK, THERE IS POTENTIAL FOR 363,000 CASES OF TENDINOPATHY AT ANY GIVEN TIME"

small number of those with missing data would not significantly reduce the response rate, also the various mechanisms for computing missing data were considered inadequate or had the potential to influence results.

Combined results and discussion

In total 1,845 responses were received, of these 1,547 were considered valid. A further 72 were excluded due to inconsistencies in reported data, leaving a total of 1,475 respondents.

Prevalence rates

REPORTING OF AT COHORT

This section relates only to the subjects who reported AT

In total 842/1,547 (57%) respondents reported a history of AT with 43% of this group reporting having symptoms at the time and the remaining 57% being resolved. This prevalence suggests that AT is a far more common problem than we realise. The most common site for symptoms was the mid-tendon reported by 67% of respondents, while insertional tendinopathy appeared present in 16% and another 15% reported mixed, i.e. both mid-portion and insertional symptoms (figure 1). We currently know that mid-portion and insertional tendinopathy requires slightly different management strategies, e.g. reduction of compression for the insertional tendon issues, via reducing dorsiflexion during loading. The reported frequency of combined (mid-portion and insertional) tendinopathy appears to be a new finding; this group may require different management strategies, but we do not have any data on this at present.

The exact prevalence may differ from that reported as participants may have been more likely to respond if they were currently experiencing or had previously had AT.

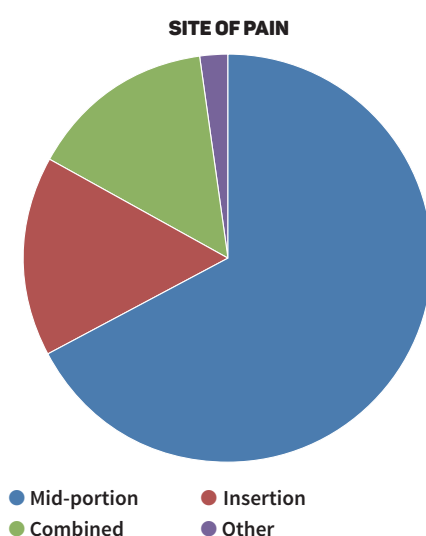


FIGURE 1: The breakdown of reported site of pain

Onset

Subjects with AT reported a sudden onset in 28% of cases, with 44% reporting an insidious onset and a further 22% relating the onset of AT to a delayed response to a specific training session (figure 2). It appears likely that sudden onset of pain corresponds to collagen tearing and may represent partial tears, flap tears, longitudinal splits or fascia cruris tears. However, clinically we do not know whether these pathologies need different rehab as no-one discriminates in the current research. I would suggest greater caution with heavy loading for those people with sudden onset of their pain, but this is experience-based only and cannot be substantiated by the current research.

HOW DID YOUR ACHILLES PAIN START?

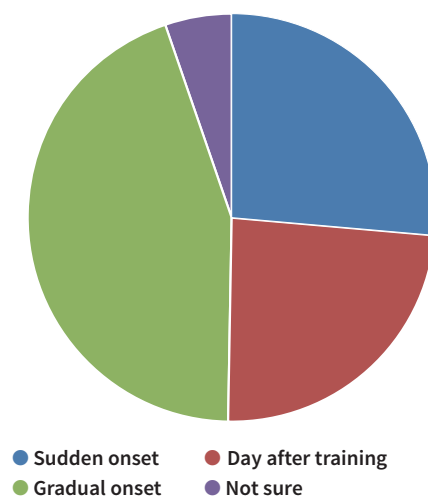


FIGURE 2: Response results to the question regarding onset of AT

The most common trigger for the onset of AT appeared to be increases in training load, with 64% of AT cases reporting this and only 31% of AT respondents reporting steady training volumes at the point of symptom onset (figure 3). The remaining percentage of respondents were unable to remember whether their training volume altered or not. Training load is probably the most important factor when it comes to AT onset and maybe explains why various risk factors are associated in some studies and not in others. For instance, calf muscle weakness is a known risk factor for AT, but if you have weak calf muscles and maintain running volume at the same threshold you are unlikely

WHICH OF THESE BEST DESCRIBE WHEN YOUR ACHILLES FIRST BECAME SORE?

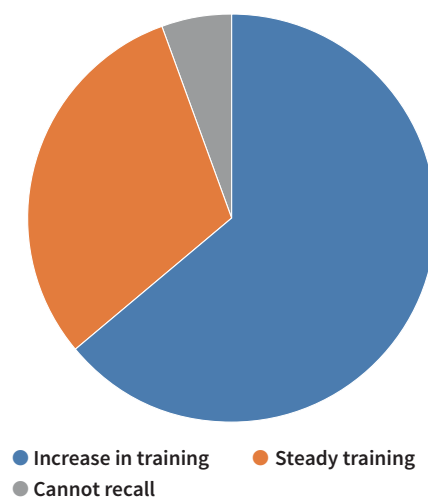


FIGURE 3: The most common triggers for the onset of AT

needs to be considered during clinical examination and treatment sessions.

Nearly all respondents (92%) had received treatment for their AT, with strengthening exercises being undertaken in 77% of cases and providing a lot of benefit in 37% of those subjects. However, 23% of subjects did not undertake any strength training and this is of concern as, according to the highest level of evidence, “changes in the neuromuscular system are the most likely explanation for the clinical benefit observed with rehabilitation” (Malliaras *et al* 2013). Strengthening was either eccentric loading (44%) or other forms (33%). We currently know that much of this strengthening is completed at levels insufficient to resolve the neuromotor deficits identified in AT (Gravare Silbernagel *et al* 2007; O'Neill *et al* 2018).

The results of treatments reported as received by respondents is shown in figure 5. Stretching featured very heavily in the care respondents received. However, the value of stretching may be limited as tendinopathic tendons are too flexible (Coombes *et al* 2017) and treatment should aim to increase stiffness. This is probably best done by strength training. If there is the reason to lengthen the muscle tendon unit, i.e. reduced ankle dorsiflexion, then it is probably more efficacious to strength train at end of range as this can add sarcomeres, i.e. lengthen the muscle tendon unit quicker than stretching while, most importantly, adding



FIGURE 4: The causes of AT based on the responses from survey participants

to develop tendinopathy because your body is already coping (in homeostasis). However, if you have weak plantarflexors and increase running volume, you are likely to be less able to cope with the increased load and therefore more likely to develop AT.

Respondents' views on the cause of their AT

Respondents were asked to report what they thought the cause of their AT was and their text answers are shown in the word cloud (figure 4). The larger the word appears the more frequently it featured.

for between 6-12 months, and 16% had symptoms for longer than 12 months.

Achilles problems required significant time off training with 45% of respondents missing more than three months of training. This is likely to have a large impact on the subject's sense of self and lead to some psychosocial influences on their pain experience (McAuliffe *et al* 2017). Work was also affected in 28% of cases, the extent of this influence was not measured but the finding does highlight that this aspect

The data from the word cloud supports the previous results, suggesting that overload may be critical. Overload equates to increasing training distance, intensity or frequency. This factor is supported by previous research assessing causes of AT (O'Neill *et al* 2016).

Length of symptoms and treatment

People with AT generally suffered for longer than three months. While 45% had symptoms for less than three months, the remainder was broken down as follows: 21% had symptoms for between three to six months, 17%



FIGURE 5: Word cloud highlighting the responses to the question ‘what did your treatment include?’

strength in this position (O’Sullivan *et al* 2012). Strength in a lengthened position appears critical for both prevention and rehabilitation of AT as data shows this is where the deficits lie (O’Neill *et al* 2018) and where most load is transferred through the tendon during normal locomotion. The use of

ultrasound, massage and acupuncture for tendinopathy fails to really get to the cause of the disorder and is of little value in comparison to activity modification and progressive loading.

One interpretation of the data contained in figure 5 is that too many people

undertake/receive too many low-value treatments that are unlikely to influence the natural time course of their condition.

The risk factors of AT in UK runners

For the purposes of our study we refer to the variables as risk factors, rather than associated factors as we asked the respondents about the period prior to the onset of pain, rather than looking at an AT group once they had developed the disorder.

Each risk factor included within the survey was assessed using statistical testing. If a statistically significant relationship was identified, then this factor was used within the logistic regression modelling – a method employed to test how accurate that model is at predicting the presence/onset of a disease. Despite being statistically significantly related, some factors, such as height, were irrelevant. Height was identified as related during the between group statistical analysis (t test) when it showed a highly statistical difference, but the between group difference was only 1.5cm, so measuring height would not provide an accurate indication of individuals at risk of developing AT. Height may also be considered a confounder for weight, that is to say much of the variance in either factor can be explained by the other. Due to these considerations, height was removed from the model as a variable.

Odds ratios (OR) are one of those statistics that physiotherapists often struggle to comprehend as our undergraduate training fails to cover it. Essentially, the OR tells you how a variable influences your likelihood of developing a disease (table 1). An OR of 2 means you are twice as likely to develop the disorder, in this case AT, and an OR of 1.33 means you are 33% more likely to develop the disease. Negative OR highlight variables that reduce the likelihood of subjects developing AT, i.e. more rest days decrease your risk of injury.

Important factors with a higher association are shown by the more positive OR. Table 1 shows that an older ➤

ODDS RATIO FOR ALL SIGNIFICANT EXPOSURE VARIABLES

EXPOSURE VARIABLE	OR (CI95%)
Advancing Age	1.02 (1.01-1.03)
Age categories (years)	
31-40	1.94 (1.28-2.94)
41-50	2.69 (1.79-4.04)
51-60	2.90 (1.88-4.47)
>61	2.22 (1.35-3.62)
(compared with below 30 yrs of age)	
Height* (cm)	1.02 (1.01-1.03)
Male gender	1.71 (1.38-2.10)
Number of years running	1.03 (1.02-1.04)
Weekly mileage	1.01 (1.00-1.02)
Number of training sessions per week*	1.11 (1.03-1.19)
Number of rest days per week (no training)*	0.86 (0.79-0.94)
Less than 1 day rest per week	1.56 (1.26-1.92)
Number of tempo/speed training sessions per week*	1.15 (1.04-1.28)
Reduced average run speed*	0.81 (0.75-0.88)
Focus of running*	
Club	1.22 (0.96-1.54)
Competitive	1.80 (1.18-2.76)
(compared with recreational running)	
Training surface*	
Grass/dirt	1.54 (1.14-2.07)
Track	1.50 (0.85-2.66)
(compared with tarmac/road)	
Previous tendinopathy	1.32 (1.08-1.63)
Regular calf stretching*	1.44 (1.17-1.77)
Ankle stiffness	2.68 (1.94-3.70)
History of calf pain*	1.80 (1.43-2.25)
Regular strength training*	1.44 (1.17-1.78)
Strength training	
Every week	1.49 (1.10-2.02)
Regularly	1.84 (1.36-2.50)
Infrequently	1.28 (0.96-1.70)
(compared with never strength training)	
Uses Orthotics	1.67 (1.31-2.13)

If the 95% CI is not given in brackets it is because the logistic regression used this categorical variable option as the constant value.

*New variables not previously identified

TABLE 1: Variables that indicate the likelihood of an individual developing AT

// STRENGTH TRAINING SEEMS TO BE THE TREATMENT PATH THAT IS CRITICAL IN SUCCESSFULLY REHABILITATING PATIENTS WITH AT //

male who trains more, with fewer rest days, who runs fast and does hill work is at greater risk of AT. A history of calf pain in someone who stretches and strength trains, and who has stiff ankles, further increases the risk. We do not yet know why many of these factors are linked.

INTERESTING FACTORS FROM A CLINICAL PERSPECTIVE

When it comes to risk factors, many of those identified may link to neuromuscular function of the plantarflexors. This makes logical sense when comparing to our current understanding of why treatments work, i.e. owing to changes in neuromuscular performance of the plantarflexors. As such it currently appears prudent to target the following risk factors/variables in patients with AT.

- **Previous calf pain** – probably arises because the calf complex is not resilient enough for the load it is under. Either reduce load or improve resilience with strength training.
- **Ankle stiffness (dorsiflexion)** – often occurs due to calf discomfort/pain or may be a perception of stiffness due to delayed onset muscle soreness after training. If the latter, then this is more likely due to calf weakness and the muscle should be strengthened. Where it is legitimately a stiff ankle, consider the reason, whether this is amenable to intervention and, if so, consider using strength training instead of stretching as it will improve muscle tendon length more quickly while importantly improving strength in the new range of movement (O'Sullivan *et al* 2012).
- **Regular calf stretching** – attempt to understand why the person stretches, if it is done to reduce injuries this is unlikely to be useful (Lauersen *et al* 2013). If it is to prepare for sport, then it is better to “warm up” with a steady run and some neuromuscular co-ordination training instead. Those who stretch to alleviate calf pain or a perception of stiffness in the calf muscles should be advised that strength training may be more appropriate for increase ROM (assuming that the individual does, in fact, have reduced ROM), and the reason for calf discomfort/pain is due to delayed onset muscle soreness (DOMs) that relates to the tolerance of the calf muscle. If this is the case, strength training is more useful at reducing DOMs. Stretching a tendon with tendinopathy makes an already too compliant tendon more compliant.
- **Regular strength training** – the survey did not seek information about what strength training was undertaken, but from experience of giving talks on running to sizeable audiences, and seeing a large number of appropriate patients, it appears that calf strengthening is not included in normal training regimes and may only be included for other lower limb muscles, which could possibly be a factor in triggering fatigue and overloading the Achilles tendon.
- **Orthotics** – based on the OR data one may conclude that we should remove orthotics as they increase the risk of problems. However, the more likely explanation is that the need by the individual for orthotics is a sign of a previous injury or problem with the foot and, as such, may cause increased stress on the Achilles or relate to an apparent lack of resilience. This has also been suggested by others (Marti *et al* 1985).

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- **Previous tendinopathy** – this is likely to have left structural alterations to the tendon, the largest known risk factor is structural abnormality so, while we often hear that structure is irrelevant, in the case of tendinopathy it appears to be critical. Structural changes (pathology) increase the risk of developing AT by 7.3 times (McAuliffe *et al* 2016). It is likely that the link relates to the ability of the tendon to remodel/repair after loading. This may be due to genetic factors, or simply the inability of the tendon cells to respond appropriately. The ability of the tendon to repair, i.e. improve structure, is currently debateable with several opposing views being published. However, the conclusion is that tendons can remodel as shown by Masci *et al* (2015). In the clinic we should not be focused on structural improvements as this does not appear to relate to pain or clinical outcome (Drew *et al* 2012), but we should anticipate seeing change given appropriate timescales, e.g. 6-12 months, rather than within the usual three-month rehabilitation period.

Please forgive my overly simplistic views on these factors as I appreciate there are other potential explanations but, based on the existing data and current thinking on tendinopathy, this is, in my opinion, the likely explanation. However, as with all science, we continue to try to confirm this.

Discussion and clinical application

Achilles tendinopathy certainly appears to have a high lifetime and point prevalence in the general running population. It appears to debilitate individuals for a long period of time and can cause some problems with an individual's ability to work. This is something that has not previously been identified. While the results found mid-portion tendinopathy is the most common presentation, they also identified a group of patients who present with, or go on to suffer, both mid-portion and insertional AT. This group may require different strategies to manage the disorder successfully.

There were also a large number of cases where the AT onset was sudden, suggesting the potential for collagen tearing. Anecdotally, this group often has problems with load progression and may have to be managed more carefully, i.e. through lower load progression over a longer period of time.

Strength training appears to change the neuromuscular function of the plantarflexors and is the treatment path that seems to help patients and links to the current literature, so seems to be critical in successfully rehabilitating patients.


Our research identifies several new aspects related to the symptoms and risk factors for AT. Targeting these risk factors is likely to be beneficial in resolving symptoms and may offer some potential for reducing injuries. As always, some further work is necessary before we can be confident about this.

About the author

Seth O'Neill is a Lecturer in Physiotherapy at the Universities of Leicester and Coventry. He also runs his own private practice www.keyworthphysio.co.uk.

Seth completed a MSc in Physiotherapy at Sheffield Hallam University, his thesis focused on Achilles tendinopathy. From this and his interest in tendinopathy he developed a scheme of work that was started in October 2012, focused on answering some important clinical questions that he's long been perplexed about. Seth's current PhD projects can be found here <http://achillestendonresearch.com/current-research>.

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Hip pain in active people: what's new in femoroacetabular impingement syndrome?

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Hip pain is common in young, active people, especially those who play sports. Until recently it was a condition that was difficult to treat. This article discusses how our research team at the University of Warwick are undertaking pioneering surgery and, in close collaboration between the surgeon and physiotherapist, developing new ideas that will help people with hip injuries, "weekend warriors" or elite international athletes, to return to activity and sport.



LEARNING OUTCOMES TO SUPPORT PHYSIO FIRST QAP

- 1 Understand the new field of hip preservation surgery.
- 2 Know how to diagnose femoroacetabular impingement (FAI) syndrome.
- 3 Learn about the new evidence to support hip arthroscopy in patients with FAI syndrome.
- 4 Hear about the developing consensus on post-op rehabilitation.

We have all heard of athletes with knee or shoulder injuries being treated with keyhole surgery and returning to full fitness. However, until recently young and active people with hip injuries didn't have this option open to them. A doctor might prescribe anti-inflammatories, some undefined physiotherapy, or even tell them just to lay off sport for a while. They would be told that they were too young for a hip replacement, as if that was what anyone would want anyway!

Fortunately, the whole field of hip surgery is changing. For a few highly specialised surgeons around the world, hip preservation rather than hip replacement has become the objective.

Our team of doctors, physiotherapists and scientists at Warwick have been at

the forefront of this new approach to hip and groin problems. From the early 1990s, I have been exploring hip joints with arthroscopic or keyhole surgery. Fifteen years ago, I decided to establish a whole new service, backed by world-class research. At the time I was amazed at how many people were limited, not only in their sport, but in their everyday activity by hip and groin pain. They were frustrated that there seemed to be little idea of how to properly diagnose their problem, let alone treat it. We needed new research, new thinking and new treatments. Since then, my focus has been exclusively on how to help young and active people with hip and groin injuries; we have found whole new opportunities for keyhole surgery for the hip and are getting thousands of people of all ages and abilities back to full fitness.

Understanding the problem

The first challenge for our team was to work out how to make a really precise diagnosis. This begins with a detailed discussion with the individual to understand the background to their injury. Together with a specialist physiotherapist, we perform careful physical examinations and compare our findings. I have found it tremendously useful to work side by side with a physiotherapist in this way because we often see different aspects of the problem. For example, my appreciation of the link between back

pain or sacroiliac dysfunction and limitation of movement in the hip (which we now call hip-spine syndrome) has been very much driven by my physiotherapy colleagues.

Following the initial examination, most people we see will require a variety of scans. With access to some of the most advanced imaging equipment in the country, we have developed scanning protocols that give us incredible pictures of the inside of the hip (figure 1). We can see fine details of the shapes of the bones that form the ball and socket, the articular cartilage that lines the acetabulum and covers the femoral head, and the flexible labrum that extends the rim of the socket. We pay special attention to the ligament teres and capsule. While micro-instability of the hip seems to be well-known in the physiotherapy world, it is another developing concept for surgeons.

Many people travel a long way to see us, so we usually carry out all aspects of the examination in a one-stop clinic. It is tremendously rewarding to draw all this information together and to be able to fully explain to the individual what is happening to their hip; this is often after they have gone through years of uncertainty and frustration. Sometimes an explanation is all that is needed, but at this stage, we usually develop a treatment plan with the patient.

"PRESERVATION, RATHER THAN REPLACEMENT, HAS BECOME THE OBJECTIVE IN TREATING THE HIP"

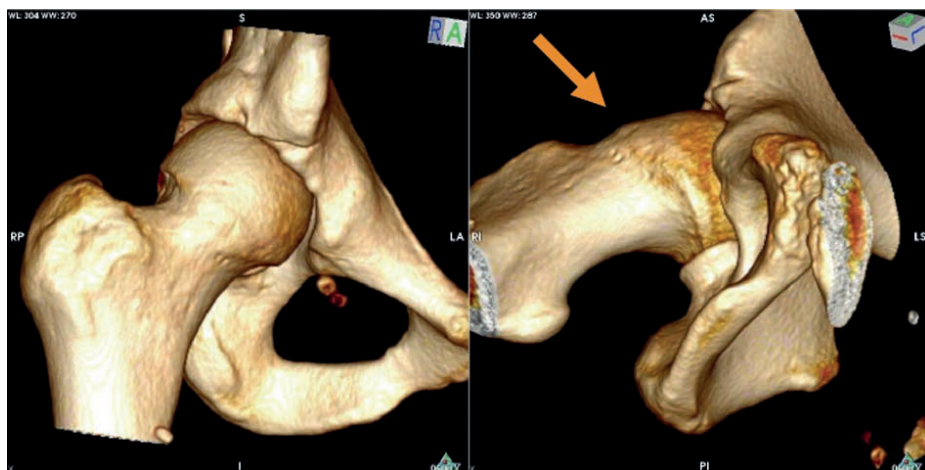


FIGURE 1: 3D CT scan of a hip with a cam shape (orange arrow) that leads to cam-type impingement when the hip is flexed and internally rotated

Using a detailed diagnosis of movement, control or strength deficits, we can reassure the patient and show them how, with a planned, individualised and progressive programme, exercise and rehabilitation can get them back to normal function. Occasionally the hip is so badly damaged that a hip replacement or resurfacing is the only option, but in many of our patients, if rehabilitation won't work the best way forward is in hip-preserving surgery; an operation that aims to rescue the natural hip, relieve pain and improve function.

In the developing arthroscopic or keyhole hip surgery, I have worked with an international group of innovative surgeons and developed techniques that

have allowed for a remarkable range of operations to be performed through tiny incisions. These enable patients to recover far more quickly than they normally would with conventional surgery.

Our aim is to work inside the hip while doing as little damage as possible to the muscles and ligaments that surround it. This was initially very challenging because the inside of the hip is so deep, but with two operating theatres specially designed to make this particular procedure as safe and simple as possible, and having completed many thousands of these operations, it is now much easier to do.

With the patient under anaesthetic, and with gentle traction on the hip, I use x-ray imaging to find our way safely between the ball and the socket, then insert a camera that enables us to see all around the joint. Once inside, we can navigate with a map of images and 3-D models of that patient's hip that have been prepared in advance. Tiny instruments, inserted through one-centimetre incisions, can remove loose fragments, repair cartilage, stitch ligaments or reshape bone.

Patients recover very quickly from keyhole techniques, which means

that, even only an hour or two after the operation, they will be able to eat something and then be in the gym for a session with one of our physiotherapists. In fact, we think that exercise is so important that the aim is for it to start straight away. Some patients go home the same day, but many stay with us for a day or two to establish their intensive rehabilitation.

Femoroacetabular impingement syndrome

One of the most common conditions treated is femoroacetabular impingement (FAI) syndrome. It is increasingly understood that, for a lot of people, the hip doesn't fit together perfectly. This is a condition that has turned out to be the main cause of most labral tears and is probably the cause of most premature arthritis in the hip. There are many ways in which the fit can be imperfect. Most common is for the femoral head not to be round; I often describe it to my patients as more rugby than football shaped. This cam-type impingement can result in the ball "jamming" in the socket, restricting movement, tearing the labrum and prematurely wearing away cartilage. Other problems include pincer-type impingement where the rim of the socket is too prominent, where the socket is generally too deep, or when the torsion of the femur is too low.

Understandably, many people are confused by the lack of clarity in the diagnosis of FAI syndrome so, with the involvement of some top

"WORKING WITH PHYSIOTHERAPISTS ENABLES US TO SEE DIFFERENT ASPECTS OF THE PROBLEM"

Hip arthroscopy can be of benefit for:

- **teenagers to active 50-year-olds**
- **people with hip or groin pain that interferes with work, sport or everyday life**
- **symptoms such as pain on exercise, or certain movements including clicking, catching, locking or giving way.**

"IT IS INCREASINGLY UNDERSTOOD THAT, FOR MANY PEOPLE, THE HIP DOESN'T FIT TOGETHER PERFECTLY"

physiotherapists, we drew up a consensus on this rather complicated set of issues to make sure that we, as health professionals, are all speaking the same language. The Warwick Agreement (Griffin *et al* 2016) has been endorsed by many sports medicine and physiotherapy societies around the world and is essential reading for anyone who is working in this area of healthcare as it has become the standard terminology to describe these patients (figure 2).

The next big challenge was to work out how best to treat femoroacetabular impingement syndrome. Some individuals may be best treated with rehabilitation and so we designed and tested the Personalised Hip Therapy (PHT) programme (Wall *et al* 2016). This progressive, physiotherapist-led rehabilitation involves a detailed assessment that leads to education and advice, and then a strategy to treat identified deficits of control and build strength around the hip and trunk.

The 12-week PHT programme is designed to be used by any physiotherapist, whether they work in the NHS or private practice. It includes up to 10 face-to-face contact sessions and, while it is not too prescriptive, it does provide a framework for physiotherapy treatment of FAI syndrome, capturing all the best ideas from around the world.

The FASHIoN trial

At the same time as developing PHT, we were developing hip arthroscopy methods to address FAI syndrome. We worked out how to accurately reshape the hip to prevent impingement, using a tiny burr to recontour the bone, and this seemed to work brilliantly well if I could treat a hip before the cartilage started to wear out. Some people we saw already had significant cartilage damage, so we worked out new techniques, such as transplant of tissue from other parts of the hip, or the use of stem cells to grow new cartilage.

The next step was to test hip arthroscopy and PHT in patients with FAI syndrome, so I led a randomised controlled trial (Griffin *et al* 2018), funded by the National Institute for Health Research. At a cost of nearly £2million, this research was performed in hospitals all across the country over a five-year period and has been a huge boost for the concept of academic collaboration between physiotherapists and surgeons.

What the NHS really needed to know was whether or not hip arthroscopy was effective. We were asked to compare surgery with PHT and this has been a huge undertaking with dozens of physiotherapists and surgeons involved. The results of our investigation found that, after 12 months, FAI syndrome patients treated with either strategy were improved, but that on average those who underwent surgery improved significantly more than those who followed a PHT programme.

So, what do these results mean? We now know that, on average, people with FAI syndrome do better with surgery than

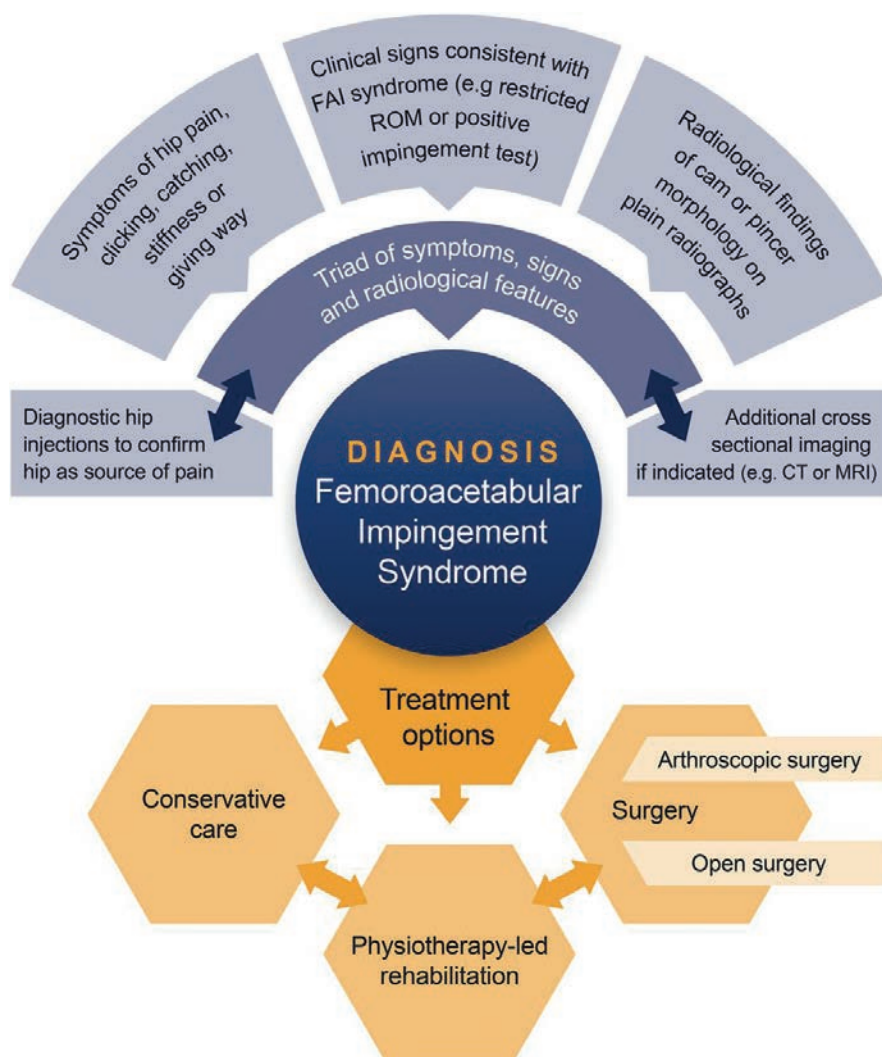


FIGURE 2: The Warwick Agreement on femoroacetabular impingement lays out a simple description of the problem and possible treatments

"SURGERY ONLY WORKS IF THERE IS GREAT REHABILITATION TREATMENT AFTERWARDS"

with conservative treatment, so we can be sure that hip arthroscopy works. However, beyond the average there seem to be some people who will do really well with physiotherapy intervention alone, some for whom physiotherapy is worth a try, and probably others who should just go straight to surgery. The key is to try to work out how to distinguish these groups, and that's what we are working on now.

Rehabilitation after surgery

The last big challenge in treating people with FAI syndrome is in working out how best to help them recover after surgery. Surgery only works if there is great rehabilitation afterwards and I am indebted to all my physiotherapy colleagues around the country who work closely with me on this aspect of treatment. We have found that professional sport is a great proving ground for new ideas in post-op rehab and pushing the boundaries here has led to big advantages for all of our patients.

In July 2018, I led a second consensus conference in which a protocol for rehabilitation was developed and will soon be published. It involved bringing together physiotherapists, surgeons, sports doctors and coaches from all over the world to work out a framework that would drive the fastest and most complete recovery possible, whether it be for a Premiership footballer or a middle-aged woman who plays occasional tennis. Again, we tried to simplify the terminology and structured the protocol around stages to ensure a quiet hip, then a stable hip, a strong hip, and finally a dynamic hip. We think that this can make recovery more predictable and straightforward.

The key is to get our patients back to activity. All of our work in diagnosis and treatment is designed to allow a rapid return to normal activity, whether that is for the individual who plays rugby or football, is a track athlete or a distance runner, a ballet dancer or gymnast, or someone who simply wants to go for a jog, ride their bike, or play with their children. We see a whole range of people, but they all ask the same question: will I be able to play again? More and more, the answer is yes!

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About the author

Professor Damian Griffin runs the Hip Arthroscopy Clinic from hospitals in Warwick and London. He is highly specialised in treating younger and more active people with hip problems, and his particular expertise is in arthroscopy for the repair of damaged or worn hip joints. The aims of his research and the treatments he provides are to relieve pain, return people to full activity and help them to avoid hip replacement. To find out more about Professor Griffin's work, visit www.hiparthroscopyclinic.co.uk. Physiotherapists are always very welcome to visit or to get in touch to discuss patients. Private patient appointments can be made in Warwick or London by contacting Tom or Emma on 01926 403529 or secretary@hiparthroscopyclinic.co.uk. Professor Griffin also treats NHS patients, please email NHS@damiangriffin.org for advice.

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For more information:

The articles mentioned above can all be downloaded free from

www.hiparthroscopyclinic.co.uk/research 

Bedside ultrasound imaging as a tool to rehabilitation prescription

CHRIS JERRETT MCSP

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Like many physiotherapists, I use an ultrasound scanner in my daily practice. Although, 10 years ago, I was an early adopter of this tool and I have had appropriate training in its use, I am not trained to be diagnostic and, importantly, do not claim to be diagnostic. This article is about how the ultrasound scanner is useful to me in my practice and why I use it with a considerable number of clients.



LEARNING OUTCOMES TO SUPPORT PHYSIO FIRST QAP

- 1 Increase an awareness of the benefits of an ultrasound scanner in an everyday physiotherapy practice setting.
- 2 Understand scope of practice restrictions in the use of a scanner.
- 3 Demonstrate scanning as a biofeedback and motivational client tool.

Introduction

Why do I use an ultrasound scanner as part of my practice? Well, for a start it looks impressive, but we are not just talking of image (excuse the pun) over substance. The scanner's practical value comes with being able to add further insight to how I describe certain injuries with the help of moving pictures; nothing helps a patient to grasp a problem more than seeing it in action as they move.

One of the first injuries I became happy to describe and show to patients via the scanner was Achilles tendinosis (figure 1).

By imaging this particular condition it is easy to see the change in shape, from parallel to fusiform (spring onion shape) that occurs with an Achilles issue, or the changes in appearance in the collagen and ground substance. I have found that this visual image, coupled with a

description of what we aim to achieve with loading regimes aids getting the client on-board for the long-term home exercise regimes required for successful treatment.

Does a scanner help to decide if an injury is a tendinosis in the first place? While access to the equipment is an asset, a physiotherapist can spot this condition from across the room, or as part of taking a patient's history, a scanner is completely unnecessary for such a diagnosis.

At this point, I must make it clear that I am not an ultrasonographer. There are courses available for anyone wishing to move up to this degree of use, but I have not undertaken this more advanced image training and so, if I see what looks like a bursitis in a shoulder scan, I am

not able to make that diagnosis. In such cases I would contact the client's GP and report that I have found changes on my own bedside ultrasound and request a formal scan if appropriate.

Promoting exercise adherence

For me, a scanner is a really useful tool for muscle biofeedback. I often ask patellofemoral pain patients to follow an intensive vastus medialis oblique (VMO) activation and an isolation regime to overcome pain and swelling based muscle inhibition. Some patients appear to be micro-sensitive and know right away, even if it's a weak one, that they are getting a VMO twitch or contraction and they can work on improvements from this. Other patients are more

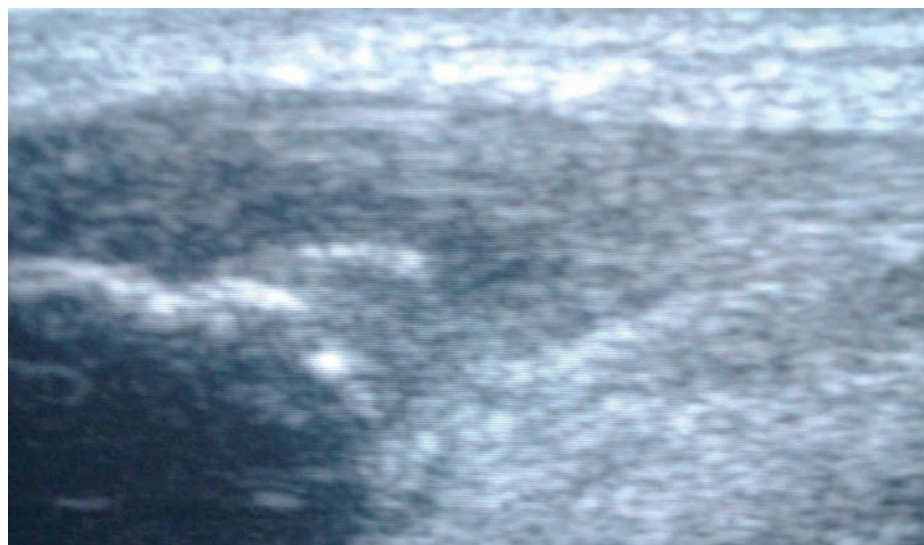


FIGURE 1: Ultrasound scan of Achilles tendinosis

"IMAGING ENABLES PATIENTS TO SEE THE MUSCLE CONTRACTION AND VISUALISE WHAT THEY SHOULD BE AIMING FOR IN THEIR HOME EXERCISES"

macro-sensitive and, although I can see a contraction and they have a finger on the muscle in question, they have no concept that it is activating. By imaging the VMO, these patients get a visual of the muscle contraction as they work and it enables them to key into the activity and leave the clinic knowing what they should be aiming for in their home exercises. They are also aware that we will check the muscle contraction on the scanner for improvements on their return visit and there is nothing like the fear of a test to encourage patients to pull their weight at home.

I am also able to nudge patients with mobile device technology towards exercise prescription adherence. I can send a copy of the video of the scan showing the muscle contraction to their phone and from this we can compare any differences at each treatment review.

A scanner can also be a further biofeedback aid for actions where it is hard for both the therapist and the patient to know if they are being done correctly, or even at all. The scanner is also used by Sandra, my wife and working partner, for use in her women's health practice. Invaluable information, not attainable from questioning or palpation alone, can be obtained, as well as easier detection of how the neck of the bladder moves with a correct pelvic floor contraction.

I find a dynamic ultrasound image shows patients with, say, low back pain or a sports injury, how to attain appropriate muscle activation. Seeing an image with simultaneous palpation of their abdominal wall helps to direct correct muscle use and level of effort. This can then be replicated in their home regime, complementing standard exercise packages. This process takes 10 minutes;

however, without a scanner and by using verbal prompts and palpation alone, it can take several treatments and may never be attained!

The National Institute for Health and Care Excellence (NICE) low back pain guidelines (NICE Dec2016), and the pain-ed website (www.pain-ed.com) covers a variety of information on the care of low back pain.

Identifying structure for treatment

I recently treated a patient with a long-term shoulder problem. Having undergone a scan at the hospital, a calcific supraspinatus tendon had been noted. Based on this scan, the patient had gone elsewhere to receive a course of shockwave therapy, but this had not improved the problem.

Shockwave therapy has mixed evidence (NICE Nov2016) but my personal experience of using it has been very encouraging and, as its original application was in lithotripsy for dissipating kidney stones, it seems ideally suited for the treatment of calcific tendons. As all normal conservative treatments had been tried with this patient, and not been helpful, my approach was to revisit the shockwave therapy treatment, allied with shoulder girdle posture and strengthening within good biomechanical models.

By carrying out a bedside scan with our own scanner, I was able to clearly mark on the surface the calcified zones and thus deliver treatment to the structure that produced excellent results on BmPROM scores and subjective questioning. This result has sustained over a four-month period so far. While

a single patient study is far from ideal, there seems to be a use in being able to pinpoint where to treat as accurately as possible. Imaging a calcaneal heel spur in a patient and seeing shockwave break down the spur and finding the heel pain resolves is also helpful and aids probe selection to target bone change over soft tissue change.

Pinpointing structure for treatment has also been useful to me in determining depth and accuracy when carrying out acupuncture treatment. I have found that deep needling into the Piriformis seems most effective as the needle reaches the Piriformis fascia, and I can also ensure I do not creep the needle into the hip joint and run any increased risk of joint-based infection. Major blood vessels can also be easily seen and avoided and anxiety over those patients with anomalous anatomy reduced.

As my own professional interests and client base have developed, having a scanner in my clinic has been of great help in identifying injuries specific to patients who share my passion for rock climbing and attend my practice because of that. An injury that occurs in climbers is when the "pulleys" that hold the finger flexor tendons close to the joints (in a similar way that the loops on a fishing pole hold the line to a bowing pole to avoid a bowstring effect) is damaged while on a crimp or difficult hand hold. This is often signaled by an audible cracking sound, instant pain and the climber falling from the rock. With a scanner, the distance from the tendon to the phalanx can be



"THERE IS A USE IN BEING ABLE TO PINPOINT WHERE TO TREAT AS ACCURATELY AS POSSIBLE"

easily imaged and accurately measured and, if this is over 1mm, a rupture is indicated allowing the clinician to plan appropriate management advice and taping techniques. To learn more about this injury, search climber's pulley injury in YouTube.

The role of ultrasound in major muscle injury

A fit 37-year-old male attended my clinic for assessment and his presentation is very much of relevance to the discussion in this article.

The patient had been playing rugby, having come out of retirement for a one-off game and, after the match, his right anterior thigh had become swollen, a lump had developed and he was in pain. He had struggled with walking and climbing stairs for a few days and at around five days from injury he felt there was some improvement, so increased his walking and did some very light leg extensions to try to help rehabilitate the injury further. This additional activity caused his symptoms to flare and, when he visited my clinic 10 days after the initial event, the aggravated symptoms were just beginning to settle.

On examination, there was a large bruised area running from the whole length of the patient's anterior right thigh to the knee and extending around the patella area. He walked with a limp but reported very little discomfort. His aim in attending my clinic was for a sports massage and strengthening advice. On palpation, I detected a depression and general fullness or swelling in his quadriceps. The patient experiences mild discomfort on isometric hold.

My assessment was of a fairly major muscle tear of the rectus femoris with haematoma and some bleeding having escaped into the tissues. Treatment advice was rest, no massage, no stretches, no exercises and definitely not "trying the area out". The patient was clearly not "on board" for this advice as the pain level did not support this view of the damage, and he was feeling well enough to consider returning to exercise.

Through the use of bedside ultrasound I was clearly able to show the patient the large intramuscular haematoma (figure 2) which, as it turned out was located in the vastus intermedius quadriceps muscle, rather than the rectus femoris.

This matched the description of the damage to the muscle to be of between three quarters to full rupture, and a haematoma with the volume of blood that would fill a mug to three quarters full. With regard to the patient's insistence on massage treatment and exercise, I used the analogy of how treating a cut to the arm this way would result in it continuing to bleed. I explained that ultrasound scanning was also used by equine vets, and their patients could not give a history, and that if a scan on a racehorse had produced a similar result to the one we were currently looking at, the animal would be on "box-rest" to ensure that it was kept inactive enough to prevent the chance of any hindrance to the muscle repair process.

Following this explanation, the patient, who before the scan had clearly not been convinced or willing to accept my treatment plan, was now happy to be "box-rested". The stage after complete rest would involve stretches, progressing to easy activity and then training. However, this step would not be down

to either of us but would be reliant on a normalised scan image acting as an objective measure. It is worth noting that there sometimes is a lack of pain a week after a major tear. A partially torn, pain-sensitive muscle will be aggravated during movement, with a major tear there is just a free moving "stump" (Evans 1980).

Each re-scan of this injury will show the haematoma reducing in volume, to a point where the image of what remains of it will look like "snow". This indicates repair tissue and each of these stages will guide the appropriate timing for increasing loading and dynamic rehabilitation.

The role of ultrasound in cyclic injury

At the other end of soft tissue damage is the very small tear in the muscle that presents as a cyclic injury.

A runner feels a cramp in their calf muscle, rests for two days before easing back into running. After a few gentle runs they return to normal training at which point, "bang!" the calf "goes again", and the runner repeats the rest and rehab process. If the cause of this repeated injury is a small tear in the gastrocnemius, it will not hurt enough to prevent the runner from carrying on with

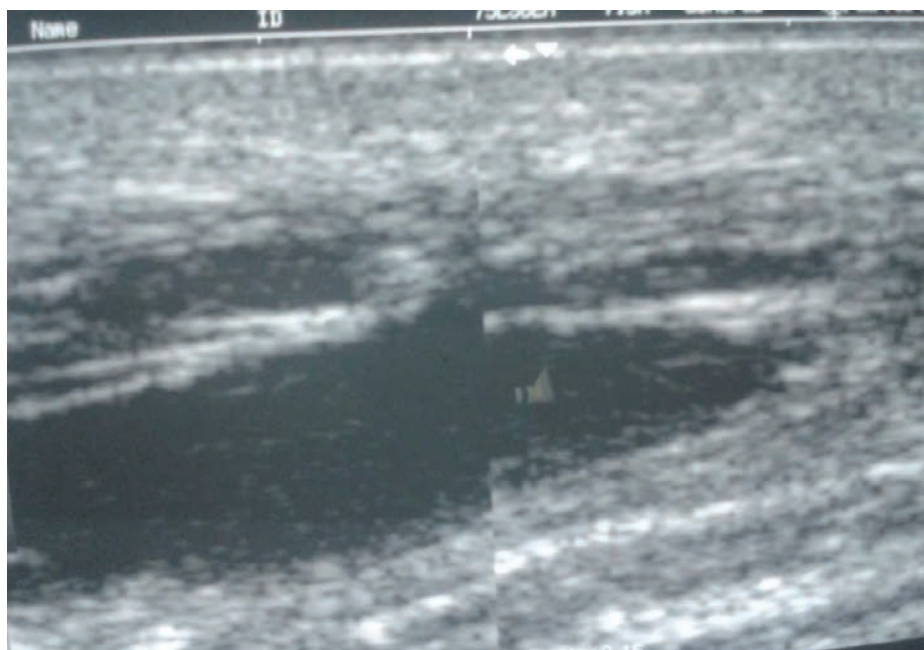


FIGURE 2: Ultrasound scan of intramuscular haematoma

// SHARING THE SCAN OF THEIR INJURY WITH THE PATIENT HELPS TO REINFORCE CONFIDENCE IN THE DIAGNOSIS, AND PROMOTE COMPLIANCE TO HOME-BASED TREATMENT //

their training. By showing the patient that the damage to the gastrocnemius is producing a small amount of bleeding at the point where it joins on to the Achilles, the clinician can help them understand that the issue is not just cramp that is relieved with a couple of days rest, but is an injury that needs four days, prior to a stretching and graduated rehabilitation regime over a further three-week period before returning to normal training. This enables us to gain compliance and break the injury cycle. In addition, sharing the image with the patient via their mobile device allows them to compare the progress of the injury at each stage of the treatment and engage with the rehabilitation decisions made.

Reinforcing patient confidence

As a therapist I do not need the scan for clinical diagnosis, but it helps to reinforce patient confidence in my diagnosis and promote their compliance to a home-based treatment regime which relies strongly on the patient carrying out prescribed exercises several times a day.

The other great bonus of regularly using imaging has been the steady improvement of my own anatomy knowledge. I once attended a course where the participants were blindfolded and asked to identify coins in a bag, putting them into order of value and a heads-up position. This was generally

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done well until a few foreign coins were introduced without notice. The point of the exercise was that you really can't carry out palpation without first having a mind's-eye image of what, and where, you are palpating in the first place. Scanning has really helped with my "what" and "where".

Conclusion


We, as private physiotherapists, do not give ourselves enough credit for being educators, descriptors, debunkers and narrators for healthcare. We have the ability to allocate time and resource, that is often simply not available to GPs and other specialists within the NHS, to explain to our patients the tests we are carrying out and their results, when and why a problem occurs, or an operation is indicated, and what they can expect of their rehabilitation in the short- and long-term. When I scan I don't hide the image from the patient, and I comment on findings at the time rather than decline to do so and send them in a later report. For me the ultrasound scan is a co-operative tool that is part of the patient education process and not for rigid structural diagnostics.

About the author

Chris graduated from Guy's Hospital and has gained experience from working in a variety of hospitals. In 1994, he established and worked in his private practice in the West Midlands until 2001 when he and his family moved to Scotland where Chris initially worked as a physiotherapy manager before, again, opening his own practice in 2004.

Chris has worked extensively with athletes at all levels and he has travelled widely with UK Athletics and Team GB to the European Championships, Grand Prix events and the Manchester Commonwealth Games. He currently works with Scottish Athletics teams.

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Low back pain: an unsolved problem – how might physiotherapists help?

MARY O'KEEFFE PhD BSc

Physiotherapist and Marie Skłodowska-Curie Global Fellow, The University of Sydney

The theme of our Physio First 2019 annual conference is “Hands On, Hands Off: what is the evidence?” Dr Mary O’Keeffe has kindly agreed to present the Private Physiotherapy Educational Foundation lecture on Saturday 06 April 2019. To give our members a taste of what to expect from our excellent line-up of guest speakers, this article is an introduction to what she will cover in her presentation.



LEARNING OUTCOMES TO SUPPORT PHYSIO FIRST QAP

- 1 Understand the multidimensional and personal nature of chronic low back pain.
- 2 Develop skills to reframe assessment and treatment to align with the multidimensional and personal nature of chronic low back pain.

Low back pain (LBP) is a common musculoskeletal disorder and is costly, both at a personal and a societal level, resulting in a significant personal, social and economic burden. *The Lancet* low back pain series (Hartvigsen *et al* 2018; Foster *et al* 2018; Buchbinder *et al* 2018) thoroughly outlined the global burden of LBP and how disability is expected to increase over the coming decades. The series called for the worldwide recognition of LBP-related disability and the importance of removing ineffective and harmful practices, such as inappropriate imaging, opioids, and surgery (low-value care). At the same time the series called for a shift to safer, non-pharmacological (high value) forms of care, such as education and exercise. Physiotherapists are well placed to implement this latter care-path and have the potential to play a leading role in the lives of people with LBP.

Very little innovation has taken place in the treatment of LBP in recent decades.

The new approaches we do have are built on previous ones but seem to be integrated or packaged differently. This in itself is not an issue provided we recognise that we currently do not know what to do about solving LBP; we have not arrived at the new successful treatment destination. This possibly means two things:

1. We should not be too hard on ourselves when we cannot “fix” people
2. We should not be promising fixes.

In the absence of a real answer to LBP, how can we as physiotherapists strive to provide the best care? It is an important question as we do not want to become nihilistic. We can provide as much value as anybody or anything else delivering care to the LBP population, but we also do not want to be overconfident and overselling our therapies. Can we find a middle ground?

This question informs my lecture at the Physio First 2019 annual conference “Hands On, Hands Off: what is the evidence?” In order to give you a taste of what will be covered, here are some of the key areas of my presentation.

A tapestry of heterogeneity

There is reasonable evidence to suggest that LBP emerges from the whole person (Thacker & Moseley 2012; O’Sullivan *et al* 2016, 2018). The state of our tissue, how we move, our expectations, perceptions, thoughts, and emotional states, our

genes, environment, lifestyle, social lives, and everything else science does not yet know about, all interact, and we cannot decouple one “area” from the other. This has broad implications for how we treat and manage LBP. Many approaches to LBP seem to take a bias towards targeting “higher centres”, i.e. through trying to change cognitions, emotional states, and beliefs, while others take a bias towards targeting “lower” or “peripheral” centres through trying to change movement, structures, strength, or flexibility. Some approaches have tried to marry the two. The result: no superior treatment approach has emerged.

Taking a more flexible approach to management, one that appreciates the interaction between the myriad factors which might be at play, might help us get the best out of interventions, in the hope of providing the best information and management we can to the individual with LBP. With our expertise in movement and anatomy, physiotherapists are in an excellent position to help individuals make sense of their pain, and by continuing to build and update our knowledge in areas of communication, behaviour, psychology, philosophy, physiology, neuroscience, immunology, etc we can help individuals to manage and improve their pain.

Meeting the person with pain for the first time

Our first time meeting an individual with

"TAKING AN APPROACH TO MANAGEMENT OF LBP THAT APPRECIATES THE MYRIAD FACTORS AT PLAY MIGHT HELP GET THE BEST OUT OF OUR INTERVENTIONS"

pain comes with many expectations from both sides. While we, as clinicians have our own views of what physiotherapy is and what we do, the public might see our role as something very different. However, this discussion is not in the scope of this article or my presentation, but it is a very important consideration. Many of the concepts we talk about or hope to include in physiotherapy will not be realised until there are societal shifts in what pain means and what it represents.

If pain emerges from the whole person, getting a first-person account of pain, if possible and with the co-operation of the individual, is very important (Thacker & Moseley 2012; O'Sullivan *et al* 2016, 2018). Physiotherapists are trained to complete an assessment, part of which is to ask about particular aggravating and easing factors in order to identify the structure or the cause of the problem (Thacker & Moseley 2012). How might we engage the first-person narrative and elicit valuable information of the type that cannot be sourced from a checklist or "recipe book"? To do so could involve any information that the individual chooses to disclose and could include anything in their pain history, their lived experience of pain, meaning of pain, meaning of their life, life satisfaction, beliefs regarding the cause of their pain, emotional responses to pain, general health, and personally relevant goals. Placing people into "boxes" may mean we miss out on important information (O'Sullivan *et al* 2016, 2018).

What if pain is dangerous?

Understandably, many clinicians worry about missing a serious condition or disease, such as cancer. There is reasonable evidence that this is an automatic thought process and that we

are susceptible to an array of cognitive biases and use heuristics to help guide our clinical decision making (Blumenthal-Barby & Krieger 2015). Sometimes this can be good and efficient, but, unfortunately, it can also mean that we do not update our approaches when the evidence encourages us to do so. This is very important in the context of imaging and LBP. Only an estimated 1% to 2% of people presenting with LBP will have a serious condition, such as systemic inflammatory disorder, infection, spinal malignancy or a spinal fracture (Henschke *et al* 2009). For the remainder, there is a weak correlation between pathoanatomical findings and the development of LBP. While some cross-sectional research shows that specific imaging findings, i.e. endplate (Modic) changes and severe disc degeneration are associated with LBP, they are poor predictors of future chronic LBP (Deyo 2013; Jarvik *et al* 2005; Steffens *et al* 2014).

A systematic review and meta-analysis (Brinjikji *et al* 2015a) found that specific imaging findings, e.g. disc degeneration, disc bulges and modic changes, are more prevalent in people with LBP than asymptomatic individuals. This suggests that particular imaging findings may play a role in the pain experience. However, pathoanatomical findings on spinal imaging are widespread across people with LBP and asymptomatic individuals (Brinjikji *et al* 2015b).

It is highly probable that anatomy can play a role in the pain experience (Hancock *et al* 2011), but if it does, we cannot identify it, and even if we could, would it matter? Unfortunately, inappropriate imaging is now an endemic problem in managing the care of LBP (Hartvigsen *et al* 2018; Foster *et al* 2018; Buchbinder *et al* 2018), and the

physiotherapist's task is made more difficult by the fact that the majority of people with LBP request imaging (Jenkins *et al* 2016). How do we navigate this? We can do so by getting better at sharing their uncertainty, and the risks and benefits of testing, with our patients and by communicating the consequences of different management and treatment options. This will facilitate a shared decision-making approach.

Psychological factors

Dealing with the psychological factors involved in LBP can be within the scope of the physiotherapist (O'Keefe *et al* 2018). Does this mean we need a whole new set of skills? I would argue that our current interventions, if framed in a "helpful" manner, can yield a positive effect on psychological factors. Interventions traditionally labeled as "physical", e.g. exercise, do not exert their effects through purely physical changes in the musculoskeletal system (O'Keefe *et al* 2018). Instead reductions in pain and disability after treatment are at least partially mediated by changes in "non-physical" parameters such as self-efficacy, fear, beliefs and distress 🔄

"WE CAN FACILITATE SHARED DECISION-MAKING BY COMMUNICATING THE DIFFERENT MANAGEMENT AND TREATMENT OPTIONS WITH OUR PATIENTS"

"HOW WE MIGHT OPTIMISE OUR SKILLS TO EMPOWER OUR PATIENTS WILL BE DISCUSSED IN MY LECTURE AT THE PHYSIO FIRST 2019 ANNUAL CONFERENCE"

(O'Keeffe *et al* 2018; Lee *et al* 2016). It is probable that we can provide all physical interventions with a narrative that exerts a positive or negative influence on the patient's psychological factors (O'Keeffe *et al* 2018). As physiotherapists, each time we treat a movement or activity which the individual is fearful of, or they deem to be painful or limited, we are, consciously or otherwise, empowering them by using a combination of physical rehabilitation and cognitive behavioural principles (O'Keeffe *et al* 2018). How we might optimise this will be discussed in my lecture at the Physio First 2019 annual conference.

Remove hands-on at our peril

Hands-on or hands-off for LBP? This has been the subject of much debate for a long time. We see the pendulum swinging in the extremes of both directions, with some saying hands-on causes harm and promotes dependence, and others claiming it is necessary and creates real changes in the structures of the spine. It is probably fair to say that both claims lack factual evidence. Perhaps some of the problems start with the definition of hands-on. Must it be a formal part of treatment, i.e. massage, manipulation, or needling, to be regarded as hands-on? What about touch during exposure, or assessment, or feedback? There has been a move towards more hands-off educational and reassurance approaches. Does this mean hands-on is neither reassuring nor educational? Perhaps it could be? As some of us move further away from a biomedical view of LBP, do we remove the necessity to be confident with hands-on? Do we take this away from physiotherapists at the beginning of their training? Are there any downsides to this? On the other hand, how do we

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ensure individuals get a sense that, with the necessary tools, they can treat their own pain, in as much that the evidence says we can do this.

My lecture will aim to tease out the nuances in the answer to all of these questions and reflect on how hands-on might be better defined or framed in the clinical encounter. Keep it, or remove it, or find a middle ground?

Always practice high-value physiotherapy

What constitutes high-value physiotherapy? This is a particularly tricky question in the area of LBP where treatment effect sizes are consistently small. While some might say all our treatments are equally low in value, others might argue that all our treatments are similarly high in value. If the treatment effects are the same, how are we making these distinctions? This is an essential discussion as these terms have made their way into the physiotherapy conversations.

Another discussion is whether we should label our interventions as higher value when compared to harmful practices like opioids, while some may say physiotherapy treatments and "labels" can be harmful.

When *The Lancet* series suggested a move towards treatments such as exercise, manual therapies and education, do we think this will properly tackle the burden of LBP? The answer remains unclear.

About the author

Mary is an Irish Physiotherapist and early career researcher. She is currently on a Marie Skłodowska-Curie Postdoctoral Fellowship in The University of Sydney (Australia). Mary's fellowship involves two years at The University of Sydney, a three-month secondment to EFIC in Brussels, and nine months in the University of Limerick where, in 2017 she completed her PhD on the effectiveness of individualised multidimensional care for chronic low back pain.

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Tips from our team

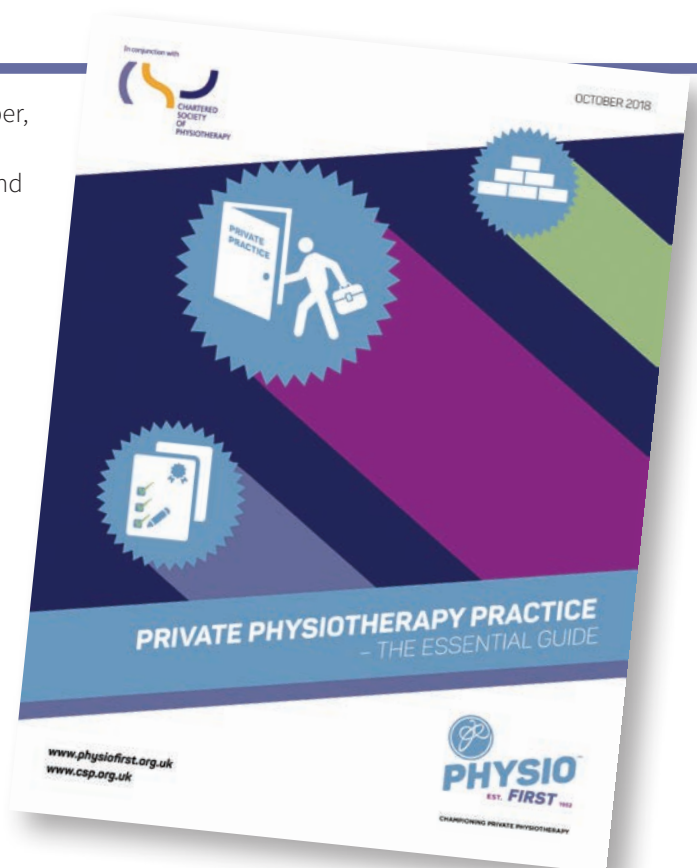
Launch of our joint Physio First and CSP Private Physiotherapy Practice – the Essential Guide

At the Physiotherapy UK 2018 event in October, we launched our new complete e-guide that covers all aspects of setting up, working in and making a success of a private physiotherapy practice and explains how to negotiate the world of private practice.

Private Physiotherapy Practice includes advice and information on all aspects of setting up a private physiotherapy business or becoming a self-employed associate. It is also relevant to the physiotherapist undertaking private work in any capacity, or who may already be a private practitioner and is considering how to resize or redesign their practice.

This free eResource has been co-produced by Physio First and the CSP, the professional, educational and trade union body for the UK's 57,000 chartered physiotherapists.

Members can access the *Private Physiotherapy Practice – the Essential Guide* directly from www.physiofirst.org.uk



Physio First AGM 2019

East Midlands Conference Centre

The Annual General Meeting, open to all members of Physio First, will take place in Nottingham on Friday 05 April 2019 at 16:05hrs.

Physio First members are invited to submit motions for inclusion on the Agenda of the AGM. These must be proposed and seconded and reach the Physio First office by **Friday 25 January 2019**.

Please address your submissions for the attention of our Secretarial Support team and send to: Physio First, Minerva House, Tithe Barn Way, Swan Valley, Northampton, Northamptonshire NN4 9BA or email minerva@physiofirst.org.uk.

Private Physiotherapy Educational Foundation (PPEF) AGM 2019

The AGM of the PPEF will take place on 05 April 2019 at 13:00hrs at the East Midlands Conference Centre, Nottingham.



Chairman Pam officially receives her Distinguished Service Award

As was announced in our winter 2017 edition of *In Touch*, our Physio First Chairman, Pam Simpson was awarded the CSP's Distinguished Service Award (DSA) but was unable to attend last year's awards dinner.

She was, however, able to receive this prodigious award at this year's Physiotherapy UK.

Pam's award was conferred in recognition of her longstanding contribution to the field of patient handling, occupational health and ergonomics and medico-legal report writing. She has contributed to major gold standard publications and to CSP guidance in 2011 and 2014. Her award is in particular for her work with Physio First in leading the introduction

of a unique kite mark of quality in private MSK.

Pam is not the only award winner in the Simpson household, however as Pam's husband, Brian was presented with the DSA in 2012 for his outstanding contribution to the treatment and enhanced healing of fractures by the use of pulsed magnetic field therapy, lasers and other modalities. He, too, worked as a volunteer on

the CSP Council and with Physio First.

Receiving this award is, therefore, not only an amazing achievement for Pam but it also puts her and Brian in the unique position of being the only married couple in the UK to have been recipients of the DSA.

We are also proud that they are the only married couple, practising members of Physio First to do so.



Helping physiotherapy make a difference



PPEF Louis Gifford Award

Congratulations to Clare Pettigrew and Claire Oldroyd... the lucky recipients of the Louis Gifford Award.

The award was set up by the PPEF Trustees in honour of the late Louis Gifford and his outstanding contribution to the physiotherapy profession.

Louis was a private physiotherapist who ran his own business and was passionate in teaching pain science and management. He was also a regular attendee at the Physio First annual conference, both as a lecturer and as a delegate. He believed in healthy exchange and vibrant discussion around physiotherapy topics.

As winners of the Louis Gifford Award, Physio First members Claire and Clare



will each enjoy a complimentary place for the full 2019 Physio First conference, travel expenses to and from the venue, and two nights' accommodation at the Orchard Hotel.

We would like to thank everyone who submitted their names in application for this award. Next year we aim to extend the option for this award to be available to non-Physio First members as well. There will be a complimentary place available for each category.

For more information on this and other news from PPEF, see our website at www.ppef.org.uk



Clare Pettigrew



Claire Oldroyd



Spine and Joint Articulation for Manual Therapists

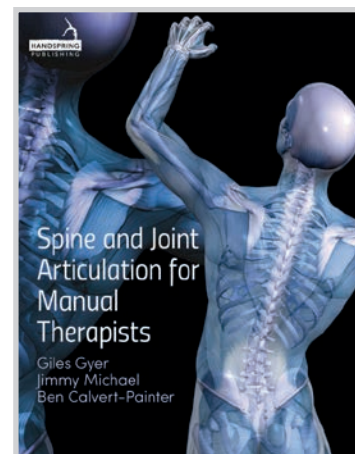
Giles Gyer, Jimmy Michael, Ben Calvert-Painter

Publisher: Handspring | ISBN: 9781909141315 | RRP £34.95

This is a solid companion that will guide the practitioner through the assessment and treatment of joints. The text is well referenced, and the presented information for each body area draws from a wealth of sources making this text a comprehensive and valuable clinical tool.

Each body area is covered by a theoretical aspect explaining the biomechanics and anatomical specifics as well as common presentations. The chapters contain some very useful tables which give a succinct overview of tests to be used, as well as the responses to these and their clinical implications. The photographs easily demonstrate the techniques available, which again makes this book useful as a study guide or quick reference book for clinicians. My one concern is that this book may be a little 'light' for the experienced practitioner looking to deepen their knowledge rather than refresh their existing stock.

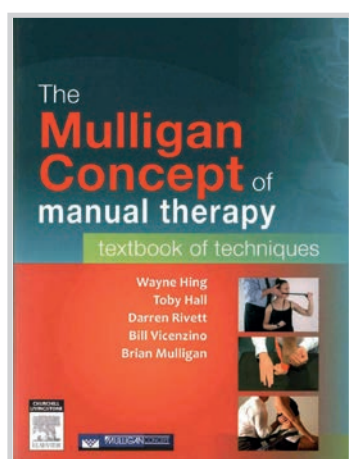
Tobias Bremer



The Mulligan Concept of Manual Therapy (1st Edition) Textbook of Techniques

Editors: W Hing, T Hall, D Rivett, B Vicenzino, B Mulligan

Publisher: Elsevier | ISBN: 9780729541596 | RRP £83.99



I write this review with unashamed bias. The Mulligan concept was one of the first courses I went on after graduating as a physiotherapist and it is something I have always been fond of. I loved how easy it was to apply, and the good clinical outcomes that resulted from using it. My love affair was rekindled when Bill Vicenzino gave his presentation on tennis elbow at the Physio First conference in 2016 when he demonstrated, in our increasing aim for evidence-based medicine, how relevant the Mulligan concept still is.

The Mulligan concept has come a long way from its humble narrative beginnings. Brian Mulligan, with contributions from some world renowned manual therapists, guides the reader through various techniques, clinical presentations and evidence, all of which back up what the manual therapist does. As a clinician at heart, I particularly like the "clinical reasoning gems" aspect highlighted in each chapter.

As far as I can tell, other than the addition of a TMJ section, the techniques manual therapists employ seem not to have changed much from the first Mulligan book, however our understanding of how they work is an ongoing investigation, and this latest Mulligan publication certainly adds to the clinical understanding of the reasoning for their application.

If you don't possess a copy of one of the older Mulligan books, I think now might be time to purchase your first!

Tobias Bremer

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