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DANSK SPORTSMEDICIN

Tema: PATELLOFEMORALE SMERTER

Redaktionelt

Ansvarshavende redaktør, PT, PhD Heidi Klakk

Patellofemorale smerter en udbredt lidelse både i almenbefolkningen og i sportsverdenen. Tilstanden vil derfor være kendt af de fleste klinikere, men med særlig høj frekvens inden for idrætsklinikken. Tilstanden er, trods den høje hyppighed, snarere et symptomkompleks som ofte begrundes med udelukkelse af andre og mere kendte lidelser i knæet, end en egentlig klart defineret diagnose i sig selv. Heldigvis har der de seneste år, fra både klinikere og forskere, været en stigende interesse for bedre at forstå og håndtere patellofemorale smerter. Der er efterhånden etableret god evidens for effekt af tidlig rehabilitering, bl.a. med øvelser, tapening og ortoser, men svagere evidens for præcis ætiologi og prognose samt effekten af rehabilitering i det lange løb; hvad skal der til for at undgå kronicitet? I dette nummer kan du bl.a. læse, at mellem 71% og 91% af individer med patellofemorale smerter har smerter endnu efter 20 år! Det må vi som klinikere være med til at lave om på.

Vi er derfor i Dansk Sportsmedicin rigtig glade og stolte over at kunne udgive dette nummer af Dansk Sportsmedicin med temaet patellofemorale smerter belyst fra flere perspektiver.
The Private Physiotherapy Education Foundation (PPEF) i England har gennem de sidste år uddelt midler til forskning indenfor patellofemorale smerter. For at sikre formidling af forskningsresultaterne fra disse midler tog Dylan Morrissey teten og fik samlet en række personer, der sammen har lavet et tema-nummer om patellofemorale smerter til det engelsk magasin "In Touch". Den tidligere redaktør, Michael Skovdal Rathleff, var med til at skrive nummeret og Dansk Sportsmedicin har fået lov til at genoptrykke dette nummer, således at de danske læsere også kan få indsigt i den nyeste viden om patellofemorale smerter formidlet af en gruppe dygtige klinikere og forskere.

Gruppen bag artiklerne fører os på elegant vis gennem både opsummering af eksisterende evidens, applied science og kliniske vurderinger (Morrissey). Rathleff understreger bl.a. vigtigheden af anamnesen til at vurdere risikofaktorer for ætiologi og prognose. Dernæst giver Lack et bud på hvordan tidlig rehabilitering kan progredieres og tilpasses det enkelte individ. Laupheimer diskuterer, hvad vi har at gribe efter, når tilstanden ikke bedres af vores behandling. Barton efterspørger i sin artikel "Rehabilitation - the long view" forskning på effekten af rehabilitering udover de indledende 8-12 uger, så vi kan undgå kronikere, der har ondt endnu efter 20 år! Slutteligt ser Callaghan og Neal på rehabilitering og forebyggelse af patellofemorale smerter i sportsspecifikke settings, nemlig inden for cykling og løb.

En stor tak fra redaktionen til PPEF, "In Touch" og alle forfatterne Dylan Morrissey, Michael S. Rathleff , Christian Barton, Michael J. Callaghan, Bradley Stephen Neal, Simon Lack og Markus Laupheimer. En ganske særlig tak til Michael S. Rathleff for at gøre det muligt at genoptrykke.

Glæd jer til spændende læsning.

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FORMÅL
DANSK SPORTSMEDICIN er et tidsskrift for Dansk Idrætsmedicinsk Selskab og Dansk Selskab for Sportsfysioterapi. Indholdet er tværfagligt klinisk domineret. Tidsskriftet skal kunne stimulere debat og diskussion af faglige og organisationsmæssige forhold. Dermed kan tidsskriftet være med til at påvirke udviklingen af idrætsmedicinen i Danmark.
TILGANG
Tidsskriftet udkommer online 4 gange årligt i månederne januar, maj, august og november. Målgruppen er medlemmer af Dansk Idrætsmedicinsk Selskab og Dansk Selskab for Sportsfysioterapi samt andre idrætsmedicinsk interesserede. Tilgangen er åben for alle.

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DANSK SELSKAB FOR SPORTSFYSIOTERAPI

Deadlines for kommende numre:

Nummer	Artikelstof	Annoncer	Udkommer
3/2016	1. juli	1. august	i august
4/2016	15. oktober	1. november	i november
1/2017	1. december	1. januar	sidst i januar
2/2017	15. april	1. maj	i maj

Dansk Idrætsmedicinsk Selskab

v/ Tommy F. Øhlenschlæger, formand

Tillykke til DSSF

Først og fremmest skal der lyde et KÆMPE tillykke til Dansk Selskab for Sportsfysioterapi, DSSF (tidligere FFI). DSSF har i år 30 års jubilæum.

DSSF er vores søsterorganisation, som har gjort det super flot gennem 30 år. Ikke mindst de sidste år har DSSF udviklet mange nye tiltag, og har i dag mere end imponerende 1.800 medlemmer. **Tillykke.**

Foreningslivet har svære vilkår

Medlemmernes krav til en mere professionel drift er stigende. Omvendt har foreningernes drift langt hen ad vejen været drevet af frivillig arbejdskraft. Men muligheden for de fleste til at lægge tid og energi i foreningerne er faldet, hvilket gør det svært at opretholde et højt serviceniveau for medlemmerne.

Idrætsforeningerne har oplevet et fald i antallet af medlemmer. For at imødegå faldet har foreningerne måtte tænke ud af boksen og udtænke flere og billigere tilbud til medlemmerne. Traditionelle idrætsgrene som badminton, fodbold, håndbold osv. tilbyder nu fitness og andre ydelser - ikke nødvendigvis kerneydelser - til medlemmerne.

DIMS befinder sig langt hen ad vejen i samme situation.

Det bliver vigtigt at få afklaret hvilken motivation unge læger har til at melde sig ind i en forening som DIMS. Der er i dag mange tilbud om information via nettet, netværksgrupper, databaser, industridrevne hjemmesider osv., så konkurrencen for at fange de unge og fastholde de ældre bliver større.

Det skandinaviske tidsskrift

DIMS tilbyder for nuværende medlemmerne to tidsskrifter, dels "Dansk Sportsmedicin" og dels "Scandinavian Journal of Medicine & Science in Sports".

Sidstnævnte tidsskrift beror på et skandinavisk samarbejde mellem Norge, Sverige, Finland, Danmark (i den såkaldte Scandinavian Foundation) og forlaget Wiley.

Desværre har der været nogle samarbejdsvanskeligheder med Wiley. Vanskelighederne sætter spørgsmålstegn ved den nuværende konstruktion af det skandinaviske samarbejde. Især Sverige har ønsket en anden struktur, måske fordi de er det eneste af de nationale selskaber hvor fysioterapeuter og læger er i ét selskab. Dermed er deres situation anderledes, og der er ikke altid overensstemmelse mellem Sveriges interesser og vi andres, som har afsæt i rent lægebaserede organisationer.

Det giver et behov for nytænkning, og det næste møde i Foundation i juni måned vil være med til at afgøre, hvordan en fremtidig konstruktion af det skandinaviske samarbejde skal være, og om vi opsiger aftalen med Wiley.

Ny formand næste år

DIMS står over for mange udfordringer i den nærmeste fremtid, og jeg håber at medlemmerne vil bakke op om den nuværende bestyrelse, og hjælpe med at komme med forslag til, hvordan vi løser den nuværende opgave bedst muligt.

Til orientering vælger jeg at træder ud af bestyrelsen ved næste generalforsamling, og vi skal derfor have fundet en ny formand til selskabet.

Idrætsmedicinsk Årskongres 2017

Reserver allerede nu dagene **2.-3.-4. februar 2017** til deltagelse i Idrætsmedicinsk Årskongres.
Kongressen afvikles i København på Hotel Radisson Blu Copenhagen.
I løbet af efteråret kan du finde flere oplysninger om kongressen på:

www.sportskongres.dk

Dansk Selskab for Sportsfysioterapi

v/ Karen Kotila, formand

TAK for sidst!

Aldrig før har vi været så mange til vores årlige sportskongres. Det var nogle gode og travle dage med super gode symposier og workshops. Vi er i gang igen med planlægningen til næste års kongres, hvor vi igen håber at nå 500+ deltagere. Kvantitet er ikke lig kvalitet – det er vi klar over. Det er programmets indhold, rammerne og det sociale program, der skal spille sammen for at give den gode og udbytterige oplevelse.

Generalforsamlingen

Generalforsamlingen bød på to afgange. Vibeke Bechtold og Søren Peder Aarvig stoppede begge i bestyrelsen. Søren Peder har været en super arbejdskraft, blandt andet i arrangørgruppen for kongressen. Søren Peders ihærdighed og grundighed og gode lune vil blive savnet. Vibeke har i nogle år bebudet sin afsked og har forberedt bestyrelsen på de (mange) opgaver, der skal varetages af andre. Alligevel har det været underligt at holde møder uden Vibekes tilstedeværelse. Hendes gode humør, skarpe vid og tunge er savnet. Vibeke fortsætter dog i UKU et år mere, hvor en løbende overlevering af opgaverne sker til Bente Andersen. Generalforsamlingen bød også på mange gode input og diskussioner af, hvad DSSF skal beskæftige sig med fremadrettet.

På første bestyrelsesmøde efter generalforsamlingen blev den nye bestyrelse konstitueret. Martin Uhd fortsætter som kasserer, Simon Hagbarth som webmaster og jeg selv som formand. Vi siger velkommen til to nye medlemmer Lisbeth Pedersen og Lars Damsbo, som sammen med Bente Andersen og Berit Duus er tovholdere på diverse udvalgsarbejder. På baggrund af de fremkomne forslag til generalforsamlingen og de igangværende projekter, har vi allerede nu defineret arbejdet for de næste to år. Blandt andet kan nævnes fokus på synlighed af DSSF på fysioterapeutskolerne, og vi vil arbejde for oprettelse af netværksgrupper og have fokus på fysisk aktivitet i folkeskolen.

Kurserne

Kursusudbuddet i DSSF har i de sidste år været fordoblet. Nu sker der imidlertid en afmatning, som gør at vi justerer udbuddet ned igen. Den store søgning, vi så tidligere, var til dels et resultat af de mange kommunale genoptræningstilbud der blev oprettet, og de mange nye fysioterapeuter der blev uddannet. I kølvandet på dette er konkurrencen på udbud af kurser også spidset til de sidste år. DSSF må følge med og vi skal være gode til at informere om, at dét vi er gode til - ikke blot til evidensbaseret diagnosticering, behandling og genoptræning, men også til at målrette indsatsen dér, hvor den skadede forlader patientrollen og skal tilbage på sit ønskede og opnåelige niveau.

Ove Bøje Prisen 2016

Professor, dr.med. - og fysioterapeut - **Henning Langberg** modtog i forbindelse med Idrætsmedicinsk Årskongres 2016 Ove Bøje Prisen for sin evne til at implementere forskning i borgernes hverdag.
Henning Langberg leder forskningsenheden CopenRehab, der har fokus på at finde innovative løsninger, som kan gøre det lettere for mennesker med langvarig sygdom at forbedre deres livskvalitet gennem fysisk aktivitet. Forskningen foregår primært i klinikken, blandt patienter og sundhedspersonale.
"Forskning skal ud af universiteternes elfenbenstårn.Vi skal gøre forskel hos den enkelte, hos sportsmanden eller patienten. Det glæder mig, at Ove Bøje Prisen netop anerkender, at det er lykkedes os at bygge en bro mellem videnskab og virkelighed. Alt for mange patienter formår ikke at være fysisk aktive, selv om de gerne vil. Vi skal lære at forstå, hvad der kan motivere dem, og hvordan vi kan hjælpe dem med at genvinde lysten", siger Henning Langberg.

Dansk Sportsmedicin ønsker tillykke.

Om Ove Bøje Prisen:
Prisen uddeles hvert andet år af Dansk Idrætsmedicinsk Selskab og Dansk Selskab for Sportsfysioterapi. Den gives til en person, der gennem sit virke inden for forskning, klinik eller undervisning har bidraget væsentligt til at fremme og højne niveauet for klinisk idrætsmedicin. Med prisen følger et beløb på 10.000 kr..

Assessment of a patient with patellofemoral pain: what's new?

Dylan Morrissey, PhD MSc BSc(Hons) MMACP MCSP
NIHR/HEE Consultant Physiotherapist and Clinical Reader

For this edition, dedicated to patellofemoral pain (PFP), I am delighted to present some really interesting applied research in a fast maturing field. By interpreting, I mean using clinical assessment with an individual patient to direct specific treatment. I am therefore taking this opportunity to share some suggestions that may be a little different from the norm, and any clinical tips which may, or may not be familiar, in order to provoke thought and further innovation and, additionally, extend the findings of a large body of work on patellofemoral pain to people with osteoarthritis of the joint.

Learning outcomes:
- Understand the depth of evidence available in a fast moving field.
- Consider how assessment can be modified and link via treatment to better outcome.
- Consider the links between treating patellofemoral pain associated with, or without, arthritis.

Introduction

There seems little point in presenting a complete, definitive guide to PFP assessment as that has been done many times before. Instead this article puts forward some ideas that have been percolating for some time, underpin my clinical practice and will, hopefully, offer some fresh food for thought.

Let's flip our approach for a moment; as well as collecting the evidence in the usual order and then deciding on a management plan, testing a series of structures and determining nociceptive mechanisms, ruling out masqueraders, judging the psychosocial as well as the bio '-genics', exploring the context of the individual patient's presentation, and quantifying objective measures of symptom severity and irritability, let's work backwards.

The strength of the evidence we now have allows us to think anew about what we are looking for. So the flip is to look for evidence within the individual presentation that we know we can treat. Why not look for aspects that lead us to evidence-based treatment?

Systematic review (SR) and consensus based evidence is now strong enough that we have a review of *high quality reviews* to work from, informed by clinical reasoning analysed from interviews with the worlds' experts (Barton et al 2015). I may be biased, but I regard this paper this as clinical gold, and a must read for ay clinician treating people with PFP. For example, we know that PFP in young women can usually be helped by addressing lower limb biomechanics from the hip down with a focus on improving coronal and horizontal plane lower limb control during weight-bearing tasks. So does the patient present with that? If so, can we alter their movement and so alter symptoms? Equally, are there strength deficits at the hip or knee that we know should benefit from strengthening (Lack et al 2015)? If so, how can we reliably identify these, and address them? Further, if the pain is associated with running or cycling, what can we determine from our assessment that would lead us to interventions such as those described in the articles by Brad Neal and Michael Callaghan respectively?

In this edition, Brad Neal, Christian Barton and I have also attempted to produce a summary of where we are at in terms of SR evidence that may be useful to guide your assessment. The diagram in figure 1 is meaty both in terms of the evidence contained, and in its strength. Level 1 evidence, from systematic reviews, is exactly that – the top of the pyramid – robust, accessible and immediately applicable. This

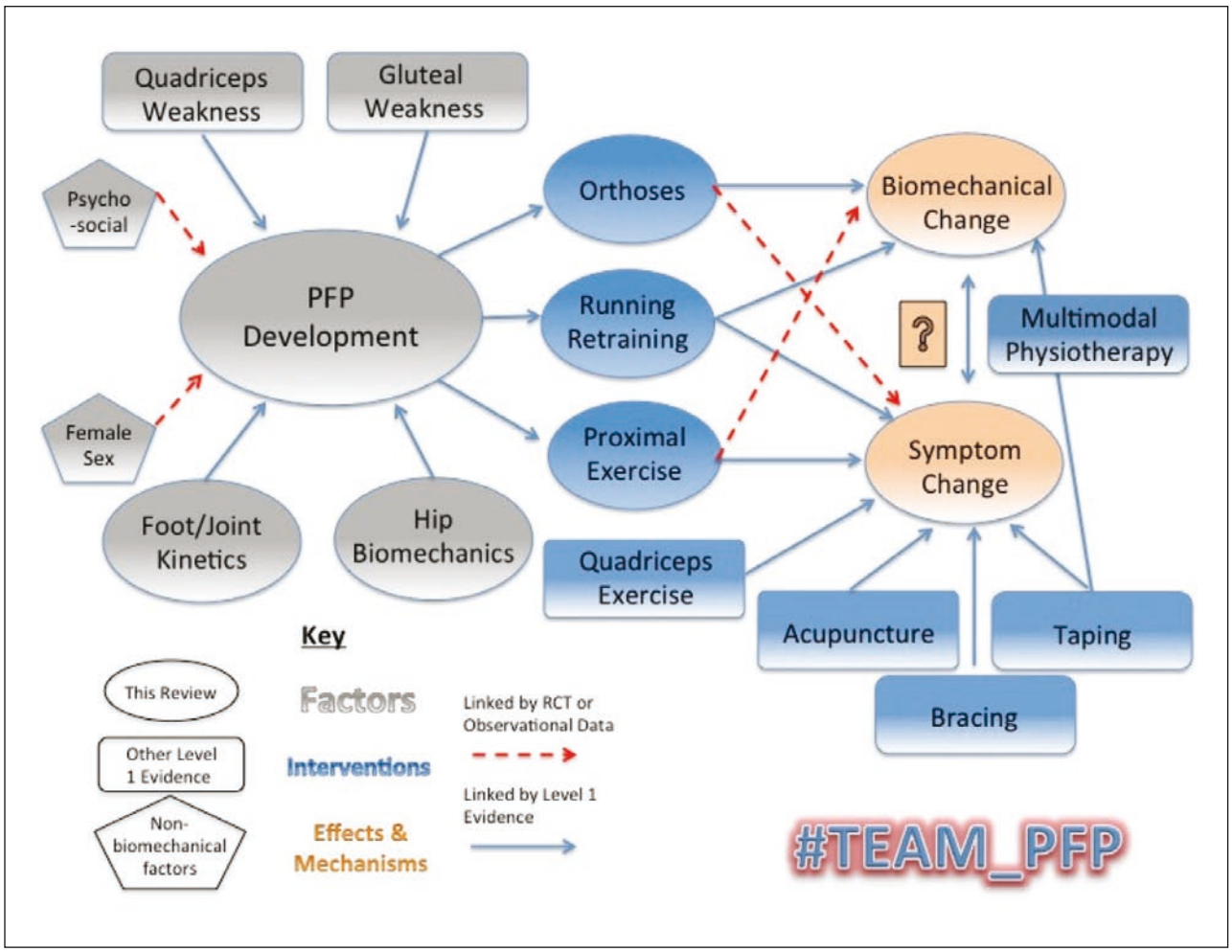

Figure 1: *Evidence summary based on systematic reviews, published and in preparation. #TEAM_PFP relates to the research group Treatment Effects and Mechanisms applied to PFP.*

diagram is the tool to use to apply it. Factors leading to PFP development are summarised to the left and those which alter symptoms or biomechanics to the right. Areas which need more work, such as the direct links between biomechanical changes and symptom improvement are indicated with a question mark. Dotted lines are high levels of evidence and solid lines are level 1. So, when next assessing, my challenge to you is to go looking for some of the aspects mentioned in the diagram and target your treatment accordingly.

I suspect you are already picking up a theme. This article is based on sound principles. The real value of a diagnostic test, or assessment procedures should be best judged by the resultant outcome for the patient in the longer term, via the treatment that is then applied. In other words, the assessment should ideally lead further than just to 'diagnosis', but on - via treatment - to outcome. Is there any real value in a testing procedure if there is no ultimate gain for the patient ? Arguably, not a strong one. In the case of MRI for low back pain for instance, if the results will not change treatment, why request one?

We know that tailored 'McConnell' taping works for some people and that weight-bearing lower limb alignment can also be successfully addressed, but how do we prove this to ourselves and to the patient? How about taking a symptomatic manoeuvre, such as a painful weight bearing lunge, with your next patient and with expert handling and clear communication skills determine how to focus your treatment? If you can immediately alter symptoms using a patellar glide, or lower limb realignment, or muscle facilitation manoeuvre then you will gain strong evidence to guide treatment.

This example can be easily applied in many presentations as long as they are non-irritable. Further, patient compliance may well be enhanced by this proof of effect, as the power of a tangible reduction in symptoms is a potent indicator to the patient of likely outcome. Then the hard work begins to make the changes long term and within the patient's control.

To switch track a little, let's give ourselves permission to think multimodal in the presence of mild-moderate patellofemoral osteoarthritis (PFOA). High quality trials of multimodal treatment including taping, education and exercise have been successfully employed both for PFP and for PFOA. We do not yet fully understand the continuum between PFP and PFOA, if indeed there is one, but from some perspectives it may not matter. PFP is

perceived pain from the patellofemoral joint, whether or not there is radiological evidence of degenerative change or not. Any nocioceptive input to the central nervous system will go through the same, or similar, psychological and physiological pain 'lenses' before being interpreted as pain. Further, there is emerging evidence that an essentially similar treatment approach may have similar positive results (Crossley et al 2015) so we can – with caution – take what we know about non-degenerative PFP and utilise this with our patients with osteoarthritic disease. Given the aging population, and the need to keep people as active as possible throughout life in the interest of adding 'life to years' this is knowledge we must use and explore to the full.

Where might future innovation and guidance come from? At the recent International PFP research retreat, hosted in Manchester by James Selfe and Michael Callaghan, the progress of the targeted interventions for patellofemoral pain syndrome (TIPPS); classification of clinical subgroups work was shared revealing the sub-grouping that may well move us forward in choosing the most appropriate treatment for our patients. One of the conundrums we face is that men with PFP present, and respond, very differently to women. Equally there are people who have high function and are strong, and people who are weak with low function. There may be men and women in each category and it is reasonable to hypothesise that different treatments may be more beneficial to some subgroups.

You will also be able to get future evidence synthesis from the consensus statements being produced after the retreat. Some sterling work was carried out by a faculty of 50 led by some key players; Chris Powers, Kay Crossley and Bill Vicenzino amongst them, which will extend the interpretation of the existing evidence still further and give more therapeutic targets to aim at, using the approach described above.

It's 25 years since, inspired by the work of Jenny McConnell, a rising star of physiotherapy, I did my first research on PFP and I found very little, although it was my research skills that were the issue, not the hypothesis I was testing. Times have changed. To be able to contribute to, benefit from and share the work done by a dynamic research community, and produce high quality reviews has been extremely rewarding and I hope you find the description of a few of them here, together with the clinical tips offered, useful.

The Private Physiotherapy Education Foundation (PPEF)

A last word about the support received from the PPEF. It is through this funding that we have been able to kick-start some future projects, about which more will be announced soon.

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About the author

Dylan Morrissey aims to combine the best of educational, clinical and research practice in order to develop and deliver high quality evidence based physiotherapy for patients with musculoskeletal disorders. Dr Morrisey is part funded by the National Institute for Health Research (NIHR)/HEE Senior Clinical Lecturer Scheme. He is a Consultant Physiotherapist in Sports and Musculoskeletal Physiotherapy and combines this with a Clinical Readership in Sports and Exercise Medicine (SEM). He recently started a 5 year NIHR/HEE fellowship with clinical trials as a primary focus. My key research theme is the link between movement and pathology, whether that link serves as a diagnostic tool, treatment modality or outcome measure. The views expressed in this article are those of the author and not necessarily of the NHS, NIHR or the Department of Health.

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Applying what we know about the aetiology and epidemiology of patellofemoral pain to an individual

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Patellofemoral Pain is very common in both adolescents and adults. It can be quite a challenge to treat and knowledge about the aetiology and risk factors may help to understand why the individual in front of you developed patellofemoral pain. This brief narrative paper also describes the prognosis of patellofemoral pain and describes which questions we can ask our patients to get a rough idea of their prognosis.

Learning outcomes:
- Understand the prevalence of patellofemoral pain across different populations.
- Learn the common risk factors for developing patellofemoral pain and how they may interact with training load.
- Understand prognostic factors and learn which questions to ask the patient to get a rough idea of their prognosis.

How common is patellofemoral pain?

If you work clinically as a physiotherapist and see patients with musculoskeletal complaints on a regular basis, chances are that you regularly see patients with patellofemoral pain (PFP). Although it is one of the most common knee disorders, there is no official definition of PFP, but operationally it has previously been described (Brushoj et al 2008) as:

1. Pain located around or behind the patella on at least one of the following: prolonged sitting, squatting, stair climbing, running, kneeling, or hopping/jumping.
2. Pain on palpation of the patella facets or when compressing the patellofemoral joint, with no other signs of knee pathology.
3. An insidious onset unrelated to a specific traumatic event.

The most commonly reported symptom is a diffuse peripatellar (around the knee cap) and retropatellar (behind the knee cap) localised pain, typically aggravated by ascending or descending stairs and squatting. PFP can have an insidious, slowly developing onset, or a more sudden onset. The most commonly studied type is PFP with an insidious onset which is the main focus of this article.

Patellofemoral pain is often referred to as a knee condition among young adults, and most research involves patients between 18 and 40 years of age (Rathleff et al 2015a). However, PFP also exists among younger adolescents from around the age of 10 and also extends to those older than 40 (Rathleff et al 2015a; Rathleff et al 2015b; Stathopulu & Baildam 2003; Crossley 2014; Hinman et al 2014). Epidemiological research has tried to answer the question *"How common is PFP and in which population does it exist?"*. The best data we have at present suggest that as much as 6-7% of the school attending population may be affected by PFP of varying severity (Rathleff et al 2015b; Molgaard et al 2011). In selected sporting populations the prevalence may be even higher, which suggests a link between sports participation and risk of PFP (Barber Foss et al 2012; Myer et al 2010).

Among adults, i.e. those more than 18 years of age, we see a similar trend. Witvrouw et al (2000) followed students enrolled in physical education classes and found that, over a 2 year study period, 8.5% developed PFP. Thijs et al (2008) followed a group of novice runners during a 10 week "start to run" programme and found that 17% developed PFP. Three interesting studies have been conducted among military populations. Boling et al (2009) included a cohort of naval recruits

who were injury free at baseline and then followed them for up to 2.5 years, during which time they discovered that 3% of the recruits developed PFP, although this lower percentage may reflect a gender difference and pre-selection compared to other cohorts. In strong contrast, a study from the Belgian military found that 43% of their recruits developed PFP during 6 weeks of very intense basic training (Thijs et al 2007), and a similar Danish study followed 1020 recruits during 12 weeks of basic training and showed that 3% developed PFP (Brushoj et al 2008). These data could suggest that large training loads and increases in training load may increase the risk of developing PFP.

These epidemiological data also suggest a strong link between participation in some kind of sport, or knee loading activity, and PFP. However, an important point is that we may also meet patients with PFP who do not participate in any sporting activity and, this "non-sport participating" population will, most likely, consist of two smaller subgroups; those who developed PFP during some past sporting activity, but their knee pain continued after they had ceased participating in sports, and the population who can only tolerate very low doses of loading before developing PFP. This group may develop PFP after walking on stairs, bicycling, or similar activities which load the patellofemoral joint. Collectively, this suggests that inadequate load capacity of the patellofemoral joint for that individual is the common denominator.

Aetiology

The research suggests that PFP is very common, especially among individuals who participate in sport, so the obvious question is: *"Why did they develop PFP?"* There are a number of well-conducted studies researching the onset of PFP in which large groups of pain-free individuals have been followed over extended periods of time. At the end of the study period, the data is analysed to compare how those individuals who subsequently developed PFP differed from those who did not.. Lankhorst et al (2012) published an excellent systematic review on risk factors for PFP, in which they included seven prospective cohort studies that investigated 135 potential risk factors for PFP. Pooling the study data was possible for 13 of the variables, i.e. height, weight, BMI, age, Q-angle, and 8 different measurements of knee strength, expressed as peak torque for the extensors or flexors. The results of the meta-analyses suggest that low knee extension strength significantly increases the risk of developing PFP, while isometric hip strength did not appear to be associated with the risk of PFP (Rathleff et al 2014). Single studies also found that the clinically measureable variables of large navicular drop, reduced gastrocnemius and quadriceps flexibility, greater range of motion for thumb-forearm mobility, knee extension mobility, and a lower range of motion for elbow extension mobility were also significantly associated with increased risk of PFP (Witvrouw et al 2000; Boling et al 2009).

An important finding from the systematic review from Lankhorst et al was also which variables were not associated with increased risk of getting PFP (Lankhorst et al 2012). A large Q-angle has often been cited as an important aetiological factor for PFP, but two prospective studies actually failed to document that this increased an individual's risk of developing PFP (Lankhorst et al 2012), and the q-angle has now been more or less discounted as a relevant measurement.

While knee extension strength was the most consistent risk factor for PFP among adults, it is only a small piece of the puzzle. Ask yourself; would any of these patients have developed PFP if they had not participated in any loading activity such as sport? Another way to interpret these risk factors could be that they modify how much loading an individual may tolerate before they develop PFP. For example, Liz, who has a low knee extension strength and a high navicular drop may only tolerate 75% of the loading activities compared to Peter who has a high isometric strength and a normal navicular drop. The main point here is that we always need to take into account extrinsic factors such as training load when we want to screen individuals for risk factors.

Prognosis

What can we expect in terms of recovery and return to sport? Do all patients with PFP fully recover to a pain free state and return to full

Common risk factors	Findings	Comment
Gender	Women have higher risk of developing PFP compared to men	Gender is not modifiable
Training load, progression and intensity	This has not yet been thoroughly investigated, but it is very likely that high training loads, fast progression or large increases in intensity will increase the risk of developing PFP	Training characteristics are modifiable. Importantly, discuss progression and training loads with the patient (this is important both before or after they develop PFP)
Knee strength	Low knee extension strength and lower vertical jump height is associated with a higher risk of developing PFP	Knee strength can be improved through strength training, however we don´t yet have any evidence to suggest that increasing knee extension strength will reduce the risk of developing PFP. Vertical jump height and knee extension strength may be interrelated which is why they both are risk factors
Navicular drop	A large navicular drop may increase the risk of PFP	It is unknown if specific foot exercises can reduce a large navicular drop and if this will be associated with a decreased risk of PFP
General joint laxity	Increased joint laxity may be a risk factor	From a single study it appears that increased joint laxity may increase the risk of PFP (thumb-forearm mobility). It is unknown if general joint laxity may be changed through specific training and if this is associated with a decreased risk of PFP
Muscle flexibility	Decreased range of motion of quadriceps and gastrocnemius may increase the risk of developing PFP	Muscle flexibility may be modified. However, there are no studies that have investigated if this will reduce the risk of PFP

Table 1: *Risk factors for patellofemoral pain*

pre-injury sports participation? The evidence suggests that a substantial proportion continue to have symptoms even a year after their initial diagnosis and treatment. A joint effort between researchers from Australia and the Netherlands pooled the outcomes of all 310 patients from their combined large randomised controlled trials to report that 55% and 40% had an unfavourable outcome after 3 and 12 months, respectively (Collins et al 2013). Slightly higher rates of unfavourable outcomes have been reported among adolescents at the same time-points (Rathleff et al 2015a; 2015b).

The question is whether we can predict who is at risk of an unfavourable outcome. To know this would be valuable in both primary and secondary care as it would enable us to prioritise resources to those with the highest risk of persistent knee pain. Lack et al have conducted a systematic review to help answer this question (Lack et al 2014). They included 15 studies that investigated a total of 205 potential predictors of outcome. Of these 205 variables, 19 were found to be associated with outcome. The most consistent evidence from their review suggests that less "worst pain", shorter symptom duration, lower frequency of pain are associated with higher odds of successful outcome. This is important and suggests that the patients we see with the highest pain levels and long duration of pain, have a higher risk of an unfavourable outcome.

In addition to intrinsic prognostic factors, compliance to an exercise intervention may also be equally, or even more important to recovery. A recent study carried out by our group showed that higher compliance to exercise therapy was associated with improved odds of recovery (Rathleff et al 2015b). This finding strongly suggests that the exercises are only effective if they are being performed. This is an important message to our patients and may help them understand the importance of compliance. Novel tools like elastic band sensors or even Apps for their phones or tablet devices may help to increase the patient's motivation to perform the exercises given (Rathleff et al 2015c; McGirr et al 2015).

Conclusion

Patellofemoral pain is common, especially among adolescents and young adults participating in sports. A range of risk factors have been identified with the most consistent being low knee extension strength. An important point is that, just because an individual has low knee extension, it does not necessarily mean they will develop PFP, some kind of loading activity always needs to be involved before these risk factors become important. The key point to consider, therefore, is their loading pattern both during sporting activity and in their everyday life.

In order to get a rough idea of their prognosis, on examination ask the patient three simple questions:

1. What is their worst pain during activity? Is it is above 60mm on a VAS?
2. For how long have they been experiencing knee pain? Has it been for over 12 months?
3. Do they experience knee pain daily?

Closer attention should be paid to the individual with PFP who presents with these characteristics, compared to the individual who just recently developed PFP, and you may need to adjust your prognostic judgement accordingly.

A range of treatments exists for PFP and these, together with the method of incorporating them into your clinical practice, are covered in the other articles in this edition.

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Prognostic factor	How to measure in the clinic	Finding
Frequency of pain	"How often do you experience your knee pain?"	If the patient states "daily knee pain" or knee pain several times per week, they will have a much higher risk of a less favourable prognosis compared to "weekly", or "monthly" knee pain
Pain intensity	Use a visual analogue scale (VAS) and ask the patient to rate their worst pain during the last week	High pain intensity, e.g. 60 mm on a 100 mm VAS will indicate less favourable prognosis compared to a VAS of below 60 mm
Duration of knee pain.	"How long have you had this type of knee pain?"	Where the patient reports that their knee pain has lasted for more than 12 months, it will suggest a less favourable prognosis
Gender	Visual	Women seem to have a less favourable prognosis compared to men
Age	By asking	Among the adult population, a younger age is associated with a better prognosis. This, however may not be the case for with adolescents with PFP

Table 2: *Prognostic factors for patellofemoral pain*

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This patient with patellofemoral pain is not getting optimally better - what tickets to treatment do I have?

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Although patellofemoral joint (PFJ) pain is mainly conservatively treated condition, the question remains what to do with patients who do not improve with physiotherapy alone? In this article we discuss the use of medications and injections therapies in relation to establishing a firm diagnosis. Depending on the underlying pathology and patients' preferences, medications and injection therapies can play a role in treating PFJ pain.

Learning outcomes:
- Understand the benefits of review of diagnosis by a sports or musculoskeletal physician in the exclusion of any other pathologies, for those patients not improving with conservative treatment.
- Understand how medication can help to control symptoms in the short term, and aid rehabilitation.
- Understand the potential of injection therapies in the control of pain and, therefore their effect on the rehabilitation process.

What's up Doc?

Although conservative management is the mainstay of treatment in patellofemoral pain (PFP), there are occasions when patients are not getting any better with purely conservative measures. Evaluation of patellofemoral joint pain is complex and requires a comprehensive assessment (Endo et al 2011). Here we will discuss what a sports physician can do in addition to physiotherapy to help patients with PFP.

We know that knee pain reduces muscle strength and therefore can have a significant impact on the rehabilitation process (Henriksen et al 2011). Two questions I get asked most are:

1) Do I need to have a scan?
2) Can injections or medications help my condition?

Although the evidence is fairly mixed on medical treatments of PFP, there are certain medical interventions that can play a role to aid the rehabilitation process.

Helping with the diagnosis

Although, as previously mentioned, diagnosing PFP is mainly a clinical Judgement there are patients for whom conservative measures do not work, or who simply find it too painful to adhere to the rehabilitation programme. With these patients further investigations might be useful to determine the source of pain and / or give them confidence to continue with the rehabilitative process.

It is common, in patients with PFP, that MRI scan findings will be normal, or will show a minor thinning of the retro patellar cartilage which some radiologist report as chondromalacia grade 1-4, depending on the amount of cartilage loss. Stage 4 is the last stage before the diagnosis of patella femoral osteoarthritis. Other findings can be Hoffa's fat pad impingement with some oedema in the fat pad itself and, in rare cases, severe bone marrow oedema of the femoral condyles, or underlying meniscal pathologies can be found, which would also alter the rehabilitation process. Scan results become important when we consider the clinical and radiological findings together in order to target injection therapies to help with the patient's pain.

Injection therapy - what can be done in PFJ pain?

Over the years, several forms of injection have been used for PFP without any solid evidence, but they could still have a role to play in helping the rehabilitation process.

Intra-articular steroid injections have been used for the treatment of knee osteoarthritis (OA) for years and are regarded as safe and effective long-

term, even when administered at three-monthly intervals over a two year period, and when compared to a placebo (Raynauld et al 2003). In some cases of PFP, where there is chondromalcia combined with either an effusion or synovitis, which can be identified on ultrasound, a steroid injection can be useful to reduce swelling, pain and inflammation, however the emphasis here is on aiding rehabilitation as, although they can be of use in this patient group, steroid injections on their own usually have only a short-term effect.

Hyaluronic acid injections are increasingly being used for OA of the knee with some evidence of their effectiveness in improving symptoms (Lo et al 2003; Wang et al 2004), which has led to them becoming more popular as a safe approach for treating PFP, despite the lack of evidence in this patient group. The logic is that, even in very early degenerative changes of the patellofemoral joint (PFJ), the concentration and the molecular weight of intra-articular endogenous hyaluronic acid are decreased, and this reduces the viscoelasticity of synovial fluid. Therefore, the rationale for intra-articular injection of hyaluronic acid is to restore the viscoelasticity of synovial fluid. In addition, it has been found that injected hyaluronic acid can augment the flow of synovial fluid, normalise the synthesis and inhibit the degradation of endogenous hyaluronic acid, and relieve joint pain (Lo et al 2003; Wang et al 2004). With the findings of early thinning of the cartilage behind the patella on MRI, and the discussion of whether PFP is a precursor for the development of PF arthritis, hyaluronic acid is a substance worth researching in future for PFJ pain.

Hoffa's fat pad injections are frequently used to reduce pain associated with inflammation and or impingement of the Hoffa's fat pad between patella and femoral condyle. Often fat pad changes come together with PFJ changes on MRI, therefore clinical features rather than MRI findings should guide injection therapies. A more targeted approach, using ultrasound guidance, is now the prefer method for all injection treatment. The literature for this is sparse, but promising (Morton et al 2015).

Platelet rich plasma (PRP) injections have also been gaining popularity in patients with knee OA and, therefore in some patients with PFP. Two recent studies compared PRP with hyaluronic acid and the trend favoured PRP, especially in early degenerative changes (Spaková et al 2012; Kon et al 2011). Although it can be seen as a promising injection therapy, more research into PRP, especially to assess efficacy of different preparations, and frequency of application is needed, as is similarly the case with hyaluronic acid.

Medication – what should I use?

Many patients try to avoid any form of pain relief as their perception is that they don't want to suppress their pain response. However, as discussed earlier, pain can inhibit muscle recruitment and, therefore interfere with the rehabilitation process.

A systematic review found that Naproxen reduces symptoms in the short term, which could give patients a window of opportunity to engage in their rehabilitation. Depending on the patient's preference and past medical history, in most cases a two week trial to evaluate the individual's response to such medication might be of benefit (Heinties et al 2004; Rodrigues-Merchan 2014). Glucosamines and Chondroitin have been used with a lesser side effect profile, but with mixed results in the literature. The trend seems to show that Glucosamines and Chondrotin might need longer treatment periods to have any results (Heinties et al 2004; Rodriguez-Merchan 2014).

As well as medications to help with pain, overall nutritional factors should not be overlooked. Every rehabilitative process needs to build new muscle, bone and tendon tissue, and in this the right nutrients; protein, omega-3 fatty acids and safe sun exposure for vitamin D might all play a role (Laupheimer 2014).

Taking it all together

Patients with PFP who, due to ongoing pain, are not responding to physiotherapy might benefit from being reviewed by a sports physician to aid, or confirm the diagnosis and / or help with pain control. Most medical interventions have a low level of evidence and should be fully discussed with the patient prior to embarking on such treatment. Injection therapies certainly have a lesser side-effect profile than surgical interventions, however, and can potentially help to reduce pain and therefore help the physiotherapist to address the underlying biomechanical and strength issues.

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About the author

After receiving his MD with distinction from Ulm Medical School (Germany) Markus qualified as a GP and Consultant in general medicine with a focus on sports and musculoskeletal therapy, an area he became interested in while he was working in sports and orthopaedic centres in Switzerland, Germany, the US, and the UK. Markus followed his long-term interest in this aspect of health care by completing an MSc in Sports and Exercise Medicine at Queen Mary University, London.
As well providing holistic sports medicine care, Markus also has a keen interest in myofacial pain and muscular dysfunction and, for the past 5 years has worked as a sports and MSK physician for the RAF, and for the England Football Association, covering the England senior men's football team and working part-time with the U18 / U19 and U20 England football team. Markus' passion for all sports also found him working as a sports medicine Doctor for a variety of disciplines at the London 2012 Olympic and Paralympic Games.
In addition to the practical aspects of MSK and sports Medicine, Markus is interested in research and developing new ideas. He is currently looking into the effects of stem cell treatments in musculoskeletal medicine.
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Ny vejledning fra Anti Doping Danmark

Praktiserende læger, speciallæger, hospitalslæger, klublæger, farmaceuter, fysioterapeuter og andre med sundhedsfaglig uddannelse, der i arbejdet har kontakt til eliteidrætsudøvere, møder sandsynligvis forskellige spørgsmål om medicin på Dopinglisten, særlige krav til ansøgninger om medicinsk dispensation fra listen, doping generelt mv. Mange af spørgsmålene kan besvares umiddelbart, mens andre er ikke entydige, fordi listen ændres løbende, reglerne ændres etc.

Anti Doping Danmark (ADD) har derfor samlet en række informationer og vejledninger i denne pjece, som læger og andet sundhedspersonale kan bruge i arbejdet med at vejlede og guide idrætsudøvere bedst muligt.

Pjecen kan downloades fra ADD's hjemmeside **www.antidoping.dk** (under 'publikationer'/'læger og andet sundhedspersonale').

Et besøg på ADD's meget informative hjemmeside kan i øvrigt varmt anbefales.

How do I start rehabilitating patellofemoral pain and what is my initial progression?

Simon Lack, MSc MCSP MHCPC MACPSM

Identification of the patient's primary symptom driver has been presented in this article as a method through which clinicians can offer their patients a tailored rehabilitation programme. It is proposed that greater treatment efficacy can be achieved by addressing the individual's specific needs, progressing the intervention in a structured and specific manner to maximise long term success. The article builds the framework about which this treatment approach can be delivered to the patient.

Learning outcomes:
- Development of a broader perspective when starting the rehabilitation of individuals with patellofemoral pain.
- Identification of specific treatment targets that will facilitate the delivery of a more tailored intervention.
- Has the knowledge to progress the implemented rehabilitation programme in a structured and patient specific manner.

Introduction

Conservative management of patellofemoral pain has proven efficacy within the current evidence base (Barton et al 2015). It has been shown to have positive effects on pain reduction and improved function in the short (<3months), medium (3-12months) and longer (≥12months) term (Fukuda et al 2012; Fukuda et al 2010; Collins et al 2012). Despite its reported success, pain symptoms have been shown to persist in as many as 73% of patients at 5.7 year follow up (Blond & Hansen 1998). The factors that influence the symptoms reported by a patient with PFP can be defined as the 'driver'. With ever increasing evidence identifying efficacious conservative interventions, poor long-term outcomes could be indicating that either the interventions are not correcting the underlying driver of the symptoms, or the change in the patient's behavior that leads to short-term symptom reduction does not 'stick' in the longer term (Witvrouw et al 2014). Consequently, where you start with rehabilitation of PFP, and how you progress this process, may be a key determinant of the patient's short- and long-term treatment outcome.

Identification of symptom drivers and rehabilitation targets

The current literature highlights 4 key domains that are likely to drive the patient's symptoms. These include their underlying anatomy or structure (Kannus 1992; Ward et al 2007), their biomechanics, or the way in which they move about that anatomy (Lankhorst et al 2013), the load, volume and intensity with which they do particular activities (Barton et al 2015) and their underlying psychosocial, or psychological robustness (Barton et al 2015; Lankhorst et al 2012) (Figure 1).

With consideration of Dye's 2005 model of tissue homeostasis in patellofemoral pain (Dye 2005), and in combination with the accepted impact of psychological and social factors on pain (Zusman 2002; O'Sullivan P 2005), insufficiencies in any one or multiple domains could plausibly be the driver of PFP symptoms. The clinical challenge, therefore, is to best identify which of these domains is likely to be the primary driver of symptoms, and which could be considered as secondary, tertiary or peripherally relevant to an individual's pain presentation. Furthermore, the clinician needs to determine to what extent deficits co-exist and, consequently which are likely to

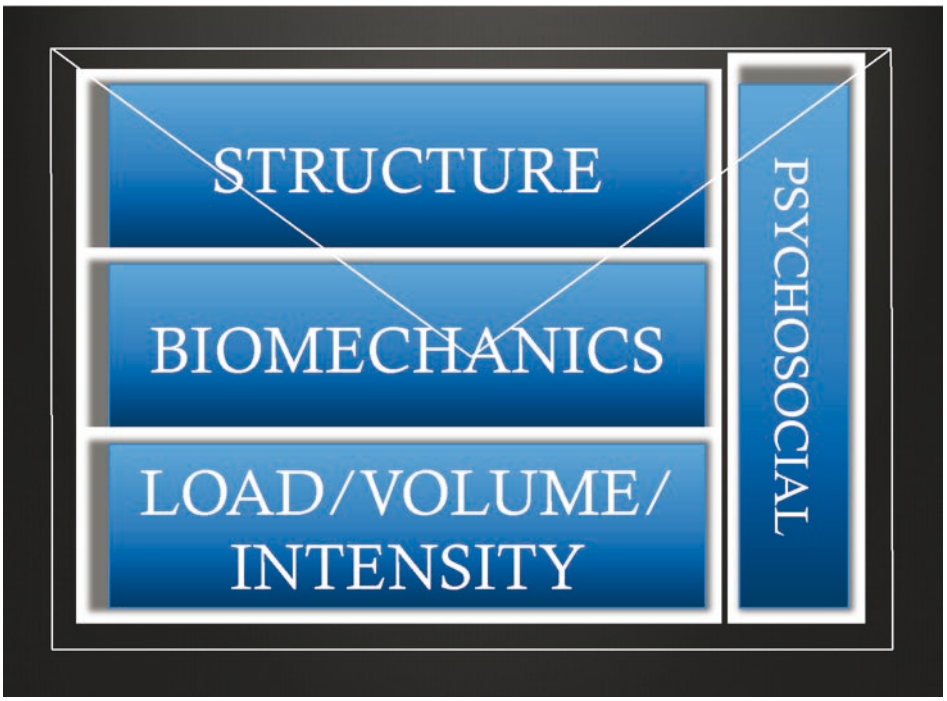

Figure 1: *Structure, biomechanics, load / volume and psychosocial drivers within an 'Envelope of Function'.*

benefit from specific interventions. The complexity of this task requires sound clinical reasoning, using the available evidence to inform the decision making process.

Starting rehabilitation

Structure

Successful identification of the patient's primary driver of their symptoms offers the clinician an early treatment target and one that, if effectively modified, is likely to result in the greatest immediate reduction in symptoms. The limitation to this approach is clear from the outset. What if it is concluded, following the subjective and objective examination, that structure is the primary driver of their symptoms?

Conservative management obviously has a limited capacity to change structure, however, effective communication can describe the conclusions of the assessment to the patient and, in doing so, start to demonstrate your understanding of the problem to the patient. From here you have options; either the structure is of sufficient concern to you that further investigation is required, and input from an Orthopaedic Consultant or sports physician would be beneficial to comprehensively discuss the appropriate route forward or, despite the limitations imposed by compromised structure, the capacity of the individual is sufficient to progress into an appropriate level of rehabilitation intervention. Having identified the drivers that you believe to be secondary, tertiary or quaternary to the presentation, and adjusted your prognosis, it is these that therapeutic intervention is then focused towards.

Biomechanics

Although the mechanism of effect for many conservative interventions has not been fully established within the current literature, level 1 evidence does show some to be effective at modifying pain in the short-term, with a growing body of work demonstrating the effectiveness at longer term follow up.

Taping

Patellofemoral, or McConnell taping has shown to be effective (Barton et al 2014). Following systematic review, moderate evidence of large effect showed tailored taping to address patella tilt, glide and spin was effective in reducing pain (Barton et al 2014). Possible mechanisms of this effect are a promotion of increased internal knee extension moments and earlier onset of VMO (Barton et al 2014). Evidently, what taping represents in the short term is an opportunity for more effective rehabilitation to take place, possibly even in those for whom structure has been identified as the primary driver of symptoms.

Biomechanical deficits identified as the primary driver of an individual's symptoms offer a more direct route 'in' for therapeutic intervention. Importantly, although primary drivers offer a means of stratifying patients, its ability to be predictive of *outcome* following a specific intervention has yet to be validated within the literature (Lack et al 2014). However, if the deficit has been isolated to the knee, taping interventions offer the strongest evidence to facilitate localised muscle strengthening, movement re-education and muscle balance restoration in the short term.

Muscle rehabilitation

Strength deficits within the quadriceps have been identified as a risk factor for PFP development (Lankhorst et al 2012) and are often evident in those with pain (Lankhorst et al 2013). Utilising an adjunct, such as taping in the early stages of a rehabilitation programme to allow for pain-free activation and strengthening of the quadriceps, represents a useful tool for conservative management. It should be stressed that symptom reduction and provision of a rehabilitation programme that does not increase pain symptoms is paramount. Programmes that have been designed to control pain levels to ≤ 3/10 have shown significant benefit at all stages of follow-up, up to 1 year (Fukuda et al 2012). This approach would seem logical from a neurophysiological perspective; reducing pain-associated muscular inhibition and sustained peripheral nociceptive input, thought to increase the risk of chronicity (Zusman 2007).

Commonly, biomechanical deficits, both proximal and distal to the knee, are also evident in patients with PFP. These have been identified as resulting from hip muscle weakness (Rathleff et al 2014) and / or altered neuromuscular activation and kinematics (Powers 2010). Given the absence of improved kinematics resulting form interventions attempting to strengthen the hip muscles, but improvement in symptoms following proximal exercise prescrip-

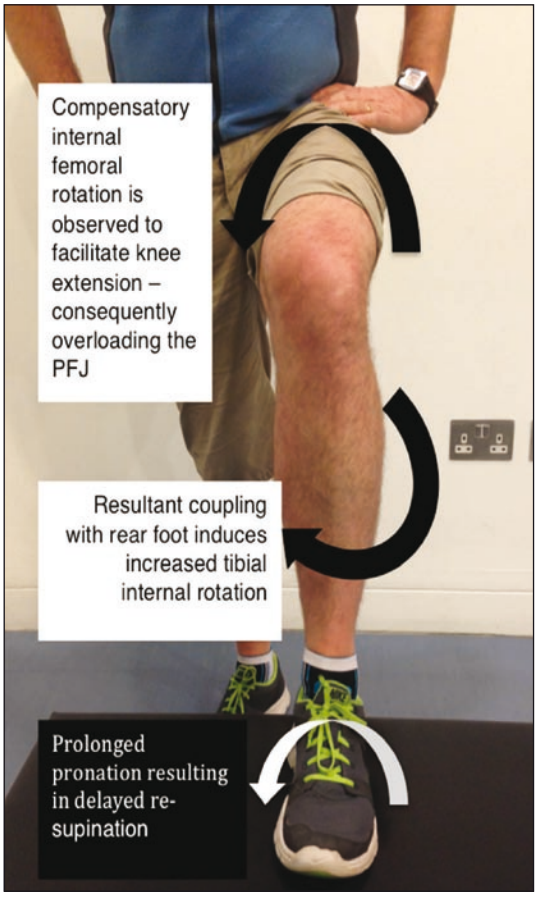

Figure 2. Diagrammatic representation of the hypothesised kinematic coupling within the lower limb.

tion, irrespective of kinematic change, then the clear priorities, if proximal deficits have been identified as the primary driver of symptoms, are in improving the individual's movement patterns and strength. Early open kinetic chain exercises allow for a period of offload for an irritable PFJ and can help to educate the patient to the location and 'feel' of activating these muscles. In less irritable presentations, closed kinetic chain exercises can be implemented earlier in the rehabilitation programme. Anecdotally, the advantage of this approach has been improved carry-over from exercise prescription to function. Again, the intensity of the rehabilitation should aim to respect symptoms, after which its design should utilise mechano-biological descriptors to design specific interventions relative to the intended treatment outcome, i.e. improved strength, neuromuscular activation, strength endurance or power (Toigo & Boutellier 2006).

Orthoses

Distal interventions in the form of orthoses, taping and foot muscle retraining have all been discussed and evaluated scientifically to varying degrees. The single largest randomised controlled trial exploring the use of orthoses reported improvements superior to flat inserts in the short term, but no additional benefit when added to a multi-modal physiotherapy approach compared to physiotherapy alone (Collins et al 2009). It has been theorised that the absence of significant benefit could be the absence of appropriate patient stratification, a hypothesis that is currently under investigation by groups in the UK and Australia. It can be concluded that orthoses are likely to have a role in management of PFP in some individuals and are certainly better than no intervention (Mills et al 2012). Furthermore, the addition of an orthoses can provide a useful adjunct to early rehabilitation, facilitating improved movement patterns and less pain in some individuals (Barton et al 2011).

To date foot taping, and strengthening exercises have not been tested within PFP populations, but have been proposed to be efficacious given the theoretical link between the dynamic control of foot pronation, sub-talar joint eversion, resultant tibial internal rotation and compensatory increased internal femoral rotation (Figure 2). The net effect of these movement deficits are purported to be elevated retro patella forces within the lateral facet and associated lateral femoral condyle (Tiberio 1987). A distal contribution to a biomechanical driver of symptoms may be due to this lack of rotational control and consequently likely to benefit from this rehabilitation approach.

Load/volume/intensity

Effective questioning and history taking will have offered the clinician an insight into the likely involvement of poor load / volume / intensity management and, as such, helped to identify the primary driver of the patient's symptoms. Education becomes the most effective tool in the therapist's armory when managing this presentation. In addition, it is critical that the patient and clinician establish together the current capacity of the individual's PFJ, as it is uncommon that all activity is too much for the knee to tolerate (Dye 2005). The use of finite pain limits (VAS ≤3/10) ensures that some activity can be maintained without further exacerbating symptoms in the longer term.

Importantly, in sporting populations this lower level of activity keeps the athlete engaged, prevents global deconditioning, and assists with the psychological burden of injury. Low loading activity, such as cycling, can be utilised in the early stages of rehabilitation, with a structured approach of graded exposure to load and volume outlined early on in physiotherapy sessions. Should running be the eventual goal, progression from the bike, to x-trainer and finally a structured programme for return to running can be given to allow for sufficient tissue adaptation. Concurrently, any biomechanical deficits should be rehabilitated allowing for a smooth transition from relative inactivity to increasing demand.

Psychosocial

A psychosocial primary driver of symptoms remains a significant clinical challenge for the musculoskeletal physiotherapist. For some clinicians, identification of this as the primary driver, explanation of the findings to

the patient, and onward referral to psychologist support can be appropriate. However, it is unlikely, even in individuals in this situation that identified secondary, tertiary or quaternary contributors to symptoms cannot be managed effectively to contribute to the overall progress of the patient, whilst receiving psychological support. For other clinicians who are more confident in treating such a pain-dominated presentation, successful management may be achieved through the implementation of a pain neuromatrix approach proposed by Moseley (2003). Reduction of threatening nocioceptive input using adjuncts described previously, in combination with a reduction of threatening non-nocioceptive input through patient education, can help to reduce threat levels and consequently patient symptoms. An increase in the patient's understanding of human physiology has been shown to positively influence their beliefs about, and attitudes toward the meaning of pain (Moseley 2003).

Rehabilitation progression

Following the successful implementation of a primary driver focused intervention, pain severity is likely to have reduced and progressions in the patient's programme can be made to build increased tissue tolerance (Khan & Scott 2009) and improve control in more challenging contexts. In addition, greater consideration to the additional contributing factors, identified at the initial assessment, can be incorporated in the rehabilitation programme design. The programme should be progressed to maintain the patient within finite pain limits, reduce their reliance on passive, temporary adjunctive interventions, and be goal driven. An on-going focus towards rehabilitation specificity will ensure that these goals are being achieved. In particular, rehabilitation of muscular activation, endurance, strength and power require consideration for specific training parameters as outlined by Toigo & Boutellier (2006). The pace of treatment progress is patient centred, with demands outside of the clinic likely to be as influential on the rate of change as those proposed within it. The most complex component of any rehabilitation programme is success implementation targeted at the right drivers in the early stages, from this point forward re-assessment, reflection and capacity for fluidity within the programme design ensures that progress is continued.

Conclusion

Successful identification of the primary driver of PFP symptoms, in combination with appropriate consideration for contributory drivers, should be utilised to provide a patient centred rehabilitation programme. Structural, biomechanical, load / volume / intensity and psychosocial deficits have been reported within the current literature to exist outside of an 'envelope of function' in symptomatic individuals. A targeted intervention directed at these specific deficits, has been proposed to maximise the likelihood of successful conservative management.

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Patellofemoral pain rehabilitation: taking the long view

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There is substantial evidence for the benefits of a range of interventions in the management of patellofemoral pain (PFP), including various multimodal approaches, exercise rehabilitation, patellar taping and bracing, and foot orthoses [Barton et al 2015]. However, longer term prognosis in individuals with PFP remains poor, with between 71 and 91% of individuals reporting pain up to 20 years following initial diagnosis, despite receiving evidence based treatment (Rathleff et al 2012; Nimon et al 1998; Stathopulu and Baildam 2003). There are a number of factors which may result in this poor prognosis, including an absence of evidence related to the provision of rehabilitation beyond the short term, i.e. > 8-12 weeks, patient education and guidance on rehabilitation progression to address all relevant deficits, and a failure to address or consider the potential presence of central pain drivers (central sensitisation).

Learning Outcomes:
- Understand how addressing pain remains a priority through rehabilitation and that possible central sensitisation should be considered.
- Understand that optimal rehabilitation takes time.
- Understand importance and success of gym-based rehabilitation is for many patients.
- Understand the specificity of exercise and rehabilitation necessary to optimize outcomes.

The importance of addressing pain

Pain has a number of established detrimental effects on function which may continue to drive further tissue irritation in PFP, including impaired vastii function (Chester et al 2008), reduced knee flexion and joint loading (Barton et al 2009), quadriceps inhibition and subsequent weakness (Lankhorst et al 2013), and persistent kinesiophobia or fear of movement (Domenech et al 2013). Considering this list, addressing kinesiophobia as symptoms settle may be an important part of rehabilitation. Additionally, long term use of adjunctive interventions, including patellar taping and bracing, foot orthoses and manual therapy during rehabilitation, should be considered where they show to be effective. In many cases patients may go for long periods without the need for such adjuncts, however, a flare-up in symptoms owing perhaps to an increase in activity or other aggravating factors, may result in such interventions being required. Careful intermittent use of pain modulating interventions in the longer term may help prevent the pain-persistent kinesiophobia-deconditioning-deficits cycle (Figure 1) from recommencing, and importantly perhaps assist in addressing it in the first place.

Central sensitisation

There has been little research evaluating the possible presence of central sensitisation (CS) in patients with PFP. The possible presence of CS was highlighted by Rathleff et al (2013) who recently reported reduced pressure pain thresholds (PPTs) in female adolescents with PFP, both around knee and in the tibialis anterior muscle. The likely presence of CS in PFP is further highlighted by links between lower PPT values associated with chronic knee pain in osteoarthritic patients (Fingleton et al 2015). The potential presence of CS may have important implications for the management of patients with PFP.

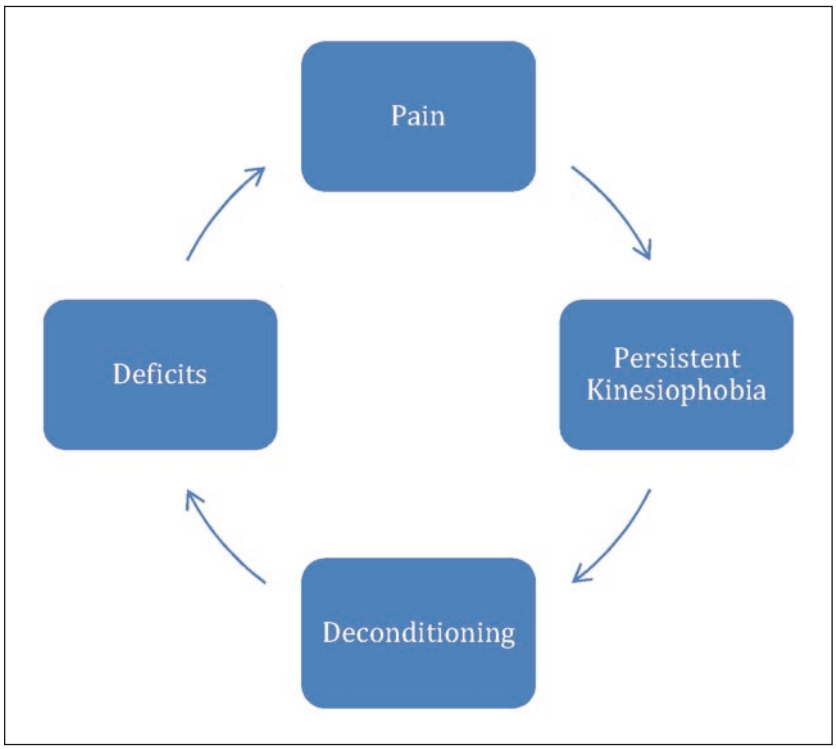

Figure 1: *Cycle of pain, persistent kinesiophobia, deconditioning and deficits which often occurs in the presence of patellofemoral pain.*

Previous recommendations to assist in addressing CS in chronic musculoskeletal pain include a cautious approach to initial exercise loads and progression to avoid symptom flaring, and encouraging exercise of non-painful areas of the body (Nijs et al 2012; Nijs et al 2015). Other, non mechanical interventions include strategies to address psychosocial factors linked with PFP (Piva et al 2009). The clinical implications of this are that rehabilitation is likely to take longer and require more time in the presence of non-mechanical deficits. Additionally, it is also very important to avoid pain aggravation throughout the rehabilitation process and consider adjunctive interventions where effective.

The long view

A patient with chronic PFP is unlikely to be cured. Importantly, emerging evidence has linked chronicity in PFP with poorer prognosis (Collins et al 2010; 2013), so it is of huge importance to managing patient expectations in relation to likely outcome, particularly in the short to medium term. If there is potential for improvement in the patient's condition, they must understand the time and effort that will be required to complete appropriate rehabilitation, and that chronicity, current symptoms and irritability, and associated deficits that individual patients possesses will impact on this.

Evidence for strength deficits in individuals with PFP is strong, particularly with regard to the hip (Rathleff et al 2014) and quadriceps (Lankhorst et al 2013). As such, it is not surprising that research evaluating rehabilitation programmes aiming to correct these deficits produce positive results (Lack et al 2015; van der Heijden et al 2015). However, these studied rehabilitation programmes rarely provide additional benefit when evaluated in the longer term, e.g. 12 months after enrollment, and in some cases initial benefits, compared to control interventions, diminish over time (Lack et al 2015; van der Heijden et al 2015). This is not surprising when you consider potential, long standing pain and kinesiophopia (Domenech et al 2013), and associated strength deficits and muscle atrophy (Lankhorst et al 2013; Giles et al 2013) in PFP. Put simply, fully addressing significant deficits will take a considerable amount of time; far longer than 3 to 8 weeks, which is the period of rehabilitation provision often studied.

Large neural adaptations occur in the early stages of any resistance training (American College of Sports Medicine 2009), and hence these are likely to explain a lot of the improvement from previously evaluated exercise rehabilitation programmes in PFP management (Lack et al 2015; van der Heijden et al 2015). However, true muscle hypertrophy, required to address muscle atrophy in individuals with PFP, is much slower. It takes around 6 weeks before hypertrophy signs are present, and requires far longer and progressive overload in order to optimise outcomes. In fact, gains are unlikely to plateau for at least 6 months in healthy adults (America College of Sports Medicine 2009), and in the presence of muscle atrophy as a result of PFP, this time period may be much longer. Considering this, if you are to truly get your patients with PFP better, you need to take the long view. In most cases, this will require follow up for at least 12 months following commencement of rehabilitation.

The gym

In most cases, home exercise including the use of resistance bands and body weight exercises is appropriate in the early stages of rehabilitation. The majority of clinical trials supporting the efficacy of exercise rehabilitation in PFP have used this approach (Lack et al 2015; van der Heijden et al 2015). In fact, when commencing any resistance training programme, low to moderate intensity exercise prescription is recommended to facilitate muscle function, i.e. strength, power and endurance gains (American College of Sports Medicine 2009). However, progressing from home-based to gym-based rehabilitation is often an important step in optimising the management of PFP, particularly in patients who wish to return to stair negotiation, running and other sporting activities, where knee and other lower limb joint forces significantly increase. Gym based resistance training 3 times per week will allow the prescription of progressive overload, and hence optimal muscle function gains (American College of Sports Medicine 2009).

Current research comparing different exercise dosage in PFP rehabilitation is limited, and requires attention. However, in a previous randomised trial comparing exercise dose outcomes in PFP, higher intensity was reported to be more effective than lower intensity exercise prescription (Østerås et al 2013). Additionally, the only study reporting improvements in pain at 1 year follow-up in Lack et al's (2015) recent review of proximal exercise used exercise intensities of > 70% of 1 repetition maximum (RM) (Fukuda et al 2012). This exercise prescription is consistent with recommendations that novice to intermediate individuals train with loads corresponding to 60–70% of 1 x RM for 8–12 repetitions to maximise strength gains (American College of Sports Medicine 2009).

Rehab specificity

Human movement is complex, requiring adequate available joint motion and tissue integrity, as well as muscle activation, strength, endurance and power (American College of Sports Medicine 2009). In most cases of PFP, multiple aspects related to this complexity will be impaired due to deficits resulting from the pain-persistent kinesiophobia-deconditioning-deficits cycle. Although initially rehabilitation should be tailored to prioritise addressing key deficits, e.g. muscle activation or soft tissue flexibility, the evolution of the programme must be guided to ensure all potential deficits are addressed over time. There is no recipe, and progression requires careful, ongoing assessment by the treating clinician to identify and address all associated deficits. Consideration should be given to possible deficits to type of muscle activation (concentric, eccentric, isometric), movement velocity and power, endurance, range of motion, and muscle group, i.e. quadriceps, gluteal, etc. Additionally, the patient's functional goals must also be considered. The requirement for quadriceps strength and power for a high level athlete will be far greater than that of a patient who is seeking to walk their dog around the block, pain-free again.

Movement pattern retraining for individuals with PFP is receiving growing attention in research and clinical practice, and has been recommended by international experts (Barton et al 2015). Although limited to research into running, emerging evidence supports the use of visual and verbal cues to reduce hip adduction in females with PFP (Willy et al 2012; Noehren et al 2011). These findings are particularly important when you consider that excessive hip adduction during running is reported to be a risk factor for PFP development (Noehren et al 2013), and that rehabilitation exercise in individuals with PFP does not seem to address this deficit (Ferber et al 2011; Earl and Hoch 2011). Similar cueing to reduce hip adduction and internal rotation during other activities that increase loading on the PFJ, such as squatting and stair negotiation, may also be an important part of rehabilitation in patients with PFP, particularly once pain is under control and other deficits have been addressed. The need for movement pattern retraining should be assessed on an individual basis, and can be aided by video and mirror feedback in the clinic (Barton et al 2015).

Conclusion

Ensuring a patient's pain is minimised throughout rehabilitation is of vital importance to reduce the impact of the pain-persistent kinesiophobia-deconditioning-deficits cycle. Home-based exercise combined with adjuncts such as taping, manual therapy and foot orthoses to reduce pain may all be important starting points, and all possess a growing evidence base. Large deficits in muscle function resulting from PFP, e.g. hip and quadriceps muscle atrophy, will take a number of months, or even years to address. In many cases, progression of rehabilitation to a gym-based programme should be considered, particularly in patients wishing to return to higher level activities such as running and other sports. Movement pattern retraining, specific to an individual's functional requirements may also be a vital part of rehabilitation, particularly once pain is under control and other deficits have been addressed.

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Patellofemoral pain: a vicious cycle?

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Knee pain, and particularly patellofemoral pain (PFP) is common in the cycling population. Practitioners looking after cyclists, or triathletes, must determine whether it is the athlete's body or their bike which is predominantly causing incidences of knee pain. Faulty bike equipment and incorrect setup are important considerations for any clinician treating a rider who presents with atraumatic knee or patellar pain.

Learning outcomes:
1. Knowledge of bike equipment terminology.
2. Knowledge of the bike set up.
3. Knowledge of equipment adjustments as part of treatment for patellofemoral pain.

Introduction

Patellofemoral pain (PFP), or anterior knee pain, has been associated with elite cycling (Callaghan & Jarvis 1996) with one study citing a 12 month prevalence of 36% of elite cyclists with PFP (Clarsen et al 2010), so problems in this area will commonly be seen in clinics and private practice.

There are 3 possible biomechanical reasons for this, all of which are related to the cyclist's position and the forces needed through the quadriceps and patellar tendon to turn the pedals (Figures 1a, b & c).

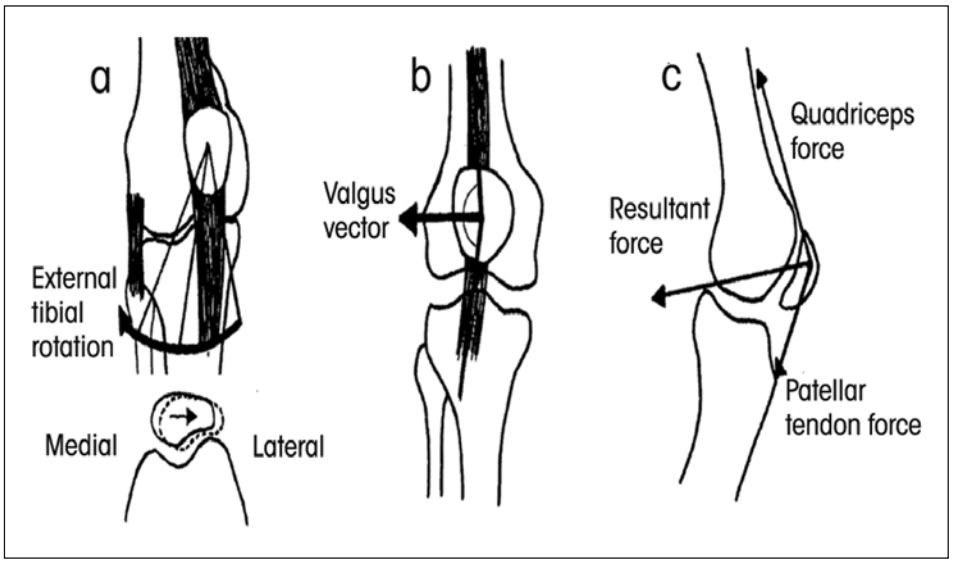

Figure 1: *Possible causes of PFP in cycling:* ***a)*** *increased axial rotation;* ***b)*** *increased knee valgus;* ***c)*** *increased patellofemoral joint reaction force.*

1. High knee flexion and high quadriceps tendon force. The knee usually achieves about 30 degrees at the bottom of the pedal stroke (figure 2) and 110 degrees flexion at the top (figure 3). There are also large forces going through the knee when it moves into extension during the power phase of the pedal cycle. A combination of high knee flexion and large quadriceps tendon force results in a high patellofemoral joint (PFJ) reaction force.

2. Knee valgus stress in knee extension. During the downward power phase the knee moves into slight valgus, i.e. as it moves from 12 – 3 o'clock it moves nearer to the cross-bar. This has the effect of relatively moving the patellar laterally and increasing the contact stress at the PFJ.

3. Associated axial rotation during the extension phase. This movement is a neglected consideration. Its importance, however, lies in tibiofemoral rotation affecting PFJ mal-alignment and the relative contrary rotation of the femur. It is now known that increased internal rotation of the femur will increase pressure and stress behind the patella (Liao et al 2015).

The cause of PFP can be divided, most simply, into problems with the body or with the bike.

Figure 2: *Sir Bradley Wiggins on his time trial bike shows 30 degrees knee flexion when the pedal is at bottom, dead centre (6 o'clock position).*

Figure 3: *Sir Bradley Wiggins in 110 degrees knee flexion at the top, dead centre (12 o'clock position).*

Body problems include the usual suspects of anatomy and soft tissue which can be seen not just in cyclists but in individuals participating other sports; tight ITB, tight quadriceps, hip flexors and hamstrings. Although there is no known incidence of problems in cycling, hip abductors should also be assessed owing to the role they play in controlling hip rotation.

Bike problems include the equipment, its set up, and the cyclist's position all of which, due to the myriad of adjustments and mal-adjustments that can be made, can result in problems that can be just as complex as those related to the body.

The 3 key areas where the body makes contact with the bike are:

1. The saddle
2. The pedal
3. The handlebars

This creates a 'golden triangle' (Figure 4) in which the saddle and the pedals have an influence on knee pain in general, and PFP in particular.

Adjusting the saddle

The key measurement to check on the saddle is the height, and small adjustments can alter compression forces on the PFJ (Bini & Hume 2014). The effects of the saddle being too high or too low can be seen in table 1.

Measurement to ensure correct saddle height can be made in standing (Figure 5) and then checked again whilst the individual is sitting on the bike, by measuring the knee flexion angle when the pedal is in the 6 o'clock position (Figure 6).

The saddle can also be moved forwards and backwards, which effectively moves the knee in front of, or behind the centre of the pedal spindle. This 'fore-aft' adjustment is known to have small effects on the tibiofemoral and PFJ by altering knee flexion angles (Bini et al 2013).

Pedal position

The pedal is sometimes described as the 'bike – body interface' as it is where, in order to move the bike forward, the force of the body is transmitted. As such, checking the pedal position also includes checking the cyclist's feet, shoes and cleats.

The major consideration, and the difference between cycling and most other sports, is that the major force and stress is delivered by the forefoot; the rearfoot has a very small role (Figure 7).

Figure 4: *The 'golden triangle' for cycling. The 3 points of contact between body and bike are handlebars, saddle and pedal.*

A cyclist has a choice of 3 major pedal systems, all of which have a connecting cleat under the shoe that can be adjusted to move the position of the foot in antero-posterior, medio-lateral, or rotation directions. We know that a change in these positions can affect loading in the knee (Hull & Ruby 1996), so careful setup is needed. There are some basic alignment guidelines which state that, when looking from the side, the pedal spindle should lie directly under the line of the metatarsal heads. Additionally, looking from the front, the second toe should be aligned with the tibial tuberosity when the knee is in the full flexion position of about 110 degrees. This is not an easy measurement to determine however, so a laser light can be very helpful for verifying this alignment in the frontal plane. Adjustments can also be made to the shoe cleats to ensure these basic positions are achieved.

Another method of adjusting the lower limb position is through the use of insoles. However, as the forefoot is the cyclist's area of contact, the usual type of insoles that are designed, for example, for runners may not be appropriate for cyclists (Bousie et al 2013).

In other sports, correction of foot position is recommended as a treatment option for PFP. To correct this type of abnormality in cyclists, however, the shoe cleat and pedal arrangement allows for the use of external wedges that sit under the forefoot and influence the position of the lower limb during the drive phase.

Asplund & St Pierre (2004)	Saddle too high	ITB pain; PF loading; posterior knee pain
Holmes et al. (1994)	Saddle too high	ITB pain
Farrell et al (2003)	Saddle too high	ITB pain
Kronisch (1998)	Saddle too high	ITB pain; hamstring tendonitis;
Fleming et al (1998)	Saddle too high	ACL strain
Timmer (1991)	Saddle too high	ACL strain
Holmes et al (1991)	Saddle too high	Biceps femoris strain; post capsule strain
Burke & Pruitt (1996)	Saddle too high	Posterior knee pain
Mellion(1991)	Saddle too low	Patellofemoral pain
Sanner & O'Halloran (2000)	Saddle too low	Patellofemoral pain
Burke & Pruitt (1996)	Saddle too low	Anterior knee pain

Table 1: *Various authors' recommendations of saddle height on the knee structures and PFJ*

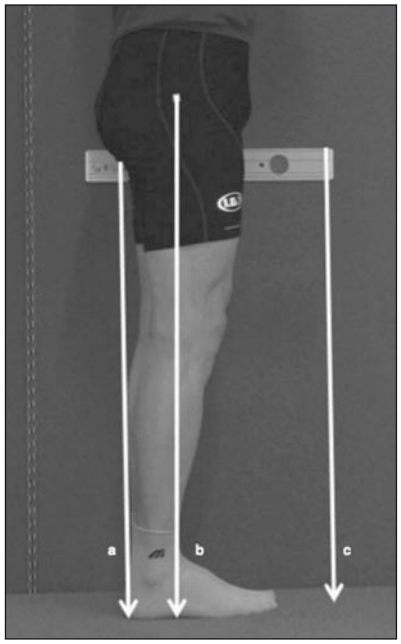

Figure 5: *Measurements for saddle height in standing.*

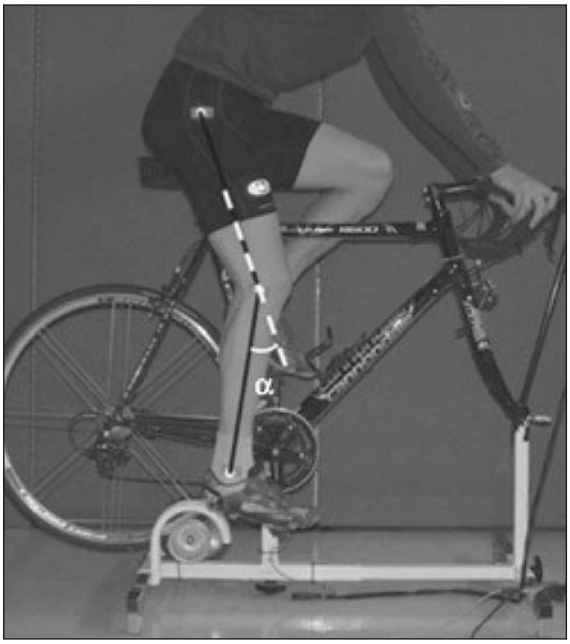

Figure 6: *Measurement for saddle height on the bike. Angle 'alpha' should be 30 degrees.*

Figure 7: *Arrows show relative forces through the pedals and feet during cycling.*

Handlebar position

Handlebar position has a very limited affect on the knee, but influences the shoulder-trunk angle and elbow angle; this is included to complete the 'golden triangle'. The main bike component which alters these angles is the handlebar stem which moves them closer to or away from the rider. For the purists, adjusting the handlebars to be further away can produce better aerodynamics. This, however, causes increased neck extension as the cyclist is required to look up to see the road ahead; a posture that some riders cannot maintain for long because of inflexibility and the resulting pain. Bringing the handlebars closer by fitting a shorter stem, offers a more comfortable position with less neck extension and a more acceptable shoulder-trunk angle of about 90 degrees and an elbow angle of about 15 degrees. These two extremes can been seen in the sleek, stretched out position of great cyclists such as Sir Bradley Wiggins or Chris Boardman versus the 'sit-up-and-beg' position of the daily Dutch commuter!

Treatment

Treatment for PFP in cyclists should be through a combination of adjustments to their body structures and to the bike.

Body structure treatment is similar to that recommended for other sports; stretching, strengthening and mobilising tissues, while "treatment" for the equipment involves a full analysis of the rider's position, and necessary adjustments, particularly in the 3 areas where the body meets the bike, i.e. saddle, pedal, handlebars. As has already been mentioned, saddle height and cleat / pedal position and orientation are important considerations when treating PFP in cyclists.

Taping around the patella can also be used, the main consideration being that the tape must allow about 110 degrees of knee flexion. This may be why coloured, elasticated taping such as kinesiotape has recently been more in evidence in professional cycling. It is still largely unknown what this form of tape does to the PFJ, but it is thought that it offers a combination of proprioceptive enhancement and subtle alignment alteration. However, notwithstanding the limited evidence of its superiority to any other standard sports elasticated tape (Morris et al 2013) the ability of kinesiotape to remain in situ is a consideration for recommending it for cyclists.

Summary

Ascertaining the likely cause of PFP in cyclists requires evaluation of the body tissues and the bike equipment. Faults in either body or bike, or a combination of both, need to be identified and rectified in order to help those with this knee condition.

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About the author

Michael Callaghan is a Professor of Clinical Physiotherapy at Manchester Metropolitan University, Clinical Specialist in the Emergency Department at Manchester Royal Infirmary and Head of Physical Therapies at Manchester United FC. For many years he has represented cycling on the British Olympic Association Medical subcommittee, and was physiotherapist for the Great Britain cycling team at two Olympics, and the England cycling teams at two Commonwealth Games.

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Der sker en kontinuerlig udvikling inden for sportsfysioterapi og vi vil derfor gerne fremtidssikre vores uddannelsestilbud på bedste måde. Uddannelsesudvalget vil derfor gerne have ansøgninger fra medlemmer, der kunne have lyst til at blive del af undervisningsstaben i forhold til undervisning på de kliniske og praktiske kurser (svarende til Del 1 i DSSF undervisningsforløb http://www.sportsfysioterapi.dk/Kurser/Ny-uddannelses--og-kursusstruktur/).

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Vi ser det som en fordel, at ansøgeren som minimum har gennemgået Del 1 undervisningsforløbet (eller det gamle Del A), så de har kendskab til indholdet i undervisningsmodulerne. Andre sportsfysioterapeutiske forudsætninger vil naturligvis blive vægtet, ligesom den øvrige efter- og videreuddannelse inden for det sportsfysioterapeutiske speciale samt de praktiske erfaringer.

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Uddannelsesudvalget i DSSF 28. april 2016

Running retraining in the management of patellofemoral pain

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Running is becoming increasingly popular as a form of general exercise and so, for clinicians, the prevention and management of running injuries, and patellofemoral pain (PFP) in particular is an ongoing challenge. This article explores the options for intervention and retraining runners in order to reduce the instances of injury and PFP.

Learning outcomes:
- Understand the established evidence base behind running retraining as an intervention for PFP.
- Identify the differing mechanisms behind the varied forms of feedback used in running retraining interventions.
- Understand the potential dual role for both running retraining and rehabilitative exercise.

Introduction

Despite the growing popularity of running as an exercise modality, it remains associated with a high incidence of musculoskeletal injury (Saragiotto et al 2014). Patellofemoral pain is, depending on the literature source cited, the most common running related musculoskeletal condition, affecting up to 15% of runners (Hetsroni et al 2006; Callaghan & Selfe 2007; Boling et al 2009). Whilst the source of pain in PFP can be heavily debated, a well-established explanation is increased joint stress, as a result of altered patellofemoral kinematics (Davis et al 2010; Liao et al 2015). Given that exercise interventions designed to improve altered running kinematics have proven ineffective (Willy & Davis 2011), strategies by way of internal or external feedback, known as 'gait retraining', are starting to be explored (Agresta & Brown 2015; Napier et al 2015).

Running retraining

At present, just two observational trials (Noehren et al 2011, Willy et al 2012) have investigated the effects and mechanisms of running retraining in PFP specific cohorts. Both studies identified significant improvements in both pain, measured with a visual analogue scale, and function, measured with the lower extremity functional index in female runners at short-term follow up. The mechanism attributed to these positive effects was a reduction in peak hip adduction, which was significantly reduced in both studies. The limitation of these quality observational trials is the mechanism of feedback used. Noehren et al (2011) employed a method of feedback based around a live display of peak hip adduction, whereas Willy et al (2012) used multiple mirror feedback and cueing to reduce peak hip adduction. Whilst the external feedback methods used in both of these studies is known to be more effective than internal feedback for facilitating skill acquisition (Wulf et al 2010), both methods used here have a significant lack of clinical carryover.

A more clinically viable form of external feedback is increasing step rate or cadence via audio metronome, which has been evaluated to a degree in relation to PFP. One high quality observational trial (Willson et al 2014) investigated the immediate effects of cadence increase using external metronome feedback in both asymptomatic and PFP runners. A significant reduction in patellofemoral joint stress was identified in both groups, both in relation to stress per step and stress per mile. Unfortunately, no concurrent measures of pain or function were taken in this study, most likely due to the immediate nature of the data collection and, at present, it is not known if this reduction in patellofemoral joint stress will result in associated reductions in pain or improvements in function. This positive finding is supported by a more recent piece of observational research (Willy et al 2015) which identified that 7.5% cadence increase, cued via audio metronome, significantly reduced both peak hip adduction and vertical loading rates, factors known to be associated with PFP development and maintenance (Davis et al 2010; Noehren et al 2013).

Is there a role for barefoot running?

Switching to barefoot running is often suggested by clinicians and academics alike as a potential means to reduce running injury rates (Hall et al 2013). A recent, high quality observational laboratory study (Bonacci et al 2014) investigated patellofemoral specific kinetic and kinematic outcomes achieved when switching to barefoot running, using a cohort of asymptomatic runners. A 12% reduction in patellofemoral joint stress was achieved in the barefoot condition, attributed to a reduction in stride length, an increase in baseline cadence and a reduced peak knee flexion angle at mid-stance of running (Bonacci et al 2014). Another observational laboratory study (McCarthy et al 2015) has also identified positive changes to hip kinematics when comparing barefoot to shoed running.

Despite this positive finding, it must be highlighted that equivocal reductions in patellofemoral joint stress and favourable changes to hip kinematics have been shown to be achievable with a 10% increase in cadence alone (Heiderscheit et al 2011; Lenhart et al 2014). The limitation of all of these findings is that they come from asymptomatic populations but, given that a secondary increase in injury may occur with a switch to barefoot running (Murphy et al 2013), and that clear clinical guidance for the use of barefoot running as a feedback tool remains absent (Hall et al 2013), other forms of external feedback should be advocated for the majority of runners before suggesting a switch to barefoot running.

Where does this place rehabilitative exercise?

It must be highlighted that the two intervention studies investigating the effects and mechanisms of rehabilitative exercise in runners with PFP also yielded significant improvements in both pain and function at short-term follow up (Earl & Hoch 2011; Ferber et al 2011). Although a reduction in peak knee abduction moment was identified by one of these studies (Earl & Hoch 2011), no other significant biomechanical mechanisms were identified. It is becoming clear that, whilst rehabilitative exercise is an effective management strategy for PFP especially when targeting muscles proximal to the hip (Lack et al 2015), no apparent mechanisms of effectiveness can be suggested.

It is possible that in a running population, a program of rehabilitative exercise leads to a reduction in reducing vertical loading rates (Esculier et al 2015), although this has only been shown when rehabilitative exercise was combined with advice and education on training error, and instruction to change cadence and foot strike pattern (Esculier et al 2015). However, it is certainly plausible that a combination of gait retraining and proximal exercise may lead to superior clinical outcomes, and the authors would suggest that this should become a future research priority.

Conclusion

Patellofemoral pain is a challenging condition to treat, particularly no more so than in the running population. Selecting an intervention that targets appropriate mechanisms is, therefore, of paramount importance. The early positive outcomes of gait retraining appear to be the result of a kinematic mechanism, targeting the primary risk factor for PFP development, established amongst the literature. As such a mechanism has not been determined for rehabilitative exercise, it can be suggested that gait retraining should be the primary intervention when managing running specific PFP. However, this must not detract from the positive effects of rehabilitative exercise when managing PFP on the whole, and a combination of interventions may well bring about superior clinical outcomes.

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About the author

Bradley is a physiotherapist and clinical academic. He is a lower quadrant specialist, taking a special interest in knee pathology, tendinopathy and overload conditions. Bradley commenced his PhD studies at Queen Mary University, London in April 2014, investigating the effects and mechanisms of running retraining in the management of PFP. He combines his research and clinical roles with regular teaching.

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Taping
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- (evt.) Sted ikke fastlagt, 25. okt.

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- Horsens, 8.-9. september
- København, 15.-16. november

Idrætsfysioterapi og hofte/lyske
- København, 12.-13. september
- La Santa, 30. sep.-7. okt.
- Odense, 11.-12. november

Idrætsfysioterapi og fod/ankel
- Horsens, 15.-16. sep.
- København, 9.-10. november

Idræt og rygproblemer
- La Santa, 30. sep.-7. okt.
- Århus, 28.-29. oktober

(introduktionskursus skal være gennemført)

Supervision af praksis
- København, 31. okt.-1. nov.

Specialekurser:

Undersøgelse og rehabilitering af muskel-/seneskader
- SDU, efteråret

Eksamen:

Eksamen, praktisk/klinisk del
- Hillerød, 26.(-27.) november

Eksamen, afsluttende del
- Hillerød, 3. december

Find aktuelle kursusoplysninger på:

www.sportsfysioterapi.dk

Invitation to IOC Symposium

Strategies in relation to patellofemoral problems in athletes

Section for Sportstraumatology M51 and Institute for Sportsmedicine M81
Bispebjerg-Frederiksberg Hospital

June 16, 2016 10-17

Call for free papers, deadline June 1, 2016. Please send abstracts to:
pia.charlotte.andersen@regionh.dk.

Admission free.

Preliminary program:
10.00 – 10.15 Introduction to the problem
10.15-10.45 Biomechanics of the patellofemoral joint and changes leading to symptoms (Joanna Stephen)
Patellofemoral pain:
10.45-11.15 Causes of anterior knee pain in the athlete and strategies for examination and visualization of the problem (Christoffer Brushøj)
11.15-11.40 Non-surgical treatment possibilities - scientific background. Results and prognosis (Marius Henriksen)
11.40-12.00 Surgical treatment possibilities. Results and prognosis.
12.00-12.15 Return to sports
12.15 – 13.00 Lunch
13.00-13.30 Free papers on patellofemoral pain
Patellofemoral instability:
13.30-14.00 Causes of patellofemoral instability. Clinical findings. Biomechanical explanations (Joanna Stephen)
14.00-14.30 Strategies for examination and visualization of the problem (Peter Lavard)
14.30 – 15.00 Coffee/tea
15.00-15.15 Non-surgical treatment possibilities. Results and prognosis (Marius Henriksen).
15.15-15.45 Surgical treatment possibilities. Results and prognosis. Complications to surgery (Peter Lavard)
15.45-16.00 Return to sports.
16.00-16.30 Free papers on patellofemoral instability
16.30-17.00 Panel discussion. Conclusions and recommendations

IOC Sports Medicine Copenhagen

Research Centre for Prevention of Injury and Protection of Athlete Health

Registration (maxium capacity 150 participants): Pia.charlotte.andersen@regionh.dk

Final program will be mailed to participants June 5, 2016.

Welcome !

DIMS kurser

Info: Idrætsmedicinsk Uddannelsesudvalg, c/o kursussekretær Christel Larsen.
E-mail: dimskursus@gmail.com

Generelt om DIMS kurser

DIMS afholder faste årlige trin 1 kurser i Østdanmark i uge 9 og i Vestdanmark i uge 35. Trin 2 kursus bliver afholdt i lige år på Bispebjerg Hospital, Institut for Idrætsmedicin. Der afholdes eksamen hvert andet år mhp. opnåelse af status som diplomlæge i idrætsmedicin (forudsat godkendelse af trin 1 + 2 kursus).

DIMS TRIN 1 KURSUS:

Formål og indhold: Basalt kursus i idrætsmedicin med hovedvægt lagt på diagnostik af hyppigste idrætsskader, herunder grundig gennemgang af akutte- og overbelastningsskader i knæ, skulder, hofte/lyske og ankel/underben. Patientdemonstrationer med instruktion og indøvelse af klinisk undersøgelsesteknik. Planlægning og tilrettelæggelse af udredning, behandling og genoptræning af skadede idrætsudøvere.
Kurset udgør første del af planlagt postgraduat diplomuddannelse i idrætsmedicin; 40 CME point i DIMS regi.
Målgruppe: Fortrinsvis praktiserende og yngre læger, der har interesse for idrætsmedicin og som ønsker basal indføring i emnet.

DIMS TRIN 2 KURSUS:

Formål og indhold: Kursisten skal indføres i nyeste viden indenfor idræt og medicinske problemstillinger herunder hjerte/karsygdomme, fedme, endokrinologi, lungesygdomme, osteoporose, artritis og arthrose. Derudover vil der være en gennemgang af træning og børn/ældre. Ydermere vil kursisten præsenteres for idrætsfysiologiske test/screeningsmetoder. Der vil være patientdemonstrationer samt undervisning i mere avanceret idrætstraumatologi. Varighed er 40 timer over 5 dage.
Målgruppe: Kurset er et videregående kursus, der henvender sig til læger med en vis klinisk erfaring (mindst ret til selvstændigt virke), samt gennemført trin 1 kursus eller fået dispensation herfor ved skriftlig begrundet ansøgning til DIMS uddannelsesudvalg.

Krav til vedligeholdelse af Diplomklassifikation (CME)

1. Medlemsskab af DIMS. Medlemsskab af DIMS forudsætter at lægen følger de etiske regler for selskabet.
2. Indhentning af minimum 50 CME-point per 5 år.
3. Dokumentation for aktiviteterne skal vedlægges:
- For kurser og kongresser vedlægges deltagerbevis og indholdsbeskrivelse (kursusplan).
- Kursusledelse eller undervisning dokumenteres af aktivitetsudbyderen.
- Anden idrætsmedicinsk relevant aktivitet dokumenteres af den ansvarlige for aktiviteten.
- Klublæge/teamlæge erfaring eller lignende dokumenteres af klubben/teamet eller lignende.

Opdateret december 2013.
Opdaterede **Krav til opnåelse af Diplomklassifikation** kan findes på www.sportsmedicin.dk

AKTIVITET	CERTIFICERINGSPOINT
Deltagelse i Idrætsmedicinsk Årskongres	10 point per kongres
Publicerede videnskabelige artikler inden for idrætsmedicin	10 point per artikel
Arrangør af eller undervisning på idrætsmedicinske kurser eller kongresser	10 point per aktivitet
Deltagelse i internationale idrætsmedicinske kongresser	10 point per kongres
Deltagelse i godkendte idrætsmedicinske kurser eller symposier	5 - 30 point per aktivitet
Anden idrætsmedicinsk relevant aktivitet	5 point per aktivitet
Praktisk erfaring som klublæge, forbundslæge, Team Danmark-læge eller tilknytning til idrætsklinik (minimum 1 time per uge og gyldig dokumentation fra klub/forbund/klinik)	10 point i alt

Idrætsmedicinske arrangementer pointangives af Dansk Idrætsmedicinsk Selskabs Uddannelsesudvalg før kursusafholdelse.

NAVN: _____ **KANDIDAT FRA ÅR:** _____ **DIPLOMANERKENDELSE ÅR:** _____

Sendes med bilag til DIMS diplomudvalg v/ Jan Rømer, Karensmindevej 11, 8260 Viby J, eller pr. e-mail til jromer@dadlnet.dk

DSSF kurser

Info: Kursusadministrator Vibeke Bechtold, Kærlandsvænget 10, 5260 Odense S.
Tlf. 2028 4093 • vbe@idraetsfysioterapi.dk
Kursustilmelding foregår bedst og lettest via DSSF's hjemmeside: www.sportsfysioterapi.dk

DANSK SELSKAB FOR SPORTSFYSIOTERAPI

Uddannelses- og kursusstruktur

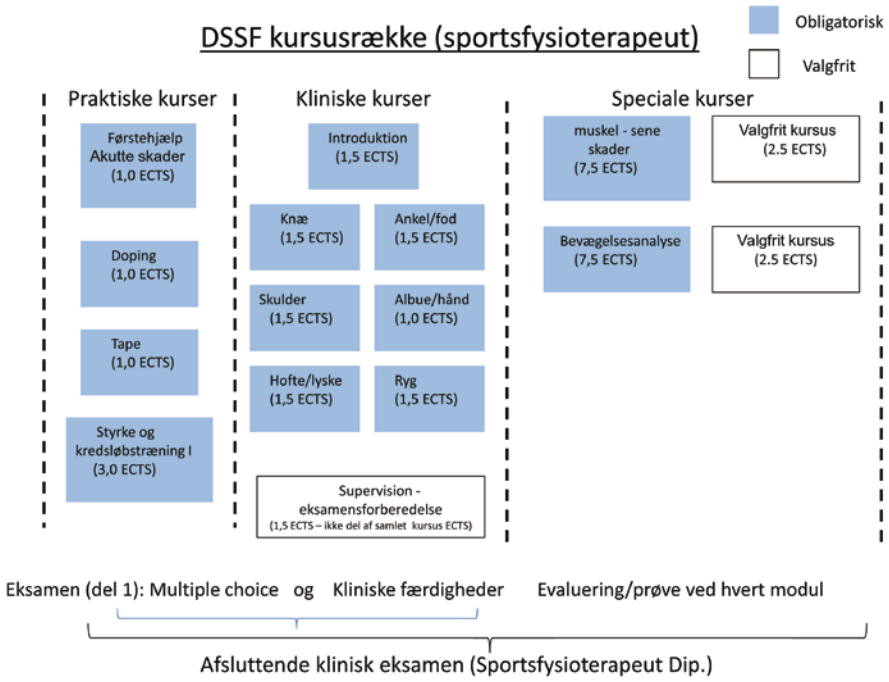
Fremtidssikring

Dansk Selskab for Sportsfysioterapi (DSSF) har ændret uddannelses- og kursusstrukturen med det formål at fremtidssikre den såvel nationalt som internationalt. Ved de ændringer, der er planlagt, kan DSSF sikre at medlemmerne kan dokumentere den kontinuerlige kompetenceudvikling, der skal være til stede for at kunne kvalificere sig til at gå til specialisteksamen, som beskrevet af Danske Fysioterapeuter/Dansk Selskab for Fysioterapi og dermed bære titlen: Specialist i Idrætsfysioterapi. Derudover hjælpes medlemmerne til at få et redskab til brug ved karriereudvikling, f.eks. karriereplanlægning, lønforhandling og anden form for markedsføring af kompetencer.

Mål

Vores mål med den samlede uddannelses- og kursusaktivitet er at ligge væsentligt over grunduddannelsesniveauet ved at skabe klinisk kompetence hos vores medlemmer på et højt niveau i forhold til de sportsfysioterapeutiske kerneområder og med evidensbaseret baggrund, hvor der tages afsæt i videnskabelig viden kombineret med omfattende kliniske færdigheder og praktisk erfaring.

Tabel 1: Skematisk oversigt over uddannelses- og kursusstrukturen



Samlet uddannelsesforløb

Vi har tilstræbt at skabe et samlet uddannelsesforløb med deleksamener undervejs, så man kan vælge at tage kurserne enten enkeltstående eller som dele af et samlet forløb.

Uddannelsen er opdelt som beskrevet i **tabel 1 og 2**: Praktiske kurser, Kliniske kurser og Speciale kurser. Det samlede udannelsesforløb inkl. eksaminerne er beregnet til 45 ECTS.

Praktiske og kliniske kurser

De praktiske kurser indeholder: Akutte skader og førstehjælp, Antidoping og kost, Styrke- og kredsløbskursus, Tapekursus.

De kliniske kurser består af Introduktionskursus, Rygkursus, Hoftekursus, Knækursus, Fod/ankel-kursus, Skulderkursus, Albue/hånd-kursus.

Har man gennemgået kurser før 2002, kræves det at man tager introduktionskursus for at kunne deltage på de kliniske kurser/regionskurserne. Har man gennemgået kurser mellem 2002 og 2015 godkendes disse i den nye struktur fra 2015.

For at gå til eksamen skal man dog supplere med de kurser, man mangler i forhold til den nye struktur (2015). Fx. Akutte skader/Førstehjælp, Antidoping/Kost, Styrke/Kredsløb, Tape og Ryg.

Fysioterapeutstuderende kan deltage i uddannelsesforløbet efter bestået Modul 12.

Specialekurser

DSSF har indledt et samarbejde med SDU om specialekurser. Dette foregår via valgmoduler på Kandidatuddannelsen i Fysioterapi, og modulerne: "Muskel-/seneskader - i relation til sportsskader", og "Analyse af bevægelse og muskelfunktion - i relation til sportsskader" er i gang og man kan søge via SDU 'tom plads-ordning'. DSSF vil bestræbe sig på at udvikle flere moduler af denne art.

De valgfrie kurser i den specialiserede del kan f.eks. være kurser fra andre

DSSF Kursusrække – Sportsfysioterapi ECTS

Tabel 2: Oversigt over ECTS point for uddannelses- og kursusrække for Sportsfysioterapeuter i DSSF.

Praktiske kurser	Kliniske kurser	Speciale kurser	Samlet (ECTS)
Akut førstehjælp **(1 ECTS)**	Introduktion **(1.5 ECTS)**	Muskel-seneskader **(7.5 ECTS)**	
Doping **(1 ECTS)**	Knæ **(1.5 ECTS)**	Analyse af bevægelse og muskelfunktion **(7.5 ECTS)**	
Tape **(1 ECTS)**	Ankel/Fod **(1.5 ECTS)**	Valgfrit kursus **(2.5 ECTS)**	
Styrke- og kredsløbstræning **(3 ECTS)**	Skulder **(1.5 ECTS)**	Valgfrit kursus **(2.5 ECTS)**	
	Hofte/lyske **(1.5 ECTS)**		
	Ryg **(1.5 ECTS)**		
	Albue/hånd **(1 ECTS)**		
Eksamen Multiple choice **(1.5 ECTS)**	Eksamen Kliniske færdigheder **(2.5 ECTS)**	Eksamen Inkluderet i individuelle speciale kurser	
I alt: 7.5 ECTS	**I alt: 12.5 ECTS**	**I alt: 20 ECTS**	**I alt: 40 ECTS**
Afsluttende klinisk eksamen i sportsfysioterapi: **Sportsfysioterapeut, DSSF regi (5 ECTS)**			**I alt: 45 ECTS**

selskaber og universiteter nationalt og internationalt, for hvilke medlemmerne kan søge merit hos DSSF.

Eksamen

Den planlagte, afsluttende kliniske idrætsfysioterapi-eksamen skal bestås, for at man kan kalde sig Sportsfysioterapi i DSSF regi.

DSSF´s samlede uddannelsesforløb vurderes til 45 ECTS. Dette er fremtidssikret i forhold til den endnu ikke godkendte specialistordning i Danske Fysioterapeuters regi.

Supervision

Uddannelsesudvalget (UKU) er i gang med at beskrive supervisionsforløb, som kan matche det angivne krav til supervision for at blive specialist i idrætsfysioterapi (i regi af Dansk selskab for Fysioterapi/Danske Fysioterapeuter). Det ser ud til at kravet vil blive 100 timers supervision, og en stor del af dette vil være en del af de praktiske og kliniske kurser. Derudover planlægges specielle supervisionskurser og endelig skal den enkelte sørge for de sidste supervisionstimer selv. De nærmere beskrivelser vil foreligge, når den nye specialistordning er endeligt godkendt.

Løbende info på www

Uddannelsen og kurserne vil løbende blive uddybende beskrevet på DSSF's hjemmeside, og kvalificeret med ECTS. ECTS på tabel 1 og 2 skal således tages med forbehold for ændringer.

Du vil løbende kunne finde opdatering og informationer på *www.sportsfysioterapi.dk*

Vibeke Bechtold/Bente Andersen

Dansk SPORTSMEDICIN

Adresse:

Produktionsansvarlig
Gorm Helleberg Rasmussen
Terp Skovvej 82
8270 Højbjerg
info@dansksportsmedicin.dk
www.dansksportsmedicin.dk

Redaktionsmedlemmer for DIMS:

Humanbiolog, M.Sc. Anders Nedergaard
Nannasgade 1 1.sal
2200 København N
anders.fabricius.nedergaard@gmail.com

Læge Jonathan Vela
Øster Ågade 11 3.sal
9000 Aalborg
jonathan@pyrdologvela.dk

Redaktionsmedlemmer for DSSF:

Fysioterapeut, PhD Heidi Klakk
Skibhusvej 191
5000 Odense C
hklakk@health.sdu.dk

Fysioterapeut Merete N. Madsen
merete@friismadsen.dk

Fysioterapeut, cand.scient.san. Merete Møller
meretem@stofanet.dk

dansk idræts medicinsk selskab

Adresse:

DIMS c/o sekretær
Trine Stefanski
Institut for Idrætsmedicin, BBH
Bispebjerg Bakke 23
2400 København NV
Tlf. 7178 7876
mail@sportsmedicin.dk
www.sportsmedicin.dk

Formand Tommy F. Øhlenschlæger
Institut for Idrætsmedicin, BBH
Bispebjerg Bakke 23, 2400 København NV
tpv@dadlnet.dk

Næstformand Annika K. N. Winther
Ortopædkirurgisk afdeling
Herlev Hospital, 2730 Herlev
winther.annika@gmail.com

Kasserer Niels Christian Kaldau
Spanagervej 1
2700 Brønshøj
nckaldau@gmail.com

Jesper Petersen
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mortenwad@gmail.com

Jørgen Guldberg-Møller
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Morten Knudsen
Jens Baggesens Vej 114, 3.th.
8200 Århus N
mortknud@rm.dk

Fysioterapeut
Mikkel Ammentorp Pedersen
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mikkelmap@hotmail.com

Fysioterapeut
Gorm Helleberg Rasmussen
Terp Skovvej 82
8270 Højbjerg
gormfys@sport.dk

DANSK SELSKAB FOR SPORTSFYSIOTERAPI

Adresse (medlemsregister):

Dansk Selskab for Sportsfysioterapi
Sommervej 9
5250 Odense SV
Tlf. 6312 0605
muh@idraetsfysioterapi.dk
www.sportsfysioterapi.dk

Formand Karen Kotila
Christianslundsvej 107, 5800 Nyborg
3082 0047 (P) kk@sportsfysioterapi.dk

Kasserer Martin Uhd Hansen
Sommervej 9, 5250 Odense SV
6015 8698 (P) muh@sportsfysioterapi.dk

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Berit Duus
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Lisbeth Lund Pedersen
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llp@sportsfysioterapi.dk

Lars Damsbo
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Suppleant Vibeke Bechtold
Kærlandsvænget 10, 5260 Odense S
2028 4093 (P) vbe@sportsfysioterapi.dk

Suppleant Peder Berg
Abels Allé 58, 5250 Odense SV
5098 5838 (P) pbe@sportsfysioterapi.dk

www.dansksportsmedicin.dk

Find fakta og gamle guldkorn

På hjemmesiden kan du finde de forskellige faktuelle oplysninger af interesse i forbindelse med Dansk Sportsmedicin.

Du kan finde det nyeste blad. Du kan bladre og printe. Du kan også finde eller genfinde guldkorn i artiklerne i de gamle blade. Alle blade kan læses og downloades fra "bladarkiv".
Du kan også søge i alle bladenes indholdsfortegnelser for at få hurtig adgang til det, du er interesseret i at finde.

Adresser. Referencelister. Oplysninger, aktuelle som historiske. Det er alt sammen noget, du kan "hitte" på hjemmesiden, og savner du noget, må du gerne sige til.

IDRÆTSKLINIKKER

Sjælland

Frederiksberg Hospital, ortopædkir. afd.
Tlf. 3816 3490 hverdage 8 - 15

Gentofte Hospital, Kl. f. ortopædkirurgi
Tlf. 3867 3382 hverdage 8 - 15

Bispebjerg Hospital, Inst. f. Idrætsmedicin
Tlf. 3531 2154 hverdage 8 - 14
Professor Michael Kjær

Nordsjællands Hospital - Hillerød
Tlf. 4829 4829
Overlæge Henna Lise Chenoufi

Hvidovre Hospital, ortopædkir. afd.
Artroskopisk Center Hvidovre
Tlf. 3862 2244 hverdage 8:30 - 15
(dog torsdage 9 - 15)
Professor Per Hölmich

Sjællands Universitetshospital, Køge
Artroskopisk Sektion
Tlf. 4732 3350
Overlæge Gunner Barfod

Næstved Sygehus, tlf. 56 51 20 00
Overlæge Muhammad Afzal

Fyn

Middelfart Sygehus, Idrætsklinikken
Tlf. 6348 4105 hverdage 9 - 14

Odense Universitetshospital, ortopædkir. amb.
Tlf. 6541 2255/6541 2260 hverdage 8 - 14

Jylland

Sydvestjysk Sygehus Esbjerg, ortopædkir. amb.
Tlf. 7918 2126 hverdage 9 - 15

Sydvestjysk Sygehus Grindsted, ortopædkir. amb.
Tlf. 7918 9230

Vejle Sygehus, Idrætsklinikken (Vejle-Give)
Tlf. 7940 6675 hverdage 8 - 15

Regionshospitalet Horsens, Idrætsklinikken
Tlf. 7842 5000 hverdage 9 - 15

Regionshospitalet Silkeborg
Tlf. 7841 6260 hverdage 9 - 13

Regionshospitalet Viborg, ortopædkir. afd.
Tlf. 7844 6511 /7844 6522 hverdage 8 - 13
Overlæge Steffen Skov Jensen
Overlæge Ejvind Lynderup

Regionshospitalet Herning, Idrætsklinikken
Tlf. 9927 2096
Cheflæge Per Østergaard Jensen

Regionshospitalet Holstebro, Idrætsklinikken (ortopædkir. afd.)
Tlf. 7843 7637 hverdage 8 - 14
Overlæge Steen Taudal

Aarhus Universitetshospital THG, Idrætsklinikken
Tlf. 7846 7460 hverdage 10 - 12

Regionshospitalet Randers, Idrætsklinikken (ortopædkir. afd.)
Tlf. 78 42 20 86
Overlæge Philippe Nicolini

Ålborg Universitetshospital, Idrætsklinikken (ortopædkir. afd.)
Tlf. 9766 2838, hverdage 8 - 14:30
Overlæge Hans Peter Jensen

Sygehus Vendsyssel, Hjørring
Reumatologisk Idrætsklinik
Tlf. 97 64 09 90
Overlæge Søren Schmidt-Olsen

Sygehus Vendsyssel, Hjørring
Center for Artroskopi
Tlf. 9764 0613

Rettelser og tilføjelser til listen modtages gerne. Private klinikker optages ikke.

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DANSK SELSKAB FOR
SPORTSFYSIOTERAPI