MDT World Press

The McKenzie Institute® International
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Feature Commentary

SEVEN REASONS WHY MDT IS THE FUTURE OF SPORTS MEDICINE

ALLAN BESSELINK, PT, DIP. MDT

In the world of orthopedics, MDT is gradually becoming accepted as a standard of musculoskeletal care. As slow as the progress has been in orthopedics, it has been virtually glacial in the world of sports medicine.

Research in sports sciences indicates that injuries are rarely a function of asymmetries, muscle imbalances or biomechanical mal-alignments; they are a function of training. In the most basic terms, sport training is simply a series of repeated movements and sustained postures.

After many years of working with an athletic population, there is no doubt in my mind that MDT is a comprehensive, athlete-centered and exercise-based approach to the care of musculoskeletal injuries in sports. That being said, I present seven reasons why I believe MDT is the future of sports medicine, including what makes MDT appealing to clinicians, athletes and coaches alike.

1. ***Mechanical assessment consistent with the demands of sport.***
   Most endurance sports injuries, and a great percentage of injuries in power and team sports, are directly related to training issues. Sport activities are the epitome of "mechanical loading". MDT utilizes repeated movements in its mechanical assessment process in order to fully understand the effects of mechanical loading sustained during the training process, an integral factor in the onset of sports injuries.

2. ***The clinical reasoning process.***
   MDT is a clinical reasoning process, not just a tool in a toolbox. MDT's operational definitions provide a consistent understanding of the effects of mechanical loading and the sport training on the athlete's presenting problem.

3. ***Consistent stages/phases of care.***
   MDT utilizes very consistent stages/phases of care, consisting of mechanical assessment, mechanical diagnosis, self treatment strategies, recovery of function and injury prevention. These stages are all very appropriate for a comprehensive sports medicine model, and are consistent with the sports sciences literature in the process.

4. ***Treatment progression based on responses to mechanical loading.***
   Appropriate progression is not based on arbitrary rules. It is based on responses to mechanical loading, as well as reliable prognostic indicators established during the assessment. Return to training is, in effect, a force progression.

5. ***Self care treatment focus.***
   Most athletes don't want to be passive participants in their injury recovery. From a psychosocial perspective, the focus on self care is a positive for the athletic population. This focus on self care strategies can be naturally and effectively integrated into training programs, be it through modified training or full return to training.

6. ***Recovery of function is integral to the athlete's success.***
   McKenzie specifically notes the importance of "recovery of function". He provided a context for it to take place and principles for its implementation. We can assess biomechanics, sport technique, and training programs – all issues well-grounded in up-to-date sports sciences research. We can use these sound and well-established principles of sport science to develop a "recovery of function" program for the athlete based on principles of training and force progression. MDT simply provides a context in which to approach the problem of recovery of function and return to sport.

7. ***Injury prevention.***
   One of the primary elements of MDT, injury prevention, is a hallmark of effective sports medicine approaches. It is one thing to promote resolution of the problem, but it is another to provide guidance in strategies to effectively prevent the problem as part of the athlete's training program.

MDT is the future of sports medicine. MDT is not an arbitrary treatment intervention applied to an athlete. It provides clinicians, athletes, and coaches with a comprehensive approach to sports injuries through proper assessment, treatment planning and progression, and a context in which to pursue effective recovery of function and return to sport training.

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GUEST COMMENTARY

Choose Your Own MDT Adventure!

Jared Mallory, DPT, Dip. MDT

As a child, I was always a big fan of comic books. I loved following along with the action and adventure, but, many times, I would sit and wonder, "Why did Spider-Man do that? Shouldn't he have used his spidey-sense earlier to catch the Green Goblin? I mean, come on Spider-Man! You should have done it my way!" Alas, I had to just read along, watching my favorite superheroes do things their own way, but knowing that if they would have just listened to me, the whole thing would have been solved much earlier. So, imagine the excitement I had when one day when my mom bought me a book that was a "Choose Your Own Adventure". The characters had to do what I wanted them to do. I was in total control. I was on top of the world!

By now you are probably thinking, "How in the world does this relate to MDT?" Well, a recent conversation with another Diplomate brought these anecdotes to mind. We spoke about how common it is to hear clinicians ask similar questions regarding the clinical use of MDT. These questions can come from those new to MDT, those who are on the opposite side of the MDT fence, and sometimes even from some experienced MDT clinicians themselves. Have you pondered these thoughts before? "When can I go lateral? With a relevant lateral, when can I return to the sagittal plane? When do I add overpressure versus doing more reps?" All are common examples of questions which we hear or we may even think to ourselves. The answer, ladies and gentlemen, is quite simple … When You Can!

Most likely, this is not the answer clinicians like to hear, but it is the correct answer. The beauty of the MDT system is in its simplicity. However, simplicity does not mean it is always black and white. For the most part, when treating a patient in the clinic, MDT lives more in the gray. Although there are some definite dos and don'ts of the system, the daily treatment and interaction with the patient is very individualized. This individualization occurs not only per patient, but also per clinician.

We all know that the quickest way between two points is a straight line, but when treating a patient in the clinic, straight lines are few and far between. It all depends. It depends on what the clinician sees. It depends on what the clinician asks. It also depends on what the patient says. If ten MDT Diplomates listened to the history of a single patient and then began to assess the patient, in the end they would all get to the same place, correct? At least, that is what the literature and research tells us. MDT has been proven to be reliable. However, when looking at how MDT clinicians assess and treat patients, you would probably have many different answers and reasons as to why they chose the course of action they did.

So, how can a system be reliable, but also allow for individualization? This is the true beauty of MDT. There is not a specific prototype MDT clinician that you need to be in order to treat patients using this system. The only qualification is to simply "get the system". And, part of "getting the system" comes with the realization that you must be comfortable knowing that going from point A to point B does not have an exact road map. Instead, as fellow MDT clinician, Michelle Miller, PT, Dip MDT, explains it, "Treating a patient with MDT is more like using a GPS Navigation System which continually changes the course as you make a different turn."

When speaking with clinicians outside of the MDT world, most seem to be very comfortable explaining their logic in a step by step system, moving from Step 1 to Step 2, and so on. "First, I mobilize this and then I do this." I believe this works very well until the wheels fall off and you are heading down the cliff looking around for help. Sometimes things do not go as planned, and we all know that when dealing with patients, things we did not expect show up frequently. However, when using MDT, all is not lost if you are utilizing the system correctly.

During my Diplomate clinical component and sometime soon after, I was given some advice that has stuck with me. In order to use the system correctly and efficiently, you need to think a few steps down the road. You need to plan out what you will do next with different responses. When performing the history during an initial assessment, you begin to gather data about how you should proceed with the examination. Then, from the examination, you gather the data as to how to proceed with the repeated movements. So on and so on …

Many times, MDT clinicians are viewed as being "hands-off" and almost disinterested in the patient, since we are not "actively" doing something to the patient. I think this comes from the misunderstanding that much, if not all, of the system happens simply between the ears. It is a system that requires the clinician to be continually active. The clinician must actively listen to the patient and base his or her examination off of the patients' response. The clinician must actively watch the patient when performing movement loss in order to think ahead as to what should be attempted with repeated movements.

The same is true when a patient returns for a follow-up visit. Based on the prior visit, the clinician needs to have an algorithm in his or her head before the patient arrives. "If the patient arrives and says "X", then I do that. If the patient arrives and says "Y", then I do this." What makes this system unique is that it is an ongoing evaluative process. With each patient's response or movement assessment, the algorithm may change drastically. Each patient, with his/her derangement, dysfunction, postural or other classification, brings a new adventure to the clinician each visit. I may choose to try this, and you choose to try that. But, in the end, we should all arrive at the same place.

Some could make a strong argument that there are more efficient and effective ways to get to that point. I believe that this is where discussing methods with other MDT colleagues and clinicians comes into play. Asking others for advice and sharing stories or case studies is always a good start. We have a team of MDT clinicians around the world who have most likely seen some of the same things you have seen. However, remember that each patient is different, and what others have tried may not work in each particular case. Therefore, just like in those books which I loved to read, you are in control and in charge. There is a right answer, but there are many ways to get to a positive result. The key is that you get there. Some of us may take the path less travelled, and others will not. Experience will help us fine tune our skills and allow us to get there faster. In the end, you must simply trust the system and decide where you want to go. So, go forth MDT clinicians… and choose your own MDT adventure!

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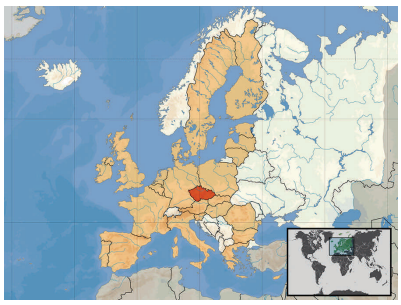
BRANCH SPOTLIGHT

McKenzie Institute Czech Republic

Eva Novakova PT, Dip. MDT, Jana Letakova, MD, Cert. MDT and Hana Solcova, MD, Cert. MDT



A - Ask & Answer

The Czech Republic is a small country in the middle of Europe with a population of ten million, within which exists about 5,000 physiotherapists. It is four times smaller than Poland and 122 times smaller than the USA.

B - Baselines

The Czech Branch is 10 years old, having been founded in 2003 by Eva Novakova, a physiotherapist, Jana Letakova, a neurologist, and Hana Solcova, a physiatrist. If it had not been for the opportunity to attend our first McKenzie course, taught by Scott Herbowy in 1995, we might still be using manual therapy, PNF or Vojta concept, like many other physiotherapists in this country.

Around 2000, all three of us were working in one of the best hospitals, the Military University Hospital in Prague, and we were struck by the contrasts between the Department of Neurology, where Eva had introduced the McKenzie Method, and the Department of Musculoskeletal Medicine, utilizing the traditional concept. The same patients, most with discopathies, experienced completely different results: full recovery versus partial with only temporary improvements.

The official branch office is located in Prague, the capital of the Czech Republic, also known as the heart of Europe.

The McKenzie Institute CZ is a non-profit association. The Board of Directors consists of Eva Novakova, Chair, Hana Solcova, Vice-Chair, and Jana Letakova, Treasurer. Currently, Eva Novakova, Jr. and Eva Mendlova split the duties of Branch Administrator/Secretary and Jan Novak assists with all necessary tasks, including website development.

C - Continue

We are proud of our 250 members, which has grown immensely from just five in 2003. Hopefully each year we will continue to welcome more MDT fans.

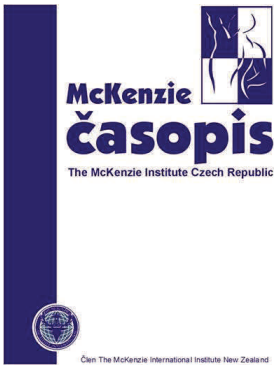
All courses are organized with the official approval of the Physiotherapy Association. Courses are mainly organized in Prague, though, over the past two years we have also held courses in Brno (Moravia) after securing financial support for education of the people in this region. Overall, we have two Part A–D course sets every two years. We usually have about 40 people registered for Part A courses and 25

people registered for Part D courses. Interest exists for the old Part E course and also for advanced courses capable of accommodating around 30 participants. We have also tried two special, one-day courses for doctors, led by Thomas Stengert.

Only Eva is able to teach the Parts A and B courses. The other courses are taught by the International Instructors, Nico de Bruine, Jenny Ross, Sara Luetchford, Barbara Zrnec and Grant Watson.

What are some of the branch's greatest attributes?

- Established a study group which meets regularly once a month and tries to solve the problems faced by physiotherapists
- Obtained accreditation and re-accreditation of MDT education at the Department of Health (though, during the last 20 years we have had a new Minister of Health each year)
- Teaching physiotherapists at 1st and 3rd Medical Faculties of Charles University in Prague
- Translation of the books: TYOB, TYON, TYOShoulder, TYOKnee and Solving the Mystery
- A video presentation about the McKenzie method http://www.youtube.com/watch?feature=player_embedded&v=qBY1GVQ5DvM
- A randomized trial - Direction specific or stabilisation exercises for chronic low back pain patients
- A LBP conference at the Central Military Hospital with Ron Donelson
- Webinars
- The Czech McKenzie Journal
- Assisting in the establishment of the Slovak branch in 2008 and close cooperation with its chairman PhDr. Michaela Kotrbancova Cert.MDT



D - Difficulties

Czech participants have been successfully using the Czech version of the exam for six years and all manuals for nine years. However, the main issue facing participants is the financial burden of the exam fee. The cost of the exam is roughly two-thirds of the average monthly salary in our country.

The Czech Branch currently has 41 Credentialed MDTs, including five from Slovakia, and one Diplomaed MDT.

What are the greatest challenges for your branch?

- Increasing the number of patients who are satisfied with McKenzie treatment
- Training more experienced McKenzie therapists
- Encouraging more medical experts to listen
- Incorporating the McKenzie Method in the basic education of physiotherapists, so they are not surprised at the difference between school and reality
- Promoting MDT to basic diagnostic and treatment approach for all musculoskeletal patients

E – Eva: From the beginning to the end.....

Eva consistently works to get the green light in our CNS (brain) to persuade us to give lectures for the physicians and physiotherapists, but the lights are too often amber.

Staying passive, we ride on the wave with her. We like her, we admire her, we thank her for everything and try to support her in lots of small ways, but that is all our capacity allows us... and for that we are sorry. We keep our fingers crossed for all her efforts, and to all of you with similar abilities!!!

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A CLINICIAN'S PERSPECTIVE

Is the Juice Worth the Squeeze?

Josh Kidd, PT, DPT, OCS, Dip. MDT, CSCS

About twelve months ago, I decided that I wanted to contribute to the advancement of Mechanical Diagnosis and Therapy (MDT) within the realm of treating peripheral joint pain. While determining the best way to do so, I came to the conclusion that writing a case report for publication would be the most effective and challenging way to go about reaching a high volume of non-MDT practitioners. Having minimal to no previous experience in writing a case report, I was unsure where, or even how, to begin. Since I am a member of MIUSA, I have access to the Journal of Manual and Manipulative Therapy (JMMT), the official journal of The McKenzie Institute International. On JMMT's website, they explain clear criteria and the complete process for writing and submitting a case report.

Since this was my first attempt, it took some time to complete the report. Altogether, the case report process went on for about two months from start to completion. Ironically, it only took two weeks to treat the actual patient! The most time consuming part of the case report was performing the literature review and synthesizing the information. However, this was also the most rewarding part for me. It challenged me to look into the effectiveness of other treatment approaches and brought me up to speed on the most current research in shoulder rehabilitation. At times, we as practitioners tend to get so focused on our specific method of treatment that we forget there are other approaches being practiced. I would like to add that throughout this process, I had some great resources in Stephen May, PhD, MA, FCSP, Dip. MDT, MSc (UK) and Richard Rosedale, PT, Dip. MDT, both of whom were willing to assist me in any way that I needed. So, if the thought of the literature review is intimidating, rest assured that McKenzie faculty are able to provide some direction and guidance.

When submitting the case report to JMMT, I was given clear instructions from the editorial board on guidelines and format. After I submitted the article, I received a response back for edits. The journal's editors provided very clear recommendations that strengthened the article.

While the process did take some time to complete, overall, it was a beneficial experience. If you are committed to MDT, I would challenge you to take on the experience as well. Those who know me personally know that when it comes to writing, I have a difficult time just forming a complete sentence. Please do not let your perceived lack of writing skills or any other part of writing a case report discourage you, as resources are available to guide you throughout the entire process.

If you are not a member of your respective McKenzie Institute branch, I encourage you to become one! Members of MIUSA and MICanada receive hard copy mailings of JMMT four times per year, while a number of other International Branches provide online access to JMMT as a membership benefit.

For those who have not yet read my case report, I offer the brief synopsis below, as well as a direct link to the complete report.

Case Report Synopsis

The case report described the effectiveness of Mechanical Diagnosis and Therapy (MDT) in the management of a patient referred with a diagnosis of shoulder tendonitis. The patient was a 56-year-old male with a three month history of left anterior shoulder pain. Upon initial assessment, he presented with a positive open-can test, lift-off test, and Hawkins-Kennedy impingement test. A MDT assessment quickly eliminated cervical involvement and identified a loss of end-range shoulder mobility and pain during active shoulder movement. After the patient underwent a repeated movement examination and treatment based on responses to end-range movements over three visits, his shoulder pain was completely eliminated and motion was completely restored. Despite having positive rotator cuff and impingement signs, this patient was effectively treated with repeated end-range movements over a short period of two weeks. The purpose of the case report was to demonstrate that treatment based on MDT classification principles is an effective way to manage shoulder pain.

Access the complete case report at:
http://www.ingentaconnect.com/content/maney/jmt/2013/00000021/00000003/art00007

LITERATURE REVIEWS

Summary and Perspective of Recent Literature

Celia Monk, PT, Dip. MDT and Stephen May, PhD, MA, FCSP, Dip. MDT, MSc (UK)

Coombes BK, Bisset L, Brooks P, Khan A, and Vicenzino B (2013). Effect of corticosteroid injection, Physiotherapy, or both on clinical outcomes in patients with unilateral lateral epicondylalgia. A randomized controlled trial. Journal of the American Medical Association, 2013; 309:461-469.

Objective:

There were two objectives of this study into patients with unilateral lateral epicondylalgia:

1. To evaluate the clinical efficacy at one year of corticosteroid injection vs placebo injection
2. To evaluate the clinical efficacy at one year of physiotherapy vs no physiotherapy

Design:

A randomized controlled trial.

Setting:

Physiotherapy clinics and medical practices in Brisbane, Australia. Unfortunately, we are not informed what the specific setting was.

Patients:

Public advertising was used to invite adults, aged 18 years or older, with unilateral lateral epicondylalgia of longer than six weeks duration, to participate in the study. Potential participants were then screened by a telephone interview and a physical examination performed by one researcher and confirmed by a second researcher.

Inclusion criteria were:

- Pain over the lateral humeral epicondyle
- Pain severity of greater than 30mm on a 100mm long VAS scale
- Pain provoked by at least two of the following:
    - gripping
    - palpation
    - resisted wrist or middle finger extension,
    - stretching of forearm extensor muscles with reduced pain-free grip.

Exclusion criteria were:

- Receiving an injection in the previous six months
- Receiving a course of physiotherapy within the previous three months
- Symptoms suggesting radicular, neurological or systemic arthritic conditions
- Pregnancy
- Breastfeeding
- Contraindication to injection

Intervention:

The participants were randomly allocated to be in one of four treatment groups:

1. Corticosteroid injection
2. Placebo injection
3. Corticosteroid injection plus multimodal physiotherapy
4. Placebo injection plus multimodal physiotherapy

The two injection-only groups received a single injection from one of five medical practitioners within ten days of randomization. The injections were either placebo (0.5mL of 0.9% isotonic saline) or corticosteroid and local anesthetic medication (10mg/mL or triamcinolone acetonide plus 1 mL of 1% lignocaine). The participants were instructed to rest from aggravating activities for two weeks post-injection and then to gradually increase activity level. Participants were permitted to use an analgesic or anti-inflammatory medication, heat, cold, or braces as needed, but were advised against seeking other treatments.

The two physiotherapy groups underwent eight, 30-minute sessions of treatment during an eight week period, with the first session schedule prior to the initial injection. The treatment given was based on a previously researched protocol and the 11 participating physiotherapists underwent a two hour training session to ensure standardisation. The programmes were then individualised for each participant's functional ability and pain intensity level. The manual therapy component involved mobilisation with movement in combination with gripping. The exercise programme involved concentric and eccentric work with a resistance band to progressively load the extensor tendons and was performed twice a day. The participants maintained an exercise diary to assist compliance.

The patients were followed up at four, eight, 12, 26, and 52 weeks.

Main Outcome Measures:

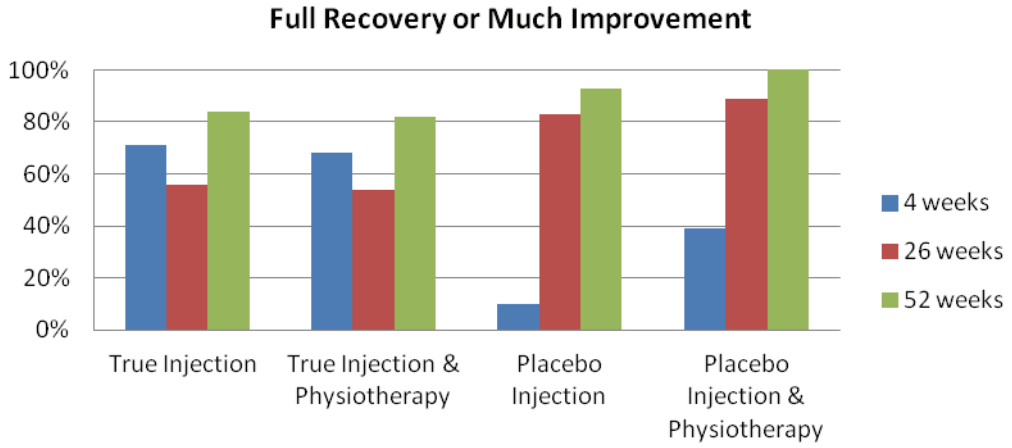
1. Patient-rated one year global change scores for complete recovery or much improvement
2. One year recurrence – defined as complete recovery or much improvement at four or eight weeks, but not at eight, 12, 26, or 52 weeks.

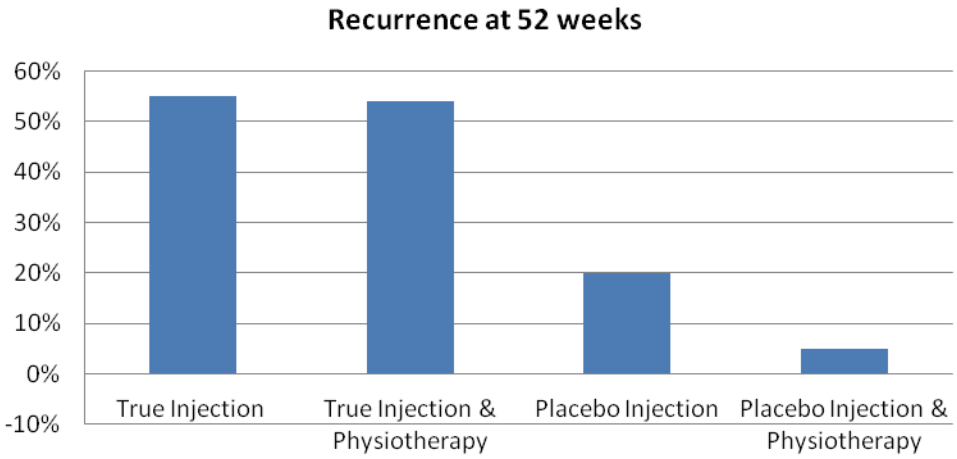
Main Results:

165 participants were recruited and only seven were lost to follow up over the 12 months.

There were no significant differences between the four groups at baseline. The median duration of symptoms was 16 weeks and 76% reported this as their first episode.

At the four week follow up, the corticosteroid injection groups had a higher level of improvement than the non-steroid injection groups. However, at 26 and 52 weeks the placebo injection groups had a higher level of improvement, with the placebo and physiotherapy group having 100% rating of 'full recovery or much improvement'.





Likewise, the recurrence rate at 52 weeks was as high as 55% for both groups receiving the one corticosteroid injection (including the group that also received physiotherapy) and as low as 5% for the group receiving the placebo injection and the eight week physiotherapy treatment.

Conclusions:
Among patients with chronic unilateral lateral epicondylalgia, the use of corticosteroid injection vs placebo injection resulted in worse clinical outcomes after one year, and physiotherapy did not result in any significant differences.

Comments:

My initial comment is that the conclusion the authors have drawn seems to be in contradiction to the results. In the published article, the results in Table 2 clearly show a positive effect from the physiotherapy programme with the placebo injection. In fact, at the one year follow up, the recurrence rate was just 5% compared to 55% with the corticosteroid injection group. In my opinion, that is a significant difference and endorses the use of the combined concentric and eccentric loading programme.

The interesting factor is that the use of the corticosteroid injection resulted in worse outcomes than the placebo injection. The corticosteroid injection initially had a more favourable outcome than the placebo, but this was short-lived, and by six months there was far greater positive effect from natural history (placebo injection alone) and physiotherapy. This does call into question the use of corticosteroid injections for patients presenting with lateral elbow pain.

Unfortunately, we are not informed as to whether participants continued their physiotherapy exercises beyond the eight week treatment period. This could have influenced the low recurrence rate and therefore could make it difficult to reproduce the same results in another clinical setting.

Overall, this is a well-designed study with a low drop-out rate for follow up and a large sample size. The randomization and blinding were adequate and the authors attempted to ensure the injections and physiotherapy treatment given were standardised within a set protocol. The significant issue, however, is in the conclusion drawn. The combined physiotherapy approach did seem to be effective according to the table of results.

In terms of adding value to the field of MDT, in treatment of contractile dysfunctions, we utilize a combined approach which progressively loads the impaired tissue according to the symptomatic and mechanical response. The protocol used for the physiotherapy treatment in this study appears to be along similar lines. It would be interesting to study whether the one year recurrence rate following MDT treatment in this type of patient population was as low as in this study.

♦♦♦♦♦

Cullinane FL, Boocock MG, & Trevelyan FC. (2013) Is eccentric exercise an effective treatment for lateral epicondylitis? A systematic review. Clinical Rehabilitation. Published online 23 July 2013. DOI: 10.1177/0269215513491974

Objective:
To investigate the effectiveness of eccentric exercise as a physical therapy intervention for patients with lateral epicondylitis.

Design:
Systematic review.

Setting:
AUT University, Auckland, New Zealand.

Intervention:
Systematic review following a search of six electronic databases.

Inclusion criteria for the studies were:

- Randomized controlled trials
- Controlled clinical trials
- At least one treatment programme involving eccentric exercise therapy
- Patients who had undergone a diagnostic test for lateral epicondylitis or were diagnosed by a General Practitioner
- At least one functional or disability outcome measure
- Full text articles written in English

Exclusion criteria for studies were:

- Patients had received corticosteroid injections prior to the intervention or as part of the treatment.

The methodological quality of the studies meet-ing the inclusion/exclusion criteria was assessed using the Modified Cochrane Musculoskeletal Injuries Group score sheet.

Main Outcome Measures:
Change in pain intensity, grip strength, and disability & functional outcome measurements.

Main Results:
The initial search found 392 studies, of which 32 underwent a full-text review. A total of 12 studies met the inclusion criteria.

From the 12 studies, there were a total of 616 subjects; 336 of whom were female, 280 male.

A total of 326 subjects underwent eccentric exercise as part of their rehabilitation. None of the 12 studies provided rationale for the exercise parameters used in their treatment programmes.

Of the 12 studies, only three were considered to be of 'high' methodological quality.

Studies were grouped into four categories:

1. Isolated eccentric exercise programme ver-sus different therapies
2. Eccentric exercise and adjunct therapies versus the same adjunct therapies
3. Eccentric exercise and adjunct therapies versus different therapies
4. Identical eccentric exer-cise programmes with different study parameters

Seven out of the nine studies that involved eccentric exercise as part of a multi-modal therapy programme showed improved out-comes for pain, function, and/or grip strength in comparison to other combined treatment pro-grammes.

One low-quality study that investigated isolated eccentric exercise found no significant improvements in pain when compared with a multimodal treatment programme.

Overall, across all 12 studies, there was a lack of consistency in the diagnostic criteria for lateral epicondylitis; a lack of long-term follow up, with only three studies investigating the effective of the treatment beyond 24 weeks; and a lack of clear description of the treatment interventions provided.

No studies reported any adverse effects during the eccentric exercises.

Conclusions:
The absence of adverse effects, coupled with evidence of improved pain and function recovery in comparison to other treatment therapies, lends support to the inclusion of eccentric exercise within a multimodal treatment programme for the rehabilitation of patients with lateral epicondylitis.

Comments:
This systematic review highlights several limitations in research of lateral epicondylitis. In particular, there appears to be a lack of consensus on the diagnostic criteria for the condition. Unfortunately, the authors do not define what 'lateral epicondylitis' encapsulates, nor do they have any discussion concerning its complex etiology - is it chronic tendinopathy of the wrist extensor tendons, or a reactive tendinopathy, or is it an enthesis issue? It is interesting that one of the inclusion criteria was a diagnosis of lateral epicondylitis by the General Practitioner, especially in consideration of the complexity of the condition and the lack of diagnostic criteria.

A surprising outcome was the lack of adverse effects found with eccentric exercises. From clinical experience, we would expect a patient to have increased pain and decreased functional outcomes if eccentric loading is performed too early in the rehabilitation process, especially in the presence of a reactive tendinopathy. The authors state that all the studies lacked clear descriptions of the treatment interventions provided. This, alongside the lack of a definition and diagnostic criteria, mean that it is difficult to apply the findings to a generalised patient population.

In terms of what value this article adds to the field of Mechanical Diagnosis and Therapy (MDT), the authors discuss the importance of progressively increasing the intensity of exercise in order to promote the necessary stimulus for tendon remodelling. They also conclude that multimodal interventions that include eccentric loading are more effective than those that don't. If by 'lateral epicondylitis' the authors mean a chronic tendinopathy of the wrist extensors, the mechanical diagnosis for that condition is a contractile dysfunction. Treatment therefore is a progressive loading programme which may involve eccentric loading, and gradually increases the load on the affected tissue as guided by the mechanical and symptomatic response. Therefore, it could be concluded that this paper supports the MDT treatment approach. However, due to the lack of definition and other limitations already discussed, a word of caution needs to be given before we can use it to validate MDT in the treatment of 'lateral epicondylitis'.

♦♦♦♦♦

Malliaras P, Barton CJ, Reeves ND, & Langberg H. (2013). Achilles and Patellar Tendinopathy Loading Programmes. A systematic review comparing clinical outcomes and identifying potential mechanisms for effectiveness. Sports Medicine. 43:267-286 DOI 10.11007/s40279-013-0019-z

Objective:

1. To evaluate the evidence in studies that compare two or more loading programmes in Achilles and patellar tendinopathy
2. To review the non-clinical outcomes, such as improved imaging outcomes, associated with clinical outcomes

Design:

Systematic Review.

Setting:

Centre for Sports and Exercise Medicine, Mile End Hospital, Queen Mary University of London, London, UK and Institute for Biomedical Research into Human Movement and Health, Manchester Metropolitan University, Manchester, UK

Intervention:

Studies included utilized any type of muscle-tendon unit loading, including:

- Eccentric
- Concentric
- Combined eccentric-concentric
- Isometric
- Stretch-shortening cycle (SSC)
- Loading involving a fast muscle tendon unit eccentric-concentric turnaround (e.g. jumping, hopping)

Other inclusion criteria were:

- Human studies
- A minimum follow-up period of four weeks
- Single cohort studies and trials comparing two or more groups
- Randomised and non-randomised studies were both included

Exclusion criteria were:

- Studies that did not include any participants with tendinopathy
- Studies that investigated loading following another primary intervention, such as injections or surgery
- Non-English studies
- Abstracts, non-peer-reviewed studies, case reports and reviews

MEDLINE, EMBASE, CINAHL, Current Contents and SPORTDiscus™ electronic databases up to June 2012 were searched and 403 studies were included in the initial yield.

Following the review process the final yield contained 33 studies:

- Ten studies comparing loading programmes
- 29 studies investigating at least one non-clinical outcome (potential mechanism of effectiveness)

The loading programmes which featured in the studies were:

Loading Programme	Achilles Studies investigating	Patellar Studies investigating
Alfredson eccentric model	70%	60%
Eccentric-concentric Stanish and Curwin model	4%	20%
Silbernagel – combined model	17%	
Heavy-slow resistance (HSR)		20%

Main Outcome Measures:

1. Comparison of Achilles and patellar tendinopathy loading programmes
2. Identification of potential mechanisms of the effectiveness of the loading programmes:
   a. Neuromuscular and Jump Performance Outcomes
   b. Imaging, Structural and Mechanical Property Outcomes
   c. Biochemical and Blood Flow Outcomes

Main Results:

1. Comparison of Loading Programmes:

Ten studies compared loading programmes in either Achilles or patellar tendinopathy:

	Achilles Studies	Patellar Studies
Number of studies	4	6
Total Participants	139	112
Mean Age	44 years	27 years
Percentage of Males	39%	77%
Participation in sport	57-100%	100%

There is limited evidence from three low-quality Achilles tendinopathy studies that showed:

1. Eccentric loading was more effective than concentric loading for patient satisfaction and return to pre-injury activity.
2. VAS pain outcomes and patient satisfaction were greater following the Silbernagel-combined loading programmed compared to calf raises and stretching.
3. VAS pain and return-to-sport outcomes were greater following Stanish and Curwin compared to isotonic loading.

One high-quality Achilles tendinopathy study had moderate evidence which showed that functional improvement following Silbernagel-combined loading is similar whether sport is continued or not.

There is moderate evidence from two high-quality studies which showed:

1. Functional improvement was comparable but patient satisfaction was greater following HSR versus eccentric loading.
2. There was no difference in change in VISA (functional) scores during a volleyball season with and without the addition of eccentric loading.

There is limited evidence from three low-quality studies which showed:

1. Clinical outcomes were superior following eccentric compared with Stanish and Curwin loading and concentric loading.
2. VAS pain and return-to-sport outcomes were superior following Stanish and Curwin loading compared with isotonic loading.

2. Identification of Potential Mechanism of Effectiveness

29 studies investigated non-clinical potential mechanisms of loading programmes:

	Achilles Studies	Patellar Studies
Number of studies	21	8
Total Participants	293	163
Mean Age	47 years	28 years
Percentage of Males	59%	81%
Participation in sport	79%	98%

a. Neuromuscular and Jump Performance Outcomes
   i. Achilles Loading Programmes:
      - Moderate evidence from three low quality studies that eccentric loading improved calf work
      - The Sibernagel-combined loading improved jump performance and calf power

   ii. Patellar Loading Programmes:
      - Moderate evidence from two high-quality studies that improved clinical outcomes with eccentric loading were associated with increased quadriceps work
      - Strong evidence from two high-quality studies that improved clinical outcomes with Heavy Slow Resistance (HSR) loading were associated with increased knee extensor torque
      - Limited evidence from one low-quality study that the Stanish and Curwin loading programme increased knee flexor but not extensor torque

b. Imaging, Structural and Mechanical Property Outcomes
   i. Achilles Loading Programmes:
      - There was moderate evidence from one high-quality study and four low-quality studies that showed changes in imaging does not predict a change in symptoms following eccentric loading
      - The same studies demonstrated that improved clinical outcomes

following isokinetic loading were associated with decreased intratendinous signal intensity

ii. Patellar Loading Programmes:
- Moderate evidence from one high-quality study showed that the improved clinical outcomes following an eccentric loading programme were not associated with changes in tendon stiffness nor a reduced Doppler area
- There was moderate evidence from two high-quality studies of the Heavy Slow Resistance Loading programme that showed improved clinical outcomes were associated with a reduced Doppler area and increased fibril density and decreased fibril mean area. There was conflicting evidence from two high-quality studies that improved clinical outcomes were associated with decreased tendon stiffness

c. Biochemical and Blood Flow Outcomes:
   i. Achilles Loading Programmes:
   - Two low-quality studies showed that improved clinical outcomes from eccentric loading were associated with an increase in type I collagen synthesis but not with reduced glutamate concentration. There was also reduced capillary blood flow and post-capillary filling pressure

   ii. Patellar Loading Programmes:
   - Moderate evidence from one high-quality study showed that clinical outcomes were not associated with biochemical changes following eccentric loading
   - Heavy Slow Resistance loading was shown in one high-quality study to have moderate evidence for an increase in the HP/LP ratio and a decrease in pentosidine concentration

Some studies reported continued neuromuscular and jump performance deficits at 12 months and five years, which may initially relate to inadequate loading or a lack of appropriate maintenance loading

Conclusions:
For Achilles and Patellar tendinopathies, there is limited and conflicting evidence that eccentric loading programmes are superior to other loading programmes for clinical outcomes. There is equivalent evidence for the Silbernagel-combined approach for the Achilles and greater evidence for the Heavy Slow Resistance programme for the patellar.

There was greater evidence for improvement in neuromuscular performance and imaging following eccentric-concentric compared to isolated eccentric loading.

The authors suggest that the current clinical approach utilising eccentric loading should therefore be questioned.

Comments:
Over the past decade, there has been a strong clinical focus on eccentric loading programmes for the treatment of tendinopathies. This is the first systematic review to examine whether eccentric loading is in fact superior to the other loading programmes utilised and therefore deserves to be considered the optimal treatment option. The conclusions drawn by the authors are that the use of isolated eccentric loading should be questioned as there is limited and conflicting evidence for its effectiveness.

Treatment of a contractile dysfunction utilising MDT involves progressive loading of the involved tendon, utilising all forms of muscle contraction – active, resisted, concentric, eccentric, sports-specific, et cetera. The actual exercise and loading programme each individual patient undergoes is determined by the symptomatic and mechanical response to load, which changes as the treatment progresses. Eccentric loading may have a role to play in a patient's recovery, but that role is determined on an individual basis as revealed by on-going assessment and clinical reasoning. This systematic review adds value to the MDT process by revealing the lack of evidence for isolating eccentric loading and applying a blanket approach to treatment of tendinopathies.

One word of caution, however, is the small number of studies able to be included in this systematic review, and the lack of high quality research. The findings are, therefore, limited and further research is required.

An interesting potential study would be to compare the progressive loading approach of MDT to other tendinopathy loading programmes. However, that could prove to be difficult as by its true nature the MDT progressive loading programme is individualised for each patient and standardisation for research would be difficult to maintain without losing the clinical effectiveness of the programme.

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BUSINESS & MARKETING CORNER

"Whole" Marketing

Kay Scanlon, PT, Dip. MDT

When Yoav Suprun, DPT, Dip. MDT suggested I go to the local Whole Foods supermarket to provide mini-seminars, I thought he was crazy!!! Who would listen to discussions about neck and back pain when they were simply there to buy groceries?

I've been doing these presentations now for over a year and it has definitely benefitted my practice. It took some perseverance and time to convince the store manager that I was a resource for her customers that wanted to maintain a healthy lifestyle. MDT meshes nicely with the mission of Whole Foods: "Whole Foods, Whole People, Whole Planet, emphasizes that our vision reaches far beyond just being a food retailer."

The store has a small break room that we use for the seminars. I have established the 6:00 p.m. to 7:00 p.m. time frame, once per month, as the "PT Hour". My presentations are advertised in the store newsletter, on their activity board and announced by the staff when the program is about to begin. I have had as few as one person and as many as 15 people attend my programs. The participants have lots of questions, which keeps things moving along and informative.

I create colorful flyers with the time, place and topic for each month's seminar that I use at various locations in the building where I practice, as well as in the store where the seminar is to take place. The relaxed, informal setting allows for a healthy, productive discussion. The usual questions, regarding the validity of MRI's, presence of severe OA or DJD, as well as "core stabilization", always come up during the discussions.

The subject matter covered varies each month. One month the subject might be back pain, the next month neck pain, and the following, shoulder and knee pain. I have found there to be a great deal of misinformation floating about the general population, and often well-meaning friends and relatives recommend counterproductive exercises and/or treatment. The quantity of bad information available on the internet only adds to the confusion and frustration.

What my seminars offer these people is a place to have their questions answered and an explanation of basic anatomy and kinesiology. They become very interested when I explain the MDT approach, especially when I tell them most people see a benefit within the first few visits and treatment usually lasts no longer than eight to ten visits. For the most part, they are frustrated with the overprescribing of medications and epidural steroid injections, the temporary relief received from chiropractic manipulation and acupuncture.

When I explain that the assessment and treatment with MDT is very specific and targeted, they perk up. People are tired of being handed sheets of exercises to perform with no understanding of what they are trying to accomplish. It is exciting to see them become more interested when I tell them they will receive ONE exercise and will learn how to manage their symptoms on their own. I do not hesitate to share that many of my patients have often "failed" traditional physical therapy, but, nonetheless, do well with the MDT program. This helps to dispel the myth that all physical therapy is generic and the same.

I have since branched out, providing these seminars for local Chambers of Commerce, Rotary, Public Libraries and even senior apartment complexes. I have also started writing a quarterly newsletter for my in-house office building, along with the monthly e-newsletters I send out to all of my previous patients. Each time I send out an e-newsletter I have one or two patients that call and say, "I was going to call you and when I got your newsletter, it triggered me to do so."

The bottom line is, informing the public works! I rarely market to physicians. There are a handful of "enlightened" physicians that request MDT for their patients, but the rest require too much work to change their mindset. I get around the prescription requirement for Medicare by performing the evaluation, then sending my results and recommendations to their physician for approval of the care plan. Rarely do I have a problem getting this back from the physician to allow me to start care by the second visit.

If you are not marketing MDT in this fashion, I suggest you give it a try. The public is hungry for answers and we have many solutions!