

## Feature Commentary

**HOW TO TELL MY PATIENTS: 1001 WAYS TO TALK ABOUT DERANGEMENTS AND DIRECTIONAL PREFERENCE**

GEORG SUPP, PT, MT, DIP. MDT

A *déjà vu* moment for every MDT clinician:

History suggests a Derangement, clinical exam identifies Directional Preference and the symptomatic and mechanical response is telling the patient what to do to get better. Great! A contented smile appears on DP finder's face. Explain the patient's home exercise and postural modifications and done – seek and destroy! ALMOST! At this point, many patients want to know “What's up with my back, neck, knee? What does this exercise actually do to my joint?” As diverse as patients can be, therapists can also be just as diverse with their answers to this particular question. The following article provides a potpourri of models, analogies and explanations for Derangements, Directional Preference and Self Treatment.

**Tips and Tricks from Worldwide Experts****Movement**

The clinician who wants to completely avoid models and structures uses an analysis of the Better/Worse Section to explain the treatment strategy or utilizes just the framework of movement.

*“You're sitting during the day and you feel standing up and walking is helping you? So, if you bend your spine, you get worse, but if you keep your spine erect, it feels better, right? If we extend your spine further, we can check what that does to your symptoms. This then ‘rebalances’ the body with more end range extension versus all the end range flexion you do during sitting.”*

*“Our body likes to move and it likes to move in all directions. Sometimes we do too much of one thing and this may lead to problems. The solution often lies in moving in the opposite direction. Let's try that.”*

**Joints**

For the most part, joints are less fear provoking than discs or meniscal structures.

*“This joint is locked up. If we can find the right combination of movements, it will unlock. Often, it matters in which order the movements are done and finding the first movement in the combination starts the unlocking process, and you will feel that as easier movement and/or less pain. Can we look for this together?”*

*“There is an obstruction in your joint and the joint is not able to move freely. That affects the muscles and other structures around the joint. Movement is painful as a result. But we are attempting to find a movement in one direction that you can continue yourself that will remove that obstruction.”*

**Cut knuckle**

If we deal with an acute pain.

*“If I did cut my finger - exactly here at the knuckle, would you advise me to bend the finger? No. What should I do then? Right. Keep the finger straight for a while allowing the cut to heal. As soon as it's healed, I can move in all directions.”*

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**Bent finger**

Classic model – helpful not only for Postural Syndrome.

*“Bend your finger back as far as you can. What do you feel? Imagine you hold your finger like that for the next hour. What would happen? Exactly, it would hurt. What would you do to get rid of the pain then? Stop bending. The pain would cease because the finger is actually healthy.”*

## **Keep it simple**

Magic.

*“If you go one way, you get pain. If you go the other way, the pain disappears. If you do that a lot, you won't have pain anymore with the direction you get the pain now. It's like magic.”*

## **Bicycle gears**

*“It's like when you have a problem with your bike. It's a good model, usually works perfectly. You can jump on every day with no worries. But recently, it has not been running smoothly and you think, maybe it is a simple problem. Let's check the gears first. You get your screw driver out and move the adjustment one way...makes it worse...move it the other way, makes it ride smoothly again...problem solved.”*

## **Bent wheel**

*“It's like you have a bent wheel of your bike. When you adjust the spokes, the bike will function perfectly again.”*

## **Drawer**

*“You are trying to open a drawer and something inside is preventing it from opening. Then you move the drawer a little differently or shake it and the thing moves out of the way and the drawer opens fine again.”*

## **Door hinge 1**

*“Like a rusty door hinge. If you don't move it, it seizes up. If you keep it moving it, it has a better chance of continuing to be able to do its job.”*

## **Door hinge 2**

*“Have you ever had a front door that works perfectly fine on some days, but then on others, you can't turn the key in the lock? This may happen on humid days, for example. So, you fiddle around with the door until you figure out that the key turns smoothly if you pull the door a little and lift it up. Your back is like that door. Except, whether it moves smoothly or not doesn't depend on the weather, but on the things you've done in your day. And, just like you'll know to pull and lift that door for the key to turn smoothly, you'll know what exercise to do to ensure your back moves as it should.”*

## **Zipper**

*“Sometimes a joint gets stuck. This may be similar to a zipper. When a zipper gets stuck, then you wiggle it in different directions until you find the one that unblocks it and then it is working fine again.”*

## **Rock in a shoe**

May help to explain that the management of an obstruction should be a mechanical one.

*“Imagine you have a small rock in your shoe. You will continue to feel pain from the rock regardless if you use ice or meds. You need to get rid of the obstruction (rock) and only then will the pain abolish.”*

## **Anatomical**

How cartilage behaves.

*“Imagine cartilage like paint on a surface that has been exposed to the weather. A crack or a flake of paint has raised up from the surface and you bump into it when you move. If you move the wrong way, you will pull the paint up more and create a bigger block to movement. However, if you move the correct way, that flap of paint will lay back down and you can move over it smoothly and go further.”*

*“Under a microscope your cartilage looks like a sponge. Healthy cartilage is like a wet sponge; soft and resilient. It can also be dry, brittle and hard. This can happen when you are still. Perhaps you sit with your knees at 90 degrees for a long time. However, if you keep a joint moving, and move it as far as you can, you start to lubricate that surface and push fluid in to places it has not gone for a while. This “lubrication” of the surface makes movement easier.”*

*“Exercise is medicine. Motion is lotion.”*

### **Modelling clay**

Great to demonstrate the effect of static positions / postures.

*“This ball of modelling clay is exemplary for the structures playing a role in your back: muscles, ligaments, joints, joint capsule and so on. These structures are made for movement. I can punch the clay – nothing happens. But, when I take my time and apply pressure for a longer time the modelling clay deforms. Prolonged sitting or standing, everything that you do for a long time, will have this effect. Our back likes to move.”*

### **For craftsmen and do-it-yourselfers**

Leg pain and its treatment.

*“The nerves down your leg react like electrical wires. Some movements prevent the flow of power supply and the opposite movements restore the power.”*

*“The nerves down your leg react like a water hose. When the water hose is kinked or something is sitting on the hose, water doesn’t get to the garden. You unblock the hose and the supply continues.”*

### **The bowling ball**

Impressive analogy for neck patients.



*“Imagine this ball being a bowling ball – 5 kg heavy. Does this look like a comfortable position for my wrist to carry the ball? Why not? It’s obvious – too much weight in front of the wrist. Please tell me how to carry it. Of course! I should carry the ball like that. The weight is balanced on my wrist. Look at this now. Does this look like a comfortable position for my neck to carry my head? Tell me how to carry it? Of course, that’s much better.”*



### **For football (soccer) fans**

This is from a Dutch colleague. You may only understand it if you are aware how poorly they usually perform against Germany!

*“Your exercises are your offence. Your posture is your defense. Sometimes you will get a goal against. Don’t worry, stay on offense and score for yourself. But remember: treating a Derangement is like playing a soccer match against Germany or rugby against the All Blacks. You have only won when the team has left the pitch.”*

### **Soap**

This analogy may be outdated sooner or later as many households only have liquid soap nowadays.

*“Imagine my hands to be wet. Where would the soap slide to if I push like this? Right, it moves to the front. And if I push like this? Yep to the back. Imagine now I wouldn’t have the soap in between my hands but here in my back, between the vertebra. The soap represents joints, ligaments, the disc and everything that is in between there. If I sit like this where does it move to?”*



### **Disc**

If a patient insists on the relevance of his MRI, the disc model can make sense. A whiteboard helps to explain.

*“You can improve this situation with movement. If you do your exercise, the disc material moves in this direction. It’s comparable to pushing on one side of a hamburger. The ketchup moves to the opposite side.”*

## **BEWARE!**

An individualized explanation may sometimes mean NO explanation at all. Not every patient needs extensive information. Sometimes, less is more and a “*Do it! You realize that it works!*” may be sufficient. Too much information may be fear provoking (George 2003). Back pain patients commonly look at a patho-anatomical model and from a purely biomechanical perspective (Hoffmann 2013). What we say to patients may have an enduring effect (Darlow 2013, Darlow 2015) and how we explain things may have a helpful placebo effect, but also an unfortunate nocebo impact (Bingel 2011, Coppieters 2005, Crum 2007, Louw 2016).

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## INTERNATIONAL SPOTLIGHT

### **Life in East Timor—McKenzie and More**

*Gill Cammell, NZDipPT, Cert. MDT*

Ever since I was at Physiotherapy school (1974 - 1976, Auckland, NZ), I had wanted to work in the developing world.

As a new graduate, I had been particularly inspired by stories of those working in rehabilitation amongst sufferers of Leprosy and victims of landmines in various parts of Asia. I knew that, in these situations, it would be prudent to have a broad base to my clinical experience, so happily entered the public hospital system doing the mandatory rotations in different areas of the hospital.

Even as a youngster who was often mistaken for a school girl, I was at home in medical, orthopaedic, geriatric, paediatric and even burn wards and gymnasiums motivating people to reach towards that next level of function or independence ... all except the dreaded Physiotherapy Outpatient Department. Post-trauma and Post-op I could deal with, but necks and backs scared me. I could not see the pain producers nor understand the mechanics, just putting machines on people was not my cup of tea, and I didn't really get the point of them either. "Get a real injury" I was often tempted to say. I avoided that area for many years.

A husband and two children later, I had been able to continue to work part-time in a variety of physio roles, even in the community health arena. Physiotherapy had been such a great career for this stage of life! A two-year stint in the 1980's working in Sydney followed, but still not yet in Asia.

### **McKenzie to the Rescue**

Once my children were a little older and I was working four days a week in a rehabilitation gym, I was eventually asked to help in the outpatient area – aaaghhh the dreaded backs!!

I vividly remember the first in-service where the McKenzie approach was referred to. Now this was getting easier to understand. Encouragement followed from my senior colleague to go on a McKenzie Part A course and that sounded just like what I needed - it was!

After nearly 20 years working in the public sector, now in a smaller North Island town, I was invited to start a private practice in a local medical centre.

With Part C and lots of outpatient 'miracles' under my belt, I was ready. I completed Part D and Credentialing not long after.

### **Asia at Last**

My husband and I had our first awareness of Timor Leste (East Timor) in the 1980's when journalist John Pilger brought the nation's plight to the western world with his documentary about the massacre at Santa Cruz cemetery in the occupied nation's capital, Dili.

Pilger and two others were there to cover a protest march against Indonesia's brutal occupation and were caught up in the ensuing drama. Their film footage was smuggled out, and finally, the world took the situation seriously. East Timor finally gained its independence in 1999.

Our first visit was with a team from our town in 2003. We were looking to establish an ongoing relationship between an area of East Timor and our church and town. One week there, and we were sold! The poverty and brokenness of the nation was obvious, but so was the hope, resilience and gratitude of the people for international assistance and the chance to move forward as an independent nation.

My husband and I, along with others from our home town, made regular visits to Timor. I went every second year, spending some time at the National Hospital teaching the nurses who, after some extra input, were running a Physiotherapy Department. In later years, also encouraging Timorese who had returned from Physiotherapy training overseas via scholarships, helping community workers and visiting disabled people in their homes among other things.



I enjoyed connecting with local physiotherapists in different ways over the years. New graduates face many challenges on their return to government placements, not least of which is a general lack of understanding about physiotherapy and how to use it effectively in the health service. This is especially a problem when placed as sole physios in a district hospital.

As a keen amateur photographer, I also found Timor an excellent subject. I seldom tired of capturing the beauty and character of the land and people.

### **Living the Dream**

It was not long before our children had left home and we were looking for an opportunity to move to Timor. As the nation developed, we wondered if a private physiotherapy clinic would be viable. There were certainly a lot of international NGO (Non-Government Organisation) and UN (United Nations) workers in the Capital.

By our next trip to Timor, there was already a private physiotherapy clinic advertising its services, started by an Australian Physio whose partner was stationed in Dili. "Would I like to do a locum next year?" and "By the way, it will be for sale at the end of the year". Come January 2011, and we were on another adventure, doing business in the developing world and in the world's newest nation!

### **Timor Leste (East Timor)**

At the time we arrived, the World Bank had just published its 'Ease of doing Business' survey results. Timor Leste was fourth from bottom, assisted only somewhat by its number 11 status in the tax category. I'll not take up space in this article to elaborate on our challenges in this area, except to say it was nearly a year before we finally had a registered business.

The culture of health was the next, though not quite so steep, learning curve. My clients were made up of aid workers, volunteers and business people from an amazing number of nations with widely differing beliefs about health and all things medical. To add to that, very few of them understood about physiotherapy or had been exposed to a very different experience of physiotherapy in their home country than the way I practice.

I saw many Chinese based health clinics and pharmacies pop up - to the point where I was initially refused a practicing certificate as the Health Department were clamping down on foreigners taking jobs from Timorese.

Often called 'Dr Gill', I have been asked to cure problems ranging from internal organs to psychological issues. Physio-wise, many were expecting to be given medicine, massage and sometimes acupuncture.

### **McKenzie**

How do you take someone through a McKenzie MDT assessment with only low levels of common language? In my experience, I found that MDT had significant applications with many able to understand enough from the repeated movement and sustained posture testing for the 'lights to go on'. Although a new concept, they experienced enough improvement to continue to work on their posture and home program with pleasing results.


At a quick glance through my assessments, my client's complaints were: spine 53%, peripheral 44% and other 3%.

The big step was in convincing clients that they could play a major role in their own recovery, learn to manage their own pain without drugs and attain a full recovery with very little 'hands on' therapy. New Zealand and Australian clients were likely to expect this, but few others.

### **Ergo – What?**

Poor ergonomics was by far the biggest pain-producing culprit. People were invariably working in desk jobs with poor quality, ageing furniture. Chairs were weak, and even if they had a new one, it was only a matter of months before the support had gone, especially for a foreigner who is usually many kilograms heavier. Few chairs and no desks are adjustable, which is also a challenge for the smaller Timorese.

A box, or similar, to put feet on under the desk was generally able to be arranged but lumbar rolls were my main challenge. Desperately needed, but not viable to import, I had to seek a local solution. Rolled-up towels will only do the job for so long! For me, the removable cover with elasticated band was



as important as the roll itself, so I made a sketch, took it to a Brazilian dressmaker and we were away. The rolls left the clinic in a steady stream. They are now made by Timorese women at a local sewing co-operative, which I'm very pleased about.

Beds are generally firm and less of an issue, but a good pillow is very hard to find. I was excited to find one store that stocked feather pillows, as were my patients. These pillows even had a zip in the side enabling size adjustment. The small things that make your day in the developing world!

In my last year in Timor, I was also pleased to be invited to a few workplaces to teach spine care and do ergonomic assessments. I also had the opportunity to do a talk on back care for the local Rotary Club and to advise the European Union regarding the purchase of new office equipment.

After four and a quarter years in Timor, it was time to return to New Zealand. This was to be almost as much of an adjustment as it was to settle into Timor. It is amazing how fast everyday things have changed, not to mention the developments in physiotherapy practice and protocols. Here the challenge started again!

I am thankful for the adventure and also for the friendship and support of my longstanding McKenzie oriented friends and colleagues.

## A CLINICIAN'S PERSPECTIVE

### Providing Opportunity While Assessing Shoulder Pain

*Louis Greene, PT, Dip. MDT*

As the healthcare system evolves, utilization of services and containing costs remain issues on the forefront. Research indicates that when a patient with low back pain (LBP) is sent to physical therapy before having a MRI, there are significantly lower utilizations of MRIs, surgery, injections, opioids, and overall cost of care (Fritz et al.2015). I recently encountered a patient with shoulder pain that may illustrate similar findings in the peripheral joints.

A 36-year-old female was seen for a complaint of left-sided shoulder pain after falling on the ice. X-rays at the ER three weeks prior were negative for fracture and she was referred to an orthopedic clinic. She had had three orthopedic visits and a MRI was scheduled for the following week.

Since the MRI was coming up, I made a comment to her suggesting we only had one week to get her better to avoid the MRI. To my surprise, she was stunned, almost tearful, saying "Do you think that's possible?" She was scared and apprehensive as she associated the MRI with an impending surgery. It became clear that what was presented to her previously, or how she interpreted it, was not optimistic regarding her recovery.

Her experience was an important reminder to me just how powerful our words and perspectives are to a patient. As she described it, no one ever presented it to her in a manner that suggested she might be able to avoid surgery, even though she had not tried any type of conservative care yet. Research indicates that people with abnormal MRIs can function in an asymptomatic manner (Fredericson et. al, 2009, Sher et al. 1995, Schwartzberg et al. 2016). In addition, physical therapy for symptomatic shoulder pain can be effective (Green, S. 2003, Kidd, J. 2013), even in those with rotator cuff tears (Baumer, 2016). Yet in this case, the patient was unaware that a good outcome was possible using conservative care.

Research in patients with LBP indicates patient's perceptions about their pain can predict clinical outcomes (Fostera et. al., 2008). Additionally, when looking at patient satisfaction with regards to consultations, Larum et al. (2006) identified that patients sought information regarding what they could do to help themselves. These are important points for healthcare providers to consider when discussing clinical findings, designing and proposing management strategies.

This patient's symptom onset was sudden after falling on the ice. X-rays were negative for fracture. Pain medication was prescribed and she was referred to an Orthopedic clinic. With red flags and fracture ruled out, could a referral to physical therapy have been a more cost-effective strategy? Perhaps, but physical therapy would definitely have allowed her to be active in her care which was found to be important to the patient (Larum et al, 2006).

This patient met several criteria for a Derangement: constant pain, a mechanical obstruction with major loss of ROM and a rapid change (the onset) of both ROM and pain. Her pain was significantly affected with movement consistent with a mechanical problem.

The patient was instructed in repeated extension with patient overpressure for the shoulder. Shoulder extension using the raised back of an elevated treatment table was implemented. Initially, her ROM was limited and painful. However, with each successive repetition she gained motion and reported decreasing pain. After 10 repetitions, her baseline movement shoulder ABD was re-tested and noted as "better". The patient performed additional repetitions going further and further into the ROM each time. At the end of the evaluation, the patient demonstrated nearly full shoulder flexion and ABD ROM with minimal compensation or pain. Her original complaint of 4/10 pain at rest was now rated at 0/10.

The patient was instructed to use this motion with the self-overpressure consisting of 10-20 repetitions every two to three waking hours. Precautions were also provided. Upon follow up 72 hours later, she reported she was 98% better. Coincidentally, a quick dash revealed a current score of 2% (decreased from 86% at the evaluation). The patient was provided further education and reassurance that since she was making good progress, no changes were deemed necessary. At the third and final visit, she demonstrated full, pain-free, active and passive shoulder ROM. She was off of the pain medications, back to work and had cancelled the MRI. She was instructed in the possibility of reoccurrence and reminded that she had the self-management tools required.



In summary, a 36-year-old woman was seen in an outpatient physical therapy clinic. She had fallen three weeks prior, was on opioid medication, in a sling, had constant pain, disturbed sleep and was unable to work. She had one ER visit and three visits to an orthopedic clinic. Upon clinical examination using the Mechanical Diagnosis and Therapy (MDT) assessment, she was diagnosed with a rapidly reducible presentation and classified as a Derangement. In one week's time, with three total visits, she was able to discontinue the pain medications, restore full, pain-free ROM, restore her strength, return to work and return to the gym. She was also able to cancel the MRI that had been ordered.

One consideration regarding this case was the late utilization of physical therapy. Looking at studies for patients with LBP suggests this can lead to increased utilization of potentially costly services (Frogner et al. 2016, Childs et.al 2015). Other considerations are the importance of the clinical picture we present to our patients and the management strategies we choose. This patient did present like a full thickness rotator cuff tear might have. However, she had a rapidly reducible Derangement. Had she not been sent to physical therapy, it is likely a more invasive treatment would have been sought.

One thing is clear in this case; the MDT evaluation and treatment restored a patient with an extremely high level of impairment to her prior level of function within one week's time. Her access to that treatment had been delayed by three weeks after entering the medical system via an ER visit and being referred directly to an Orthopedic surgical clinic without the utilization of early physical therapy.

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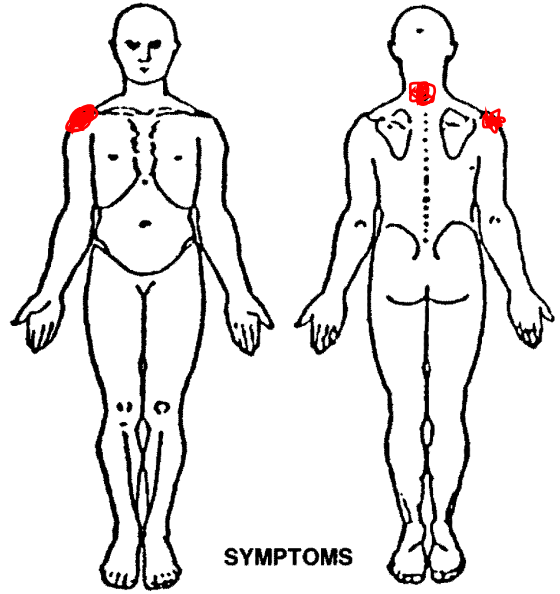
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# THE MCKENZIE INSTITUTE UPPER EXTREMITIES ASSESSMENT

Date \_\_\_\_\_  
 Name \_\_\_\_\_ Sex M / F  
 Address \_\_\_\_\_  
 Telephone \_\_\_\_\_  
 Date of Birth \_\_\_\_\_ Age: 36  
 Referral: GP / Orth / Self / Other \_\_\_\_\_  
 Work: Mechanical stresses \_\_\_\_\_  
 \_\_\_\_\_  
 Leisure: Mechanical stresses \_\_\_\_\_  
 Functional Disability from present episode \_\_\_\_\_  
 \_\_\_\_\_  
 Functional Disability score \_\_\_\_\_  
 VAS Score (0-10) \_\_\_\_\_



## HISTORY

Handedness: Right / Left

Present Symptoms \_\_\_\_\_  
 Present since \_\_\_\_\_ Improving / Unchanging / Worsening  
 Commenced as a result of \_\_\_\_\_ Or No Apparent Reason  
 Symptoms at onset \_\_\_\_\_ Paraesthesia: Yes / No  
 Spinal history \_\_\_\_\_ Cough / Sneeze +ve / -ve  
 Constant symptoms: \_\_\_\_\_ Intermittent Symptoms: \_\_\_\_\_

**Worse** ~~bending~~ ~~sitting~~ ~~turning neck~~ dressing reaching gripping  
 am / as the day progresses / pm when still / on the move Sleeping: prone / sup / side R / L  
 Other \_\_\_\_\_

**Better** bending sitting turning neck dressing reaching gripping  
 am / as the day progresses / pm when still on the move Sleeping: prone / sup / side R / L  
 other \_\_\_\_\_

Continued use makes the pain: Better Worse No Effect Disturbed night Yes / No  
 Pain at rest Yes / No Site: Neck / Shoulder / Elbow / Wrist / Hand  
 Other Questions: Swelling ~~Catching / Clicking / Locking~~ ~~Subluxing~~

Previous episodes \_\_\_\_\_  
 Previous treatments \_\_\_\_\_  
 General health: Good / Fair / Poor \_\_\_\_\_  
 Medications: Nil / NSAIDS / Analg / Steroids / Anticoag / Other \_\_\_\_\_  
 Imaging: Yes / No \_\_\_\_\_  
 Recent or major surgery: Yes / No \_\_\_\_\_ Night pain: Yes / No \_\_\_\_\_  
 Accidents: Yes / No \_\_\_\_\_ Unexplained weight loss: Yes / No \_\_\_\_\_

**Summary** Acute / Sub-acute / Chronic Trauma / Insidious Onset  
 Sites for physical examination Neck / Shoulder / Elbow / Wrist / Hand Other: \_\_\_\_\_

## EXAMINATION

**POSTURE**

Sitting Good / Fair / Poor      Correction of Posture: Better / Worse / No Effect / NA      Standing: Good / Fair / Poor  
 Other observations: \_\_\_\_\_

**NEUROLOGICAL:**      NA / Motor / Sensory / Reflexes / Dural \_\_\_\_\_

**BASELINES (pain or functional activity):** \_\_\_\_\_

**EXTREMITIES**      Shoulder / Elbow / Wrist / Hand \_\_\_\_\_

MOVEMENT LOSS	Maj	Mod	Min	Nil	Pain
Flexion					
Extension					↓
Supination					
Pronation					

	Maj	Mod	Min	Nil	Pain
Adduction / Ulnar Deviation					
Abduction / Radial Deviation					
Internal Rotation					
External Rotation					

**Passive Movement (+/- over pressure) (note symptoms and range):** \_\_\_\_\_

	PDM	ERP
_____		
_____		

**Resisted Test Response (pain)** \_\_\_\_\_

**Other Tests** \_\_\_\_\_

**SPINE**

Movement Loss \_\_\_\_\_

Effect of repeated movements \_\_\_\_\_

Effect of static positioning \_\_\_\_\_

Spine testing Not relevant / Relevant / Secondary problem \_\_\_\_\_

**Baseline Symptoms** \_\_\_\_\_

Repeated Tests	Symptom Response		Mechanical Response	
	During – Produce, Abolish, Increase, Decrease, NE	After – Better, Worse, NB, NW, NE	Effect – ↑ or ↓ ROM, strength or key functional test	No Effect
Active / Passive movement, resisted test, functional test				
Effect of static positioning				

**PROVISIONAL CLASSIFICATION**

Dysfunction – Articular \_\_\_\_\_  
 Derangement \_\_\_\_\_  
 Other \_\_\_\_\_

Extremities

**Spine**

Contractile \_\_\_\_\_  
 Postural \_\_\_\_\_

**PRINCIPLE OF MANAGEMENT**

Education \_\_\_\_\_      Equipment Provided \_\_\_\_\_  
 Exercise and Dosage \_\_\_\_\_  
 Barriers to recovery \_\_\_\_\_  
 Treatment Goals \_\_\_\_\_

### Summary and Perspective of Recent Literature

David Ham, PT, Cert. MDT

**Heidar Abady A, Rosedale R, Chesworth B, Rotondi M, Overend T. (2017). Application of the McKenzie system of Mechanical Diagnosis and Therapy (MDT) in patients with shoulder pain; a prospective longitudinal study. *J Man Manip Ther*; DOI:10.1080/10669817.2017.1313929**

The aim of this study was to investigate if the response to MDT treatment with regard to pain and function for patients with shoulder pain varied by classification over time. An additional aim was to document the discharge rate by classification over time.

The MDT literature on shoulder conditions consists of Shoulder Derangement case reports (Aina and May, 2005; Kidd, 2013) and a case series (Aytona, 2013), a Contractile Dysfunction case report (Littlewood and May, 2007), and case reports of Cervical Derangements presenting as local shoulder pain (Menon and May, 2013; Pheasant, 2016). One survey of MDT Diplomats showed very good reliability in classifying shoulder patients according to the MDT system (Heidar A, et al., 2014). There have not been any previous large cohort studies evaluating the use of MDT in the shoulder. A previous survey of MDT clinicians (May and Rosedale, 2012) found that Derangement (42.5%), Contractile Dysfunction (11.7%) and Articular Dysfunction (10.8%) were common classifications in the shoulder.

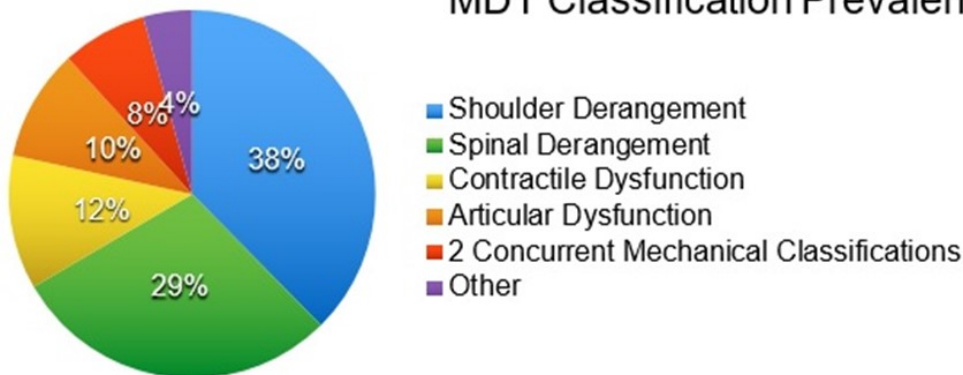
A prospective longitudinal design was used to collect data on consecutive shoulder patients. 15 international physiotherapists with either Credential or Diploma level training were recruited with at least one year of experience using MDT for upper extremity problems. Patients were required to be over 18, speak English and were ineligible if they had a shoulder surgery in the previous six months. No other inclusion/exclusion criteria were applied. Patients were assessed using MDT and were treated “as-usual” depending on the determined classification.

Primary outcome measures were Upper Extremity Functional Index (UEFI) scores (0-80/80 with greater scores indicating better function) and Numeric Pain Rating Scale (NPRS) scores (0-10/10). Data collection points were at the initial assessment, two weeks later and four weeks later. The secondary outcome was the frequency of discharge for each classification at two and four weeks. The main groups compared in data analysis were Spinal (Cervical Derangement), Derangement (Shoulder Derangement) and Dysfunction (articular and contractile); the latter group combined both Dysfunctions together to balance out sample sizes between the groups and were considered by the authors to behave similarly.

### Results

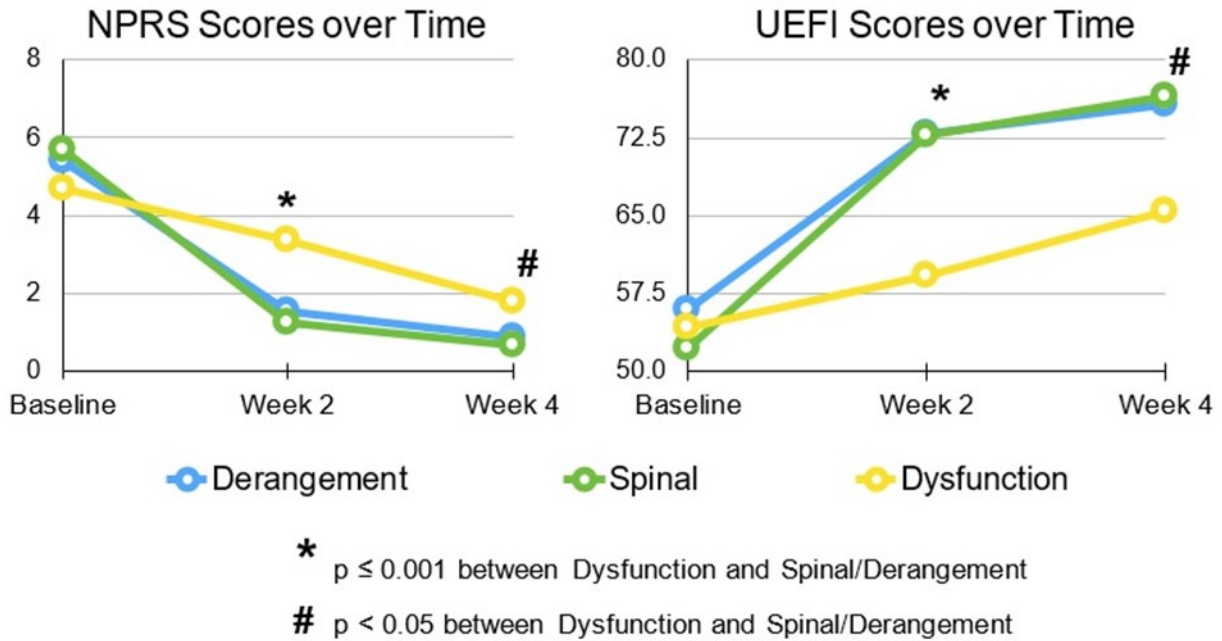
105 patients were recruited for the study, with 12 drop-outs. A breakdown of the final classifications of the 93 remaining patients is given below:

#### MDT Classification Prevalence



11 of these patients were excluded from final data analysis: seven had two concurrent MDT classifications (i.e.. Shoulder Derangement with residual Articular Dysfunction) and four were classified under OTHER. The group sizes were 35 for Derangement, 27 for Spinal and 20 for Dysfunction.

There were no significant differences between the three groups at the initial assessment for age, sex, hand dominance, previous episodes, medication use, symptom duration, activity levels, NPRS scores or UEFI scores. Statistically significant differences were seen between the Dysfunction and Derangement groups and between Dysfunction and Spinal for NPRS and UEFI scores at two and four weeks. No significant differences were seen at any time points between the Shoulder Derangement and Spinal Derangement groups.



The Derangement and Spinal Derangement groups showed similar frequency of discharge at weeks two and four, while discharge frequency was significantly less in the Dysfunction group at both time points:

Frequency of Discharge by Classification and Time		
Classification	Week 2	Week 4
Derangement	37%	83%
Spinal	37%	82%
Dysfunction	0%	15%

### Commentary

This work is an important contribution to the growing body of MDT literature on the extremity, as it is the first study to provide evidence that classifying and matching treatment to shoulder patients using MDT is a valid approach. Because there were minimal exclusion criteria and 15 international physiotherapists were recruited using a treatment-as-usual approach, the results are generalizable to MDT clinicians seeing shoulder patients. As anticipated, based on clinical practice, a majority of patients were rapid responders; two-thirds of this cohort had either a Cervical or Shoulder Derangement. Remarkably, despite different anatomical origins, they responded in a virtually identical way, lending further weight to Derangement as a valid clinical entity. Additionally, though expected based on clinical experience, the slower response of Dysfunction patients was nicely captured in this study.

Several limitations were noted by the authors. The number of treatment sessions was not fixed which may have affected results, but because the recruited therapists were unaware of the study intentions it is likely they strove for the best possible outcome with each patient. No exercise compliance was tracked with implications for the slower responses in the Dysfunction group, although anecdotal evidence indicates that this response rate is typical for this group. There was no control group or randomization and only MDT trained clinicians were used; however, given the aim of the study, this design was justified.

Interestingly, a high proportion (29%) of Cervical Derangements was found, compared to 2% reported in the May and Rosedale study (2012). In a recent smaller study, Maccio et al. (2017) found two out of 19 wrist patients had a Cervical Derangement (10.5%). Together this suggests that Spinal Derangements masquerading as extremity problems are increasingly being recognized and the importance of a thorough spinal examination in all extremity patients cannot be understated. This may partially account for the low prevalence of OTHER (4.3%) compared to the 35% seen for shoulder patients in May and Rosedale (2012). Thus, 95.7% of the cohort could be classified into one or more of the mechanical syndromes, suggesting that the clear majority of the shoulder population can be managed with simple mechanical interventions.

The results of this study along with the expanding extremity literature should give MDT practitioners even greater confidence to use the system for extremity classification. Well-designed studies such as this are continuing to endorse the system as a comprehensive assessment and management paradigm and support what is seen clinically on a daily basis.

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Maccio J, Carlton L, Fink S, Ninan C, Van Vranken C, Biese G, McGowan C, Maccio J, Tranquillo J. (2017). Directional preference of the wrist: a preliminary investigation. *Journal of Manual and Manipulative Therapy*; (published online ahead of print 9 February). Available at: <http://www.tandfonline.com/doi/full/10.1080/10669817.2017.1283767>. (Accessed July 5, 2017).

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Pheasant S. (2016). Cervical contribution to functional shoulder impingement: two case reports. *The International Journal of Sports Physical Therapy*; 11(6): 980-991.

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## Summary and Perspective of Recent Literature

Renee Spinella, PT, Dip. MDT and Richard Rosedale, PT, Dip. MDT

**Maccio JR, et al. (2017). Directional preference of the wrist: a preliminary investigation. *Journal of Manual & Manipulative Therapy*; Doi: 10.1080/10669817.2017.1283767.**

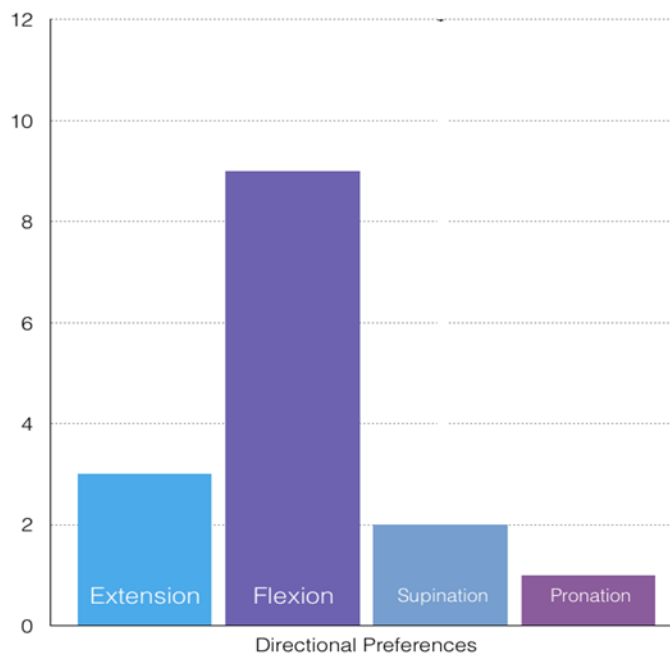
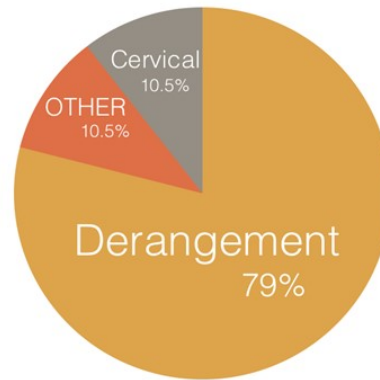
The objective of this investigation was to apply Mechanical Diagnosis and Therapy (MDT) to patients with wrist disorders and to determine the appropriate classification: Derangement, Dysfunction, Postural or OTHER. This study was in a case report style and took place in a private certified McKenzie spine and extremity out-patient clinic. The primary author has a doctorate in physical therapy and a Diploma in MDT. In addition, four students who were trained by the lead author, were co-examiners and their treatment was overseen by the lead author.

Nineteen patients with ages ranging from 15 to 69 years old were evaluated following MDT principles. Fifteen of these were classified as having a Wrist Derangements, two as Cervical Derangement and two as OTHER.

The patients classified with Wrist Derangement were evaluated to determine directional preference and were placed into one of four categories for the purposes of the study. The first, 'mechanical stress' indicates a repeated or sustained movement that is used most often throughout the day. 'Directional vulnerability' was a term used to describe the movement that reproduces the patient's symptoms. Painful Movement is the most painful movement as indicated by the patient's pain rating via the Numerical Pain Rating Scale. Finally, 'obstructed movement' was defined as the direction that is most limited compared with the opposite wrist.

Directional Preference was found for 15 of the patients and so they were classified with Wrist Derangements. Five of these patients required a change in direction following re-evaluation to promote continued resolution.

Classifications of wrist patients



Four of these patients also required traction with the Directional Preference exercise and two needed some specifically focused overpressure.

These patients were seen for a total of three to six visits to ensure proper management of symptoms prior to discharge. The other 10 patients were all able to manage their symptoms with the initial motion in their directional preference and they were all discharged at their second follow-up visit.

Investigators found 73.3% (11/15) of the patients demonstrated Directional Preference in the direction opposite of their 'mechanical stress', where 66% (10/15) had Directional Preference opposite of 'directional vulnerability'. Fifty three percent of the patients found Directional Preference associated with their most 'painful movement' (8/15). Finally, 46% of the patients found Directional Preference in the direction of the 'obstructed movement' (7/15).

This study found a high number of patients classified with a Wrist Derangement, however unlike previous studies, they found that patients required movement in multiple directions with various loading strategies to achieve directional preference (79%). These included loaded wrist extension or flexion, unloaded wrist flexion, wrist flexion with manual traction, wrist supination with proximal anterior and distal posterior overpressure and unloaded supination with high velocity whip. Previous studies focused on wrist extension and ulnar deviation as the only two motions to achieve directional preference.

In conclusion, patients included in this case series had a high success rate with MDT intervention. Wrist Derangement Syndrome was common and many of the patients were only seen for two visits with successful long-term management at home. MDT has been studied extensively in the spine, however this study adds to the growing knowledge base in the extremities. The study has also uniquely given some insight into the relationship between certain variables and directional preference. This encourages clinicians to use information gathered from a detailed history in order to guide the examination process and to formulate hypothesis as to cause and effect.

This study supports previous extremity studies indicating that MDT clinicians can use the MDT classifications of Derangement, Dysfunction and Postural Syndrome and OTHER subgroups and effectively apply them to the wrist. It is also important to note that two of the original 19 patients who were evaluated for wrist pain were categorized as having a Cervical Derangement. This also supports the recommendation to screen the cervical spine thoroughly for all upper extremity presentations, even down to the wrist.

**BUSINESS & MARKETING CORNER****Tales of a MDT Artic Adventure***Fiona MacKenzie, PT, Dip. MDT***Week 1**

So, what's brought me on this arctic adventure? Well, a love of MDT and travel. That, mixed with a keen interest in helping others in need. After listening Jason Ward's Mechanical Care Forum Podcast highlighting local MDTer, Connie Lee (Episodes No. 144 & 145), traveling north to the arctic seemed like a great opportunity close to home. And, why not? When would I next have an opportunity like THIS?!?



Hospital accommodation for staff is just a short walk from the Health Services Building. I was given a quick lesson on arctic survival day one. As I walked outside, I was quickly made aware I was no longer enjoying spring time in Southern Ontario. The temperature was  $-25^{\circ}\text{C}$  with winds gusting at 40-50kms/hr (I am told this is 'normal' and 'not that bad' for spring – winds can get up to 80-100km/hr here!). I pulled up my hood, put my head down and pushed through the cold & resistance. Then, I was quickly made aware of what it means to become 'snow blind'. Being fair and freckled, I am light sensitive at the best of times, but this was significant. Everything is covered in a blanket of white snow here – it's EVERYWHERE! My eyes were squinted so much that I could barely see! To make matters worse, I suddenly became aware of the need for foot traction in the arctic. In seconds, I was lying flat on my back, feeling like the ground came up and hit me... it did... and I have the scrapes and bruises to prove it! There are layers upon layers of ice and snow on

the roads and walkways here. The locals wear all forms of foot traction - ranging from chains to simple Yaktrax. I had nothing other than the rubber soles of my boots. I suddenly felt like Bambi on ice! And, at my height, the fall is that much more significant. Or at least it sure felt that way! I can just imagine what the locals thought watching me through their windows - shaking their heads thinking, "What a rookie southerner!"

My job, over my time here, is to assist with the lower priorities on the wait list. Specifically, priority five (P5) and priority six (P6) patients. These patients are defined as urgent and non-urgent orthopedic referrals respectively, routinely waiting five to six months (often longer) for physiotherapy care.

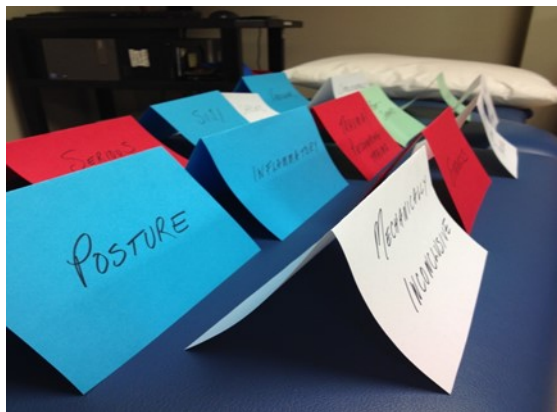
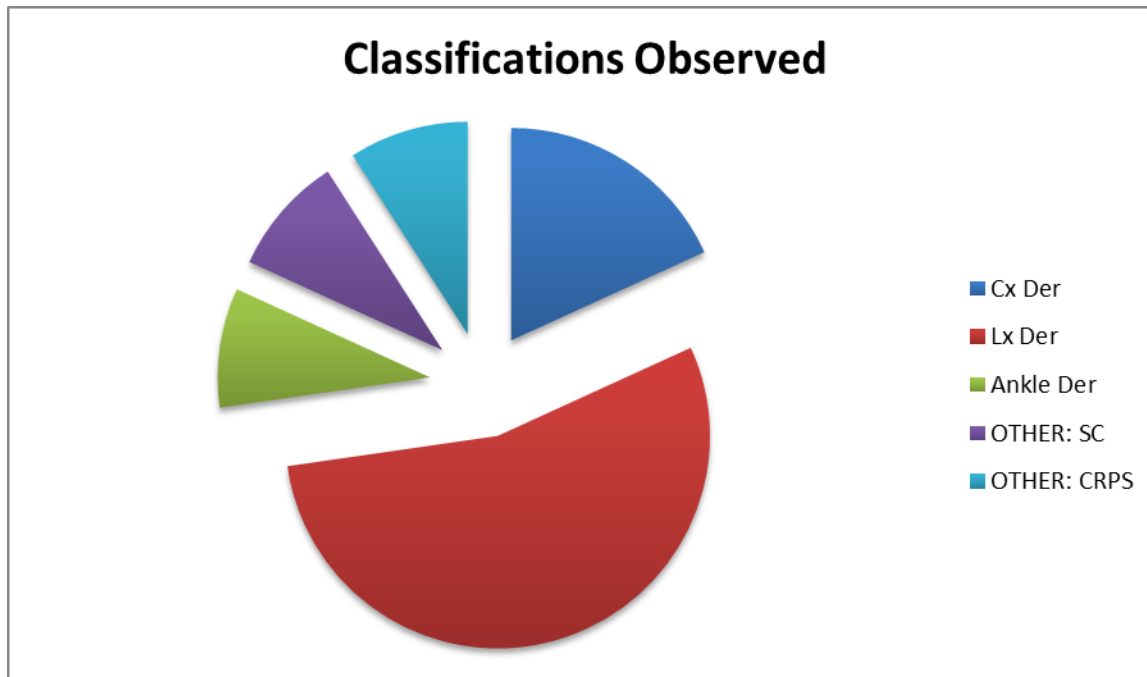


As I started with the P5 patients - a few things became apparent with this group:

- Patients are referred by locum doctors as there are no local family physicians.
- 42% of patients experienced resolution of their symptoms over the course of time alone, declining any need for treatment when contacted.
- Remaining 58% of patients were still experiencing some form of symptoms and eager for treatment.
- A relatively young patient demographic is served here. Age 48 represents the average age of patients; the youngest being 29 and the oldest being 63.
- The aggravating and easing factors reported here reflect the culture - carving, seal skinning, hide sewing etc.
- Most patients were derangements - surprise, surprise! (see pie chart below)
- MDT is an amazing system and oh-so suitable for the populations serviced here!

So, what did week two have in store? I was hoping for a dog sled expedition and a viewing of the northern lights!

Caseload:



*MDT Grand Rounds – Even in the Arctic!*



*Dog sledding on sea ice!*

## Week 2

Week one left me hoping to view the northern lights and complete a dog sledding expedition ...

We had a few clear nights here where I went to bed having set my alarm to wake up in the early hours of the morning in hopes of viewing the Aurora Borealis. Unfortunately, Mother Nature had other plans, with clouds and fog disrupting any view that I might have had. We had transitioned from winter to spring, which brought with it more than 20 hours of daylight every day. So, my opportunity has passed. Instead, blackout curtains, tinfoil on the window and/or use of an eye mask became a necessity!

I did, however, manage to arrange an AMAZING dog sledding adventure! Our day started with an introduction to the dogs, their personalities and rank within the Dog Team. We then assisted with harnessing the dogs and loading up our komatik (Inuit sled) prior to our departure. The dogs were howling with excitement of what was to come. We were off with a single command of "Atii" (Inuktitut for "Come on. Let's go!"). While out 'on the land', our guide offered us the option to explore our rebellious sides and navigate the rough sea ice. The tide here is very strong, with the ice changing in height by up to 45 feet daily! In doing so,



the movement of water creates ice jams - so beautiful to observe and SO MUCH FUN to navigate! I was laughing with delight trying so very hard to stay on the komatik when, at times, it was angled at 45 degrees on the roughened ice shelf. I am proud to say that my colleague and I each fell off only once - not bad for rookies (or so our tour guide told us)! When we returned home, we removed the dogs from harnesses, enjoyed a few cuddles with them and then fed them fresh meat as a reward for their hard work. Overall, a memorable experience!

Believe it or not, the weather was quite 'warm' at this point at +2° C! So much so, that we lost a good two feet of our snow base. This created strong streams of water and puddles of mud EVERYWHERE! Gone were our snow boots. Instead, they were replaced with rubber boots. I am certain they were NOT part of the catwalk during Fashion Week in Toronto, but here you'll stick out if you DON'T wear them and you'll be doing laundry a lot more frequently otherwise. When in Iqaluit, do as the locals do!



As I continued my work to reduce the wait list, a few more things became apparent:

***I learned more about the non-verbal components of the Inuit language:***

- When asked a question, the Inuit respond with 'Yes' or 'No' as expected, but in their own way. Their eyes are opened wide and eyebrows raised for 'Yes'. Alternatively, their eyes are narrowed, brow furrowed and nose scrunched for 'No'. I only had to repeat my questions a few times before I realized the pattern emerging in front of me!

***I learned more about the laid-back culture of the Inuit:***

- Attendance generally is an issue with the local Inuit community - just look at my stats! More than **33%** of all planned attendances were now-shows or cancellations (see chart below).
- I was told that this issue is part of their culture, but I learned to adapt with this particular patient group:
- Schedule afternoon rather than morning appointments.
- Avoid booking appointments well in advance and instead telephone and schedule patients the day before the available appointment spot.
- **Really, Really, REALLY** focus on the educational component of the patient interaction. Whether it was using patient-specific analogies, schematics and/or simple demonstrations of cause & effect, I applied all strategies I have learned from my mentors along the way!

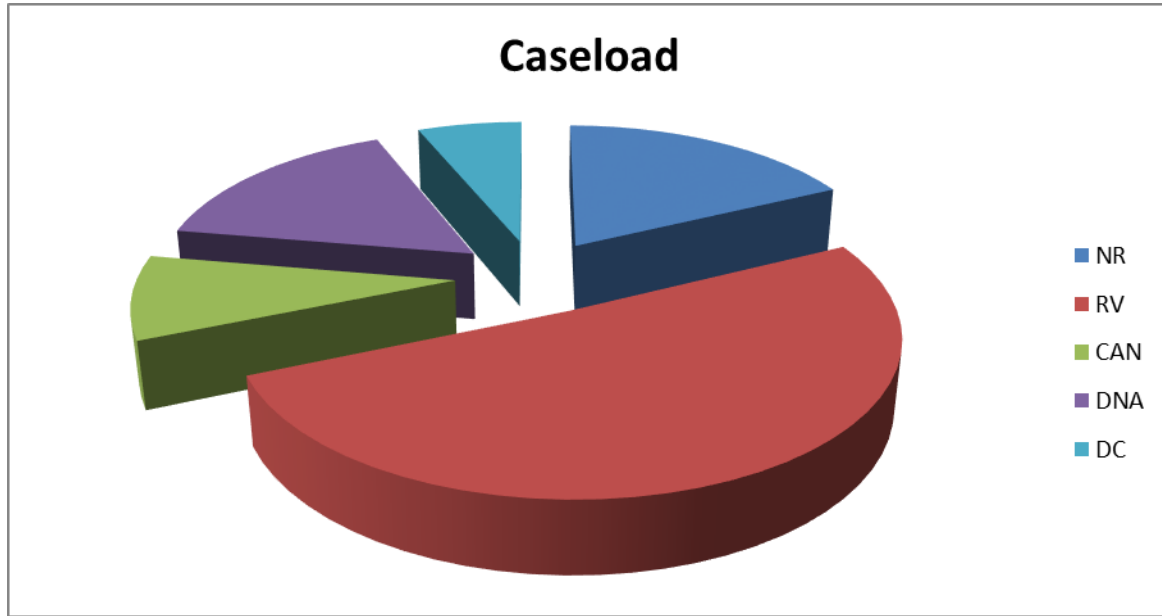
***I continued to be impressed with how well-suited MDT seemed to be for the populations serviced here!***

- One Inuk woman made me well-up with emotion when she hugged me, so honestly and truly thankful for the care received. I'll never forget her!
- Another Inuk woman made me smile and laugh when her pain fully abolished with posture correction alone - the surprise on her face was priceless. Within seconds, she had pulled out her cell phone and was taking a photo of the OPTP tag on the McKenzie Lumbar Roll so she could order it on Amazon!

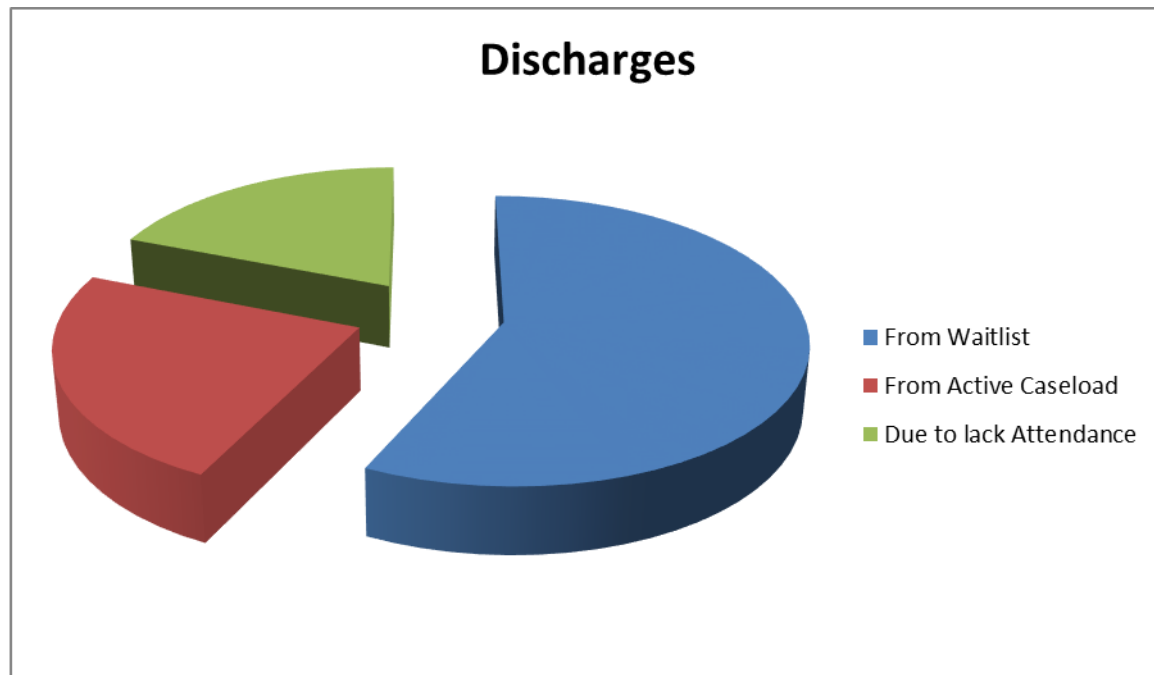
So, what does my future hold? I'm hoping for a return visit - perhaps during the summer season of 2018. I'd love to enjoy some hiking and views of the tundra in bloom at the local Sylvia Grinnell Territorial Park. We'll see!

**Graphs:**

My caseload:



Wait list discharges:





MDT classifications observed - all categories:

