



*For More Effective Physical Therapy Direct Patient Care*

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Fall 2013 Number 57

## Oh how poorly we are “designed”!

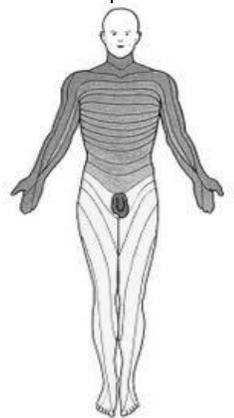
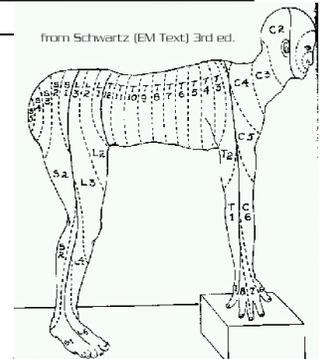
Stand up and extend your lumbar spine - did you know that we are the only mammals with the ability to do that? Notice how the dermatome map makes more sense when the human model is positioned on all fours. Since we became bipedal (approx. 7 million yrs ago), the nerves CURVE around our legs instead of going directly down in a straight line as they do in all other mammals.

I am certain that being bipedal had advantages such as being able to carry food, tools etc. while walking. The lordosis and the greater extension in our spines has perhaps made us better bipedal runners but bipedalism has come with a host of uniquely common human maladies<sup>1</sup> such as L4-5-S1 nerve root entrapments, stenosis and spondylolisthesis due to the excess compression forces occurring with erect standing.

***“All apes display significantly less spinal disease than in a comparable human sample...”<sup>2</sup>***

If only we had the intervertebral foramen of primates, perhaps back pain and nerve root issues would be much less common! I’m not suggesting going back to walking on our knuckles but it is an interesting question: ***was bipedalism worth it?*** (Read on my rant at the end of the Report)

1. The National Geographic Magazine, 2006 NGM.com  
 2. Jurmain R Degenerative joint disease in African great apes: an evolutionary perspective. Journal of Human Evolution 09/2000; 3: 203.



### Take the APTEI Report Quiz. Evidence-based answers are revealed inside!

Runners with excessive foot pronation (flat foot) should wear supportive shoes	<input type="checkbox"/> T <input type="checkbox"/> F
A simple “sleeper stretch” can prevent impingement syndrome in athletes	<input type="checkbox"/> T <input type="checkbox"/> F
Race, genetics and BMI are all risk factors for Adhesive Capsulitis (AC)	<input type="checkbox"/> T <input type="checkbox"/> F
Inject cortisone anywhere into a frozen shoulder, the outcomes are all good	<input type="checkbox"/> T <input type="checkbox"/> F
Scaphoid fractures are easy to rule out with 4 simple clinical tests	<input type="checkbox"/> T <input type="checkbox"/> F
A self-mobe using a strap from a dollar store can help regain wrist extension ROM	<input type="checkbox"/> T <input type="checkbox"/> F
Mobilization with Movement in patients with Knee OA proves to be effective	<input type="checkbox"/> T <input type="checkbox"/> F
Pelvic floor strengthening/Kegel’s may actually be harmful for some patients	<input type="checkbox"/> T <input type="checkbox"/> F
Bacteria and Alcohol consumption <i>may</i> be a risk factor for chronic low back pain	<input type="checkbox"/> T <input type="checkbox"/> F



## 'Foot Type' & Risk of Injury

**Reference:** Tong JW, Kong PW. Association Between Foot Type and Lower Extremity Injuries: Systematic Literature Review With Meta-analysis. J Orthop Sports Phys Ther. 2013 Jun 11.

In the past number of decades health care professionals and the general public have been convincingly made to believe that foot pronation is "evil" so the shoe companies saw great opportunities in "fixing" flat footed people by making supportive high arch shoes. *(That's my left flat foot by the way.)*



This paper looked at 29 relevant studies and concluded that **"High arch and flat-foot foot types are associated with lower extremity injuries but the strength of this relationship is low."**

It seems like review papers can "cherry pick" the studies they include as there are some studies that see absolutely no link between foot type and injuries. See below...

### Flat footed runners need arch support?

**Reference:** Nielsen RO, et al. Foot pronation is not associated with increased injury risk in novice runners wearing a neutral shoe: a 1-year prospective cohort study. Br J Sports Med. 2013 Jun 13.

If you have flat feet and wish to start running, you better choose a supportive "motion control" shoe to reduce your risk of injury, right? NOT!

This was a 1-year Danish epidemiological study that investigated the running distance to first running-related injury in almost 1000 novice runners wearing neutral running shoes.

Irrespective of their foot posture (i.e. supinated, neutral or pronated) all the runners were given the same neutral running shoe (Adidas Supernova Glide 3).



Within the one year period, one quarter of the runners developed some kind of running related lower extremity injury that limited their running for at least one week.

**Result:** In fact they discovered that the incidence rate of **running injury in the runners with mild to moderate pronation was significantly LESS** than those with either supinated or neutral feet.

**"Foot pronation is not associated with increased injury risk in novice runners wearing a neutral shoe."**

**Conclusion:** Although still controversial, this study contradicts the general belief that pronating runners are at increased risk of injury if they run in a neutral running shoe.

I have flat feet and am proud of them and have never considered orthotics or high arch shoes for running. In fact I love my non-supportive Vibram 5-finger shoes.



### Sleeper Stretch for Pitchers

**Reference:** Maenhout A, et al Quantifying acromiohumeral distance in overhead athletes with glenohumeral internal rotation loss and the influence of a stretching program. Am J Sports Med. 2012 Sep;40(9):2105-12.

Athletes involved in overhead activities such as pitchers, football and volleyball players have been shown to have a loss of shoulder internal rotation ROM on their dominant side. This loss of ROM has been shown to reduce the subacromial space which explains the greater prevalence of impingement in those athletes. Basically the smaller the acromiohumeral distance (AHD), the greater the risk of having a painful shoulder.



Acromiohumeral Distance (AHD)

For this study, all athletes with limited shoulder medial rotation were randomly assigned to either a 6 week "sleeper stretch" program or to a control group.

Basically the stretching group showed significant improvements in their shoulder internal rotation ROM (15° on average), while the control group showed no changes in their ROM. Most importantly the subacromial space, as measured



by ultrasound imaging, increased in the stretching group but did not in the control group.

I give the “*sleeper stretch*” to almost all my overhead athletes both as a treatment and as a preventative measure. Now I have the evidence to support giving that stretch.



If you wish to view the video of me teaching the “Sleeper stretch”, go to **YouTube** and search for APTEI.

While there, view all the other short (2 min.) videos.

### **Are Race, Genetics and BMI a Risk Factor for Frozen Shoulder?**

**Reference:** Wang K, et al Risk factors in idiopathic adhesive capsulitis J Shoulder Elbow Surg. 2013 Jul;22(7)

As of 2013 we still do not know the actual *cause* of most frozen shoulders; aka idiopathic adhesive capsulitis (IAC).

This 2013 Australian study demonstrated that the top 6 risk factors for the development of IAC were diabetes, thyroid disease, a lower body weight, a lower BMI, and a positive family history of IAC.



Surprisingly having parents/grandparents born in the British Isles or being born in the British Isles was another risk factor for AC. Funny, I recall my frozen shoulder patients being of varying race and colour but I must admit I’ve never kept a tab if most were of white British decent.

**Personal comment:** When I was a new into the PT world I used to feel guilty and responsible if my patient developed a frozen shoulder... it was as if I had failed to prevent it. In hindsight, and now thanks to research, it was never my “fault” that they developed a frozen shoulder. I can’t be expected to change genetics, race, thyroid issues, diabetes or low BMI!

### **Injection vs NSAID for Frozen Shoulders**

**Reference:** Shin SJ, Lee SY. Efficacies of corticosteroid injection at different sites of the shoulder for the treatment of adhesive capsulitis. J Shoulder Elbow Surg. 2013 Apr;22(4):521-7.

What advice would you give a patient with a painful frozen shoulder? Cortisone injection or just take meds?



For this 2013 study almost 200 patients with adhesive capsulitis were assigned to one of four groups.

**Group I:** Subacromial injection

**Group II:** Intra-articular injection

**Group III:** Intra-articular & subacromial injection

**Group IV:** NSAIDs

Irrespective of the exact location, the patients treated with a single corticosteroid injection had faster pain relief, greater ROM and had greater satisfaction levels than the patients in group IV who received only NSAIDs.

**Clinical Relevance:** Regrettably NSAIDs are of little value in patients with frozen shoulder. Recommend that they see an MD with experience in injecting anywhere in the shoulder. Ideally an intra-articular injection would seem to be better, but this study showed that the site of injection made no difference, they were all equally good.

### **Predicting a Scaphoid Fracture**

**Reference:** Parvizi J et al Combining the clinical signs improves diagnosis of scaphoid fractures. A prospective study with follow-up. J Hand Surg Br. 1998 Jun;23(3):324-7.

This prospective study involved 215 patients with scaphoid fractures and concluded that the following 4 clinical tests had 100% sensitivity, meaning if any of the tests are negative, the patient is unlikely to have a scaphoid fracture.



- i) Anatomical snuff box tenderness
- ii) Scaphoid tubercle tenderness
- iii) Pain on longitudinal compression of the thumb
- iv) Pain on thumb ROM testing



On the other hand individually these tests had low sensitivity. The specificity was 9% for anatomical snuff box tenderness, 30% for scaphoid tubercle tenderness, 48% for pain on longitudinal compression of the thumb and 66% for pain on thumb ROM testing.

**What does this all mean in a clinical setting?**

If you see a patient post fall onto outstretched hand with soreness at the scaphoid region, do the above mentioned 4 tests.

If only one, two or three of the tests are +ve they likely do not have a scaphoid fracture. If all four tests are +ve, they should definitely get an x-ray. A scaphoid fracture should not be missed!

If in doubt, the rule of thumb (*no pun intended*) is that the wrist and thumb should be braced and stabilized until symptoms improve, in case a fracture was missed on an x-ray.



**An Effective Self-Wrist Mobilization**

**Reference:** Choung SD et al Short-term effects of self-mobilization with a strap on pain and range of motion of the wrist joint in patients with dorsal wrist pain when weight bearing *Man Ther.* 2013 Jul 3.

Although I rely on various Mulligan wrist MWMs for helping my patients improve their pain and ROM, this recent study looked at the efficacy of a novel self-mobilization technique.

The effects of self-mobilization with a strap (SMWS) while weight bearing through the hand was studied on patients reporting of persistent dorsal wrist pain on weight-bearing.

They demonstrated that after only one week the self mobilization technique was beneficial in reducing dorsal wrist pain on weight-bearing and increasing wrist ROM.

The mid-point of the strap is placed across the proximal carpal bones, just below the distal end of the radius.

The patient is then instructed to passively extend the wrist by sitting up. The strap provides a volar glide of the proximal carpals the entire time.

At the onset of pain during the wrist extension, the patient then pulls the arm upwards, to distract the wrist joint space while maintaining volar gliding with the strap and maintain it for 10 seconds



The patient is instructed to repeat the technique 10 times with a 20 second rest period between each rep. The exercise is to be performed once per day.

**Clinical Relevance:** On your next patient with limited and painful wrist extension, consider teaching them this self-mob. As for the strap, I use the key lanyards sold in dollar stores.



**A Really Effective MWM for Knee OA**

**Reference:** Takasaki H, Hall T, Jull G. Immediate and short-term effects of Mulligan's mobilization with movement on knee pain and disability associated with knee osteoarthritis--a prospective case series. *Physiother Theory Pract.* 2013 Feb;29(2):87-95.

The evidence supporting the efficacy of Mulligan's mobilizations with movement (MWM) is growing and here is the latest one that every PT must be aware of and apply clinically.



Patients with symptomatic knee OA with an average age of 71, received four treatment sessions of MWMs within a 2 week period along with a home program.

The patients had significant improvements in knee ROM, pain and functional scores after only 2 weeks with the greatest benefit occurring immediately following the first session of knee MWMs.

### The Evaluation

With the patient in supine lying flex and extend the knee and note the most symptomatic direction and note pain level.

Re-evaluate active assisted knee flexion / extension in supine by applying

**Option 1:** A lateral glide to the tibia while stabilizing the femur close to the joint line (aka Lateral glide)

**Option 2:** A lateral glide with medial rotation

**Option 3:** A lateral glide with lateral rotation

**Option 4:** A medial glide

The patient is asked to report which option provides the most symptomatic relief during knee flexion/extension. Of the 4 options, the most beneficial glide direction is then chosen as the treatment of choice.

### The Treatment

The most effective glide is then applied in weight bearing with the effected knee on a chair. The MWM is repeated 10 times with 3 sets. Self MWMs are performed every 3 hours.

For a video demonstrating this evaluation and treatment of knee OA using MWMs, please go to [www.aptei.com](http://www.aptei.com) "Clinical Library"



Self MWM Sustained tibial lateral glide

## Identifying Pelvic Floor Dysfunctions

Submitted by: Carolyn Vandyken, PT & Nelly Faghani, PT

Orthopaedic therapists routinely prescribe Kegel exercises for core and pelvic floor dysfunction. Kegels are usually given without assessing the pelvic floor muscle strength or tightness first. PTs everywhere would be critical of such a practice elsewhere in the body. Should this routine practice continue for the pelvic floor?

Research shows that women with chronic low back pain (LBP) have an accompanying 78% pelvic floor dysfunction. A 5-year prospective study on almost 40 000 women showed that the strongest co-morbid factors in chronic LBP are pelvic floor dysfunction and respiratory dysfunction.

A poster presentation at the First World Congress on Abdominal-Pelvic Pain in Amsterdam (2013) involving 1600 patients demonstrated that in both LBP and pelvic pain, 57% of women and 36% of men complain of concurrent pelvic floor dysfunction. Could pelvic floor dysfunction be a major and overlooked driver of chronic LBP and pelvic girdle pain?

**So, why don't we just do more Kegels?** Simply put, pelvic floor dysfunction is a general term used for both hypertonic and hypotonic muscular problems. There may also be fascial problems, as well as neural tension challenges in the pelvic floor, which **will be aggravated by doing Kegels.**

Ideally every orthopaedic PT should be able to identify the patient's who need pelvic floor strengthening versus those who need pelvic floor lengthening. However, our training programs do not specifically address this issue unless you have taken the appropriate courses to assess the pelvic floor through internal palpation. This needs to change!





Medically and therapeutically we are divided into specialties. The orthopaedic PTs often under-represents the pelvic floor and the pelvic floor physiotherapist may too closely focus on these structures alone. The pelvic floor needs to have its rightful place back in the body, with all PTs and medical specialists considering its role accurately in both orthopaedic and gynecological problems.

However, not every PT is interested in doing internal exams. *Pelvic Health Solutions* is introducing a new, one-day evidence-based pelvic floor-retraining course for the orthopaedic PTs, involving **no internal exams**, in 2014. There is a key role for all PTs to accurately assess and treat pelvic floor dysfunction, knowing when to refer to a subspecialist and whom to treat in-house.

For more information visit  
[www.pelvichealthsolutions.ca](http://www.pelvichealthsolutions.ca) or email  
[info@pelvichealthsolutions.ca](mailto:info@pelvichealthsolutions.ca)

### *Evidence of a Poorly “Designed” Pelvis*

**Reference:** Ackerman, J. The National Geographic Magazine, 2006 NGM.com

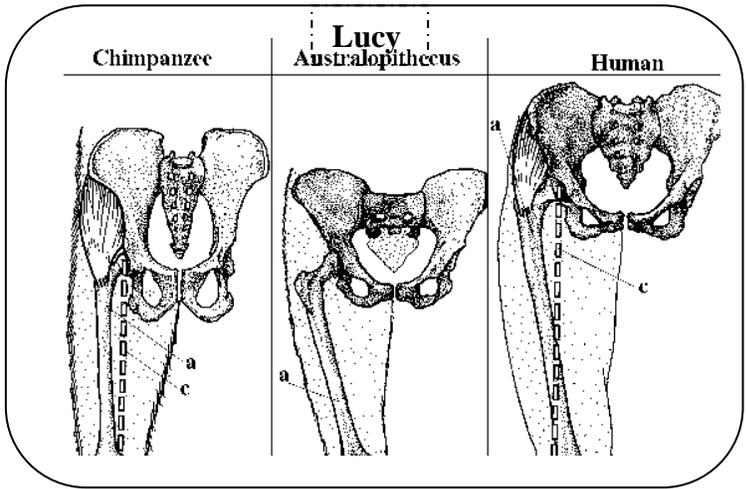
I started off this report with a rant on bipedalism, and I shall continue, especially since we are now talking about the pelvis.

The fossilized remains of the first hominid skeleton were discovered in Ethiopia dating back about 3.2 million years.



The very excited anthropologists called her “Lucy” (Since they were listening to *The Beatles “Lucy in sky with diamonds”* at the time).

Although Lucy had the physical characteristics of a chimpanzee, there was one major exception; her pelvis looked more human-like than ape-like. Lucy’s ilium was rotated which is the hallmark of bipedal locomotion. Anthropologists concluded that we all now share Lucy’s distinctly “human-like” pelvis.



You see, the pelvic canal of primates is like a straight canal ...making it ideal for giving birth.

On the other hand the human pelvic canal is flattened oval in one way and then makes a 90° turn and flattens the other way, making human birth far more difficult and risky when compared to some quadrupeds.



Among the great apes (chimpanzees, orangutans and gorillas) the female pelvis is quite roomy, and birth is far easier than it is for humans. An average length of labour for a woman having her first child is 12 to 18 hours, while for chimpanzees, the gestation period is 8 months and a their labour normally lasts only 40 minutes!

The human pelvis “design” is so bad that a century ago birthing was the leading cause of death among young women ...in fact even today birthing mothers continue to have a high mortality rate in some countries. (Note: there are many other reasons for this too, such as infections)

Most expectant primates find a quiet spot away from the group and give birth independently in solitude. However due to the difficulty of human birth it’s no wonder women around the world get help during labour and delivery. Oh how wonderfully yet poorly we are “designed”/evolved!





## Why are patients asking for Anti-biotics for their Back pain?

**Reference:** Albert HB, et al. Antibiotic treatment in patients with chronic low back pain and vertebral bone edema (Modic type 1 changes): a double-blind randomized clinical controlled trial of efficacy. *Eur Spine J.* 2013 Apr;22(4):697-707.

Following a disc herniation, blood capillaries grow into the disc in order to nourish and heal the injured area. Sometimes the blood capillaries may introduce the bacteria called *Proprione*, which is the same bacteria that causes acne. It is theorized that this bacteria may result in a chronic infection, which may explain the presence of vertebral body edema in some patients with chronic LBP.



To investigate the bacteria theory, researchers in Denmark recruited 162 patients with a history of a herniated disc, chronic LBP, and **MRI confirmed bone edema** for this study.

In this double blinded and randomized trial the patients received either 100 days of antibiotic treatment (amoxicillin) or 100 days of an identical placebo.



**Basic Result:** Compared to the placebo group, the patients receiving antibiotics had statistically significant improvements in pain and functional scores at 100 days and at one-year follow-up.

**Strange Result:** The strange part of the study was that 80% of the patients on the antibiotics had significantly less LBP, however the placebo group showed no improvement in any of the measured outcomes, whereas normally in other studies placebo groups show at least some improvement.

The problem with this study is that it is for now one of a kind and not yet replicated. However the

public and the media are so enthusiastic to find a "back pain cure" that this one study is getting more credit than it deserves.

If your patient has heard of this study through the media and asks you, "**Should I take antibiotics?**" Tell them that this was a one off study and that the subjects had proven vertebral body edema on their MRI, so it was a very selective population. Also taking antibiotics for 100 days is not a benign thing, it has consequences!

## Drinking Alcohol = Low Back Pain?

**Reference:** Ferreira PH, et al. Is alcohol intake associated with low back pain? A systematic review. *Man Ther.* 2013 Jun;18(3):183-90.

We know that excessive alcohol consumption is a risk factor for liver cirrhosis, heart attacks and type 2-diabetes. On the other hand we know that moderate alcohol use is associated with reduced risk of cardiovascular disease, systemic lupus and diabetes ...go figure!



So is drinking alcohol associated with LBP? This 2013 systematic review analyzed 26 studies and showed that there was a very weak association between alcohol consumption and LBP and likely not a causal effect.

They conclude that the relationship between LBP and drinking alcohol is likely **important only in those with alcohol dependence/abuse.**



For now if you have back pain and enjoy your couple of glasses of wine with your dinner, enjoy it! After all, a lack of enjoyment in life is a greater risk factor for developing persistent back pain.

**In a Nutshell:** Cheers! Drink and be merry, but not too much and not too often (and don't mix with meds)

***If you enjoyed reading this APTEI Report, or have any feedback just email me!***

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