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Editorial

Post hoc, ergo propter hoc!

Some of you may have been reading and contributing to the interactive CSP site (www.interactivecsp.org.uk) and seen the forum debate headed:

Is the true cause of Lumbar Back Pain/Sciatica referred pain from the Cervico-Thoracic Junction?

The debate, which started back in May, has now been closed and removed, as it apparently got rather too personal and passionate.
For those who haven't seen it, after the statement above, the thread was headed with this:-

I have been working in my own private practice for the past 14 years. Based on practical experience accumulated over that period I have found the I can relieve lumbar back pain (acute and chronic) as well as sciatica and knee pain by treating C7/T1/T2/T3 area (mobilisation/ice/stabilisation with collar) without treating the area where the actual pain is. I have a 95% success rate.
Has anybody found the same results ?

I would like to offer my own thoughts on several aspects of this:
Firstly the incredible success rate, secondly the assumption put forward in the heading: that the region treated is likely to be the anatomical source of the problem just because the pain goes away, and third, use this example as a vehicle to help us see a bigger picture in understanding pain and pain treatments.

First: – the 95% success rate:
I must be no good at my job. I've been treating, thinking about and observing, listening to and following-up common musculoskeletal aches and pains for many years and couldn't come anywhere near this 95% rate of success. I reckon that in all honesty what I mostly do is to try to wisely preside and give support during a natural history process with the added emphasis on getting best possible function for that individual as quickly as possible (rehab rules!).
I admit that sometimes, rapid changes in pain do seem to take place, but for the great majority if really observed well, the pain ebbs and flows and the natural history runs its course (back pain, sciatica, frozen shoulder, tennis elbow, carpal tunnel, ankle sprain etc.). Rapid changes and marked improvements are nice when they occur, but more often than not a degree of pain returns and the process plods along to its conclusion.

My suggestion is for an independent research group to randomly assign back pain and sciatic patients to a) the 95%-success-rate-therapist, (or to several such claimants) b) to other more pedestrian but competent therapists and c) a no treatment group… Then

have a *blind evaluation* of the outcome of each therapists patients, say at 2 weeks, 6 weeks, 2 months, 9 months, a year, 5 years…. and lets see….
I would just love it if this 95% success rate were ***to be true of some individuals*** - couldn't we learn so much from this? Are some of us really more gifted than others at helping back pain and sciatica? If some are – what is it that they've got, lets analyse it and find out more.
(Isn't it true that some surgeons have better success rates than others – doing exactly the same operation? Anyone like to review this??)

A long time ago now I read a book by Bernie Siegel called 'Love, medicine and miracles' (It's one of those American 'million-copy bestsellers!). The book's been much criticised for making cancer sufferers feel guilty about their past, but there are some great messages in it.
If I remember correctly, Bernie Siegel is an Oncologist – he noticed that some of his cancer patients, against all the odds, survived far longer than the expected prognosis and he determined to find out why. He interviewed them, got to know them and soon came to realise that they reacted to their diagnosis, their future, their life in general in remarkably positive ways. According to Siegel, some of them went as far as saying their cancer diagnosis was the best thing that had ever happened to them – they 'got a life' for the little time they had left and some seemed to live longer as a result. Siegel called them 'exceptional patients' and he got many of them to join his cancer patient groups with the aim to turn them all into 'exceptional patients'. Here, success was not the cold statistic of longevity after the diagnosis, but the quality of life and life satisfaction after it. Brilliant – so it's not how long you live, but the quality of life while you live that is important. I like the fact that Siegel was moved by success and investigated it.
So – are there 'exceptional therapists' who are good at making their patients 'exceptional' too? If there are, lets learn something from them.

Secondly, I've no problems with back pain being relieved from input to the cervico-thoracic spine as it seems that **pain can be changed and sometimes relieved from anywhere** – hence back pain being relieved by… reflexologists treating feet, cranial osteopaths the head, Reiki therapists the nearby air, acupuncture the ear lobes…. Manual therapy, C7-T1… electrotherapy the superficial dermis.. surgery an extruding disc… But, (and this is where the title *post hoc ergo propter hoc* comes in later on): - I think it is wrong to argue that because you treated an area of the body and the pain went – the area treated *must* have something wrong with it and that you've fixed it. It's wrong because it's bad reasoning in the light of what we know about pain. I think this reasoning 'error' is happening all the time – and lets include surgeons here too.
I went to my dentist once with ghastly toothache. He found the sensitive tooth by blasting cold air onto it and then proceeded to drill and fill the tooth. After he was done I asked – 'What did you find in there?' His reply – 'Nothing' – and went on, as I must have looked a bit shocked – 'Yes, it's quite common, but once the tooth's been drilled and filled, the pain goes…' Some surgeons successfully treat arthritic knees by drilling holes in the cartilage…. Cardiac surgeons used to successfully treat angina by finding and ligating the internal mammary artery (the blood vessel that supplies the pectoral/breast area of the chest) …. and the ECG's improved too! And later trials found that you don't even need to tie-off the mammary artery, all you need do is open the chest wall and look at the artery and then close the patient up again.

So, slice up, drill, destroy, tie-up, bruise, scar-up a tissue somewhere in the region of the pain and soon all's well! Clearly, just doing something physical that seemingly makes sense for both patient and clinician can make a symptom better. Bad hip? Replace it! Makes sense?

There are, in all probability, very large numbers of therapists, (Drs and surgeons) who claim very high success rates as a result of treating the feet (reflexology)/the head/the 'energy', the disc extrusion, the tethered nerve, the sacro-iliac joint, etc… for back pain and sciatica or anything else. And the explanations proferred, in most cases, of how their treatment works will be based around the anatomy, physiology, pathology, biomechanics, a something-wrong of something-or-other in the area treated.

Good clinical trials never seem to validate the level of treatment successes claimed though. Are these therapists kidding themselves, us and the public they treat? Or do clinical trials kill-off something special that is vital to the treatments success? Belief is a fascinating thing – and to illustrate one aspect I have lifted this wonderful example from one of Carl Sagan's books (direct quotes are in inverted commas):
It is estimated that one hundred million ill people have made the pilgrimage to Lourdes in France in the hope of a miraculous cure. In nearly a century and a half only 65 miracles have been accepted as authentic by the Catholic Church (the miracles relate to 'tumours, TB, opthalmitis, impetigo, bronchitis, paralysis and other diseases but not the regeneration of a limb or a severed spinal cord'). The odds of a miraculous cure at Lourdes is thus about 1 in a million – 'about as good a chance of recovering as winning the lottery, or to die in the crash of a randomly selected regularly scheduled airplane flight – including the one taking you to Lourdes.'
Sagan goes on: 'The spontaneous remission rate of all cancers, lumped together, is estimated to be something between one in ten thousand and one in a hundred thousand. If no more than five percent of those who come to Lourdes were there to treat their cancers, there should have been something between fifty and 500 'miraculous' cures of cancer alone. Since only three of the attested sixty-five cures are of cancer, the rate of spontaneous remission at Lourdes seems to be lower than if the victims had just stayed at home. Of course if you're one of the 65, it's going to be very hard to convince you that *your trip to Lourdes wasn't the cause of the remission* of your disease….**post hoc, ergo propter hoc'** (loosely translated from Latin this means: the fallacy of believing that just because the improvement happened after the event (here, it's Lourdes) there is a causal relation between them)..
Sagan then adds … 'Something similar seems true of individual faith-healers'.

It is my opinion that if pain could be seen as a *processing phenomenon* then more rational and more reasonable explanations for treatment success will be made.

Pain does sometimes disappear or lessen for a while and quite often this happens around about the time when we are treating – is it coincidence, like the trip to Lourdes, or a changed diet, for the cancer remission? Or are there better explanations? Was the improvement therapist instigated or would it have happened anyway? For pain, the answer is probably a bit of both - with huge variability from one individual to the next, as well as in the same individual at different times and in different circumstances.

It's notable that pain treatments work far better in the 'acute and sub-acute' phases of a condition rather than in the chronic, yet even here, pain can pleasingly go, or significantly lessen from time to time (see the feature article by Dr Schott later on in this issue).
I'd like to emphasise though, that it if we continue to observe after the success euphoria dies down; pain can often reappear – perhaps a few hours, days or weeks later or longer.
Most often pain bouts are 'episodically normal' – as in back pain, jointy aches and pains and even some common sport related sprains and strains. Pains can come and go for years, be really trying, but eventually stabilise and occasionally, actually go for long enough to be said to be gone.

See pain as a neurobiological process, and therefore a processing phenomenon as already mentioned. Physically, it's a chain, or circuit, of hundreds of thousands of neurones all 'noisily' firing or signalling together – and conversely, no-pain as the processing of the circuit shifting to silence – or to producing insufficient signal activity to be able to barge into consciousness. Alternatively, the signal may not waver in its intensity, but consciousness actively prevents its arrival.

If this is agreed, pain relief can be seen as a processing shift – activity in a given nociceptive circuit reaching consciousness then suddenly, or slowly, shifting to being unable/less able to reach it. The 'conscious-producing' part of the signal gets down-regulated and turned off. The 'subconscious' part of the signal may well do too in some cases.

Processing shifts can be produced via 'top-down' inputs as well as 'bottom-up'. Top-down means generated via input from our selves, our brain, our thinking and reasoning, our understanding, via conditioning, via subtle or maybe significant changes in our day-to-day feelings and so forth (I think we should forget the word placebo and use 'psycho-physiological'/top-down). Bottom-up refers to effects produced via the tissues of our body, – as in all types of physical treatments. Bottom-up cannot exist without some top-down – meaning for example, that if you have a treatment of some kind you are aware of it and it has an impact on you – not just via the physical feelings but also via the therapist, their explanations, the talk and the atmosphere and hence the feelings and changes of thinking that may be generated.

Some cases follow with comments about the processing and about the therapist or no-therapist 'requirements' for the pain relief that occurred:

The lone climber…
A lone climber gets his hand trapped in a crevice. After a day or two he realises that he isn't going to get found and rescued. He has one option for survival - he hacks his hand off with his penknife and climbs to freedom and survives. It's not pleasant, but he reports surprisingly little pain for the amount of damage.
Comment: 'From the tissues-into the CNS' nociceptive circuits must be working massively, but CNS-to-consciousness processing gets gated out/prohibited/inhibited. Hence: 'Bad' tissues, with accompanying nociceptive activity, sometimes quite massive activity, do not invariably produce pain. Even when they do, pain can still be significantly or completely dulled regardless of the degree of incoming nociceptive

activity. If pain suddenly goes following an acute injury – it is unlikely that the tissue responsible for the pain has suddenly fully healed!
Requirement: No therapist required! 'Survival' is the big issue. Pain relief then = a top down (psycho – physiological) instigated effect here. This example illustrates how powerful our own pain relief systems can be sometimes – and, how powerful the top-down effect is too! It fits with our survival needs and hence backs the need for evolutionary reasoning.

Pain remission after 10 years….
After a minor trip in the street a young, fit office worker developed ankle pain. There was a little swelling but no evidence of anything more than a minor sprain. It got better for the first three weeks, then he stubbed his toe again and the pain returned with incredible ferocity. Three years later he remained in agony and unable to walk without crutches. The ankle looked perfectly normal. The patient received almost 30 different treatments and opinions. Some treatments worked well for a few weeks, and one relieved the pain for a month. Some of the practitioners boasted very high success rates. When the pain came back the same successful treatments had no effect. After 10 years of pain and disappointment the patient tripped and fell again. Three days later the pain disappeared and has now been gone for 5 years.

Comment: This is rare, I can only remember 3 or 4 similar stories in the last 25 years! All levels (conscious and subconscious) of nociceptive signalling are capable of changing/shifting. The pain signal pathway here is likely to be well embedded (remembered/imprinted); hence always the potential to come back again.
Pain relief requirement?: Not from a therapist; but competing input from environment; ?shock rekindling and reprogramming the long-forgotten/unused/hibernating pain-relief system? ?Competing nociceptive input? So, bottom-up input was helpful at the particular time and circumstance (a vigorous manual therapy session in the right context might have done the same thing – hard to set-up and, is it worth risking!!). Top-down effects must be there too.

Acceptance, adjustment and activity….
A middle age man has had back and leg pain for 4 years. All the treatments have failed. He repeatedly hears the message from all the scans and tests he's had that there is nothing seriously wrong with his back and that he should try and get back to work and get fit. He finally comes to accept that his pain is likely to be there forever and decides to grin and bear it. He makes some changes to his life, takes up some new hobbies, joins a gentle fitness programme and generally starts to look after himself. After 8 months he feels a great deal better in himself. He gets back to a much higher level of fitness than he had before. His pain changes from having sharp stabbing and aching qualities to almost a warm 'comfort-discomfort' feeling. 'My pain is much less bothersome now' he says. Two years further on he reports 'back episodes of a week or two just like everyone else' – and virtually nothing in between.

Comment: The processing signals at all levels are likely to be firmly embedded, but have gradually reduced their conscious-reaching activity levels. They get ignored, so they gradually get forgotten, the emotional components of the signal dull too. Note the power of acceptance here brings about a changed relationship to the pain – hence a breakdown of the wired-in emotional triggers that are likely to have been attached to the pain.

Requirement: No actual therapist 'treatment' but therapist/Dr/Specialist words about the problem have had an impact over the years it seems. Top-down effects (like acceptance, reduced worry and attention, well-being, self-confidence etc.) combined with bottom-up gains (like fitness and lifestyle changes) appear to be strongly influential.

Therapy actually works!

A patient strains his back lifting an awkward box. He struggles on for 2 months. He keeps going, he stays at work, he does everything right. He does a few exercises, he takes tablets, he tries to relax etc. etc., just like it says in the little blue book his Dr gave him. A careful examination reveals good side flexion and rotation but great difficulty in flexion and extension. His low lumbar spine just doesn't seem to let go. I explained all this to him – pointing out the good movements and noting which movements needed improving. I also reassured him that there was nothing seriously wrong. After ten minutes of manual therapy the patient's range and 'comfort' during the movement improved significantly. He practiced the movement in positions where it felt good and relaxed, he quickly understood what was going on and was pleased to be able to join in with getting it going. Over three sessions in 10 days he regained normal movement. By 3 weeks he was back to normal and reported that he'd virtually forgotten his back.

Comment: Processing signals possibly maintained by increased tone, lack of normal movement. To my mind, the dramatic improvements to the loss of movement are more likely to be due to lifting of 'inhibition' than any significant anatomical or biomechanical effect.

Requirement: Processing shift initiated by therapist input – 'bottom up' and plenty of 'top down'. Big point: The treatment, the 'bottom-up', gets the credit from the patient!

Healing progression occasionally links pain!!

About a year and a half ago I cut a big chunk of skin off the back of my knuckle while sharpening a knife. There was blood everywhere; I could see the glistening white extensor tendons. I pushed the dangling flap of skin back on and held the finger under the tap (because that's what you're supposed to do) – the cold water hurt like hell (should I then be doing that??). I wrapped it up and stuck plaster all over it (felt better). It ached a bit but soon became comfortable. I kept the finger straight for 3 days (because it hurt to bend and I thought it would pull the flap off and bleed all over again). I peeked at the wound, and bent it a bit – it wasn't too bad. Over the next 10 days I got back most movements and was soon using it pretty normally (with plasters on). By 2 weeks I hardly gave it a thought. It was scabby and weepy for a long time. The scar was red and didn't go white for over a year. The pain went well before the healing completed. But the pain went in parallel with the danger to the healing and my fear of hurting it and messing it up. Pain works well for skin wounds – skin healing and pain has evolved well.

Comment: Here, the processing signal and consequent discomfort and warning signals seem to parallel the healing state very well. Sensitivity and pain soon stopped when it wasn't needed.

Requirement: No therapist required. Think about this: - what therapy, medication or intervention can help speed the complex physiological process of skin healing? Or for that matter of ligaments, tendons, discs, and nerves?? But, processing changes (via

top-down or bottom-up whether from a therapist or not) may well influence, via secondary physiological effects, the healing efficiency.

I think it important that we accept that 'top-down' effects the physiology of signal processing which in turn can affect tissue based physiological processing in the tissues – like healing efficiency. (See 'from the web' section –*Mind over Matter: how depression causes bone loss through nerve activation.* It's a fine example of the evidence for the physical effects of 'top-down')

End Notes:

1. It seems that *most* processing shifts have to have multiple interacting bottom-up and top-down elements – and for *pain treatments* to be effective the bias of our knowledge seems to be towards the top-down component being the most powerful. If a lot of the power of pain therapies is all about things like the context and conditions in which they are done - is this what the 95%-success-rate-therapists are so good at creating?
2. Sometimes, for the top-down input to work at its best it needs to be linked to an apparent physical fix – i.e. something has to be physically done with or to the patient to trigger the potent and parallel top-down effect.
3. Just like those whose 'cure' follows a pilgrimage to Lourdes are going to believe that it was the miracle of Lourdes that cured them rather than pure coincidence, our patients who experience pain relief will quite naturally reward the physical treatment as being responsible for their improvement far rather than any airy fairy change in attitude or thinking about the problem that may have subtly occurred. And or course, the apparent success of the physical treatment then reinforces the therapist belief in it too. Hence:- *post hoc, ergo propter hoc* – for therapists as well as patients!
4. See the bigger picture via a 'processing' view on pain and the little separate top-down and bottom-up bits we all argue about tend to start to cuddle-up much more comfortably. This ultimately means that it's just as silly to be an 'I just talk to my pain patients' therapist as a full on 'I just do treatments' therapist.
5. If anyone does the trial suggested earlier, can I take part please?

Here's my rule!

TOP DOWN BEFORE BOTTOM UP, THEN BOTTOM UP SUCCESS FEEDS TOP DOWN….

Talk a bit and do a bit, get some goal successes and talk a bit more and then do again……

On this theme of pain coming and going I hope you all enjoy Dr Shott's fascinating feature article 'Delayed onset and resolution of pain: some observations and implications'.

Here's the book ref for your Christmas stocking :

Sagan C 1997 The Demon-Haunted World. Science as a candle in the dark. Headline, London. *See chapter 13*

Also further reading on my spin on top-down and bottom up!

Gifford L S 2006 Red and yellow flags and improving treatment outcomes, or: ‘Top down before bottom up!”. In Touch, Summer 2006 issue no: 115:18-24

Seasonal best wishes to one and all.

Louis Gifford
PPA News Editor.