Over the years I have slowly learned that there are very few direct cause-and-effect situations where health is concerned – where one event ‘causes’ another. There are layers of complexity which we commonly ignore but which awareness of can greatly add to our ability to prevent and/or successfully treat and/or rehabilitate health problems.

Even something as simple as a fall which leads to a broken bone or a torn muscle can be seen to be more complex than first impressions suggest.

True, the break or tear would not have occurred without the fall, but neither would the same degree of damage have occurred if the tissues were more resilient and therefore able to withstand the physical stresses of the adaptive demands placed on them by the event.

Someone with more elastic tissues, or stronger bone structure, would have probably sustained a different form or degree of damage.

Recent Back Pain Study

These thoughts on complexity were reinforced by a recent study in the US which compared standard Physical therapy (Physiotherapy) with breathing rehabilitation, in treatment of chronic low back pain. In this randomized controlled study, 36 patients with chronic low back pain that had been present for not less than three months and with an average of one-year duration, improved significantly (in terms of both pain and function) when they received either Breathing Rehabilitation or Physical Therapy. Both groups received one introductory evaluation session of 60 minutes, and 12 individual therapy sessions of equal duration of 45 minutes, over six to eight weeks. Overall, the average improvements were no different between the two groups, although at six to eight weeks, there was a trend favouring Breath Therapy, while at six months, there was a trend favouring Physical Therapy.

The researchers/authors concluded: The reported study is the first study providing evidence that patients suffering from chronic low back pain can clinically improve with Breathing Therapy, an approach primarily focused on body-awareness. Changes in standard self-reported low back pain measures of pain and disability appear to be comparable to changes measured following high-quality, extended Physical Therapy.

What has Breathing got to do with Back Pain?

It’s reasonable to ask why breath retraining should benefit people with low back pain. The answer lies in the profound, body-wide, influences of a disturbed breathing pattern – which is something I intend to focus on in this series of columns in the next few issues of Positive Health.

As I hope to make clear in subsequent columns, unbalanced breathing, which is very, very widespread, has implications (among many others) that range from increased fascial tone to lowered pain thresholds, disturbed motor control and balance, profound fatigue, muscle cramps, increased myofascial trigger point activity, sympathetic arousal and feelings of anxiety. You may well ask how these and many other symptoms can emerge from a breathing imbalance.

Chain of Events due to Carbon-dioxide Deficit

The brief summary below may help to clarify the answer (this will be amplified in later columns together with suggested rehabilitation and bodywork rehabilitation approaches).

As we exhale, we eliminate carbon-dioxide (CO₂). This is recruited from carbonic acid that circulates in the blood. If breathing is more rapid than is ideal for the current needs of the body, we lose too much CO₂ (and therefore carbonic acid), and the blood becomes more alkaline than normal. This creates a state of respiratory alkalosis, as the blood’s pH moves from a normal of around 7.4 to perhaps as much as 7.5.

The effects are dramatic. Anxiety appears (and therefore so does even faster breathing) – aggravating the feelings of anxiety or even panic. Smooth muscles constrict, and this creates a narrowing of blood vessels as well as interfering with normal digestion and bladder function.

A process known as the Bohr effect starts, causing the red blood cells to bind more tightly to the oxygen molecules they carry. This means not only less blood gets to the brain and muscles, but also less oxygen is released by the blood that does get through, creating feelings of fatigue and a lack of mental clarity (‘brain-fog’). Sympathetic arousal occurs, creating altered neural function – more rapid reflex functions, disturbed balance, altered motor control along with a lowered pain threshold. At the same time, profound negative influences occur affecting core stability. The kidneys try to rebalance the increased alkalinity by excreting bicarbonates, and a generalized imbalance occurs in the calcium and magnesium levels in the body, causing even more neurological mayhem, with cramps and spasms becoming more likely, accompanied by numbness, pins and needles and possibly pain. These changes provide a superb environment for the evolution of myofascial trigger points, as these are known to evolve in ischemic tissues where oxygen levels are low. All of these symptoms are more likely in deconditioned individuals, because of the way...
their cells produce ATP (energy) in an anaerobic environment, creating acid wastes that then further stimulate the breathing rate.

Complex?
Absolutely, and wonderfully so. And perhaps this brief summary of influences will help explain why breathing rehabilitation was just as effective as physiotherapy in treatment of low back pain!

References