

# Structure & Function Revisited

## New Insights on Restoring Well Being at a Profound Level

By Dr. George B. Roth, BSc, DC, ND, CMRP



“The doctor of the future will give no medication, but will interest his patients in the care of the human frame, diet and in the cause and prevention of disease.” - Thomas A. Edison

### Using the Power of *Tensegrity* to Restore Optimal Well Being

Matrix Repatterning (MR) is a form of manual therapy, which has been in use by chiropractors, physiotherapists, massage therapists, and other medical specialists to treat a wide range of structural disorders for almost three decades. It is based on the understanding that the biomechanical and functional properties of muscles, fascia and bone are interconnected as a continuous closed kinetic chain. These properties have been associated with the concept of *tensegrity* as it applies to the cytoskeleton and the extracellular matrix (ECM) at the cellular and molecular levels (see Figure 1)<sup>3, 4</sup>. Matrix Repatterning incorporates some of the latest research from the fields of cellular physiology, imaging technology, electrophysiology and materials science<sup>5</sup>. For example, Dr. Norman Doidge, the author of two best-selling books on the use of leading-edge technologies to overcome the effects of brain injury, has attested to the benefits of MR in his book, *The Brain's Way of Healing* referred to as primary restrictions.

Matrix Repatterning was originally introduced over thirty years ago as a form of musculoskeletal therapy. As such, it has been successfully used to eliminate various pain syndromes including low-back pain, knee and shoulder pain, neck pain, and

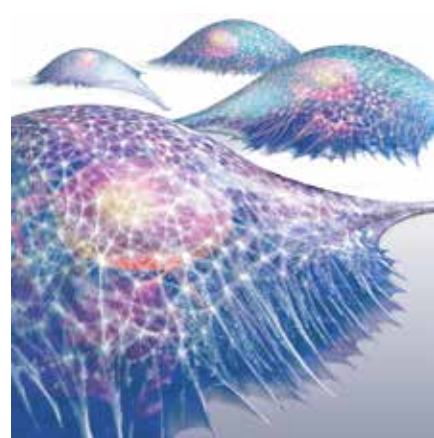


Figure 1: Cells as Tensegrity Structures

I believe that most of us entered this profession to improve the quality of life for our patients. At the most fundamental level, we have a sense that optimal structural integrity of the body is linked to optimal well-being. Indeed, the concept that structure and function are inextricably linked, lie at the very heart of chiropractic philosophy<sup>1</sup>. However, despite over a century of investigation, we have had very limited success in demonstrating the effect of our treatments on general health.

Much of our research has been focused on the so-called ‘somatovisceral’ reflex and its association with the autonomic nervous system. However, recent developments in the field of cellular biomechanics, have opened up the possibility of many more causal associations between tissue structure and functional disorders<sup>2</sup>. Although, these anatomical and physiological relationships are becoming clearer at the purely scientific level, reproducible clinical evidence and applicability has not been forthcoming, until now.

My goal with this article is to provide new insights and practical processes, which have demonstrated measurable evidence in cellular and visceral physiology. These approaches are congruent with the emerging sciences of biomechanics, cell biology and bio-electricity. In addition, they have been clinically verified by leading investigators from various fields, including radiology, orthopedics, biomedical engineering and cellular biology. In their opinion, this type of objective improvement in the field of manual and structural therapy is unprecedented.

headaches. The MR assessment process is based on a thorough evaluation of structural changes associated with injury, including alterations in the size and shape of bone<sup>7, 8</sup>. In a particularly graphic case, which I reported on in 2019, a long-standing case of severe post-traumatic osseous degeneration (diagnosed as polyostotic fibrous dysplasia), the bone structure was measurably restored with only six treatments, as attested to by radiographic evidence<sup>9</sup>.

The examination process includes objective indices of biomechanical dysfunction, including myofascial tone, ranges-of-motion, articular stability and neurological function. In addition, areas of injury are evaluated with the application of a bio-compatible magnetic field<sup>13</sup>, which has the effect of normalizing tissue tone. This allows the practitioner to determine the precise location of injuries (primary restrictions<sup>2</sup>). Treatment involves the application of gentle pressure at these sites, along with the bio-compatible magnetic field mentioned above. This combined approach appears to induce piezoelectric current<sup>11, 12</sup> in the affected area, resulting in a release of cellular tension and the restoration of osseous size and shape, in a profound manner<sup>10</sup>. Normalization of bone structure, along with that of other fascial elements, results in improvements in muscle tone, articular mobility and neurological function. Practitioners have noted a reduction in the need for strenuous procedures, such as high velocity manipulation, fascial mobilization and stretching. The results tend to be long lasting.

### Somato-visceral Connections

Primary Restrictions have often been found to involve the fascia associated with visceral structures. In addition to the biomechanical improvements noted above, many clinicians using MR have reported measurable changes in hematologic and other laboratory tests associated with visceral function. It is postulated that the fluid content and density of certain internal organs may make them more susceptible to impact trauma. This appears to correlate with those parts of the body, which

are vulnerable to ‘internal injuries.’ These structures appear to be subject to alterations in cellular biomechanics, which may explain the changes in various physiological processes. As a consequence, MR treatment of these injuries often results in significant improvement in symptoms, such as gastro-esophageal reflux, snoring and apnea, cardiac arrhythmia, cholesterolemia, incontinence, erectile dysfunction and other conditions. It may be speculated that these clinical outcomes provide clues as to how many of these functional conditions may be associated with structural dysfunction arising from common forms of injury. It may also explain why they are so common in the general population.

### Case Report: Post-Traumatic Hypertension and Tachycardia

Hypertension is a condition which affects a significant number of people. Recent estimates indicate that more than 100 million Americans (CDC, 2017) and almost 10 million Canadians (Statistics Canada, 2019) are afflicted with this potentially dangerous condition. Other than traumatic brain injury, the literature is rather scanty on the incidence of essential or primary hypertension subsequent to physical injury<sup>14</sup>. However, based on evidence gathered over three decades of clinical experience, it is my opinion that the association may be much more prevalent than previously considered.

This case involves a 51-year-old gentleman, who came to see me regarding a snowmobile collision, which occurred in February 2020. He sustained a major impact, to his left postero-lateral chest wall and serious complex fractures of his left elbow. Ten years prior to this injury, he developed hypertension following a series of lithotripsy treatments for renal calculi. His blood pressure was eventually stabilized at normal levels with medication, which remained the case for almost a decade, until the above-mentioned collision.

Immediately after the injury, his blood pressure became significantly elevated (150-155/95-100) and he developed tachycardia. Prior to the injury his heart rate averaged in the mid-sixties. After the injury, his heart rate averaged 85-95 BPM. Neither of these symptoms responded favorably to medication.

### Response to Treatment:

After two Matrix Repatterning treatments directed to the injured areas related to the upper extremity, rib cage/thoracic spine, cranial base/cervical spine and the pericardium, his BP averaged 120/80 and his resting heart rate was approximately 70-75 BPM. After two additional sessions, his heart rate is now averaging 65-75 and his blood pressure has consistently remained in the range of 110/70. In

fact, as of the writing of this report, his blood pressure has continued to decline and I have advised him to seek a re-evaluation of his medication, if it should continue to decline.

### Discussion: Visceral, Endocrine and Neurological Implications

Over the past 20 years, there have been a significant number of cases of hypertension (HTN) that have responded to the application of this form of treatment. In several of those cases, patients experienced an improvement in their blood pressure, inasmuch that they required a reduced dosage of medication, or were able to curtail the use of them entirely. These results appear to have persisted for months or years.

It has been postulated that certain injuries to the trunk (rib cage or spine), may have an influence on renal or hepatic function (renin, angiotensinogen and/or angiotensin production). Additional areas of primary involvement may include thoracic spinal injury, which may influence the sympathetic nervous system, cervical spine involvement, as it relates to the carotid sinus, or cranial injury, which may affect

the pituitary output of ADH or the vagus nerve (CN X), as it relates to regulation of cardiac contractility.

### Conclusion

The case described above is representative of the types of conditions often encountered and resolved using Matrix Repatterning. As a result of our success, we were recently invited to participate in a pilot study at a major teaching hospital in Toronto, Canada. We will be reporting our preliminary results in an upcoming article.

We are hopeful that these outcomes will provide us with even more information to support the development of scientific, reproducible, safe and non-invasive methods to be able to offer relief for this and many other somatovisceral conditions.

Practitioners from around the world, who have learned these techniques, have found that they are now able to provide real solutions for their patients. By restoring the framework of the body and supporting its natural healing abilities, they are truly becoming the ‘doctors of the future.’

### REFERENCES:

1. Palmer DD. The science of chiropractic. 2nd ed. USA: Theclassics Us; 2013.
2. Ingber DE, Mechanobiology and diseases of mechanotransduction, *Annals of Medicine*; 35(8): 564-77, 2003.
3. Ingber DE, The Architecture of Life, *Scientific American*, Vol. 1, 1998.
4. Pischinger A, The Extracellular Matrix and Ground Regulation, Basis for a Holistic Biological Medicine, North Atlantic Books, Berkeley, 2007.
5. Roth GB, The Matrix Repatterning Program for Pain Relief, New Harbinger, Oakland CA, 2005.
6. Doidge N., *The Brain's Way of Healing*, Penguin Books, New York, 2016.
7. Roth GB, Observations in a New Light: Subluxation: A case of mistaken identity? *Canadian Chiropractor*, December 2019.
8. Fantner GE, Hassenkam T, Kindt JH, Weaver JC, Birkedal H, Pechenik L, Cutroni JA, Cidade GA, Stucky GD, Morse DE, Hansma PK, Sacrificial bonds and hidden length dissipate energy as mineralized fibrils separate during bone fracture, *Nat Mater*. 2005 Aug; 4(8):612-6. Epub. Jul 17 2005.
9. Roth GB, Regenerating Bone Structure: Unexpected Results, *The American Chiropractor*, pp. 42, 43, January 2019.
10. Valbona C. et al, Response of pain to static magnetic fields in postpolio patients: A double-blind pilot study, *Arch Phys Med Rehabil*, 78:12003, 1997.
11. MacGuintie LA et al, Streaming and piezoelectric potentials in connective tissues. In: Blank M (ed) *Electromagnetic fields: biological interactions and mechanisms*. Advances in Chemistry Series 250. American Chemical Society, Washington DC, ch. 8, pp 125-142, 1995.
12. Sierpowska J et al, Prediction of mechanical properties of human trabecular bone by electrical measurements *Physiol. Meas.* 26 S119, 2005.
13. Roth GB, When Physics Meets Biology, *Canadian Chiropractor*, May 2020.
14. Krishnamoorthy V, et al, Hypertension after Severe Traumatic Brain Injury: Friend or Foe? *J Neurosurg Anesthesiol*. 2017 October ; 29(4): 382-387. doi:10.1097.
15. Clar C, Clinical effectiveness of manual therapy for the management of musculoskeletal and non-musculoskeletal conditions: systematic review and update of UK evidence report, *Chiropr Man Therap*, 2014 Mar 28;22(1):12.



### About the Author:

Dr. Roth is a graduate of the University of Toronto, Canadian Memorial Chiropractic College and the Ontario College of Naturopathic Medicine and has studied osteopathic medicine at Doctors' Hospital North, Columbus, Ohio. He is the developer of Matrix Repatterning and is the Director of Education at the Matrix Institute in Toronto. Dr. Roth has presented seminars at numerous hospital and university-based symposia throughout North America. He is the co-author, with Kerry D'Ambrogio PT, of *Positional Release Therapy* (Elsevier, 1997), and the author of *The Matrix Repatterning Program for Pain Relief* (New Harbinger, 2005). His work is also featured in the *Brain's Way of Healing*, by Dr. Norman Doidge, (Penguin, 2015).

For more information: [www.matrixforpractitioners.com](http://www.matrixforpractitioners.com)