

# **Could the clinical efficiency and the physiological mode of action of the Toggle-Recoil manual technique be explained by a mechanical oscillation transmitted to fascia ?**

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**BACKGROUND** : The Toggle-recoil technique is used since the beginnings of osteopathy and chiropractics [1], in several of these practices : Mechanical Link, SAT, Hole-in-One, SOT. [2], [3] It aims at normalizing somatic dysfunctions using a vibration transmitted to elastic tissues of various degrees of density, from vascular tissue to internal bone tissue. Its global action on the body has an impact on homeostasis and biomechanics of the corporeal pattern. While its clinical efficiency is empirically acknowledged by osteopaths and chiropractors, its mode of action is not yet scientifically proven. We studied the hypotheses formulated by the authors on the basis of their clinical practice, then compared them to recent scientific publications on fascia properties (Schleip), mechanotransduction (Ingber, Cañadas), biotensegrity (Fullford, Levin), to make new hypothesis about the Toggle-recoil physiological action and its clinical consequences.

**METHOD** : We analyzed the literature about Toggle-recoil from the beginnings of osteopathy and chiropractics to nowadays, scientific publications about the clinical effects of Toggle-recoil and Spinal Manipulative Techniques including Toggle-recoil on homeostasis, proprioception, breathing system, somatic dysfunctions, to delimitate its therapeutic fields, and publications about the application of a manual mechanical compression to fascia at different scales, from the cell to the corporeal pattern. Databases were : PubMed, GoogleScholar, ScienceDirect, Journal of Manipulative and Physiological Therapies, Journal of American Osteopathic Association, Journal of Electromyography and Kinesiology, Journal of Bodywork and Movement Therapies, Journal of Chiropractic Humanities.

**RESULTS** : The hypotheses of the authors in both osteopathy and chiropractics correspond to scientific studies about mechanical and neurophysiological reactions of fascia at all scales of the body. With fascia, anatomy is not considered anymore as a set of rigid segments linked by joints, but as a dynamic womb of viscoelastic elements in permanent pretension, reacting to external mechanical strains. In this context the application and release of a compressive force can transmit an oscillation to all fascia structures. It could explain the global clinical effect of Toggle-Recoil, from the cell biochemistry to the biomechanical pattern of the body. Thus the Toggle-recoil action on biomechanics, proprioception, homeostasis could be explained by its action on the fascia receptors : Golgi, Pacini, Ruffini receptors, the interstitial fibers III and IV ; the piezo-electric effect ; the mecanotransduction ; the biotensegrity by the three-dimension structure of fascia discovered by J.C. Guimberteau. [4]

**CONCLUSION** : To verify this hypothesis it could be interesting to modelize the Toggle-recoil technique as the compressive force of a damped harmonic oscillator, such as a spring. Modelling the fascia using the viscoelastic coefficients of the structures dependent of their densities in the body, by using the finite elements method, could allow to understand and predict better the physiological action and therapeutic effects of the Toggle-recoil technique.

## **REFERENCES :**

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