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The Atlas Vertebrae and its role in the function of the Sacro Occipital Technique (SOT) Categories

Harvey Getzoff

Narrative: The role of the Atlas Vertebrae in human function has been discussed by Chiropractors since the early days of Chiropractic. (4) Dr MB DeJarnette DC, the founder and developer of Sacro Occipital Technique (SOT), has been a valuable contributor to the Atlas discussion.

His work focuses on the role the Atlas plays in the function of three primary systems of the body (known as categories) that comprise Sacro Occipital Technique. (6, 9)

Thus, the intent of this paper is to study the significant role that the Atlas plays in the function of these three SOT categories.

Indexing Terms: Sacro Occipital Technique (SOT); Chiropractic; Atlas;SOT Categories; SOT Indicators.

Introduction

'It is my belief that Chiropractic must study the Atlas Vertebrae as it relates to the system in which it resides'

The atlas vertebrae (cervical 1) play a critical role in supporting the head, facilitating head movement and protecting the spinal cord. Its unique structure and articulation with the cranium and the axis vertebrae (cervical 2) enable a wide range of motion, while its intricate connections with the vertebral artery and spinal cord emphasises its importance in maintaining neurological function

> *... **DeJarnette:** 'To bring order out of chaos SOT offers the category system' ...'*

The Principles of the SOT Categories

SOT was founded and developed by Dr MB DeJarnette. It is based on the identification (via SOT indicators) of the state of function of three primary systems of the body (known as 'categories') and the SOT adjustments considered necessary to affect change. (21, 22, 14) The three SOT Categories are each clinically definable, but at the same time interrelated.

Category One

Category one refers to the Primary Cranial Sacral Respiratory Mechanism (PCSRM). '*Respiratory refers to the inherent motion of the cranial and sacral portions of the PCSRM, that allows for tension on the dura and the movement of cerebral spinal fluid throughout, protecting and nourishing the Central Nervous System*'. (22, 14, 6, 7)

Category Two

Category two refers to the Weight Bearing System of the body. '*It is based on the body's primary neurological principle, the ability of the body to receive sensory input, the integration of this input and the capacity of the body to react to that input through the muscles, all while the Nervous System is responding to the presence of a category two ligamentous sacroiliac weight- bearing instability. Often the sacroiliac instability is the result of other disturbances in the structural system*'. (21, 14, 6, 9)

Category Three

Category three addresses lumbar subluxations, lumbar disc lesions, and the condition of the sciatic nerve, all in the presence of functionally needed, *piriformis* muscle, *psoas* muscle and upper cervical adaptations. (26, 14, 6, 9)

SOT's primary functional indicators that designate the category most in need of adjustment

Category one heel tension monitors the involvement of the atlas in sustaining the function of the PCSRM. (To be discussed more thoroughly as this paper proceeds).

Category two arm/fossae monitor the nervous system's response to instability of the sacroiliac weight-bearing joint.

Category three 'step out toe out' (SOTO) monitors the piriformis muscles response to a lumbar disk lesion and the possible entrapment of the sciatic nerve.

All three of these tests indicate the need for SOT blocking techniques. (22, 26, 14)

SOT Categories =

a Model of Function + a State of Dysfunction + a Method of Adjustment

SOT Categories and the Atlas Vertebrae

Each of the three categories are defined by SOT indicators. (16, 19) Cervical indicators, stairstep, figure eight and cervical ranges of motion (ROM), are not category indicators. Nevertheless, each cervical indicator allows for cervical analysis, adjustment and assessment within its category systemic framework. Dejarnette states '*SOT views the cervical column as part of the total and is responsive to that which help the total respond*'. (6, 9)

Homeostasis, as defined in the Oxford Dictionary states '*A system has a tendency to maintain internal stability, owing to the coordinated response of its parts to any situation or stimulus that would tend to disturb its normal condition of function*' and '*Systems are ever changing processes of self-organisation, growth, and adaptation*'. (15)

Cervical analysis and adjusting serves as an essential part of each of the three SOT categories.

SOT's cervical figure eight and stairstep simultaneously, are both analytical and adjusting techniques.

*Refer to the appendix for illustrations of the figure eight and the stairstep

Discussion #1: SOT Categories

Category One

The atlas adapts to a functional position that allows for dural membrane tension to be maximised. Dural tension is considered as the key component of the PCSRM (category one). Therefore, the atlas vertebrae play an important role in cranial/sacral respiratory function, resulting in the movement of Cerebral Spinal Fluid (CSF) throughout the Central Nervous System. (14, 22)

DeJarnette in his 1979 *Cranial Technique* text wrote that '*The constant pumping of CSF, essential to health, is done by dural tension with its basic anchor at sacral three and its superior spinal anchor at the superior rim of the atlas, the axis and cervical three*'. (6, 9) In the presence of a sacral, spinal or cranial dysfunction atlas adaptation becomes imperative to the maintenance of the PCSRM as it strives for maximum function.

Category One: In his 1980 Sacro Occipital Technique text DeJarnette states that '*The objective of category one blocking was to return the atlas vertebrae to a normal range of compensating motion*'. (6, 9)

Category Two

Category Two is based on the ability of the body to function at its maximum in the presence of a breakdown of its weight bearing structures. Even though a breakdown of the category two system often reflects itself on the weight bearing portion of the sacroiliac joint all weight bearing structures could be and are usually involved. (14, 22) DeJarnette contended '*that cranial sutural dysfunction altering head posture can be reflected throughout the entire postural system*'. (6, 7, 9) The atlas can be key in the process of righting the head, to maximise its functional effect on the entire weight- bearing system.

In the book, *Chiropractic approach to head pain*, Chek and Curl write '*the upper cervical spine maintains an intimate relationship with the cranium as well as a tremendous influence over the structures below*'. (8) They also make the following comment: '*The influence of the atlas is believed to come primarily from influences of the mechanoreceptors and nociceptors of the upper cervical spine, traction of the cord by the dentate ligaments and compensatory shifts in the center of gravity of the head and pelvis to maintain stability*'. (8)

Category Two: DeJarnette states it this way: '*The Atlas is the only vertebrae that responds to the cerebral righting mechanism*'. (6)

Category Three

Category Three, even though it addresses lumbar problems, it still functions within a system of compensation and adaptation as the body strives for stability and function in the presence of lumbar structural imbalances. In Category three lateral and medial disc displacements, results in spinal inclines and rotations activating the need for head righting reflexes. The eyes attempt to stay level, focused on the horizon, whereas the atlas because of its articular and neuromuscular relationship with the cranium, becomes a major player as the body seeks stability, function and equilibrium." DeJarnette writes, "Without the function of atlas resistance the ability of the body to cope with the presence of lumbar subluxations would be greatly impeded." (6,9)

The piriformis muscles test known as, the Step Out Toe Out, (SOTO) manoeuvre, the psoas muscles along with cervical evaluation and adjustment (stairstep and figure eight) are all necessary parts of the Category three protocol. (2,6) '*A system's members are related. A change in one member will cause a change in other members and a change in the system and its organising principles*'. (22,24)

> **Category Three:** DeJarnette writes that '*the atlas is greatly affected by the functional position of lumbar five and responds to changes in its position*'. (6, 9)

Discussion #2: Bone Remodelling

According to Guyton '*the shape of a bone can be rearranged for proper support of mechanical forces by deposition and absorption of bone in accordance with stress patterns*'. (27) Wolff's Law emphasises that '*the shape of a bone depends upon the physical stresses applied to it*'. (28)

There are extensive studies that investigate the asymmetry of the adult atlas. In these studies, variation in the morphological development of the atlas is a common finding. In the Doherty and Heggeness study '*a significant variability was noted in objective measurements of the lateral mass height and the sagittal plane widths of the entire bone, of eighty-eight dried human atlas vertebrae*'. (11) Pei Feng et al further stated that the '*atlas asymmetry was of different shapes on both sides*', in sixty adult atlas computer models. (12) Nandini and his team described in their study of the atlas '*the variation in shape and dimension, left to right, of the superior articular facets of the atlas in fifty dried specimens*'. (3)

In his textbook, Facial Growth, Enlow states the following, '*Development is a process working to an ongoing state of aggregate, composite structural and functional equilibrium. Any change in any given part must be proportionately matched by appropriate growth changes and adjustments in many other parts, nearby as well as distant to sustain and progressively achieve functional and structural balance of the whole*'. (13)

Remodelling of bone should be considered a necessary process (form fits function) so that functional systems are able to maintain themselves.

Conclusion

Dejarnette's understanding of the abilities of the atlas vertebrae to respond to different functional needs, its remarkable design and the ability of all tissue to respond to the demands placed on it, (form fits function), support the belief that we Chiropractors need to study the atlas within the system it resides.

When examining the multi-adaptive qualities of the atlas vertebrae and its position allowing for visual and vestibular accommodations, it becomes even more apparent that it can enable functional systems to sustain themselves in the presence of structural breakdowns. '*A system is dynamic, energy is always flowing, change is continual. A system can only be defined in the presence of function and process*', '*there is no such thing as a still system*', (24) or a still (non-evolving) atlas.

Further study into the role of the atlas as both an indicator of body function as well as a focal point for analysis and adjustment, within the system it resides, is clearly warranted.

DeJarnette: '*To bring order out of chaos SOT offers the category system*'. (6, 9, 14)

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Appendix

Stairstep and Figure 8 Cervical Analysis and Adjustment

Test Rotational Range of Motion and Record

Stairstep

- **Place your hands to lateral part of skull**
- **Index and middle fingers above ear**
- **Push towards feet keeping chin and forehead level**
- **Look for restriction of motion**

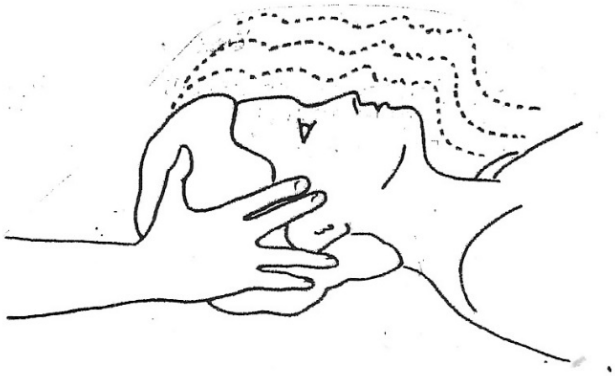
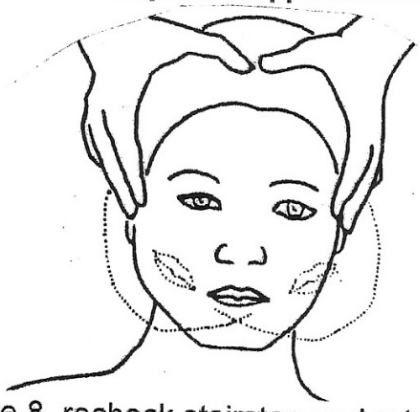


Figure 8 Adjustment

- **Stairstep hand position**
- **Draw the skull lateral (ear towards shoulder)**
- **Then slightly superior**

Then medial and inferior so as to cross sagittal plane of body (jaw towards shoulders)

- **Repeat on opposite side**



After applying figure 8, recheck stairstep and rotation range of motion

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