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In This Issue

It's all about the disc-1
The Autonomic Nervous System-2
Dr. Werking Obituary-3
Mechanics Workshop-4
Diplomate Program-4
Contributors-7
Seminars-8
Classified-9

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It's all about the Disc, The Disc, The Disc

By: Daniel D. Lyons, D.C., DPhCS

I would like to begin this article with an apology to you all, especially Michele Hohmann, Dr. Jeanne Taylor and the GCSS Board. When I took on the role of the Publications Chair I thought it would get me to read and write more, and it has. But I did not realize how much I would get lost in research rabbit holes and then miss publication deadlines. Nor did I realize how paralyzed I would become by my questioning of whether or not my work was worthy of publication. I will be better on all counts and I thank you for your support.

This article is a scientific/philosophical look at what we do day in and day out in our practices. Simply put, chiropractic is the detection and correction of vertebral subluxation. That is the most accurate description there is. What sets chiropractors apart from one another is their thought process regarding detection and correction, how congruent those thought processes are with the principles of chiropractic and how good the DC is at delivering the goods. Our product is not an adjustment. Our product is a nervous system free of interference which allows full expression and adaptation. On the surface, getting from point A (subluxated) to point B (subluxation free) seems simple. In reality it is as simple as tracing a single piece of spaghetti from start to finish on a family style service tray.

The practice of Gonstead chiropractic differs from all others in that we focus on the disc and that we look at the spine as an inseparable unit. Through our analysis, developed on our philosophy, we have all found subluxations far removed from where we would have expected them to be if they were causing the patient's symptom. When the subluxation was corrected, the symptom resolved. Currently I am taking care of a 24 year old surgical tech. The spine surgeon she works with could find no reason for her sciatica. She has a severe S shaped C-spine and anterior translation of the head. 4 visits worth of cervical work and her sciatica is much improved. She suffered 2 years of increasing pain because others were looking in the wrong place. The place is the spine, not a part of the spine. To that end, spinal imaging is of paramount importance and most of the profession does not do it. Those who do, tend to do it poorly.

In April 2019 the “American Association of Physicists in Medicine” recommended the discontinuation of Gonad and Fetal shielding in radiography. They said, “Patient gonadal and fetal shielding during x-ray based diagnostic imaging should be discontinued as routine practice. Patient shielding may jeopardize the benefits of undergoing radiological imaging. Use of these shields during x-ray based diagnostic imaging may obscure anatomic information or interfere with the automatic exposure control of the imaging system. These effects can compromise the diagnostic efficacy of the exam, or actually result in an increase in the patient's radiation dose. Because of these risks and the minimal to nonexistent benefit associated with fetal and gonadal shielding, AAPM recommends that the use of such shielding should be discontinued.” Additionally, the AAPM recommends that radiologic technologist educational

(It's All About the Disc—Continued on page 2)

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(It's All About the Disc—Continued from page 1)

programs (including patient outreach efforts) provide information about the limited utility and potential drawbacks of gonadal and fetal shielding.

“Rationale for policy: *Gonadal and fetal shielding in x-ray imaging has for decades, been considered consistent with the ALARA principle and therefore good practice. Given advances in technology and current evidence of radiation exposure risks, the AAPM has reconsidered the effectiveness of gonadal and fetal shielding.*”

You can read the entire release here: <https://www.aapm.org/org/policies/details.asp?id=468&type=PP>

If you read it all and follow the links, you will find that the “American College of Obstetricians and Gynecologists” support radiography when needed during pregnancy and has the supporting evidence that lumbar imaging is, at it’s most dangerous, 1/5 (10mGy dose of 50mGy threshold) of the dose needed to cause damage to the most susceptible neonate.

Reading this brought a smile to my face as I remembered Dr. Phyllis Markham always saying that the gonad shielding was bad practice because it routinely covered something we wanted to see and asked me why I did not x-ray pregnant women or babies. My response was, “because I want to keep my license!” It is good to see that times may be changing.

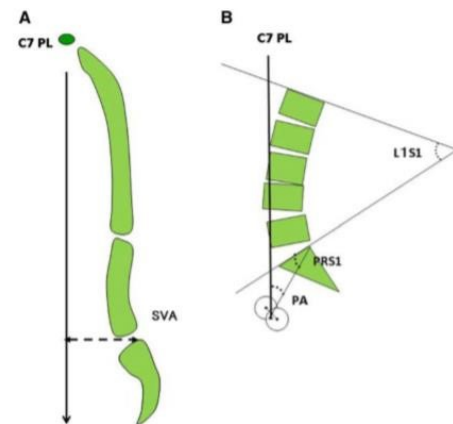
The meat of this article is centered on the changes we see or should see on our films. Our job is to correct subluxations, not to change curves. However, subluxation do eventually change curves and if we are correcting VS then we should see those curves return. The science of the Gonstead method is in how we put all the facets of our system together into a **repeatable** system. Repeatability is the hallmark of science.

In 2010, Kenji Endo et al, published a paper in the *European Spine Journal* titled, “Sagittal spinal alignment in patients with lumbar disc herniation”. In this paper they looked at several measurements we can and should be looking at on our patients films. These measurements have been shown to be an accurate predictor of degeneration (a leading indicator vs a lagging indicator) and disability.

These measurements are: SVA or Sagittal Vertical Axis (the horizontal distance between the posterior aspect of the sacral plateau and the C7 plumb line), L1S1 (Lumbar curve measured from the top of L1 to the sacral plateau), PA or pelvic tilting angle (The angle formed by the C7 plumb line and a line connecting the posterior sacral plateau and the midpoint of the line bisecting the

femur heads) and the PRS1 or pelvis morphologic angle (the angle between the sacral base and the line connecting the posterior sacral plateau and a the midpoint of the line bisecting the femur heads).

Fig. 1 Measurements of (a) SVA and (b) lumbopelvic balance. C7 PL, C7 plumb line; SVA sagittal vertical axis (mm); L1S1 L1S1 angle; PA pelvic tilt angle; PRS1 pelvic morphological angle



They found that the likelihood of disc herniation was far greater for individuals with high SVA and PA measurements than those with lower ones and that the herniation group also had lower L1S1 measurements. They also found that after surgery, these measurements improved significantly post surgery.

Table 1 JOA scores and spinal parameters in control and LDH groups

	Control subjects	LDH patients	
		Before surgery	6 months after surgery
n	26	61	–
Gender (male/female)	15/11	38/23	–
Age (years)	22–51 (32.7)	20–49 (32.7)	–
JOA*	–	3.5 ± 1.7	7.6 ± 0.8
SVA (mm)*	1.5 ± 17.7	32.7 ± 46.5	6.7 ± 27.7
L1S1 (°)*	49.0 ± 10.0	36.7 ± 14.5	44.8 ± 10.8
PA(°)*	18.0 ± 6.0	25.1 ± 9.0	21.3 ± 7.0
PRS1°*	36.6 ± 10.4	36.5 ± 8.9	36.3 ± 7.4

* Values are expressed as mean ± SD

These types of spinographic findings are regularly seen as patients presenting for care and these measurements can aid in patient management. Patients with higher SVA and PA and lower L1S1 measurements are more likely to have disc herniation and require more care and be handled more gently than someone without.

(It's All About the Disc—Continued on page 3)

(It's All About the Disc—Continued from page 2)

In 2007, Carrey C et al found that *“The loss of lumbar lordosis in LDH is not likely to be due to severe structural deformity. Rather, it may be secondary to segmental discopathy or small loss of disc height, a postural change secondary to an analgesic response to avoid posterior disc hyperpression, or foraminal stenosis due to a herniated disc.”* Kenji Et al also found that *“the relation between spinal alignment and SVA is independent. However, in the LDH group at baseline (before operation), the SVA was affected by spinal parameters. This could be interpreted that patients with LDH exhibit lack of spinal compensation to changes in spinal alignment and that such ability recovers after surgery.”*

This goes back to our unique chiropractic philosophy and analysis of the entire spine. The spine is one unit, as is the nervous system and the body and what happens in one part has an effect on the others (17. *Cause and Effect—Every effect has a cause and every cause has effects.*) Sometimes this effect is big and sometimes small. Sometimes it is noticeable immediately and sometimes it takes time (6. *The Principle of Time—There is no process that does not require time.*). Carrey's 2007 statement begs the question, *“Which came first, the chicken or the egg?”* From our perspective it stands to reason that a subluxation could and should cause those changes. We know the disc is fed by motion (*International Society for the Study of the Lumbar Spine 1994*). We know that disc degeneration leads to decreased ROM (Muturi G. Muriuki et al. *Effects of Motion Segment Level, Pfirrmann Intervertebral Disc Degeneration Grade and Gender on Lumbar Spine Kinematics JORM 2016*). We know that the primary mechanical cause of scoliosis is the disc (Rob C. Brink et al. *Anterior Spinal Overgrowth is the result of the Scoliotic Mechanism and is located in the disc. Spine 2017*). We know that the potential for disc calcification leading to stiffness and reduced ROM increases with degeneration (Jia Shao et al. *Differences in calcification and osteogenic potential of herniated discs according to the severity of degeneration based on Pfirrmann grade: a cross-sectional study BMC Muscular disorders 2016*). We know that disc degeneration and osteophytes (both part of degeneration and the bodies attempt to adapt and move) cause loss of spinal flexibility (Feng Zhu et al. *Does the disc degeneration and osteophyte contribute to the curve rigidity of degenerative scoliosis? BMC Muscular disorders 2017*) and we know that in the absence of compression fracture or vertebral body collapse, the only

structure that is able to cause measureable changes in the spine is the disc (LOGIC).

When you look at the large amount of evidence supporting Dr. Gonstead's disc theory, one finds it shocking that more chiropractors aren't investing their time and energy in learning it. One also comes to the conclusion that correcting the disc is the only thing that can change the SVA, PA and the PRS1.

One might say that the reduction of pain could cause these measurements to improve and I would agree. I would then ask, *“What was causing the pain?”* To answer that I would point to the work of Alf Nachemson and Kuslich SD et al. In 1976 Alf Nachemson published his finding in which he said, *“investigations have been performed in which thin nylon threads were surgically fastened to various structures and around the nerve root. Three to four weeks after surgery these structures were irritated by pulling on the threads, but pain resembling that which the patient had experienced previously could only be registered from the outer part of the annulus of the disc.”* In 1991 Kuslich et al published their study, *“The tissue origin of low back pain and sciatica: a report of pain response to tissue stimulation during operations on the lumbar spine using local anesthesia.”* They wrote, *“In an effort to define the origin of low back pain and sciatica, 193 patients were carefully studied using progressive local anesthesia. These patients had surgery for herniated discs, spinal stenoses, or both. Various tissues were stimulated during the performance of these lumbar spinal operations.”* In all cases the only tissues that reproduced the pain were an inflamed nerve root or the disc.

In using these metrics during film analysis, it is important to consider the entire spine. The PRS1, which is similar to the Adjusted Sacral Base (ASB) that the CBP group uses, gives us insight into what type of curves an individual should have based on their normal. Someone with a higher normal Pelvic angle (PA) will have a lower normal sacral slope and will (and should) have lower lumbar, thoracic and cervical curves. A deviation from that pattern, without bony deformity, can indicate a region of the spine which may be subluxated and in the process of degeneration. By looking at these measurements and using them as an accurate and objective measurement of the effectiveness of our care, we can improve the health of our patients and the profession. ♦