Dr. James Cox presents treatment of scoliosis due to various causes, latest published literature findings, and in-office patient cases.
Sciatic Scoliosis

- Sciatic scoliosis is due to irritation of the spinal neurons in radiculopathic stimulation and its resultant muscle activity.

- Hirayama et al in Spine 2001;26(6):602-9 reported on the effects of electrical stimulation of the sciatic nerve on background electromyography and static stretch reflex activity of the trunk muscles in rats. They verified the hypothesis that sciatic scoliosis is induced reflexively by radiculopathic pain, and that scoliosis might be maintained by prolonged asymmetric alteration of the trunk muscle tonus caused by central sensitization of the spinal neurons that constitute the postural reflex pathways.
Sciatic Scoliosis

Sciatic scoliosis usually occurs with convexity to the side of the herniated disc. The neuronal mechanism of sciatic scoliosis has not been well clarified.

In spinalized rats (transection of the spinal cord), the sciatic nerve was stimulated electrically as a conditioning stimulus. Muscle stretch elicited by bending of the lumbar spine was applied as a test stimulus.
Sciatic Scoliosis

It was found that the pattern of electromyographic activity of the trunk muscles evoked by sciatic nerve stimulation coincided with the typical direction of sciatic scoliosis in patients with lumbar disc herniation. It was supposed that the prolonged asymmetric alteration of the trunk muscle tonus was caused by central sensitization, and that central sensitization of spinal neurons may underlie the neuronal mechanism of sciatic scoliosis.
Sciatic Scoliosis

As opposed to the work of Finneson and Herlin, the sciatic scoliosis may not be, or not only be, the mechanical embarrassment of the nerve root or dorsal root ganglion by disc invasion of territory, but the embarrassment of the neurological bed of the nerve root resulting in the resultant muscle spasm and scoliosis.

This is what we are discussing in this course. Let's start with a patient case presentation and treatment...
Left Thoracolumbar Scoliosis in a Young Male

Cox® Technic Flexion-Distraction and Decompression done to all curves using all motions of the Cox® Table lying supine and side-lying.

Side Notes: This patient moved to Fort Wayne from another city where he was treated by a chiropractic physician with Cox® Technic. He came to our office seeking the same care.

At the second visit, the patient reports a drop in his VAS score from a 7 to a 1 with improvement noted in his shoulder and low back.
Dr. Cox introduces this discussion of degenerative scoliosis and its management.


Dr. Cox shows imaging and discusses scoliosis cases.
Degenerative Scoliosis (cont.)


Motions of Treatment

- In the following videos, Dr. Cox demonstrates treatment application options for specific conditions. The caudal section of the flexion-distraction instrument – **The Cox®7 Table** is used here - may be used or the thoracic restraint or the automated feature or the cervical spine headpiece or its restraint. Any condition can be treated in any number of ways. To clarify how Dr. Cox makes the table move, please review the following images.
Foot Switch Strip

to Activate Long-Y-Axis while treating the Thoracic Spine
Tiller Bar Handle Button (top)

to Activate Long-Y-Axis while treating the Thoracic Spine
Table Handle Locks
Treatment Demonstration:
Charite Disc Replacement/Dextrorotatory Scoliosis

- This is a case of L4 Charite Disc Replacement with and L5 Disc herniation and dextrorotatory scoliosis.
- The Rule of 50% is discussed in relation to the treatment plan to relieve S1 dermatome pain.
Hyperkyphosis & Scheuermann's Disease treated in the supine position.
Dr. Cox demonstrates flexion-distraction long-y-axis decompression spinal adjusting (low-velocity, low-amplitude adjusting) for any condition needing gentle thoracic spinal adjusting. Patients working on computers and carry much stress really appreciate this care.
Hyperkyphosis / Scheuermann's Disease / Upper Thoracic Spine *Low-Velocity/Low-Amplitude* (LVLA) Adjusting using the Cervical Headpiece

- **Highlights:**
  - Use of the cervical spine restraint to treat the thoracic spine curvature.
  - Long Y axis automated distraction with cervical headpiece restraint in place.

- **Goals:**
  - drop intradiscal pressures
  - increase foraminal area
  - restore physiological ranges of motion
For some patients, this very gentle application is preferred.
Compression Fracture Treated in the Supine Position
Case - Scheuermann's Disease

Here is a patient case of Scheurmann's Disease treated in the office.
- use of occipital restraint to treat hyperkyphosis
- use of long y axis automated to treat thoracic spine (LVLA low velocity low amplitude)
- treatment without occipital restraint
- use of foramen magnum pump

Initial Visit: 25 year old, post-partum 8 months, hyperkyphosis, extension irritates low back pain

Outcome of Case: At the third visit, the patient reported that the neck and shoulder pain is gone and the low back pain is over 50% gone.
Demonstration of the Mehta exercises with a male spine

- Exercises for scoliosis are for **strengthening the convex side of the curve and ensuring its mobility**, the same goals for adjusting scoliosis. We are not looking to necessarily correct the curve or reverse it, but rather ensure its mobility. Mehta Exercises are excellent tools the patient can do alone or, optimally, with a helper. Both ways are demonstrated, first alone in this video and with a helper in the next.

Mehta Exercises for Scoliosis

Curve Strengthening

- Here is a demonstration with a helper assisting.
The following slide presentations are discussions of the latest published articles related to scoliosis, both idiopathic as well as degenerative: bracing, exercise, diagnosis strategies, causes, biomechanics, potential solutions.

Each slide has a list of the articles discussed with a link to the abstract of the article or book chapter for your later study.
Scoliosis Literature – Bracing Sources

- Negrini, S; Minozzi, S; Bettany-Saltikov, J; Zaina, F; Chockalingam, N; Grivas, TB; Kotwicki, T; Maruyama, T; Romano, M; Vasiliadis, ES. **Braces for Idiopathic Scoliosis in Adolescents.** Spine 2010; 35 (13): 1285-1293 [Link to Abstract]

- Danielsson, Aina J.; Hasserius, Ralph; Ohlin, Acke; Nachemson, Alf L. **Health-Related Quality of Life in Untreated Versus Brace-Treated Patients With Adolescent Idiopathic Scoliosis: A Long-term Follow-up.** Spine 2010; 35(2):199-205 [Link to Abstract]

- Lou, E; Hill, D; Raso, J: **Brace Treatment for Adolescent Idiopathic Scoliosis.** Conservative Scoliosis Treatment: 1st SOSORT Instructional Course Lectures Book 135. 2009 [Link to Book]

- Scoliosis. Grivas, TB; Rodopoulos, GI; Bardakos, NV: **Biomechanical and Clinical Perspectives on Nighttime Bracing for Adolescent Idiopathic Scoliosis.** Conservative Scoliosis Treatment: 1ST SOSORT Instructional Course Lectures Book 135. Amsterdam: I O S Press, 2009 [Link to Book]

- Katz, DE; Herring, JA; Browne, RH; Kelly, DM; Birch, JG. **Brace Wear Control of Curve Progression in Adolescent Idiopathic Scoliosis.** Journal Of Bone And Joint Surgery-American 2010; 92A (6):1343-1352 [Link to Abstract]

- Fayssoux, RS; Cho, RH; Herman, MJ. **A History of Bracing for Idiopathic Scoliosis in North America.** Clinical Orthopaedics And Related Research 2010;468 (3): 654-664 [Link to Abstract]
Scoliosis Research II - Sources

- Schiller, JR; Thakur, NA; Eberson, CP. Brace Management in Adolescent Idiopathic Scoliosis. Clinical Orthopaedics And Related Research 2010;468 (3):670-678 Link to Abstract


- Bettany-Saltikov, J; Warren, J; Stamp, M: Carrying a Rucksack on either Shoulder or the Back, Does it matter? Load Induced Functional Scoliosis in "normal" young subjects. Research Into Spinal Deformities 6 140. 2008. p.221-224 I O S PRESS, AMSTERDAM Link to Book

- Domenech, J; Tormos, JM; Barrios, C; Pascual-Leone, A. Motor cortical hyperexcitability in idiopathic scoliosis: could focal dystonia be a subclinical etiological factor?

- Kirby, AS; Moulton, A; Dangerfield, PH; Freeman, BJC; Cole, AA; Polak, FJ; Pratt, RK. Ultrasound femoral anteversion (FAV) and tibial torsion (TT) after school screening for adolescent idiopathic scoliosis (AIS). Research Into Spinal Deformities 6 140. 2008. p.225-230 I O S PRESS, AMSTERDAM Link to Book

- Burwell, RG; Aujla, RK; Freeman, BJC; Dangerfield, PH; Cole, AA; Kirby, AS; Polak, FJ; Pratt, RK; Moulton, A. The posterior skeletal thorax: rib-vertebral angle and axial vertebral rotation asymmetries in adolescent idiopathic scoliosis. Research Into Spinal Deformities 6 140. 2008. p.263-268 I O S PRESS, AMSTERDAM Link to Book

- Stokes, IAF; McBride, CA; Aronsson, DD. Intervertebral disc changes in an animal model representing altered mechanics in scoliosis. Research Into Spinal Deformities 6 140. 2008. p.273-277 Link to Book
Scoliosis Research II - Discussion
Scoliosis Research III - Sources

- Fong, Daniel Yee Tak; Lee, Chun Fan; Cheung, Kenneth Man Chee; Cheng, Jack Chun Yiu; Ng, Bobby Kin Wah; Lam, Tsz Ping; Mak, Kwok Hang; Yip, Paul Siu Fai; Luk, Keith Dip Kei. **A Meta-Analysis of the Clinical Effectiveness of School Scoliosis Screening.** Spine 2010; 35(10):1061-1071 [Link to Abstract]
- Ugras, AA; Yilmaz, M; Sungur, I; Kaya, I; Koyuncu, Y; Cetinus, ME. **Prevalence of scoliosis and cost-effectiveness of screening in schools in Turkey.** Journal Of Back And Musculoskeletal Rehabilitation 23 (1). 2010. p.45-48 [Link to Abstract]
- Wang, Chuanfeng; Xu, Weidong; He, Shisheng; Gu, Suxi; Zhao, Yingchuan; Zhang, Jingtao; Zhu, Xiaodong; Li, Ming. **Differences in Postoperative Quality of Life Between Adolescent Patients With Idiopathic Scoliosis Residing in Urban and Rural Environments.** Spine 2010. 35(6):652-656, March 15, 2010. [Link]
- Akoume, MY; Azeddine, B; Turgeon, I; Franco, A; Labelle, H; Poitras, B; Rivard, CH; Grimard, G; Ouellet, J; Parent, S; Moreau, A. **Cell-Based Screening Test for Idiopathic Scoliosis Using Cellular Dielectric Spectroscopy.** Spine 2010;35 (13):E601-E608 [Link]
- Grivas, TB; Vasiliadis, ES; Rodopoulous, G. **Aetiology of Idiopathic Scoliosis. What have we learned from School Screening?** Research Into Spinal Deformities 6 140. 2008. P.240-244 I O S Press, Amsterdam [Link]
Scoliosis Research III - Discussion

Weiss H, Maier-Hennes A: **Specific exercises in the treatment of scoliosis.** Conservative Scoliosis Treatment: 1st SOSORT Instructional Course Lectures Book 135; 2009 [Link to Book]


Rigo M, Quera-Salva F, Villagrasa M et al: **Scoliosis intensive out-patient rehabilitation based on Schroth Method.** Conservative Scoliosis Treatment: 1st SOSORT Instructional Course Lectures Book 135; 2009 [Link to Book]

Dobosiewicz K, Drumala J, Kotwicki T: **Dobosiewicz Method physiotherapy for idiopathic scoliosis.** Conservative Scoliosis Treatment: 1st SOSORT Instructional Course Lectures Book 135; 2009 [Link to Book]

Weiss H, Rigo M: **The Cheneau Concept of Bracing - Actual Standards.** Conservative Scoliosis Treatment: 1st SOSORT Instructional Course Lectures Book 135; 2009 [Link to Book]

Durmala J, Tomalak W, Kotwicki T: **Function of the respiratory system in patients with idiopathic scoliosis reasons for impairment and methods of evaluation.** Conservative Scoliosis Treatment: 1st SOSORT Instructional Course Lectures Book 135; 2009 [Link to Book]

Rigo M, Weiss H: **The Cheneau Concept of Bracing - Biomechanical Aspects.** Conservative Scoliosis Treatment: 1st SOSORT Instructional Course Lectures Book 135; 2009 [Link to Book]


Christine C, Alin C, Riward C: **Treatment of early adolescent idiopathic scoliosis using teh SpineCor System.** Conservative Scoliosis Treatment: 1st SOSORT Instructional Course Lectures Book 135; 2009 [Link to Book]
Scoliosis Research IV -
Discussion
**Scoliosis Research V – Sources for Brace Types & Outcomes**

- **Sforzesco Brace** - Ananasio, Saina, Negrini: The SPoRT (Symmetric, Patient-Oriented, Rigid, Three-dimensional active) concept for scoliosis bracing: principles and results. *Conservative Scoliosis Treatment: 1st SOSORT Instructional Course Lectures Book* 135. 2009 [Link](#).
- **Cosmetic Effect in IS Kids** - Grivas T, Vasiliadis E: Cosmetic Outcome after Conservative Treatment of Idiopathic Scoliosis with a Dynamic Derotation Brace. *Conservative Scoliosis Treatment: 1st SOSORT Instructional Course Lectures Book* 135. 2009 [Link](#).
- **Quality of Life** - Vasiliadis E, Grivas T Quality of life after conservative treatment of adolescent idiopathic scoliosis. *Conservative Scoliosis Treatment: 1st SOSORT Instructional Course Lectures Book* 135. 2009 [Link](#).
Scoliosis Research V –
Discussion of Brace Types & Outcomes
Thank you for studying with me degenerative and idiopathic scoliosis: the latest in biomechanics, diagnosis, and treatment. Scoliosis is a challenging condition demanding confident, gentle care with a realistic goal of maintaining mobility and flexibility as well as building strength into a curve that may not ever be straightened, but deserving of good care.

James M. Cox, DC, DACBR
www.coxtechnic.com
info@coxtechnic.com