Triune Autonomic Nervous System:  

*Experimental Applications*

*based on Craniosacral Therapy*

John Chitty, RPP, RCST  
Colorado School of Energy Studies  
www.energyschool.com
Cranial Osteopathy Pioneers

William Sutherland 1873-1954
Randolph Stone 1890-1981
Rollin Becker 1918-1994
Robert Fulford 1907-1998

“My patients are happy, and my colleagues think I’m nuts.”
—Becker

The origin of Cranial Osteopathy is generally attributed to Sutherland, who detected subtle micro-movements in the bones, membranes and fluids of his patients. His experiments with this phenomenon yielded excellent therapeutic benefits, but generally his work was not embraced by his colleagues though some osteopaths did pursue the topic and continue to develop its theories and methods. Beginning in the 1970s, other health care professionals became interested in the concepts, under the term Craniosacral Therapy.
Basic Principles
of Sutherland’s Cranial Osteopathy

• “Original Health” is always present and palpable as a cyclic longitudinal “tidal” movement in the midline of the body.
• Subsurface tissues can be “palpated,” BUT it’s a hard-to-learn skill comparable to “remote viewing.”
• If you can accurately palpate anatomy, it may express itself through sensation, movement and other phenomena. This expression may constitute self-corrective processing, creating healing from the inside out.
• Encountering an anatomical expression, the practitioner supports movement in the direction of ease, rather than pushing towards a hypothetical symmetry or ideal state.
• The client’s system knows the pathway back to health: “inherent treatment plan.” Practitioner is a witness more than a fixer.
“Remote Viewing” Anatomy Comments

Description of the technique is rather difficult to put into words… To learn to feel function, to think function and to know function within anatomical physiology, is not an easy art and skill for the physician to develop. It takes hours, days, weeks and years to bring this training into the hands, eyes, ears and minds of the physician… One of the fundamental keys to diagnosis and technique is the ability to get within the cranium mentally and visualize all the activities going on.

--William Sutherland, DO, Contributions of Thought, p. v., p. 45.

I realized I would have to develop a type of palpatory skill whereby I could hear what the body physiology had to say, instead of me telling it what to do... It is a form of palpation that one might call an alert observation type of awareness for the functions and dysfunctions from within the patient, utilizing the motive energy deep within the tissues themselves… The patient is guessing as to a diagnosis, the doctor is scientifically guessing as to a diagnosis, while the patient’s body knows the problem and is manifesting it through the tissues.

--Rollin Becker, DO, Life In Motion, p. 142

[This work] enables the transfer of therapeutic information from the therapist to the patient with no other tool than human thought. Derived from Osteopathic principles, it is based on the ability of the operator to visualize his patient’s organs and tissues as a three dimensional fabric. To achieve this ability, the operator must learn how to fuse his senses of touch and vision into one sense. With experience, the operator can create “palpable images” of the organs or tissues he wishes to treat. Pathology is felt as irregularities in the “fabric” occupied by the “patient.” Treatment consists of an unwinding, a loosening or a tensing up of the knots or nodes felt by the operator. The operator learns how to feel the patient with his total self, not just with his hands.”

--Michel Abehsara, DO, www.connective.org
Why was Sutherland not more accepted?

- Too hard to learn?
- Takes too much time with each patient?
- Results defy explanation with conventional allopathic assumptions?
- Results lack predictability?
- Too many subjective factors for research?
- Too esoteric?
- Paradigm problem: healing comes from within!
Early Success in Search for Autonomic NS “Portals” (Stone, 1948)

---

**Fig. 7.3.** Parasympathetic contact areas

**Fig. 7.4.** Sympathetic contact areas

Art adapted from Sills, Polarity Process
Stephen Porges, Originator of the Polyvagal Theory

The Poly-Vagal Theory

The Poly-Vagal Theory is based on several premises. Some are firmly grounded in neurophysiological and neuroanatomical data and others are more speculative. The first premise articulates the neural regulation of bradycardia and RSA. Based upon the initial premise, it is hypothesized that the neurogenic bradycardia associated with the orienting reflex are mediated by DMNX and that the suppression of heart rate variability (i.e., reduced amplitude of RSA) is mediated by NA.

Premise 1: Neurogenic not respond in concert.

Physiological support 1: independent of NA, is; chronic bilateral lesion: bradycardia in conscious with a response latency McCabe, & Schneidere in rabbits, following su possibility that vagal p heart rate.

During the past three years we have been testing a new biologically-based intervention to children between 2-5 years of age. We have tested more than 60 children in a design that allows us to assess social interaction and communication skills immediately before and after intervention with our children. The results demonstrate significant improvements in communication skills immediately after intervention with this protocol.

Complete Porges biography & bibliography: http://www.psych.uic.edu/faculty/porges.htm

Stephen Porges, PhD
Director, Brain-Body Center
University of Illinois, Chicago

The Listening Project
Stephen W. Porges, Ph.D.
Chair, Department of Human Development
Director, Institute for Child Study
University of Maryland
College Park, MD 20742
sp37@umail.umd.edu

Emotion: An Evolutionary By-Product of the Neural Regulation of the Autonomic Nervous System

STEPHEN W. PORGES
Institute for Child Study
University of Maryland
College Park, Maryland 20742-1131

A new theory, the polyvagal theory of emotions, is presented which links the evolution of the autonomic nervous system to affective experience, emotional expression, vocal communication, and contingent social behavior. The polyvagal theory is derived from the well-documented phylogenetic shift in the neural regulation of the autonomic nervous system that expands the capacity of the organism to control metabolic output. The theory emphasizes the phylogenetic dependence of the structure and function of the vagus, the primary nerve of the parasympathetic nervous system. Three phylogenetic stages of neural development are described. The first stage is characterized by a primitive unmyelinated vegetative vagal system that facilitates digestion and responses to novelty or threat by reducing cardiac output to protect metabolic resources. Behaviorally, this first stage is associated with immobilization behaviors. The second stage is characterized by a spinal sympathetic nervous system that can increase metabolic output and inhibit the primitive vagal system's influence on the gut to foster mobilization behaviors. The third stage, which is unique to mammals, is characterized by a myelinated vagal system that can rapidly regulate cardiac output to foster engagement and disengagement with the environment. The myelinated vagus originates in a brainstem area that evolved from the primitive gill arches and in mammals controls facial expression, sucking, swallowing, breathing, and vocalization. It is hypothesized that the mammalian vagal system fosters early emotions, which in turn may determine proximity, social communication. The polyvagal construct has been previously described as the neurophysiological and neuroanatomical distinction between the sympathetic and parasympathetic nervous systems and proposes that affective behavior and emotion are mediated by the polyvagal system.

There is a consensus that affect is expressed in facial movements and the neural mechanisms regulating these behaviors have been identified. Moreover, the neural mechanisms responsible for the expression of emotion have been identified in the amygdala, hypothalamus, and other structures of the brain. These neural mechanisms control the physical expression of emotion and thus have a direct influence on the expression of emotion. The neural mechanisms that control the expression of emotion are also involved in the regulation of social interactions and are responsible for the expression of emotion in response to social stimuli.

In contrast, the neural mechanisms responsible for the regulation of social interactions are not directly involved in the expression of emotion. The neural mechanisms responsible for the regulation of social interactions are involved in the regulation of the intensity and duration of emotion, and the expression of emotion is influenced by the intensity and duration of social stimuli.

Complete Porges biography & bibliography: http://www.psych.uic.edu/faculty/porges.htm

Stephen Porges, PhD
Director, Brain-Body Center
University of Illinois, Chicago

The Listening Project
Stephen W. Porges, Ph.D.
Chair, Department of Human Development
Director, Institute for Child Study
University of Maryland
College Park, MD 20742
sp37@umail.umd.edu

Emotion: An Evolutionary By-Product of the Neural Regulation of the Autonomic Nervous System

STEPHEN W. PORGES
Institute for Child Study
University of Maryland
College Park, Maryland 20742-1131

A new theory, the polyvagal theory of emotions, is presented which links the evolution of the autonomic nervous system to affective experience, emotional expression, vocal communication, and contingent social behavior. The polyvagal theory is derived from the well-documented phylogenetic shift in the neural regulation of the autonomic nervous system that expands the capacity of the organism to control metabolic output. The theory emphasizes the phylogenetic dependence of the structure and function of the vagus, the primary nerve of the parasympathetic nervous system. Three phylogenetic stages of neural development are described. The first stage is characterized by a primitive unmyelinated vegetative vagal system that facilitates digestion and responds to novelty or threat by reducing cardiac output to protect metabolic resources. Behaviorally, this first stage is associated with immobilization behaviors. The second stage is characterized by a spinal sympathetic nervous system that can increase metabolic output and inhibit the primitive vagal system's influence on the gut to foster mobilization behaviors. The third stage, which is unique to mammals, is characterized by a myelinated vagal system that can rapidly regulate cardiac output to foster engagement and disengagement with the environment. The myelinated vagus originates in a brainstem area that evolved from the primitive gill arches and in mammals controls facial expression, sucking, swallowing, breathing, and vocalization. It is hypothesized that the mammalian vagal system fosters early emotions, which in turn may determine proximity, social communication. The polyvagal construct has been previously described as the neurophysiological and neuroanatomical distinction between the sympathetic and parasympathetic nervous systems and proposes that affective behavior and emotion are mediated by the polyvagal system.

There is a consensus that affect is expressed in facial movements and the neural mechanisms regulating these behaviors have been identified. Moreover, the neural mechanisms responsible for the expression of emotion have been identified in the amygdala, hypothalamus, and other structures of the brain. These neural mechanisms control the physical expression of emotion and thus have a direct influence on the expression of emotion. The neural mechanisms that control the expression of emotion are also involved in the regulation of social interactions and are responsible for the expression of emotion in response to social stimuli.

In contrast, the neural mechanisms responsible for the regulation of social interactions are not directly involved in the expression of emotion. The neural mechanisms responsible for the regulation of social interactions are involved in the regulation of the intensity and duration of emotion, and the expression of emotion is influenced by the intensity and duration of social stimuli.
### Triune Autonomic NS Summary

*For a text overview of Polyvagal Theory, go to [http://www.energyschool.com/writings/triune_autonomic_article.PDF](http://www.energyschool.com/writings/triune_autonomic_article.PDF)*

<table>
<thead>
<tr>
<th>Phylogenetic Sequence &amp; Autonomic Layer</th>
<th>Function</th>
<th>Anatomy &amp; “Portal”</th>
<th>Experimental Hand Position &amp; Visualization</th>
<th>Client Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Parasympathetic</td>
<td>Basic supply of nutrient &amp; oxygen-rich blood to brain</td>
<td>Torso, Vagus N.</td>
<td>Index finger at Vagus N., view path and torso as one unit of function</td>
<td>Track sensations of “Belly Breathing”</td>
</tr>
<tr>
<td>2 Sympathetic</td>
<td>Mobility for “4 F’s” &amp; more sophisticated survival strategies</td>
<td>Sympathetic chain, five appendages</td>
<td>Index finger at superior cervical ganglion, view path down to coccyx, up to pineal gland</td>
<td>Flex arm and leg muscles, track subsequent sensation</td>
</tr>
<tr>
<td>3 Social</td>
<td>Bonding to secure extended development time for cerebral cortex</td>
<td>Pharyngeal arches (CNs V, VII, IX, X, XI), corticobulbar tract</td>
<td>Embryological pharyngeal arches, Temporal bone (petrous portion),</td>
<td>Visualize “easy acceptance childhood resource,” track subsequent sensation</td>
</tr>
<tr>
<td>Amygdala</td>
<td>Sorts experience to identify threat based on early imprinting</td>
<td>Bilateral, 1” deep at temples, at anterior of lateral ventricles</td>
<td>Light contact at temple, palm above ear to palpate the 3rd ventricle</td>
<td>Visualize amygdala with feather-light tickle-pull, anteriorly</td>
</tr>
</tbody>
</table>

“At least 80% of all conditions that people see doctors for, revolve around the autonomic nervous system.”

—James Jealous, DO
Theory of Dissolution

“The higher nervous system arrangements inhibit (or control) the lower, and thus, when the higher are suddenly rendered functionless, the lower rise in activity.”

–John Hughlings Jackson (1835-1911)
Father of English Neurology
Quoted by Stephen Porges 11/01

We play our best card first, if that doesn’t work (or has not worked in the past as determined by the amygdala), we try our second card. If that doesn’t work, we play our last card. If that doesn’t work we are in extreme danger of death.
Parasympathetic Portal 1: Vagus Nerve

PORGES: “A primitive unmyelinated vegetative vagal system that fosters digestion and responds to novelty or threat by reducing cardiac output to protect metabolic resources. Behaviorally, this is associated with immobilization behaviors.”
Neck Structures

The Vagus Nerve and Superior Cervical Ganglion may serve as “portals” for interacting with the autonomic nervous system’s parasympathetic and sympathetic levels, respectively.

Art by John Chitty, based on Netter, Atlas of Human Anatomy, Plate 124
Vagus Nerve Nucleii Diagram
and, the origin of the term “Polyvagal”

Nucleus Solitarius

Nucleus Ambiguus

Dorsal Motor Nucleus of CN X

Spinal Trigeminal Nucleus

Vagus Nerve Nucleii Diagram

Front of Body

These are long fibers in the brain stem, at and just above the level of the foramen magnum

Art by Renee Peterson, based on Mosby “Brainstorm” CD

Triune Autonomic Nervous System • John Chitty • www.energyschool.com
Parasympathetic Portal 2: Visceral Tube

- The torso of the body may be visualized and palpated as a “single unit of function” incorporating the most primitive survival functions.
- The diaphragm often seems to be a key organizer for the whole autonomic system (Stone, 1948).
Sympathetic NS Portal

PORGES:
“A spinal sympathetic nervous system that can increase metabolic output and inhibit the primitive vagal system’s influence on the gut to foster mobilization behaviors necessary for “fight or flight.”

“...with the exception of work by Cannon, which focused on the sympathetic-adrenal system as the physiological substrate of emotion, the presumed neural regulation of affective state has not been investigated…”

Art by Renee Peterson

Ganglion of Impar
Superior Cervical Ganglion Highlights

- Primary & direct innervation of pineal gland (melatonin/CSF).
  
  Pineal is neuroendocrine transducer; transforms neuronal signals into hormonal messages.
  Melatonin informs endocrine system of basic environmental conditions especially light, via CSF.
  Cerebrospinal fluid is said by Sutherland, et. al., to be the key medium of energetic “ordering principle.”

- Target organ for hormones (oxytocin, prolactin)
- Affects water balance, photo sensitivity (circadian rhythm), thyroid

Pineal Gland

Pineal Gland

Superior Cervical Ganglion

Post-synaptic ganglionic neurons

Spinal Cord

Midbrain

Hypothalamus

Suprachiasmatic nucleus
Paraventricular nucleus

Retina

Retinohypothalamic track

Triune Autonomic Nervous System • John Chitty • www.energyschool.com
Social NS Origin and Portal 1

PORGES: “Unique to mammals, characterized by a myelinated vagal system that can rapidly regulate cardiac output to foster engagement and disengagement with the environment... [it] fosters early mother-infant interactions and serves as a substrate for the development of complex social behaviors... In addition the mammalian vagal system has an inhibitory effect on sympathetic pathways to the heart and thus promotes calm behavior and prosocial behavior.”

Pharyngeal Arches-5 & 20 weeks

Art by Renee Peterson & John Chitty, based on Larsen, Human Embryology, p. 362
Social NS Portal 2: Corticobulbar Tract

Another candidate for unified viewing of the social nervous system anatomy is the corticobulbar tract, a series of brainstem formations including all but Cranial Nerve XI.

However the term is obscure and the visualization opportunity is complex at best.
Amygdala Highlights

- Sorts experiences to identify threat, based on earlier experiences.
- Central role in stress response.
- Can it be “reset?” This is the holy grail of body-centered trauma work! Some osteopaths and craniosacral therapists say “Yes!”
- “From the point of view of survival, it is better to respond to potentially dangerous events as if they were in fact the real thing, than to fail to respond.” (LeDoux, The Emotional Brain, p. 165)

See if you can “find” it in yourself as a “felt sense!”
- One inch inside temples, both left and right
- Directly behind eye socket
- At anterior end of dorsal horn of lateral ventricle
  ...then, imagine that you can nudge it forward
(Reference: www.neilslade.com)
HPA Axis
Hypothalamus-Pituitary-Adrenal

Chart by Franklyn Sills
Initial Applications
Two simple, no-cost changes in current standard practice to support large-scale autonomic wellness

• Maternal Bonding
  – Let the baby be with the mom, skin-to-skin, for 20+ minutes! Stop the fast takeaway!
  – Minimize vacating of awareness (anesthesia)
  – Gentle handling and slow soft contact

• Circumcision
  – Stop the practice
  – Focus discussion on its negative effects on the autonomic nervous system (not tribal or pseudo-medical agendas)
Experimental Triune NS Session Summary

1. **GENERAL:** supporting soft, open cranial base (especially jugular foramina where the vagus exits the cranium) with good midtide balance and potency.

2. **PARASYMPATHETIC:** Have client notice breath sensations at belly. Visualize torso including viscera as elongated torus shape and one whole unit of function, seek state of balance. With index fingers on vagus at sides of neck, visualize pathway of visceral vagus and seek state of balance. Check diaphragm (including phrenic nerve) as natural fulcrum of connective tissue, seek state of balance. Hold recognition of primitive immobility state.

3. **SYMPATHETIC:** Ask client to flex muscles of arms and legs to engage mobility, then relax and track subsequent sensation. With index fingers on superior cervical ganglia below ears, visualize pathway of sympathetic chain, notice shape, seek state of balance. Hold recognition of mobility, experience of sympathetic function and value.

4. **SOCIAL:** Ask client to visualize a person or pet in childhood, “whose eyes would light up” if they met, someone who had a simple, mutually warm and friendly relationship; relatives, school playmates or pets seem to be most likely to qualify; next of kin are too complex. Alternatively, the imagined encounter can be an archetype or purely imaginary. The key is invoking the bright smiling facial expression. Once this imagined visual experience is established, have the client shift to sensation tracking. With index fingers lightly in ear canal, visualize middle ear anatomy and seek state of balance, including petrous portion of temporal bone. Visualize “pharyngeal arches” embryonic cluster, seek state of balance. Hold recognition of maternal bonding archetype.

5. **AMYGDALA:** Visualize amygdala as almond-sized bump at the anterior tip of the dorsal horn of the lateral ventricle on each side. Notice difference side to side, compressive quality or shape, seek state of balance and or gentle anterior nudge. Hold recognition of “filter for threat” function, ask client to notice safety of here and now.

6. **INTEGRATION:** Polarized contact hip to shoulder, or foramen magnum to coccyx, or light rocking perineal/side of neck; seek state of balance and pulsation equilibrium.