Bottoms Up! Somatic Interventions for Neurodivergernt Individuals

Megan Beardmore, PhD, NCSP | Licensed Psychologist
Spectrum Psych LA
Objectives

Explore the link between autonomic dysfunction and ASD

Learn body-based techniques to improve emotion regulation
Autonomic Dysfunction
Autonomic Nervous System

- Sympathetic (Fight/Flight)
- Parasympathetic (Rest/Digest)
Breath and Heart Rate Exercise
Autonomic Dysfunction … It’s Everywhere!
Measuring Autonomic Dysfunction
In Therapy

• Emotion regulation as a primary concern

• Tantrums

• Internalizing symptoms (anxiety, depression)
In Medicine

- Examples: clonidine, propranolol, guanfacine

- Mechanism of action

- Improvements in aggression, irritability, anxiety, self-injurious behavior, sleep...
Bonus Barrier: Interoception Challenges & Alexithymia
A Foundation for Intervention: Polyvagal Theory
The Vagus Nerve

Vagus Nerve (X): Schema

- Meningeal branch of vagus nerve
- Auditory (pharyngotympanic, Eustachian tube)
- Levator veli palatini muscle
- Salpingopharyngeus muscle
- Palatoglossus muscle
- Palatopharyngeus muscle
- Superior pharyngeal constrictor muscle
- Stylopharyngeus muscle
- Middle pharyngeal constrictor muscle
- Inferior pharyngeal constrictor muscle
- Cricopharyngeus muscle
- Trachea
- Esophagus
- Right subclavian artery
- Right recurrent laryngeal nerve
- Heart
- Hepatic branch of anterior vagal trunk (in lesser omentum)
- Celiac branches from anterior and posterior vagal trunks to celiac plexus
- Celiac and superior mesenteric ganglia and celiac plexus
- Hepatic plexus
- Galbladder and bile ducts
- Liver
- Pyloric branch from hepatic plexus
- Pancreas
- Duodenum
- Ascending colon
- Cecum
- Appendix
- Small intestine

- Efferent fibers
- Afferent fibers
- Parasympathetic fibers

Posterior nucleus of vagus nerve (parasympathetic and visceral afferent)
- Solitary tract nucleus (visceral afferents including taste)
- Spinal tract and spinal nucleus of trigeminal nerve (somatic afferent)
- Nucleus ambiguus (motor to pharyngeal and laryngeal muscles)
- Cranial root of accessory nerve* (see next plate)

Vagus nerve (X)

Superior ganglion of vagus nerve
- Inferior ganglion of vagus nerve
- Pharyngeal branch of vagus nerve (motor to muscles of palate and pharynx: sensory to lower pharynx)
- Communicating branch of vagus nerve to carotid branch of glossopharyngeal nerve
- Pharyngeal plexus
- Superior laryngeal nerve:
  - Internal branch (sensory and parasympathetic)
  - External branch (motor to cricopharyngeus muscle)
- Superior cervical cardiac branch of vagus nerve
- Inferior cervical cardiac branch of vagus nerve
- Thoracic cardiac branch of vagus nerve
- Left recurrent laryngeal nerve (motor to muscles of larynx except cricothyroid; sensory and parasympathetic to larynx below vocal folds; parasympathetic, efferent, and afferent to upper esophagus and trachea)
- Pulmonary plexus
- Cardiac plexus
- Esophageal plexus
- Anterior vagal trunk
- Gastric branches of anterior vagal trunk (branches from posterior trunk behind stomach)
- Vagal fibers (parasympathetic motor, secretomotor, and afferent fibers) accompany superior mesenteric artery and its branches usually as far as left colic (splenic) flexure
Top-Down Approaches

• Meaning making
• Change unhelpful thoughts -> change behaviors
• Examples
  • Cognitive Behavioral Therapy
  • Dialectical Behavior Therapy
• Shortcomings
Bottom-Up Approaches
Movement for healing in many cultures

- Yoga
- Tai chi & qigong
- Drumming
- Martial arts
- Capoeira
3 autonomic states

Safety  Fight/Flight  Freeze
What State Am I In? Learning the Signals

• 1st: notice sensations
• 2nd: label feelings
Mapping My Feelings When I’m ___

(insert feeling or emotion)

Circle or color all the sensations you feel in your body when you’re in this state. Feel free to add your own sensations that are not listed.

- **Head**: headache, flushed, pounding, dizziness, lightheadedness, throbbing
- **General**: sweating, goosebumps, tiredness, chills, trembling
- **Muscles**: relaxed muscles, tense muscles, twitching/trembling, weak muscles, achy muscles
- **Eyes**: dilated pupils, stinging, watering, itchy, heaviness
- **Neck/Shoulders**: loose shoulders, tense neck, tightness in neck, tense shoulders, hunched shoulders
- **Mouth/Throat**: relaxed jaw, dry mouth, clenched teeth, tringling teeth, sore jaw, choked up, tightness, suffocating
- **Heart**: steady heartbeat, pounding heart, irregular heartbeat, rapid heartbeat, chest pains
- **Lungs/Chest**: slow, even breaths, rapid breaths, shortness of breath, deep breaths, breathlessness, tight chest
- **Stomach**: normal digestion, loss of appetite, cravings, churning, constipation, nausea, cramps, dull ache, queasy, butterflies
- **Back**: relaxed muscles, tense back, upper back pain, lower back pain
- **Hands**: warm hands, cold hands, sweaty hands, shaky hands, trembling hands, clenched fists, numbness, relaxed joints
- **Legs**: limbs feel loose, shakiness, trembling, achiness, numbness, weak knees, muscle tension, pins and needles, jelly legs, tingling
<table>
<thead>
<tr>
<th>PRIMARY STATE</th>
<th>LETHARGIC (Parasympathetic I)</th>
<th>CALM (Parasympathetic II)</th>
<th>ACTIVE/ALERT (Sympathetic I)</th>
<th>FLIGHT/FIGHT (Sympathetic II)</th>
<th>HYPER FREEZE (Sympathetic III)</th>
<th>HYPO FREEZE (Parasympathetic III)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Parasympathetic I (PNS I)</td>
<td>Parasympathetic II (PNS II)</td>
<td>Sympathetic I (SNS I)</td>
<td>Sympathetic II (SNS II)</td>
<td>Sympathetic III (SNS III)</td>
<td>Parasympathetic III (PNS III)</td>
</tr>
<tr>
<td></td>
<td>Ventral Vagus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRIM. STATE</td>
<td>Apathy, Depression</td>
<td>Safe, Clear Thinking,</td>
<td>Alert, Ready to Act</td>
<td>React to Danger</td>
<td>Await Opportunity to Escape</td>
<td>Prepare for Death</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Social Engagement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AROUSAL</td>
<td>Too Low</td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
<td>Extreme Overload</td>
<td>Excessive Overwhelm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Induces Hypoarousism</td>
</tr>
<tr>
<td>MUSCLES</td>
<td>Slack</td>
<td>Relaxed/toned</td>
<td>Toned</td>
<td>Tense</td>
<td>Rigid (deer in the headlights)</td>
<td>Flaccid</td>
</tr>
<tr>
<td>RESPIRATION</td>
<td>Shallow</td>
<td>Easy, often into belly</td>
<td>Increasing rate</td>
<td>Fast, often in upper chest</td>
<td>Hyperventilation</td>
<td>Hypo-ventilation</td>
</tr>
<tr>
<td>HEART RATE</td>
<td>Slow</td>
<td>Resting</td>
<td>Quicker or more forceful</td>
<td>Quick and/or forceful</td>
<td>Tachycardia (very fast)</td>
<td>Bradycardia (very slow)</td>
</tr>
<tr>
<td>BLOOD PRESSURE</td>
<td>Likely low</td>
<td>Normal</td>
<td>On the rise</td>
<td>Elevated</td>
<td>Significantly high</td>
<td>Significantly low</td>
</tr>
<tr>
<td>PUPILS, EYES,</td>
<td>Pupils smaller, lids may be</td>
<td>Pupils widening, eyes</td>
<td>Pupils very dilated, eyes</td>
<td>Lids drooping, eyes closed</td>
<td>Pupils very small or dilated,</td>
<td>Noticeably pale</td>
</tr>
<tr>
<td>LIDS</td>
<td>heavy</td>
<td>less moist, eye lids</td>
<td>less moist, eye lids raised</td>
<td>eyes very dry, lids very</td>
<td>eyes very dry, lids very</td>
<td></td>
</tr>
<tr>
<td>SKIN TONE</td>
<td>Variable</td>
<td>Rosy hue, despite skin</td>
<td>Pale hue, despite skin</td>
<td>Cold</td>
<td>May be pale and/or flushed</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>color (blood flows to skin)</td>
<td>color (blood flows to skin)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HUMIDITY</td>
<td>Skin Dry</td>
<td>Dry</td>
<td>Increased sweat</td>
<td>Increased sweat, may be cold</td>
<td>Cold sweat</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mouth Variable</td>
<td>Less moist</td>
<td>Dry</td>
<td>Cold</td>
<td></td>
</tr>
<tr>
<td>HANDS &amp; FEET</td>
<td>May be warm or cool</td>
<td>Warm</td>
<td>Cool</td>
<td>Dry</td>
<td>Extremes of cold &amp; hot</td>
<td>Cold</td>
</tr>
<tr>
<td>(TEMPERATURE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIGESTION</td>
<td>Variable</td>
<td>Increase</td>
<td>Decrease</td>
<td>Stops</td>
<td>Evacuate bowel &amp; bladder</td>
<td>Stopped</td>
</tr>
<tr>
<td>EMMIONS</td>
<td>Grief, sadness, shame, disgust</td>
<td>Calm, pleasure, love,</td>
<td>Anger, shame, disgust,</td>
<td>Rage</td>
<td>Terror, may be dissociation</td>
<td>May be too dissociated to</td>
</tr>
<tr>
<td>(LIKELY)</td>
<td></td>
<td>sexual arousal</td>
<td>anxiety, excitement,</td>
<td>fear</td>
<td></td>
<td>feel anything</td>
</tr>
<tr>
<td>CONTACT WITH</td>
<td>Withdrawn</td>
<td>Probable</td>
<td>Possible</td>
<td>Limited</td>
<td>Not likely</td>
<td>Impossible</td>
</tr>
<tr>
<td>SELF &amp; OTHERS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRONTAL CORTEX</td>
<td>May or may not be accessible</td>
<td>Should be accessible</td>
<td>Should be accessible</td>
<td>May or may not be accessible</td>
<td>Likely inaccessible</td>
<td>Inaccessible</td>
</tr>
<tr>
<td>INTEGRATION</td>
<td>Not likely</td>
<td>Likely</td>
<td>Likely</td>
<td>Not likely</td>
<td>Impossible</td>
<td>Impossible</td>
</tr>
<tr>
<td>RECOMMENDED</td>
<td>Activate, Gently Increase</td>
<td>Continue Therapy Direction</td>
<td>Continue Therapy Direction</td>
<td>Put on Brakes</td>
<td>Slam on Brakes</td>
<td>Medical Emergency CALL</td>
</tr>
<tr>
<td>INTERVENTION</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>PARAMEDICS</td>
</tr>
</tbody>
</table>
Moving out of Freeze
<table>
<thead>
<tr>
<th>Moving out of Fight/Flight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any long, slow exhale</td>
</tr>
<tr>
<td>“Voo” sound</td>
</tr>
<tr>
<td>Cold exposure</td>
</tr>
<tr>
<td>Bilateral stimulation</td>
</tr>
<tr>
<td>Jin Shin Jyutsu poses</td>
</tr>
<tr>
<td>Increasing Vagal Tone</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>Ear massage</td>
</tr>
<tr>
<td>Gargling</td>
</tr>
<tr>
<td>Humming</td>
</tr>
<tr>
<td>Singing</td>
</tr>
<tr>
<td>Go outside!</td>
</tr>
<tr>
<td>Exercise</td>
</tr>
<tr>
<td>Probiotics</td>
</tr>
</tbody>
</table>
“Sideways Approach”

- Mindfulness
- Attention to body sensations + observe their impermeable nature
- Examples:
  - Dr. Dan Siegel’s Wheel of Awareness
  - Acceptance & Commitment Therapy
Closing Thoughts

“There is a voice that doesn’t use words. Listen.” - Rumi
References


