**Interoception - is this how Bowen helps us "feel" better? Presented by Karen Hedrick**

**What is interoception?**

It is how we feel the condition of all tissues of the body, not just the viscera (organs) as was sometimes thought in the past. Interoceptive awareness is achieved through sensitivity to stimuli or sensations originating inside the body. These sensations provide the feedback necessary for trouble shooting and correcting imbalances in the body thereby helping to maintain homeostasis in the most energy efficient manner.

**Interoceptive sensations -** include a wide range of physiological sensations:

Warmth, coolness, muscular effort, pain, tickle, itch, hunger, thirst, air hunger, sexual arousal, heartbeat, vasomotor activity, distension of viscera including the bladder, stomach, rectum and oesophagus.

Recent evidence has provided new insights into how our brains enable us to experience this range of sensations and mental states known as feelings. These sensations are triggered by stimulation of unmyelinated sensory nerve endings (free nerve endings) that project to the insular cortex (hidden lobe in the brain), a key player in interoception, not to the primary somatosensory cortex which is the target for proprioceptive sensations.

**Sensual or Limbic Touch -** part of the interoceptive system

Have you experienced the relief of tension that can be created by gentle human touch? In a painful situation have you felt the comfort from a loved one holding your hand? As a Bowen Therapist have you had clients tell you they feel better after you have touched them?

I always remember Ossie performing 2 very gentle moves on my upper back and my shoulders instantly released, it felt like the tissue just melted. This wasn't the result of fast or strong manipulation but rather the activation of C tactile sensory fibres (free nerve endings), which are located in hairy skin all over the body, that respond to light, slow touch. This is also referred to as crude touch as opposed to discriminative touch.

C tactile sensory fibres are responsible for pleasant touch, inhibiting actions of nociceptive (pain) sensory fibres, and signalling safety not danger. They have profound importance for human health as they trigger a general sense of wellbeing.

**Interoceptive receptors in Fascia**

In musculoskeletal tissues 80% of afferent or sensory nerves terminate in free nerve endings, and most of these are the slowly conducting C-fibre neurons which when stimulated result in activation of the insular cortex indicating a clear interoceptive role.

Termed interstitial muscle receptors, they are located in fascial tissues such as endomysium or perimysium. The number of interoceptive receptors in these tissues far outnumbers the amount of proprioceptive endings by 7 to 1. This seems to indicate the importance the body places on gaining interoceptive information. Most function as mechanoreceptors and a significant portion of them respond to light touch such as applied by a Bowen therapist.

**Pathways to the Brain**

Stimulation of the free nerve endings also referred to as unmyelinated or slow conducting or small diameter afferents produces interoceptive messages that travel to the insular cortex via the spinothalmic tract. This is a different pathway to that which is used to convey information rapidly from wide diameter neurons to the somatosensory cortex, providing discriminative touch and proprioceptive information. Some of this information contradicts many anatomy text books but has been supported by significant research detailed in AD Craig's book referenced at the end of this article.

Interestingly sensory information must pass through a filter, the reticular formation, which only allows stimuli that are particularly useful or intense to arrive at the level of consciousness. Hence Bowen Therapy seems uniquely situated as a modality that uses slow gentle moves followed by wait times which may indicate that we stimulate free nerve endings to produce interoceptive messages that are more likely to make it through the reticular formation to go to the insular cortex, as we are not adding any additional distracting stimulation.

**Interoceptive Integration**

Primary sensory inputs related to interoceptive sensations project to the posterior insula. In the middle insula integration of all important conditions of the present inner and outer environments generates bodily feelings. When asked how you feel, you subconsciously check-in with your body, and you may say my feet are cold or my back feels itchy.

Finally, the highest integrative level is expressed in the anterior insula which is crucial for integrating all subjective feelings related to the body, especially to its homeostatic conditions, into emotional experiences and conscious awareness of the environment and self. You may say I feel good today or I feel anxious. This level of integration is peculiar to humans and sets us apart from other mammals, as we have consciousness of the body and self.

The anterior insula has intimate connections with anterior cingulate cortex**.** Together they form an emotional network –the limbic insular component is involved in sensory reception and conscious feelings; the cingulate cortex serves as the motivational and motor component for behavioural expression of the feelings essential for the maintenance of physiological body integrity. For example you feel hungry consequently you eat, or you feel tired so you sleep or you feel pain you may go and seek help.

**Bicameral Brain**

We have two insulae in our brains; one on each side, each of which receives homeostatic input from the opposite side of the body in its posterior portion yet integrates feelings in its middle and anterior portions. The integration of feelings must be unified by coordination between the two sides. There is a lot of evidence for strong interactions between the left and right insulae and almost none that reveals how their activity is coordinated at this stage.

AD Craig has suggested that the left and right halves of the anterior insula and anterior cingulate cortex network function as a bivalent, opponent control system for emotional affect, expression and regulation.

Evidence from neurophysiology, psychology, functional imaging and behaviour suggests a model in which the left insula is activated or involved during parasympathetic activity, positive effect, calm behaviour and energy nourishment. The opponent or right insula is associated with sympathetic activity, negative effect, challenging behaviour and energy expenditure.

**Relationship to disorders**

There is evidence that an imbalance or lack of coordination between the two insulae is symptomatic of mental illness. Many complex disorders with a somatoemotional component are associated with clear differences in interoception. Anxiety and depression has been shown to go along with increased right anterior insula activation. Brain imaging studies of patients with irritable bowel syndrome (IBS) revealed a disrupted modulation of insular cortex responses to visceral stimuli e.g. painful rectal distension and subsequent relaxation. These dysfunctional regulations may provide the neural basis for altered visceral interoception by stress and negative emotions in these patients.

Addictions or cravings for food and cocaine show activation in the left mid insula while craving cigarettes shows activation of the right mid insula. Stroke damage to the right mid insula of a smoker resulted in them being able to give up smoking as they no longer had the urge to smoke. Aging and post-traumatic stress disorders have been shown to be associated with a significant decline in interoceptive awareness. Mindfulness based therapies focusing on subtle somatic sensations are suggested as helpful therapeutic approaches, hence a wonderful opportunity for Bowen therapy as a beneficial treatment.

**Bowen Therapy and Interoception**

Often we consider stimulation of proprioceptive nerve endings such as muscle spindles, and Golgi receptors however with these new research findings perhaps we are more effective when concentrating on interoceptive receptors and their related effects in the insular cortex. I find it interesting that we now understand more about interoception or self-awareness yet many people presenting in our clinics for treatment often seem to have lost touch with or ignore their bodily feelings.

During the Bowen treatment we need to pay attention to the autonomic responses at each moment and to the limbic emotional (insular) response of the client. We need to monitor the touch, speed and pressure of moves to achieve profound change in the local tissue hydration as well as other autonomic effects. Proprioceptive sensations are pronounced during the application of the Bowen move but during the wait time is when the finer interoceptive sensations are easier to perceive. We must wait until the sensations stop before proceeding. These sensations may be triggered by stimulation of interoceptive free nerve endings in skin, visceral connective tissues as well as in muscle tissue.

Recent discoveries related to the richness of the enteric nervous system (the mesh like system of neurons that governs the function of the gastrointestinal system) have taught us that our belly brain contains more than 100 million neurons. Many of these nerve endings are directly concerned with interoception. Several complex disorders such as IBS are associated with disrupted modulation of insular responses to visceral stimuli, it is conceivable that careful application of Bowen procedures to the visceral tissue, accompanied by a sense of safety and mindfulness of the client could be useful to enhance healthy interoceptive self regulation.

Additionally we have observed clients with skin colour changes or feel tissue soften after Bowen moves indicating changes to blood flow or hydration. Could this be a result of interoceptive feedback? Some interoceptive nerve endings in muscle tissue inform the insula about work load of local muscle portions. Their mechanical stimulation has been shown to lead to sympathetic output, which increases the local blood flow. Stimulation of other interoceptive nerve endings results in increased matrix hydration via extrusion of plasma from tiny blood vessels into the interstitial matrix.

During a treatment it is advisable to invite perceptual refinement and verbal feedback from the client regarding their interoceptive sensations as this may enhance their interoceptive processing and resultant awareness. Subjective sensations that may be triggered in clients by Bowen moves include; warmth, lightness or heaviness, spaciousness, density or fluidity, nausea, streaming or pulsation, spontaneous affection and a general sense of wellbeing.

As therapists we can observe signals from our clients that inform us of the internal functional changes related to interoceptive processes initiated by our Bowen moves. Signals include increased local tissue hydration, changes in temperature, skin colour, breathing, small movements of the limbs, pupil dilation and facial expression.

**Movement Therapies and Interoception**

Movement practices that alternate brief periods of active motor attention with subsequent periods of rest where clients pay attention to small interoceptive sensations within their body have positive health enhancing effects for a large number of common clinical conditions. The following therapies, Yoga, Tai Chi, Chi Gong, Feldenkrais and Pilates encourage perceptual emphasis on finer sensations in the body and may be useful for clients to undertake to enhance improvements in their interoceptive awareness and complement the benefits attained from Bowen therapy treatments.

**References**

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