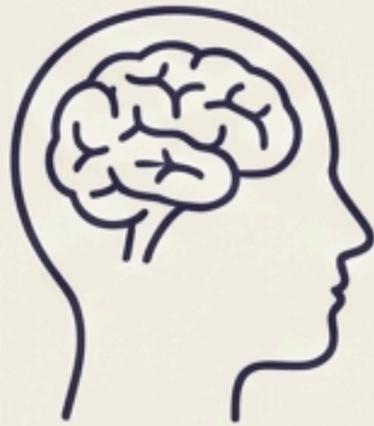


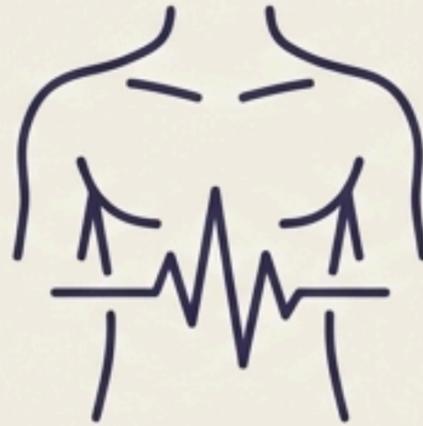
Interoceptive Disconnect in Autism: Rethinking Brain-Body Communication

Module B: Neuro-Cognitive Architecture

Executive Summary



Autistic behavior is frequently misunderstood as a deficit of character or emotion, rather than a manifestation of how the nervous system senses the internal body.

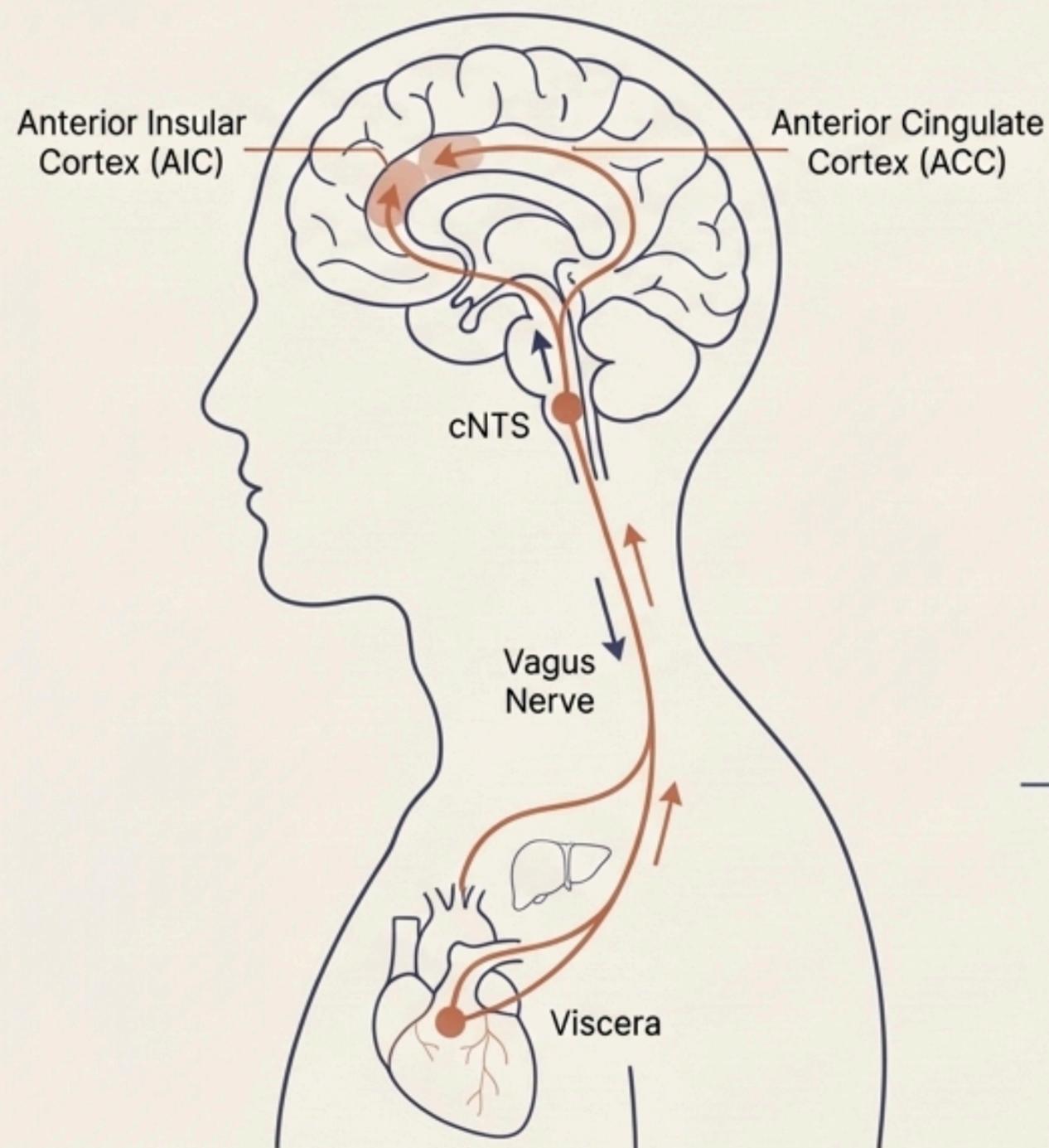


An interoceptive disconnect occurs when the brain struggles to accurately predict and process physiological signals like heart rate, hunger, or autonomic arousal.



By shifting our focus from fixing outward behavior to accommodating this hidden neural architecture, we can radically improve regulation and emotional well-being.

The Science: Neuroanatomical Hardwiring



The Vagal Superhighway

80% of vagus nerve fibers are afferent, constantly transmitting sensory data from the viscera (gut, heart, lungs) to the caudal nucleus tractus solitarius (cNTS) in the brainstem.

The Insula-ACC Network

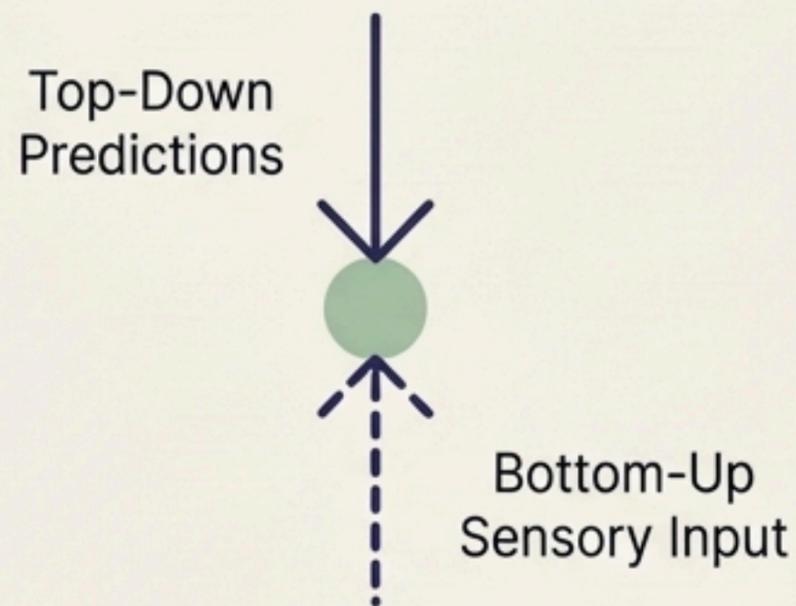
Signals travel to the Anterior Insular Cortex (the brain's interoceptive hub), which maps the body's physiological state. The Anterior Cingulate Cortex then translates this map into emotional awareness and behavioral output.

The Autistic Difference

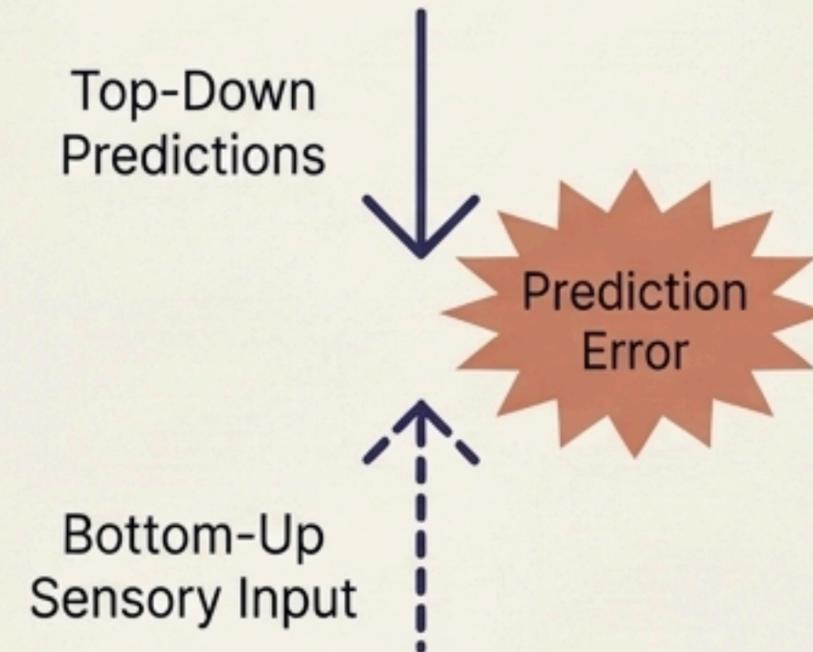
Research indicates altered functional connectivity within this Insula-ACC network in autistic individuals, impacting how visceral signals are integrated into conscious awareness (Craig, 2009; Critchley & Harrison, 2013).

The Science: Predictive Coding Model

Neurotypical Predictive Coding



Autistic Predictive Coding



The Predictive Coding Model

The brain does not passively receive bodily signals; it actively predicts them to maintain homeostasis (Seth, 2013).

The Mismatch

In autism, there is often a mismatch—or prediction error—between the brain's expected physiological state and the actual sensory input arriving from the body.

The Result

This mismatch demands massive cognitive resources to resolve, leading to delayed signal recognition or an overwhelming flood of unfiltered interoceptive noise.

The Autistic Experience



The Mechanism: Delayed Signal Recognition & Interoceptive Blinding

The brain's predictive coding errors prevent early detection of physiological shifts. Low-level autonomic arousal goes unregistered until it breaches a critical threshold.

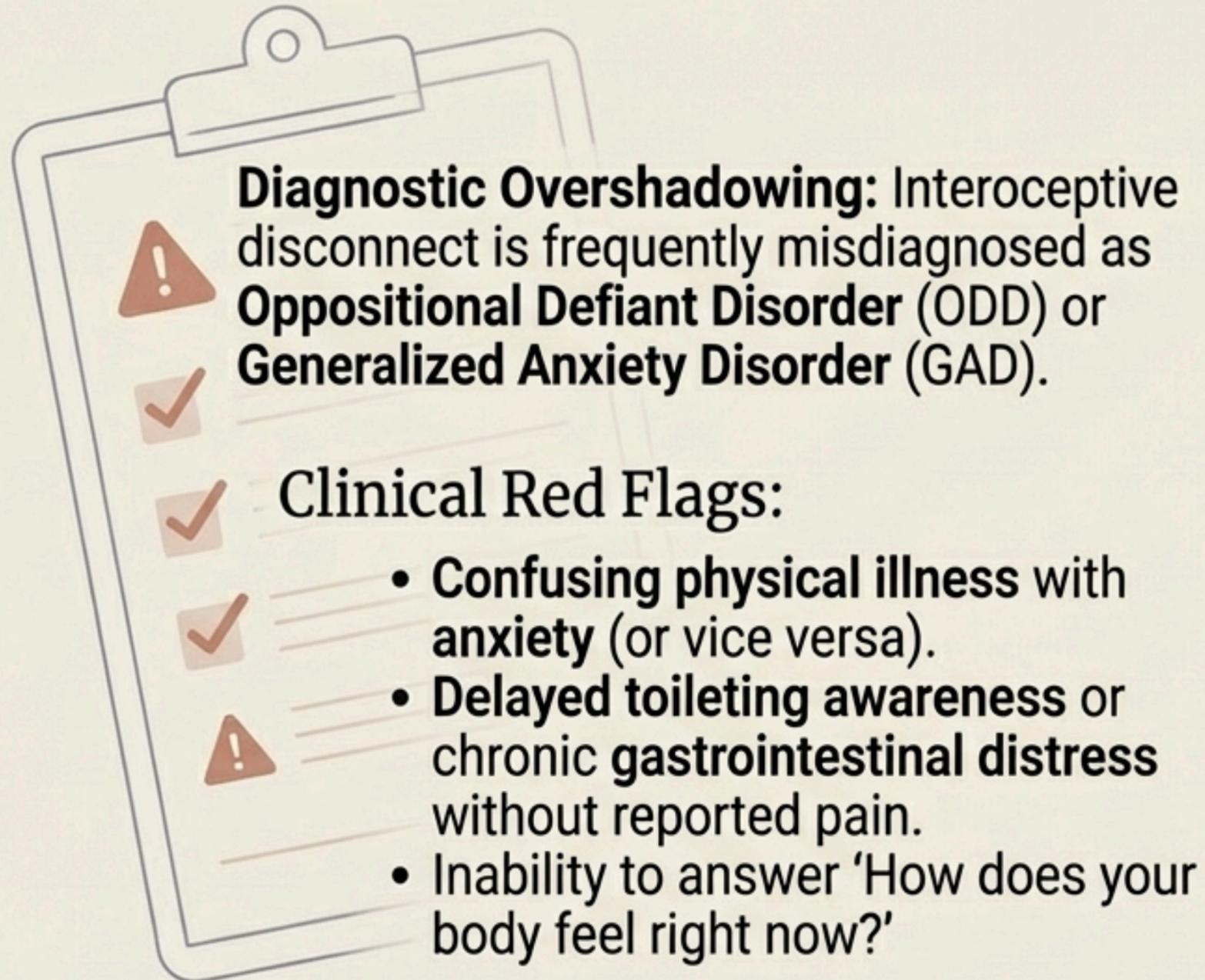
“ I don't realize I'm anxious or overwhelmed until I'm already having a meltdown. I can't feel the build-up. My body goes from zero to a hundred because the warning signals—the tight chest, the shallow breathing—are completely invisible to me until my system simply crashes. ”

— Composite community narrative

Common Misconceptions

The Myth	The Reality
Autistic people lack empathy or do not care about others' feelings.	 The issue is often Alexithymia (difficulty identifying emotions). Research shows alexithymia—not autism itself—predicts poor emotion recognition . You cannot map others' emotions if your own interoceptive signals are muted (Brewer et al., 2016).
Meltdowns are arbitrary behavioral outbursts or non-compliance.	 Meltdowns are the external manifestation of an interoceptive system that has reached allostatic overload. The brain is reacting to a physiological crisis.
Autistic individuals intentionally ignore bodily needs like hunger or toileting.	 Atypical interoceptive accuracy means the physical signals of a full bladder or empty stomach are genuinely not transmitted to conscious awareness until extreme.

Clinical Recognition



Assessment Tool Highlight

The Multidimensional Assessment of Interoceptive Awareness (MAIA-2) (Mehling et al., 2018).

Clinicians should look for discrepancies in three dimensions:

1. **Accuracy:** Veridical detection of bodily signals.
2. **Sensibility:** Attention allocated to internal signals.
3. **Awareness:** Metacognitive regulation of distress.

Practical Strategies

For the Autistic Individual

- **Somatic Mapping:** Use body outlines to draw/color where physical sensations occur during neutral moments, building an interoceptive vocabulary.
- **MABT / Interoceptive Exposure:** Engage in Mindful Awareness in Body-Oriented Therapy (Price & Hooven, 2018) to slowly build tolerance to internal sensations.
- **Scheduled Regulation:** Set external alarms for eating, hydrating, and bathroom breaks to bypass unreliable internal cues.

For Support Systems (Parents, Partners, Employers)

- **Externalize Cues:** Do not ask, 'Are you hungry?' Instead, state, 'It is 1:00 PM; it is time to eat.'
- **Remove Demand-Avoidant Language:** Shift from behavioral demands to physiological observations ('I notice you are pacing; let's get a cold drink to reset your nervous system').
- **Co-Regulation:** Model your own interoceptive narrative out loud ('My chest feels tight, I am going to take a deep breath').

Malaysian Context

Collectivist Masking

Malaysian cultural emphasis on 'saving face' and communal harmony forces higher rates of autistic masking. This actively suppresses interoceptive distress signals to appear compliant, accelerating burnout.



Linguistic Nuances

Assessing alexithymia is complicated across the English/Bahasa Melayu/Mandarin divide. Bahasa Melayu often relies on idiomatic expressions for emotion rather than granular, body-specific emotional vocabulary, leading to lost nuance in clinical translation.

Healthcare Access

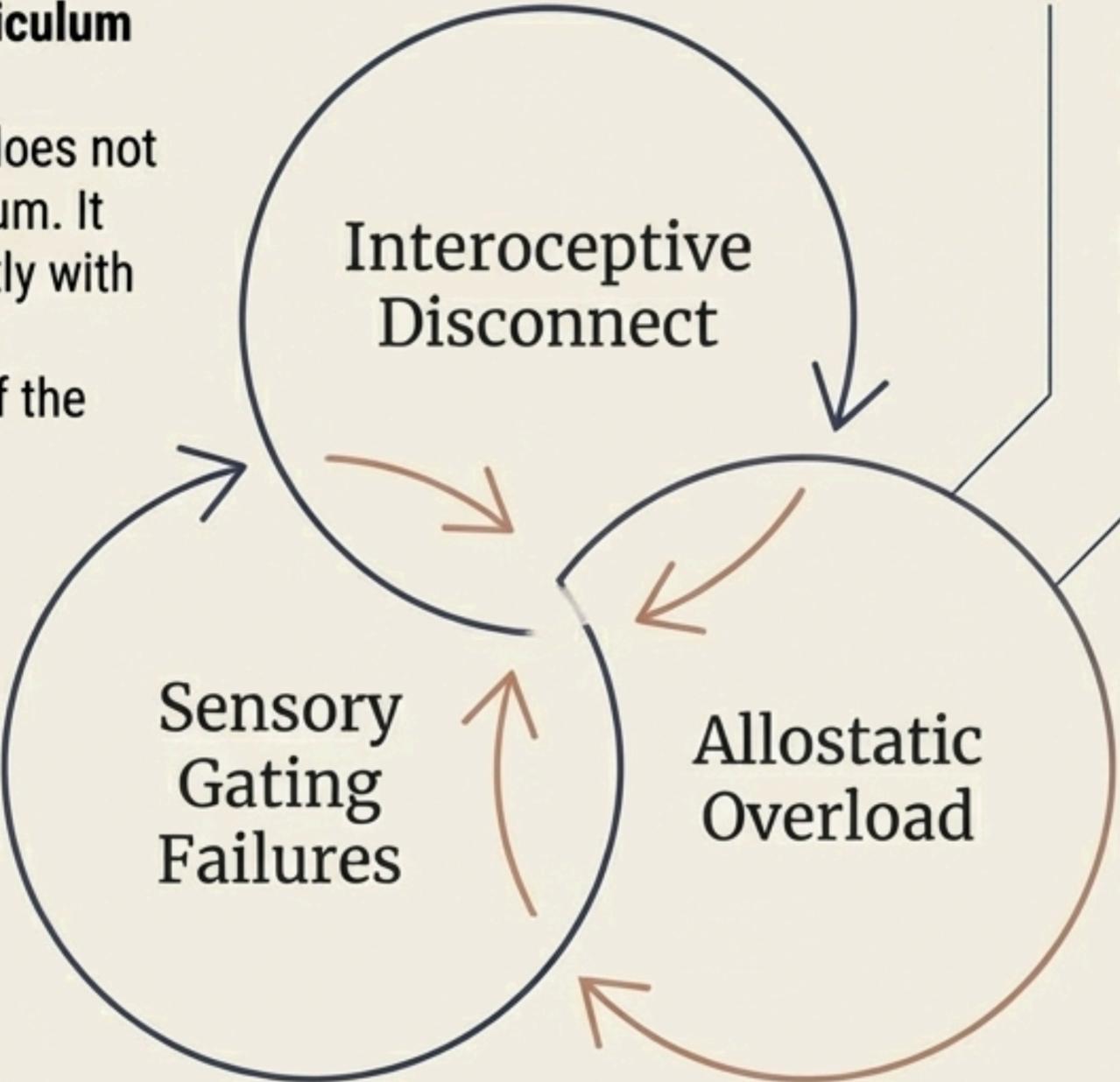
Specialized occupational therapy focusing on interoception (rather than pure behavioral compliance) remains concentrated in urban hubs (Klang Valley), leaving significant support gaps in rural and East Malaysian contexts.



Connections: The Neuro-Cognitive Feedback Loop

Module B Curriculum Integration:

Interoception does not exist in a vacuum. It interacts directly with other systemic mechanisms of the autistic brain.



Link 1: Sensory Gating Failures

When the brain fails to filter out exteroceptive noise (lights, sounds), the resulting cognitive load drains the resources needed to process subtle interoceptive signals.

Link 2: Allostatic Overload

The combination of missed internal warnings (interoceptive disconnect) and constant external bombardment (sensory gating failures) inevitably drives the nervous system into chronic allostatic overload, precipitating autistic burnout.

Key References

- Brewer, R., Cook, R., & Bird, G. (2016). Alexithymia: a general deficit of interoception. *Royal Society Open Science*, 3(10), 150664.
- Garfinkel, S. N., Seth, A. K., Barrett, A. B., Suzuki, K., & Critchley, H. D. (2015). Knowing your own heart: distinguishing interoceptive accuracy from interoceptive awareness. *Biological Psychology*, 104, 65-74.
- Khalsa, S. S., et al. (2018). Interoception and mental health: a roadmap. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, 3(6), 501-513.
- Mehling, W. E., et al. (2018). The Multidimensional Assessment of Interoceptive Awareness, Version 2 (MAIA-2). *PLoS One*, 13(12), e0208034.
- Murphy, J., Brewer, R., Hobson, H., Catmur, C., & Bird, G. (2018). Is alexithymia characterised by impaired interoception? *Biological Psychology*, 136, 189-197.
- Price, C. J., & Hooven, C. (2018). Interoceptive Awareness Skills for Emotion Regulation: Theory and Approach of Mindful Awareness in Body-Oriented Therapy (MABT). *Frontiers in Psychology*, 9, 798.
- Seth, A. K. (2013). Interoceptive inference, emotion, and the embodied self. *Trends in Cognitive Sciences*, 17(11), 565-573.