Wired For Wellness: Unlocking teenage brain changes and chiropractic breakthroughs

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Thank you!

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thank you

Helen Alevaki
Monique Andrews
Claudia Anrig
Anaise Badon
Darren Barnes-Heath
Dorte Bladt
Mary Bourke
Monika Buerger
Alice Cade
Bridgette Chelf
Sandy Clark
Felicity Cook
Jenna Davis
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Hayley Maginness
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Rob Melillo
Troy Miles
Joyce Miller
James Murphy
Nimrod Mueller
Jacey Pryjma
Martin Rosen
Jenna Salmons
Marcia Schaefer
Jo Sexton
Aisha Strand
Angela Todd
Julie Uren

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Gifts

Gifts

The HANDOUT for today's Class (the slides)

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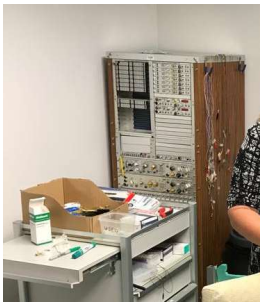
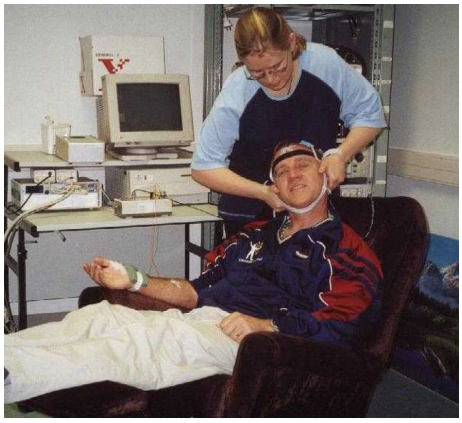
1999 NZCC Graduate





2008 PhD

HAAVIK RESEARCH

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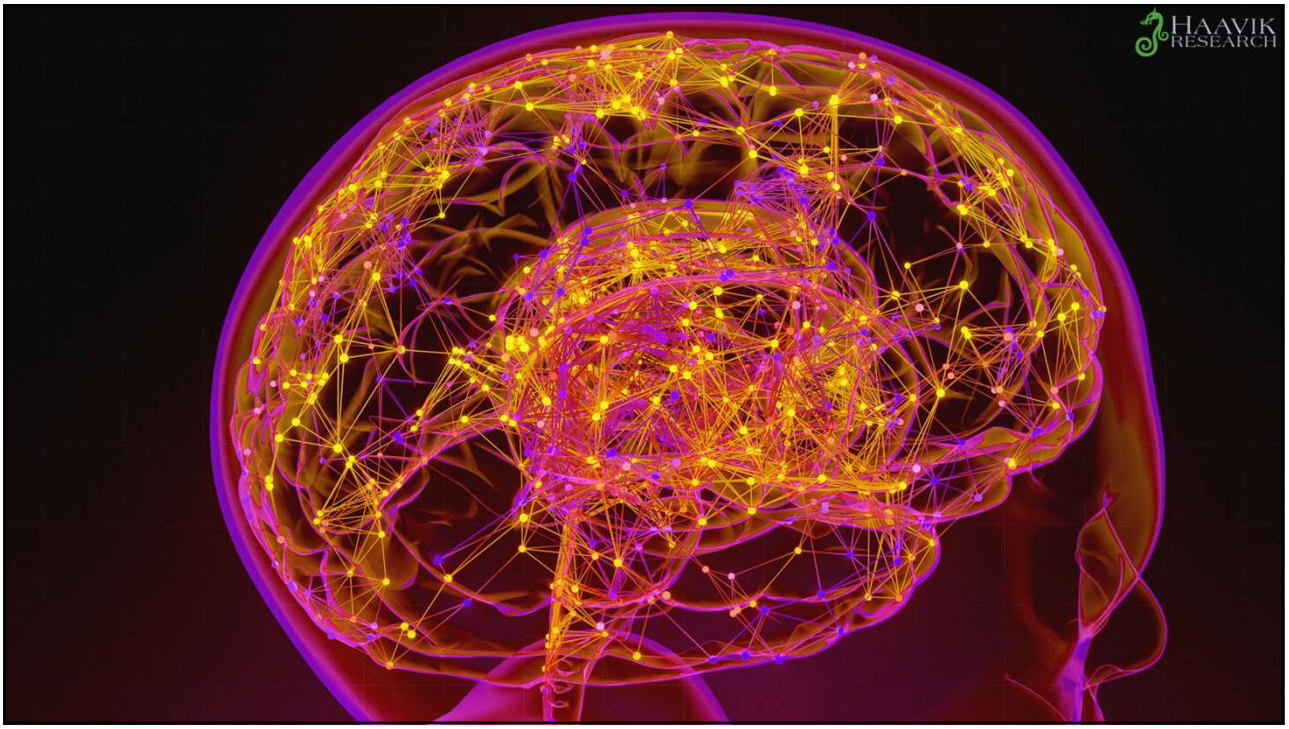

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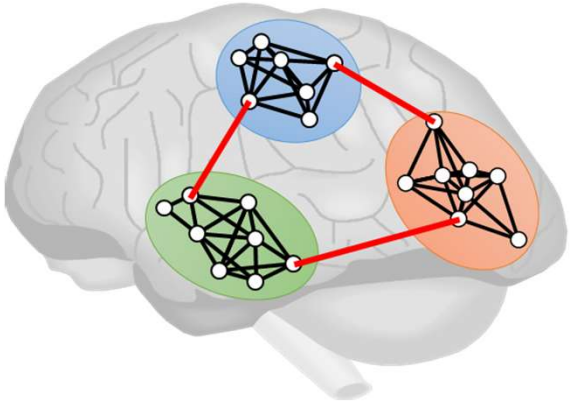
Biological Networks in the Brain (and Hubs)

- A biological neural network in the brain is a complex network of neurons that are chemically connected by synapses.
- Neurons send and receive electrochemical signals to each other, and the brain uses these signals to process information.



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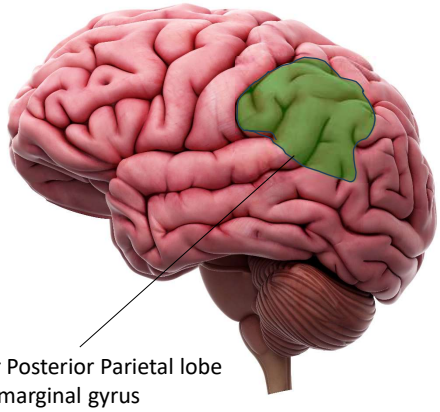
Default Mode Network

Understanding thoughts, intentions and feelings of others, and predicting behavior



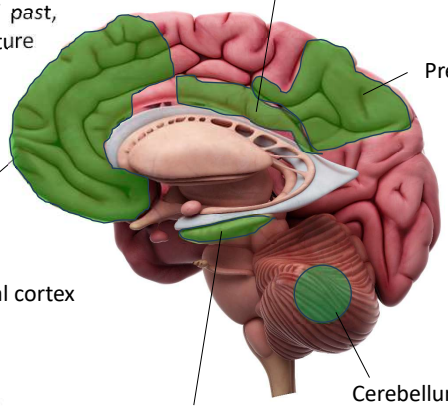
Inferior Posterior Parietal lobe
- Supramarginal gyrus
- Angular Gyrus

Emotional understanding & regulation of *past*, present and future

Constructing sense of self

PCC

Precuneus



Medial PFC
- vm PFC
- Orbitofrontal cortex
- Ventral ACC

Cerebellum

Hippocampus and parahippocampal cortex

(Dumas et al 2014)

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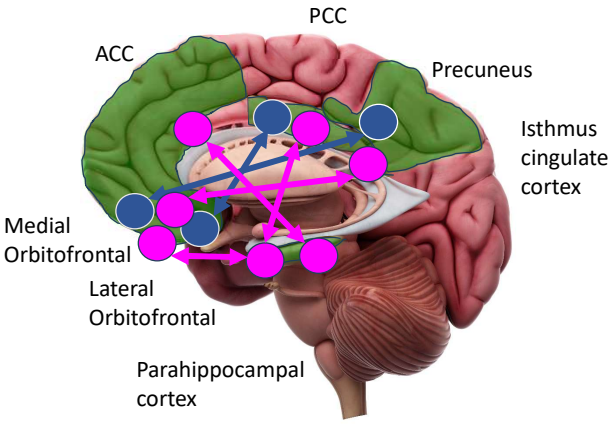
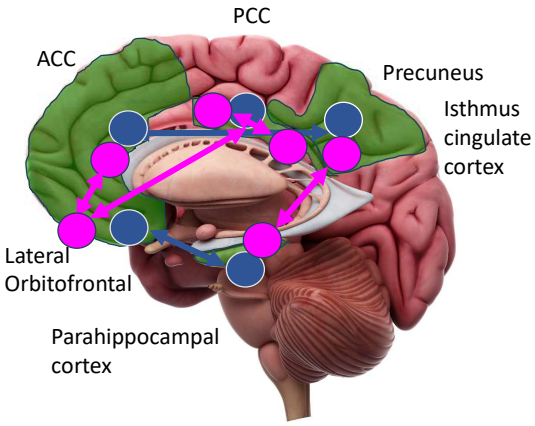
DMN changes after Chiro Care

Pre and Post Chiro



Pre and Post 4 weeks Chiro



(Haavik et al 2024, Brain Sciences)

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Unmedicated depressed people have significantly increased functional connectivity between the Precuneus and the prefrontal cortex

Increased functional connectivity of the posterior cingulate cortex with the lateral orbitofrontal cortex in depression (Cheng, Rolls et al. 2018B)

The increased connectivity of the precuneus and/or PCC with the prefrontal cortex short-term memory system may contribute to the rumination about low self-esteem in depression.

(Cheng, et al 2018A; Cheng, Rolls et al. 2018B*)*

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Questionnaire Results

Control Group

NO significant changes at all

Chiropractic Group

- Improved QOL overall
- Improved Physical function
- Less Depression
- Less anxiety
- Less Fatigue
- Less pain interference
- Less pain intensity

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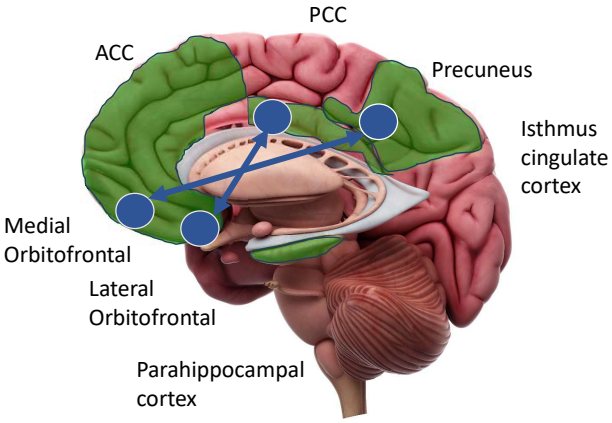
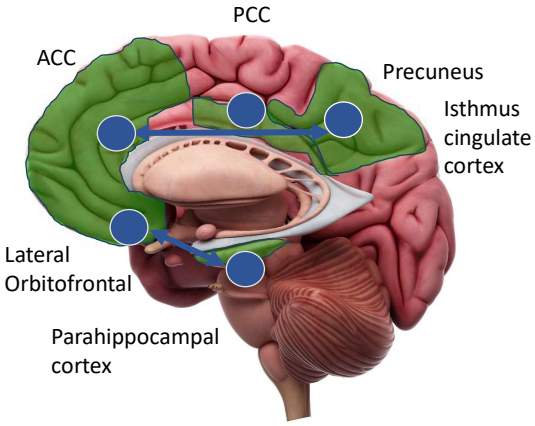
DMN changes after Chiro Care

Pre and Post Chiro



Pre and Post 4 weeks Chiro



(Haavik et al 2024, Brain Sciences)

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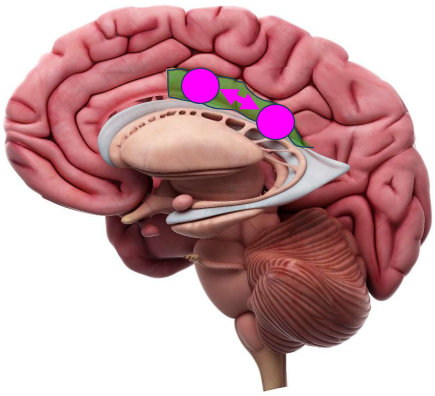
In depression there is asymmetry in the thickness of Posterior Cingulate Cortex

SEPs Alpha ↑ L isthmus-cingulate- R PCC

- PCC deals with internally focused, self-referential processing
- I.e. Construction of the narrative sense of self, including autobiographical memories
- Implicated in depression: ↑ cortical thickness in left vs right PCC
- Depressed individuals with higher somatic symptoms (e.g. sleep disturbance, appetite disturbance, and fatigue or loss of energy) have greater asymmetry in **PCC** thickness



Thus, this change may reflect altered narrative sense of self in a manner that is reducing symptoms of depression and improvements in fatigue

(Haavik et al 2024, Brain Sciences)

(Dotson et al. 2021; van Eijndhoven et al. 2013)

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But ALL this research is done in ADULTS and mostly after a single adjustment session

What about the brain's networks???

What about several weeks of chiro care????

What about kids brains????

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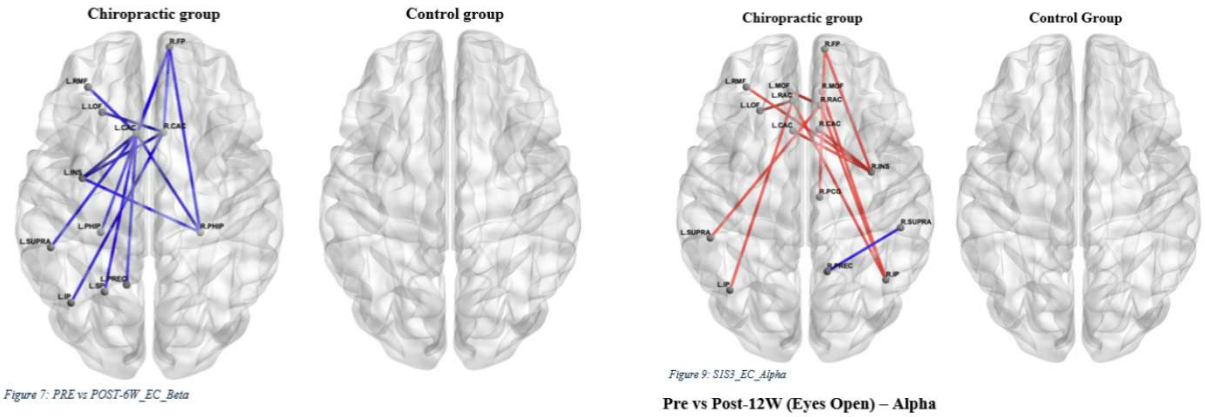

So what about kid's brains?

- Pakistan RCT in teenagers
- Clinically meaningful (and significant) improvement in Quality of Life

Preliminary Results NOT published yet

THE KID'S SUMMIT

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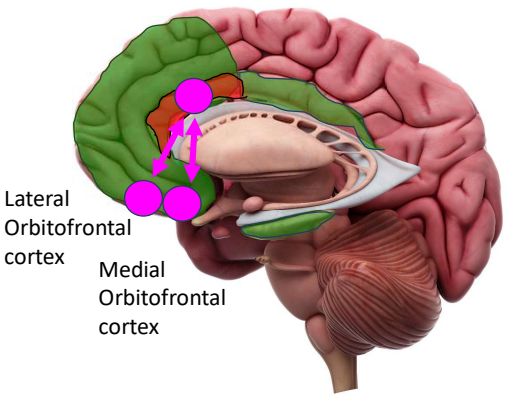
Resting EEG results CHIRO Pre vs Post 12weeks

- The Orbitofrontal cortex plays a key role in the executive control of information processing and behavioral expression, decision-making and emotional regulation. It is important for the construction of the narrative sense of self and processing information about own mental states, beliefs, intentions and desires
- The Anterior Cingulate Cortex plays a key role in error detection, cognitive control, emotional regulation and autonomic regulation. It is vital for recognizing, understanding and regulating own emotions.

- May reflects the teenagers' brain's altered processing of interoceptive signals, improving sense of self
- This may support more flexible decision-making and better emotional regulation.
- It could be why they reported improved quality of life.

Preliminary Results NOT published yet



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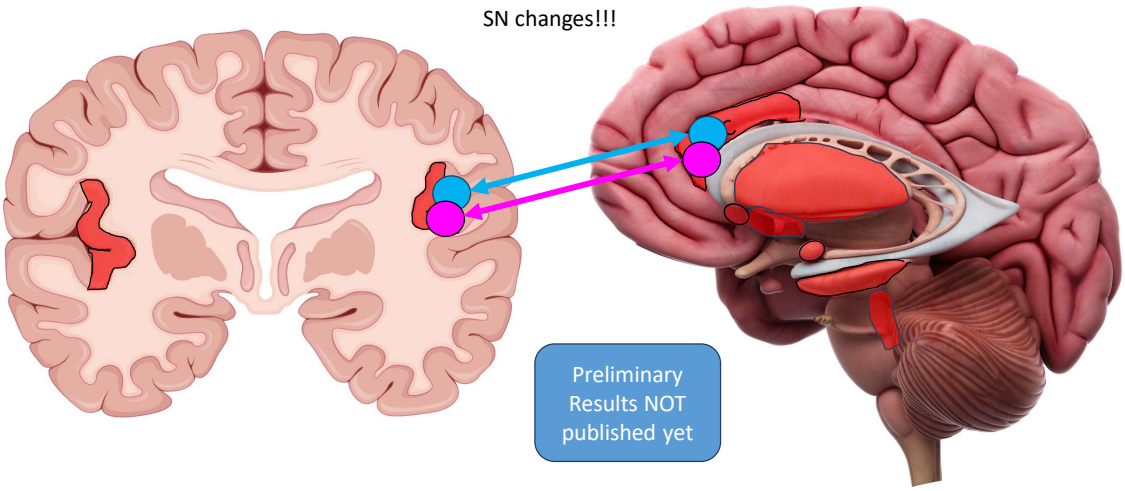
Resting EEG results CHIRO Both 6 &12weeks

Insular cortex key hub for Interoceptive processing

ACC is vital for recognizing, understanding and regulating own emotions

SN changes!!!



Preliminary Results NOT published yet

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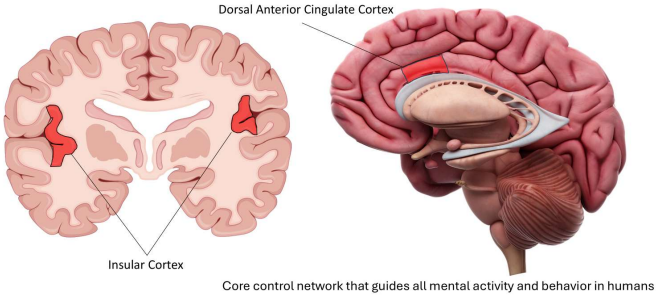
Salience Network Activation is likely where the brain recalibrates after an adjustment!

Salience Network



Core control network that guides all mental activity and behavior in humans

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Cool Upcoming Research

- Dr Jenna Duher's PhD project at Auckland University
- Baby RCT
- Infant babies
- 3 months care
- EEG
- Movement measures at 6 months

Jenna Duehr

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Exploring the neurophysiological effects of chiropractic care on infants

University of Auckland

PhD confirmation review

Jenna salmons (BHSc Nursing, BChiro, MHSc)

Main supervisor: Dr Angus McMorland

Co-supervisors: Dr Heidi Haavik and Assoc Prof Imran Khan Niazi

Waipapa Taumata Rau University of Auckland

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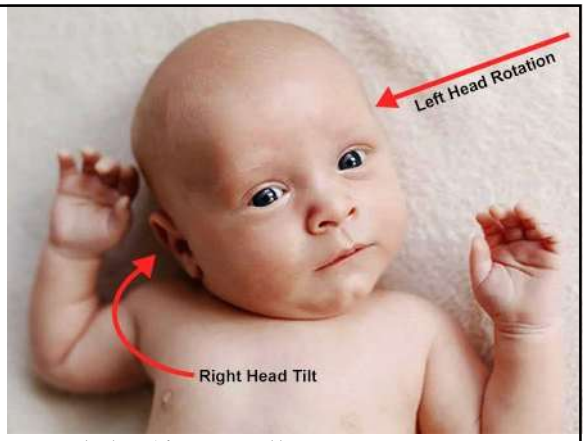
Infantile postural asymmetry (IPA) = Abnormal positional preferences of the head or trunk



- **Short term consequences:**
  - Suboptimal breastfeeding (1, 2, 3)
  - Abnormal sensory input, visual field preferences (4,5,6)
  - Developmental delay, particularly in the motor domain (7,8,9)
  - Plagiocephaly (10, 11, 12, 13)
  - Developmental hip dysplasia (14, 15)
- **Long term consequences:**
  - Neurodevelopmental disorders (9, 16, 18, 19)
  - Learning and behavioural difficulties as children (16, 19)
  - Sensory processing disorders (9, 16, 19)

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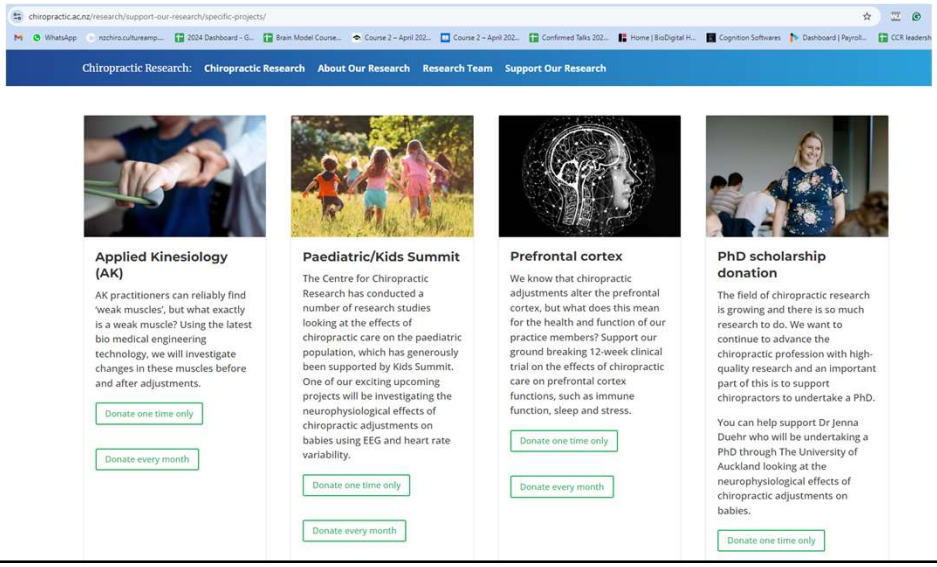
https://chiropractic.ac.nz/research/support-our-research/specific-projects/



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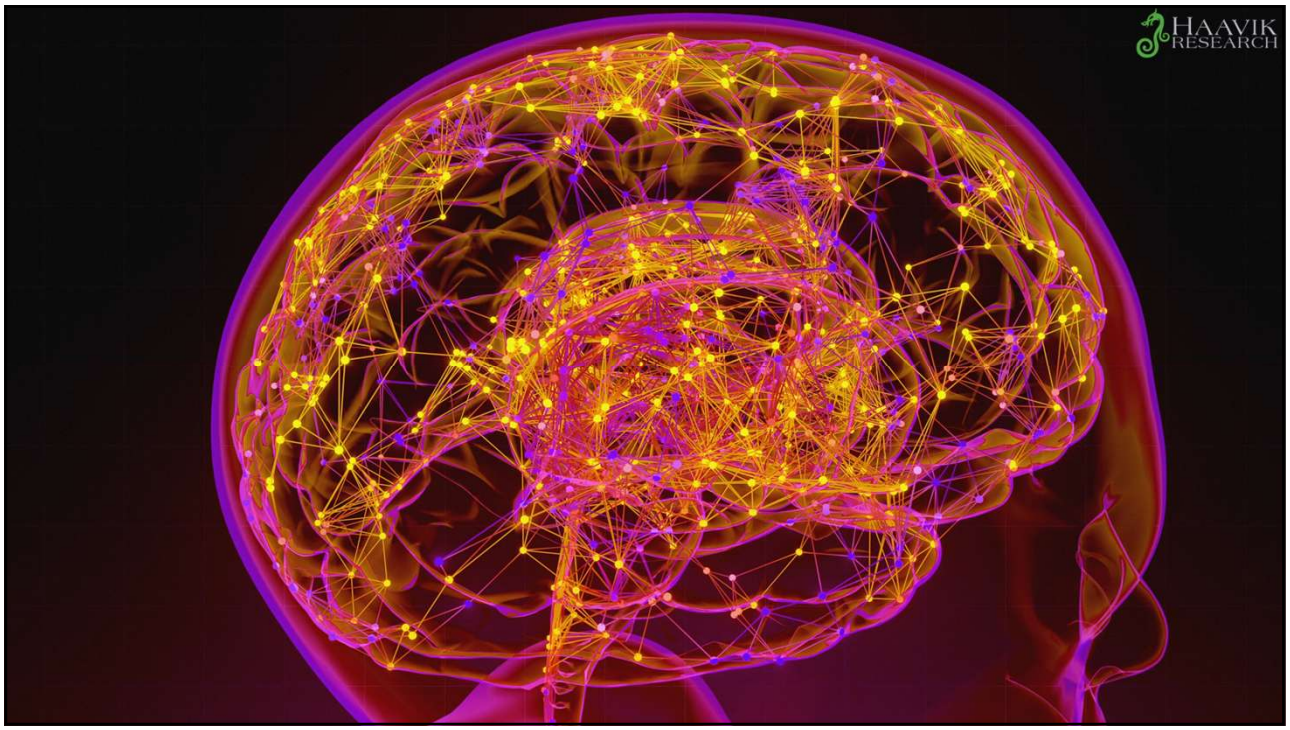

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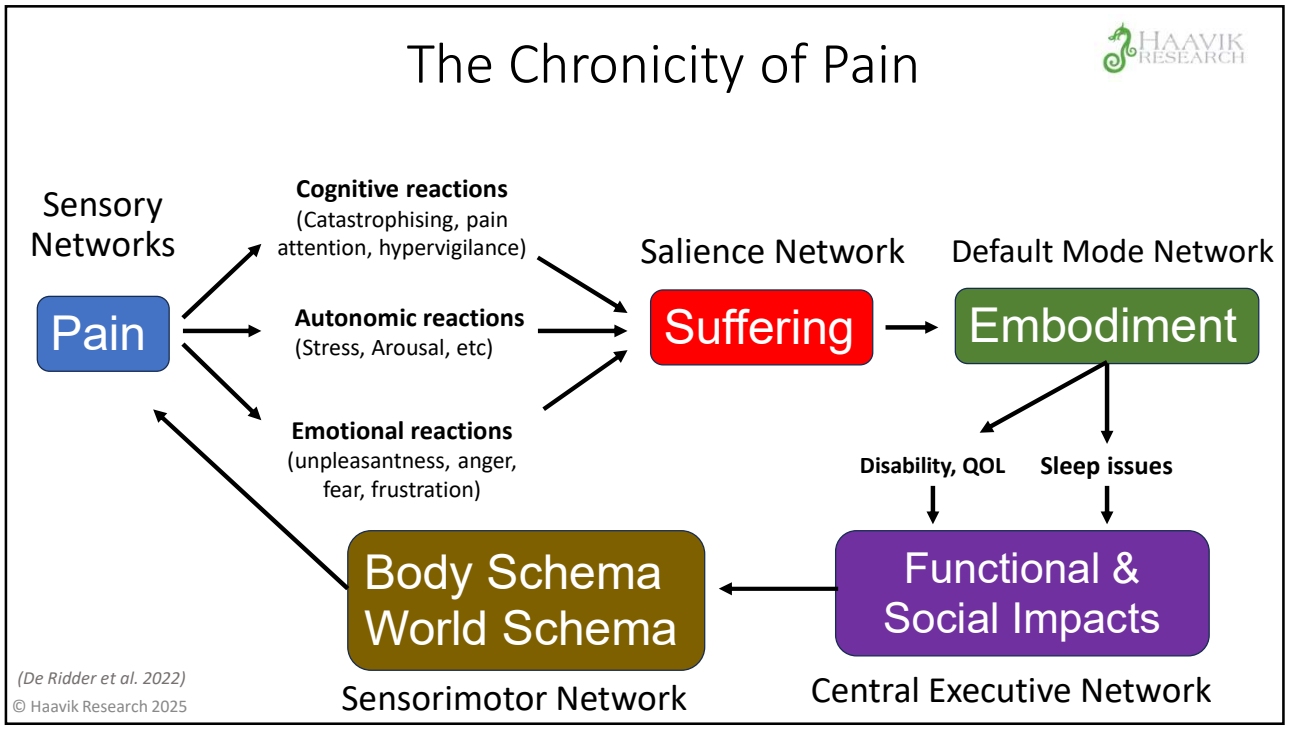
The Chronicity of Pain



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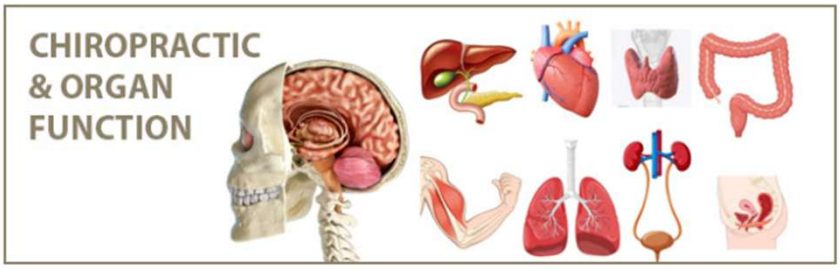
Online 2hr MasterClass about the BRAIN Model of Chiropractic Care

heidihaavik.com/masterclass



- Why an adjustment may alter organ function
- How an adjustment could alter organ function
- Why the MOPI model is not a good explanation for chiropractic altering organ function.

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TODAY'S HANDOUT

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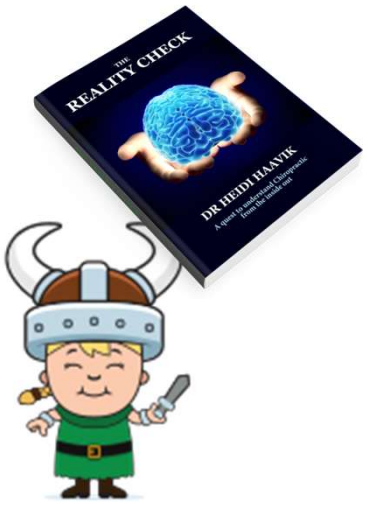
Thank you!



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