

INTEROCEPTION

FEELING YOURSELF



WHO AM I?



- KATIE KERLEY, AN OCCUPATIONAL THERAPIST AND CLINICAL DIRECTOR OF HORIZONS THERAPY SERVICES IN DUNDALK
- MULTIPLY NEURODIVERGENT- AUTISTIC, DYSPRAXIC, ADHD
- SENSORY PROCESSING DIFFERENCES
- PASSIONATE ABOUT WORKING WITH NEURODIVERGENT PEOPLE AND HELPING THEM TO BE THE BEST AND MOST SATISFIED VERSION OF THEMSELVES.
- SPECIALISING IN SENSORY PROCESSING AND HOW IT EFFECTS MEANINGFUL OCCUPATION.



Almost all of our experiences are either informed by sensations or cause us to experience sensations



The world we live in is jam packed with sensory information – as are our own bodies



Inextricably linked to emotion, experience and memory



Today we explore our perception of what goes on inside our own bodies



INTEROCEPTION -
LATIN FOR
"LOOKING INSIDE"

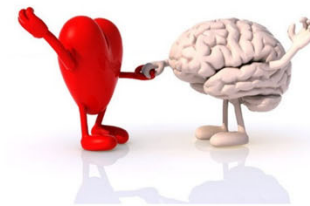


How do you feel??

- LET'S TAKE A MINUTE.....
- 



- MIND AND BODY ENGAGED IN A SYNCHRONOUS COUPLING AT ALL TIMES – A DELICATE AND COMPLEX BALANCE
- DYNAMIC RELATIONSHIP BETWEEN BRAIN AND BODY



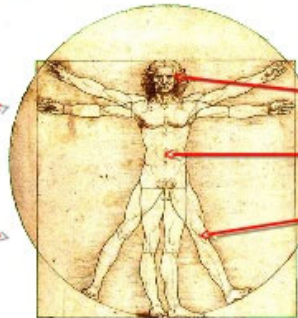
EXTEROCEPTION VERSUS INTEROCEPTION

outside and within

exteroception

interoception

sight, sound,
smell, touch,
taste

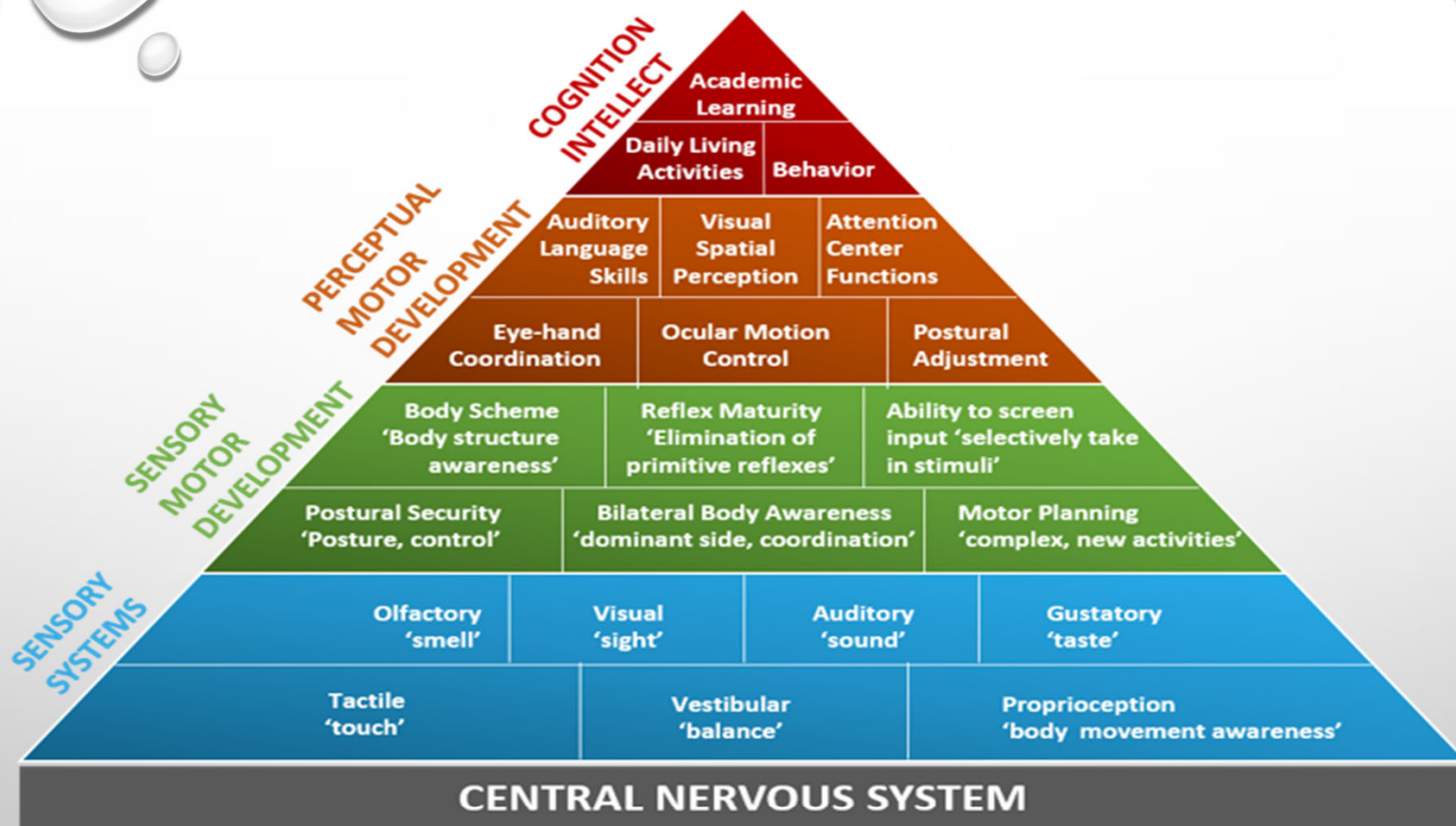


headaches,
hunger,
proprioception

sensing the
outside

sensing the
inside





Adapted from Pyramid of Learning (Williams & Shellenberger, 1-4)



- “INTEROCEPTION” – YOUR BRAIN’S PERCEPTION OF YOUR BODY’S STATE, TRANSMITTED FROM RECEPTORS IN ALL YOUR INTERNAL ORGANS
- VISCERAL SENSATION
- HELPS US MAINTAIN HOMEOSTASIS
- MORE AND MORE EMERGING AND ONGOING RESEARCH



• CONTRIBUTES TO WELL-BEING, EMOTIONAL REGULATION AND HEALTH

• HELPS US TO DO BETTER SELF-CARE, WHEN WE CAN NOTICE AND REACT TO INTEROCEPTIVE INFORMATION

• TAKING CARE OF OUR BODIES

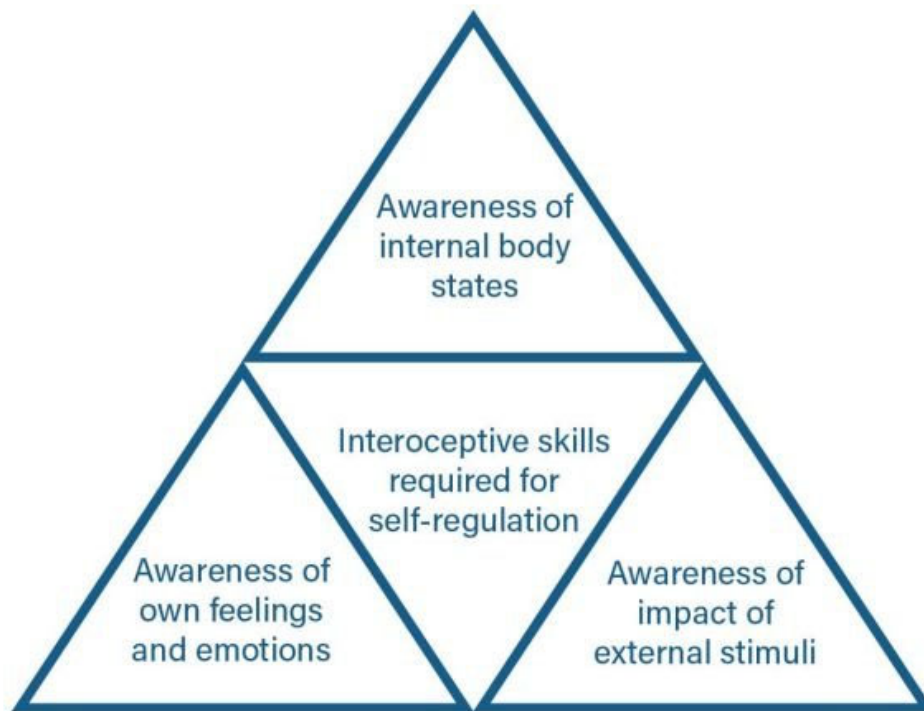
• ACTING ON WHAT OUR BODY IS

TELLING US IT NEEDS



- A LOT OF THIS HAPPENS “BEHIND THE SCENES”
- SOME ASPECTS WE ARE NOT EVEN AWARE OF
- OTHER ASPECTS WE ARE ABLE TO NOTICE
- CERTAIN INFORMATION SHOULD BE CONSCIOUSLY AVAILABLE TO US



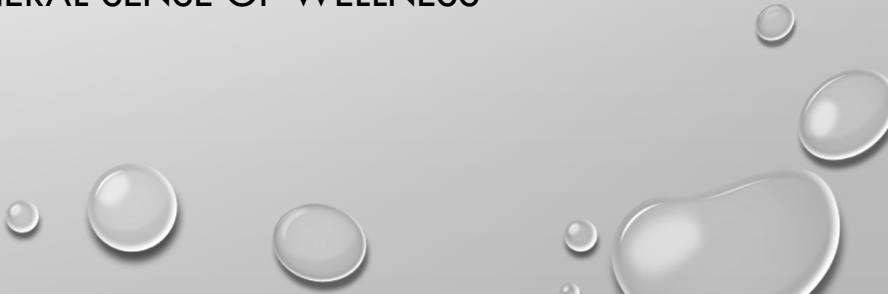


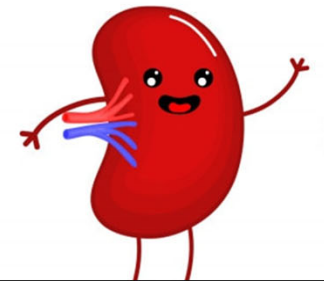
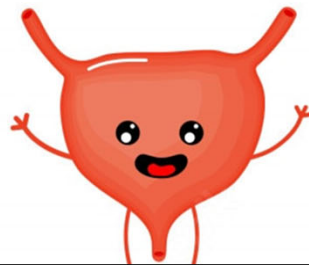
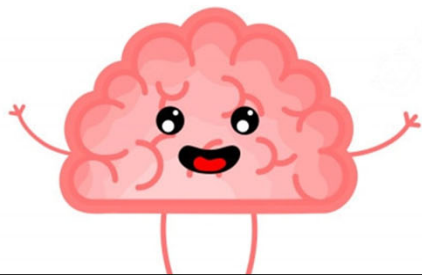
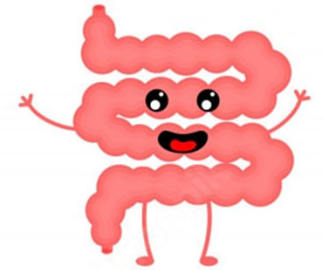
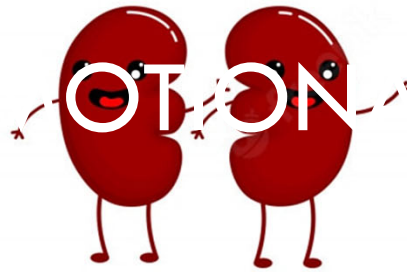
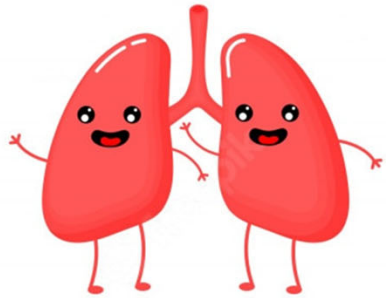
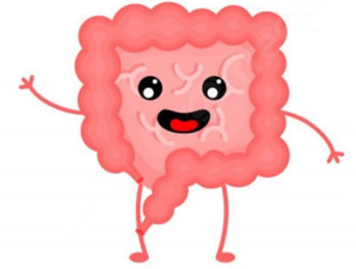
Reference: Interoception Kit SA DoE





EXAMPLES OF INTEROCEPTION

- HUNGER /SATIETY
 - THIRST
 - CIRCADIAN RHYTHM (SLEEP/WAKE CYCLE)
 - RESPIRATION
 - HEART RATE
 - NOCICEPTION (PAIN)
 - THERMOCEPTION (TEMPERATURE)
 - BOWEL/BLADDER
 - PLEASURE
 - AROUSAL
 - GENERAL SENSE OF WELLNESS
- 

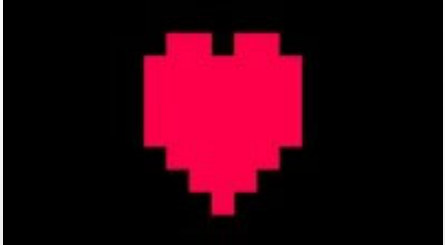


OTON

GAN'S

A medieval manuscript illustration depicting a woman on the left and a man on the right. The woman is wearing a red headscarf and a dark green dress, and she is holding a red apple in her right hand, offering it to the man. The man is wearing a red tunic with a blue collar and a purple shawl, and he is looking at the woman with a serious expression. The background is a plain, light-colored surface.

WHY DID WE USED TO THINK
OUR FEELINGS WERE LOCATED IN
OUR HEARTS?





- CARDIAC RHYTHM CHANGES WITH EMOTION
- CO-ACTIVATE WITH BRAIN CHANGES RELATED TO EMOTION.
- ALEXITHYMIA??



Listen
to your
heart!



REALLY, LISTEN TO IT

- 
- CAN HELP US MANAGE ANXIETY
 - INTEROCEPTIVE ACCURACY CONNECTED TO ANXIETY – ESPECIALLY HEART BEAT
 - DIFFICULT FOR NEURODIVERGENTS – STUDIED A LOT IN AUTISTICS
 - ANXIETY CONNECTED TO SIGNIFICANT REACTIONS TO PHYSICAL SENSATIONS
 - PANIC ATTACKS – TIGHTNESS IN CHEST, CARDIAC ARRHYTHMIA, CAN'T BREATHE
 - TUNING IN CAN HELP US NOTICE AND RESPOND BETTER
- 


EMPATHY???

- PHYSIOLOGICAL SIGNATURES OF EMOTIONS CAN BE SHARED BY OBSERVERS E.G. HEART RATE OF SOMEONE WATCHING A PERSON THEY CARE ABOUT DO SOMETHING STRESSFUL, OR MIMICKING PUPIL SIZE WHEN LOOKING AT THE FACE OF A SAD PERSON (SMALLER PUPILS)
- EMPATHETIC RESPONSE CAN BE DIFF FOR ND PEOPLE , ESP AUTISTICS, WE CAN HAVE AN EMBODIED RESPONSE E.G. REACTING TO PAIN EXPERIENCED BY OTHER PEOPLE





SEX HORMONE INFLUENCE

- APPARENT AFAB ARE BETTER AT IA THAN MEN??
 - DIFFERENT EXPRESSIONS OF HORMONES AND HORMONAL INFLUENCE
 - PUBERTY, GROWTH
 - MENSTRUATION, PREGNANCY, HORMONAL CONTRACEPTION, MENOPAUSE
 - AGING
 - TRANS EXPERIENCE
- 

RESPIRATION

- BREATH RATE
- USUALLY CONSCIOUSLY AVAILABLE
- MORE UNDER OUR CONTROL THAN MOST OTHER FUNCTIONS
- BREATHLESS AND ANXIETY



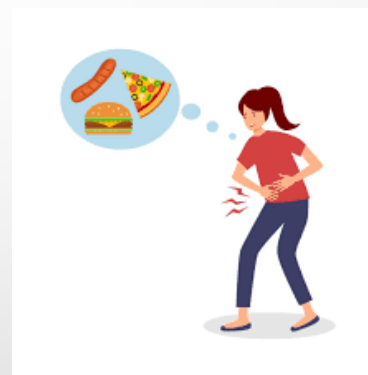




APPETITE, HUNGER, SATIETY, NAUSEA

RECOGNIZE HUNGER CUES.

- RUMBLE IN BELLY
- DIZZINESS / LIGHT HEADEDNESS
- IRRITABILITY
- LACK OF CONCENTRATION
- NAUSEA
- MOODINESS
- EMPTINESS IN YOUR STOMACH
- LACK OF ENERGY
- SHAKINESS
- CAN'T STOP THINKING ABOUT FOOD



COMMON SIGNS OF FULLNESS INCLUDE:

- TIGHT BELLY
- PRESSURE AND/OR DISCOMFORT IN YOUR STOMACH
- BEGINNING TO FEEL SLUGGISH
- NO LONGER ENJOYING THE FOOD
- THE SIGNS OF HUNGER HAVE DIMINISHED



THERMOCEPTION

- AM I TOO COLD?
- TOO HOT?
- JUST RIGHT?
- IS MY TEMPERATURE AFFECTED BY SOMETHING ELSE – E.G. FEVER, STRESS
(I GET HOT WHEN I AM STRESSED!)



NOCICEPTION/PAIN

- BODY'S ALARM BELL
- HIGHLY PERSONAL
- HOW DO WE MEASURE PAIN??
- DIFFERENT THRESHOLDS/ TOLERANCE – ESPECIALLY TRUE FOR ND PEOPLE
- CHRONIC PAIN - DISCONNECT WITH BODY
- LINK TO TRAUMA

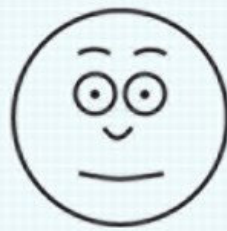




0
No Hurt



2
Hurts
Little Bit



4
Hurts
Little More



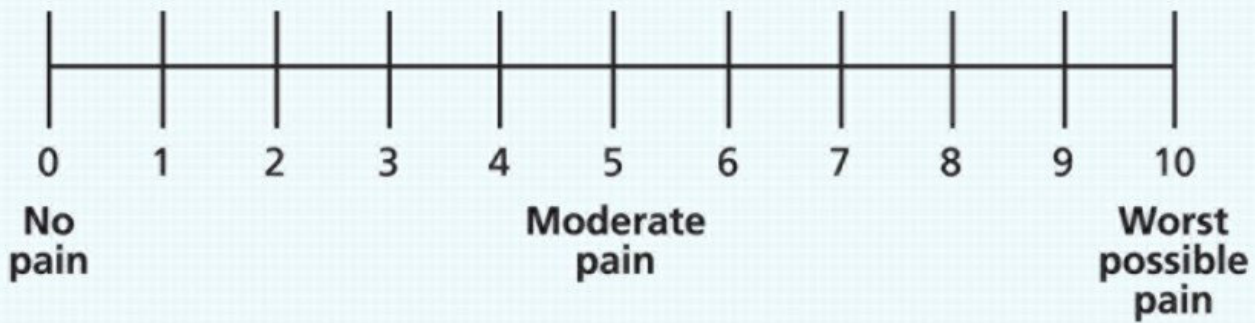
6
Hurts
Even More

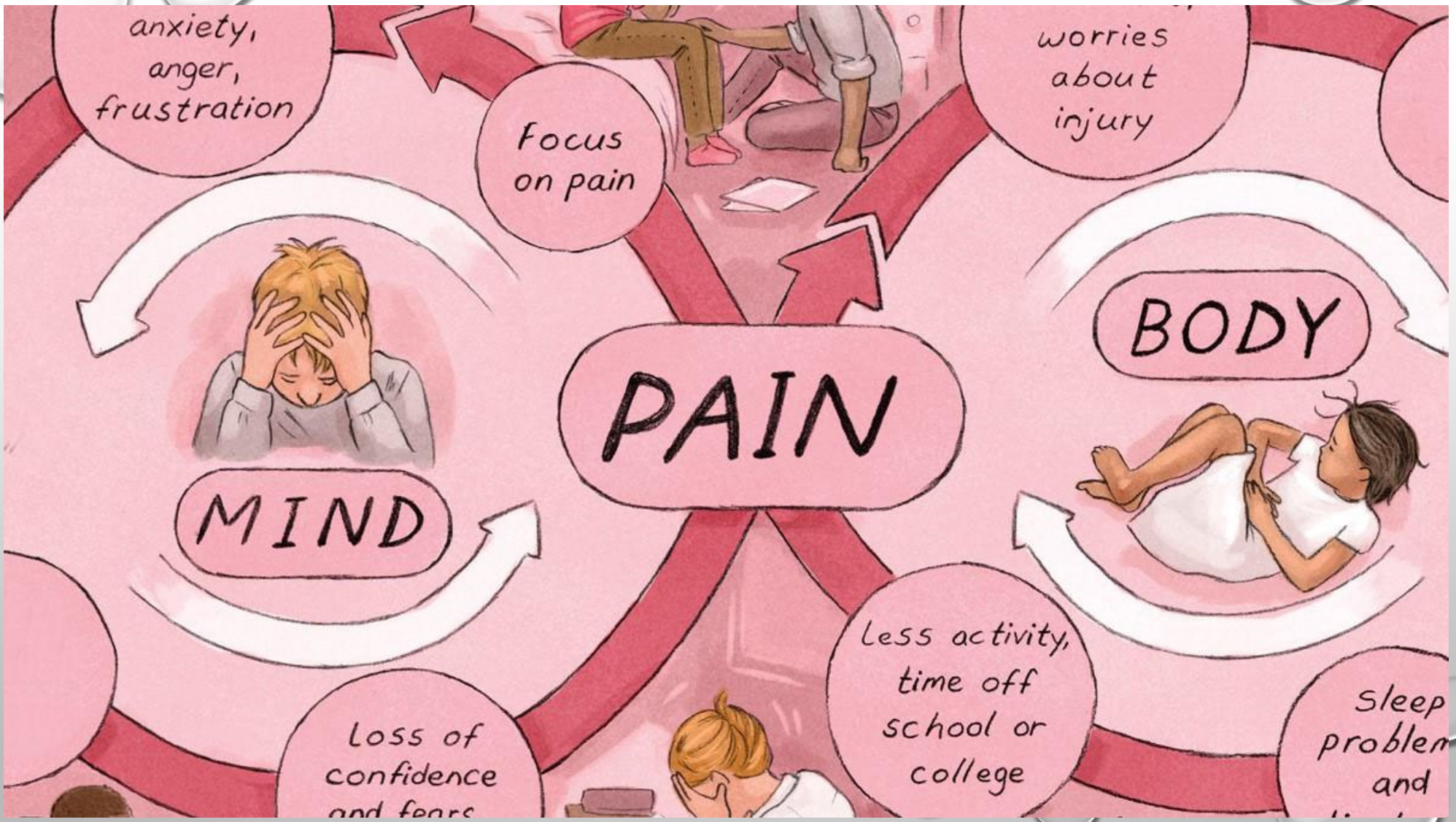


8
Hurts
Whole Lot



10
Hurts
Worst






BOWEL/BLADDER

- TOILETING / POTTY TRAINING – WHY DO SO MANY OF US APPROACH THIS FROM A BEHAVIOURAL ANGLE?
EXTRINSIC MOTIVATION – REWARDS ETC.
- THE NEED TO GO TO THE BATHROOM IS A SENSATION
NOT
A BEHAVIOUR – PRESSURE RECEPTORS
- CONSTIPATION, ENCOPRESIS, BED WETTING
- LOTS OF US IGNORE THIS IN HYPERFOCUS!
- THIS CAN BE IMPACTED BY SUDDEN ANXIETY –
OFFLOADING!





CIRCADIAN RHYTHM – SLEEP / WAKE

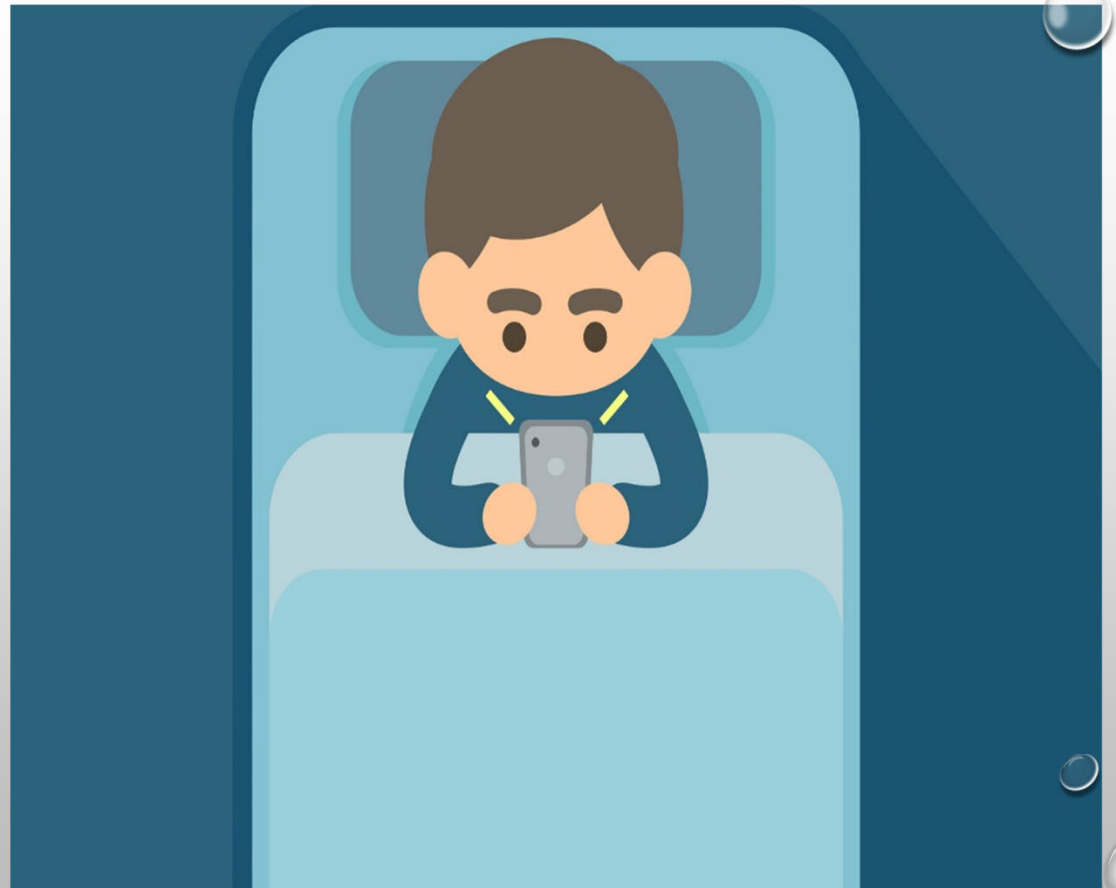
- HOMEOSTATIC SLEEP DRIVE = PRESSURE TO SLEEP- BUILDS DURING THE DAY THE LONGER YOU ARE AWAKE
 - ENERGY CONSUMING ACTIVITIES CONTRIBUTE TO THIS. SLEEP RESETS THIS.
 - CIRCADIAN RHYTHM STARTS AGAIN WHEN WE GET A NIGHT'S SLEEP
- 

MELATONIN – THE HORMONE OF DARKNESS

- MOSTLY RELEASED BY PINEAL GLAND AT NIGHT TIME
- MASSIVE ROLE IN CIRCADIAN RHYTHM
- PLATEAUS DURING NIGHT, DECLINES BY MORNING
- EXPOSURE TO LIGHT/DARK CYCLE – NOTE; BRIGHT LIGHT AT NIGHT MAY DISRUPT IT, BUT DAY TIME DARKNESS WILL NOT RESTORE IT
- IT IS POSSIBLE TO OVERDOSE ON A SUPPLEMENT



- RESPONSE TO ENVIRONMENT
- SCREEN TIME/ BRIGHT LIGHTS
- NEURODIVERGENT CIRCADIAN RHYTHM
- THE 2ND WIND!
- HOW MUCH SLEEP DO WE NEED?



**CAN YOU
REALLY WEAR
YOURSELF OUT
TO SLEEP??**

KIND OF.....



- SLEEP AND EXERCISE – POSITIVE OR NEGATIVE DEPENDING ON TYPE OF EXERCISE AND TIMING
- AEROBIC OR CARDIOVASCULAR EARLY IN THE DAY, GOOD. HIGH INTENSITY IN THE EVENING – TOO ALERTING
- RESISTANCE TRAINING GOOD IN EVENING



SOMATIC MARKERS

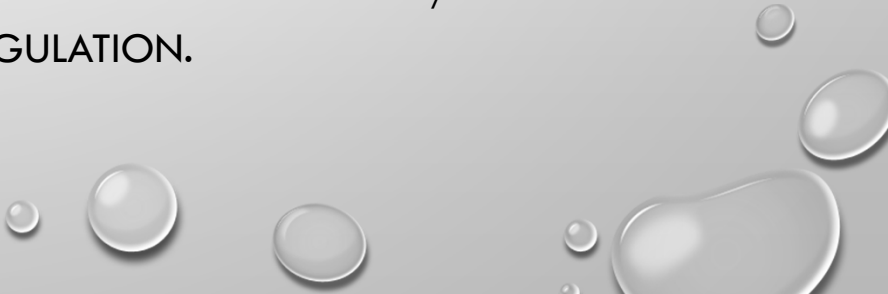
- FEELINGS IN THE BODY ASSOCIATED WITH EMOTIONS
- PHYSICAL SENSATIONS SUCH AS NAUSEA, FAST HEART BEAT, SHALLOW BREATHING, MUSCLE TENSION
- THE URGE TO RUN/ FIGHT





EMOTIONAL REGULATION



- EMOTION REGULATION INVOLVES A FLUENT RELATIONSHIP BETWEEN BODY, MIND, AND FEELINGS.
 - THE ABILITY TO ACCURATELY NOTICE AND EVALUATE CUES RELATED TO PHYSIOLOGICAL REACTIONS TO STRESSFUL EVENTS
 - ACCOMPANIED BY APPROPRIATE REGULATION STRATEGIES THAT INFLUENCE THE EMOTIONAL RESPONSE.
 - EVIDENCE FOR LINKS BETWEEN POOR AWARENESS OF SENSORY PERCEPTION/ INTEROCEPTION AND DIFFICULTIES WITH EMOTION REGULATION.
- 

- SENSITIVITY TO INTEROCEPTIVE SIGNALS CAN DETERMINE OUR CAPACITY TO REGULATE OUR EMOTIONS,
- IMPACT ON MENTAL HEALTH STATE
- ANXIETY AND DEPRESSION.



The Physical Symptoms of Anxiety



Digestive issues

Loss of appetite

Grinding teeth in your sleep

Tense shoulders and jaw

Difficulty sleeping

General tiredness

Racing heart

Sweating

Needing the toilet a lot

Feeling nauseous

Trembling

Headaches

Crying

@PSYCHOTHERAPY.CENTRAL

**ANXIETY –
SO MUCH
HAPPENS IN
OUR BODY**

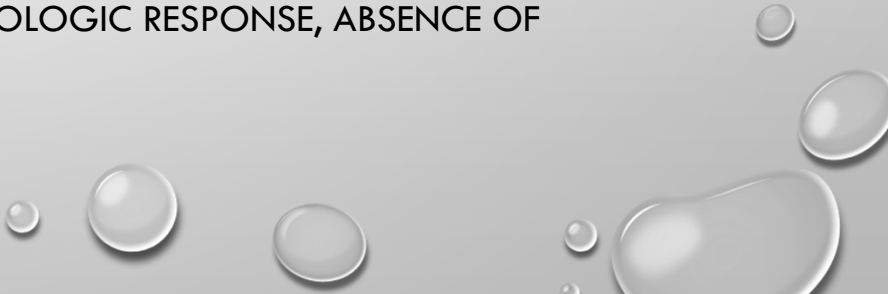
STRESS

- ADRENALINE - ^HEART RATE, ^ BLOOD PRESSURE ^ENERGY SUPPLIES
- CORTISOL, ^SUGARS (GLUCOSE) IN THE BLOODSTREAM, ^ BRAIN'S USE OF GLUCOSE ^ THE AVAILABILITY OF SUBSTANCES THAT REPAIR TISSUES.





TYPES OF STRESS

- POSITIVE
 - MILD PHYSIOLOGICAL RESPONSE, SHORT-LIVED, AVAILABLE CAREGIVER WHO FACILITATES COPING AND HELPS DEVELOP ONGOING COPING SKILLS
 - TOLERABLE
 - MORE INTENSE EXPERIENCE (NATURAL DISASTER, DIVORCE), AVAILABLE CAREGIVER TO HELP COPE AND HELP CHILD CREATE SENSE OF CONTROL OVER EVENT
 - TOXIC
 - PROLONGED OR CHRONIC STRESS AND INTENSE PHYSIOLOGIC RESPONSE, ABSENCE OF RELATIONSHIP OR CARING PERSON TO HELP COPE
- 

IMPACT OF TRAUMA

- HAS AN EFFECT ON CNS
- LASTING IMPACT
- STRESS HORMONES – ADRENALINE, CORTISOL ...
- DO I TRUST WHAT MY BODY IS TELLING ME?
- CHRONIC AND HIGHLY STRESSFUL ENVIRONMENTS AND EXPERIENCES DURING DEVELOPMENT IMPACT NEURAL ARCHITECTURE AND OVERALL BRAIN DEVELOPMENT
- ACE STUDY






- STRESS RESPONSE SYSTEMS

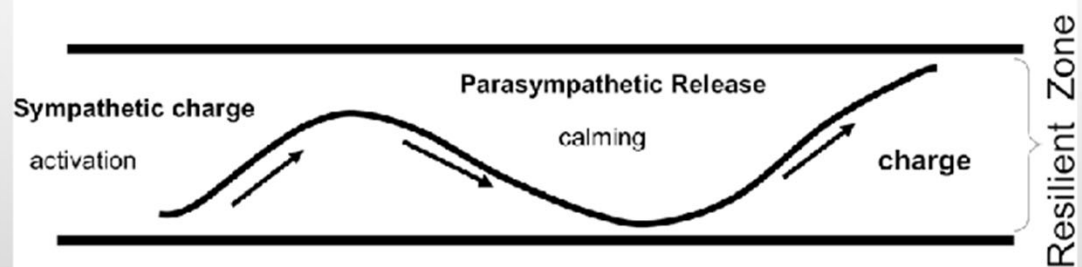
- AUTONOMIC NERVOUS SYSTEM (ANS)
- HYPOTHALAMIC-PITUITARY-ADRENOCORTICAL (HPA) AXIS

- AUTONOMIC NERVOUS SYSTEM (ANS)

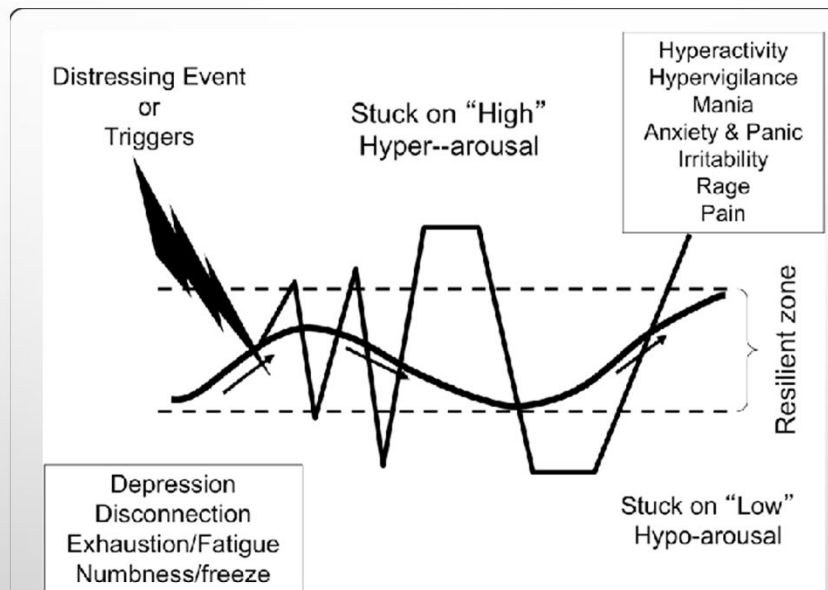
- RHYTHM BETWEEN SYMPATHETIC (ACTIVATOR) AND PARASYMPATHETIC (CALMER) BRANCHES
 - WHEN IN OPTIMAL BALANCE WE CAN BE RESPONSIVE TO LIFE EVENTS RATHER THAN REACTIVE
 - BALANCE ALLOWS FOR BETTER CAPACITY FOR PROBLEM SOLVING AND THINKING IN STRESSFUL SITUATIONS RATHER REACTIVITY
- 

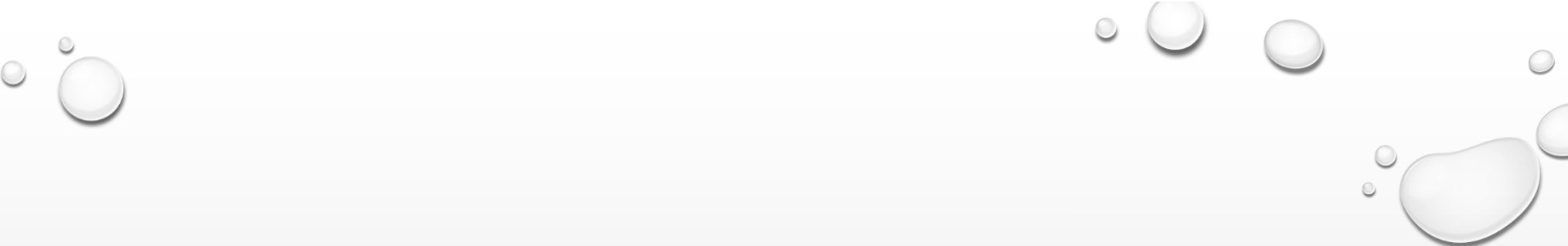

The Resilient Zone

In the "Resilient Zone" individuals have the best capacity for:
Flexibility and adaptability
Pro-social behavior
Executive functioning
Being responsive rather than reactive



Individuals can learn to remain in and return to the Resilient Zone




- 
- STRESS RESPONSE ALSO ACTIVATES HYPOTHALAMIC-PITUITARY-ADRENOCORTICAL (HPA) AXIS AND THE RELEASE OF CORTISOL (A CRITICAL HORMONE DURING FIGHT OR FLIGHT)
 - NEGATIVE FEEDBACK LOOP (SUPPOSED TO SHUT ITSELF OFF AS CORTISOL LEVELS RISE)
 - SLOWER TO ACTIVATE THAN SYMPATHETIC
 - PROVIDES ADDITIONAL SUPPORT DURING STRESS PREPARING BODY FOR STRESS RESPONSE
 - IN RESPONSE TO ACE / TRAUMA THIS RESPONSE CAN BECOME DYSREGULATED
- 




WHEN INTEROCEPTION WORKS



- RESPOND EFFICIENTLY
 - RECEIVE AND MAINTAIN BODY IN A STATE OF BALANCE
 - E.G. WHEN YOU FEEL COLD, PUT ON A JUMPER OR WHEN YOU FEEL DEHYDRATED, HAVE A DRINK
 - RESTORE BALANCE TO THEIR BODIES
 - THE INTEROCEPTIVE SYSTEM IS ALSO RESPONSIBLE FOR HELPING US PERCEIVE AND MANAGE OUR EMOTIONS.
 - EMOTIONAL REGULATION
- 



HOW TO HELP CONNECT TO INTEROCEPTION

- LISTENING TO CUES FROM OWN BODY
 - “HONOURING THE BODY’S NEEDS
 - ACCEPTING AND BELIEVING PEOPLE’S OWN PERCEPTION OF THEIR BODY AND MIND
 - CO-REGULATION
- 

INNER CURIOSITY





- PHYSICAL EXERCISE – HEAVY WORK, RESISTANCE, PROPRIOCEPTION
- MINDFUL AND JOYFUL MOVEMENT
- BEING OUTSIDE IN NATURE
- CARDIO-VASCULAR ACTIVITIES/ALERTING ACTIVITIES




- BREATHE AWARENESS/ BREATHING EXERCISES
- PROGRESSIVE MUSCLE RELAXATION
- BODY SCANS
- TOLERABLE TOUCH
- WORKING WITH AN OT TRAINED IN SENSORY PROCESSING





CO -REGULATION

- INTERACTIVE PROCESS OF REGULATORY SUPPORT BETWEEN PEOPLE
 - CHILDREN CANNOT SELF REGULATE WITHOUT SUPPORT
 - HEALTHY RELATIONSHIPS – AVAILABLE, WARM, SUPPORTIVE
 - PROVIDE WARM RESPONSIVE RELATIONSHIP
 - STRUCTURE ENVIRONMENT (HINT; YOU ARE PART OF THE ENVIRONMENT)
 - TEACH / COACH/ MODEL SELF REGULATION SKILLS
 - A DYSREGULATED PERSON CANNOT REGULATE ANOTHER
- 

The background features a vertical gradient from light purple at the top to dark blue at the bottom. Scattered across this gradient are several realistic water droplets of various sizes, some with highlights and shadows, giving them a three-dimensional appearance. The text is centered in the middle of the image.

DYSREGULATION IS NOT ABOUT
BEHAVIOUR

BY GREG SANTUCCI, OCCUPATIONAL THERAPIST

PARTICIPATION

Can't PARTICIPATE?

Go back and
Get REGULATED!

REGULATION

TRUST & SAFETY

START

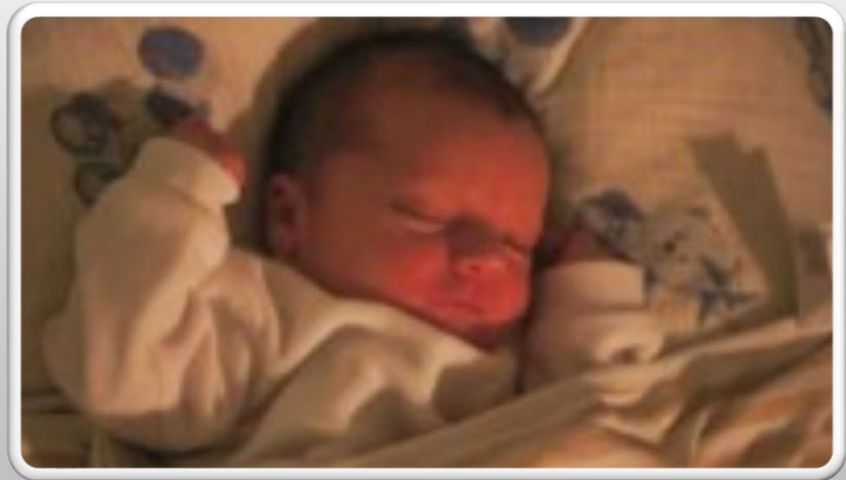
Not REGULATED?
Go back,
re-build TRUST and
help them FEEL SAFE!

If you don't feel SAFE, you can't be REGULATED.

REGULATION BEFORE EXPECTATION

- GREG SANTUCCI

- TAP INTO YOUR OWN REGULATION
- USE YOUR CALM
- SHARE YOUR CALM
- HARK BACK TO THE WOMB



Co-regulation is natural. It's how we're built.

Self-regulation is *not* natural, and it takes a lot more effort. It causes the person to move into greater isolation *which then exacerbates the whole cycle of feeling lost from each other.*

- Bonnie Badenoch -



AN EXAMPLE
FROM
THERAPY



The background of the slide is a gradient of purple, transitioning from a lighter shade at the top to a darker shade at the bottom. Scattered across this background are numerous water droplets of various sizes, some appearing as simple circles and others as more complex, elongated shapes with highlights and shadows, giving them a three-dimensional appearance. The text is centered in the upper half of the slide.

THE GOAL IS NEVER TO CREATE “NORMAL
INTEROCEPTION” BUT TO HONOUR AND EXPLORE
AN INDIVIDUAL’S EXPERIENCE AND HELP THEM
NAVIGATE THEIR OWN SENSES



RESOURCES TO LEARN MORE

- KELLY MAHLER, OT
 - CURIOUS NEURON
 - CURIOUS PARENTING
 - MAGDALENA WEINSTEIN
 - MOVEMENT MATTERS
 - GREG SANTUCCI
 - OTFC GROUP
 - DR SARAH GARFINKEL
 - DR HUGO CRITCHLEY
 - BESSEL VAN
DER KOLK
- 

