How Does It Feel? Sensory Processing, Brain Functioning and Behavior

Presented by
Gerry Morgan, M.S.
Behavior Specialist

Agenda

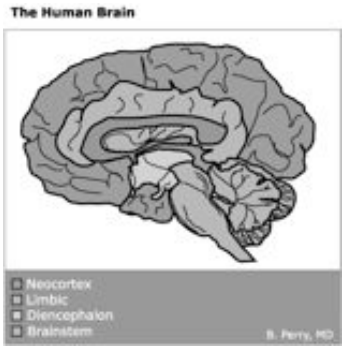
- Introduction to the Neurosequential Model of Therapeutics (NMT)
- Overview of Sensory Processing
- Impact on Children's Behavior
- Treatment and Intervention Strategies

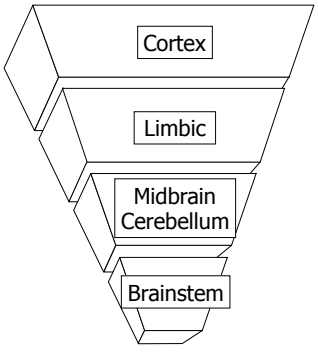
Acknowledgements

- EC Cares Sensory Group
- Lane County NMT Study Group
- Dr. Bruce Perry
  and the Child Trauma Academy

Introduction to the Neurosequential Model of Therapeutics (NMT)

Brain Development

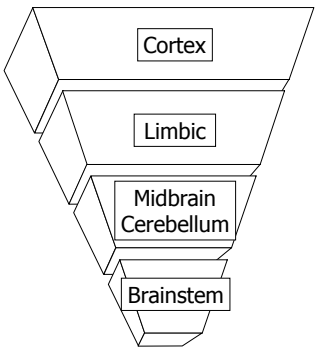




Abstract thought
Concrete Thought
Affiliation
"Attachment"
Sexual Behavior
Emotional Reactivity
Motor Regulation
"Arousal"
Appetite/Satiety
Sleep
Blood Pressure
Heart Rate
Body Temperature

Bruce D. Perry, MD, Ph.D.©

www.ChildTraumaAcademy.org



Cognitive

Relational

Self Regulation

Sensory Integration

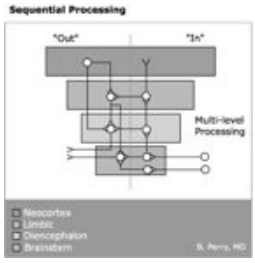
Bruce D. Perry, MD, Ph.D.©
Christine Dobson, Ph.D., LMSW ©

NMT Functional Domains

- Understanding the Functional Domains is critical to ensure that the necessary and appropriate activities are implemented in the correct order

Brain Processing

- Our senses filter everything we process
- Our sensory experiences create templates which guide our experiences



Brain Stem - Sensory Integration

Sensory processing is the normal neurological process of organizing sensations

The human brain receives sensory information from our bodies and environment, interprets incoming messages, then organizes a response to this incoming information.

Bruce D. Perry, MD, Ph.D.©
Christine Dobson, Ph.D., LMSW ©

DE/CB – Self-Regulation

Self-regulation refers to our response to the sensations and feelings that arise from our brain's alarm systems.

Infants are born with an undeveloped capacity to self-regulate.

Bruce D. Perry, MD, Ph.D.©
Christine Dobson, Ph.D., LMSW ©

In the newborn, the vast majority of waking experience is provided by the mother or primary caregiver.

Thus, this relationship and all of the sensory experiences associated with it in the very first weeks of a child's life, begin to create the templates for feeding, soothing, rocking, singing, touching and all future human social interactions.

(Perry, Czyzewski, Lopez, Spiller & Treadwell-Deering,1998)

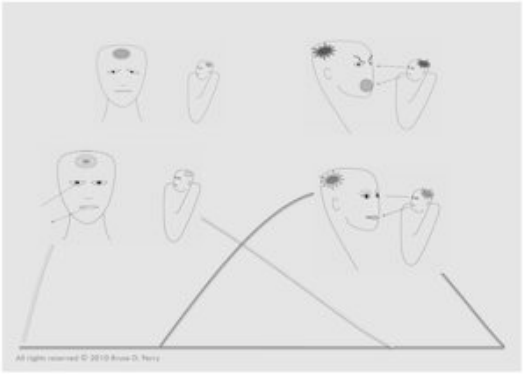
Christine Dobson, Ph.D., LMSW ©

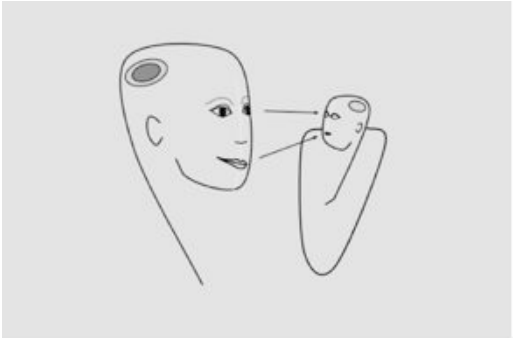
Associations

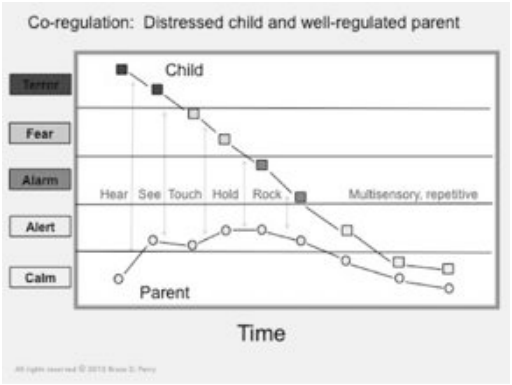
When the caregiver consistently and predictably meets the infants needs the infant begins to make an association in their brain between their caregiver and pleasure that comes from having their physiological needs met (feeling full, dry, warm and soothed)

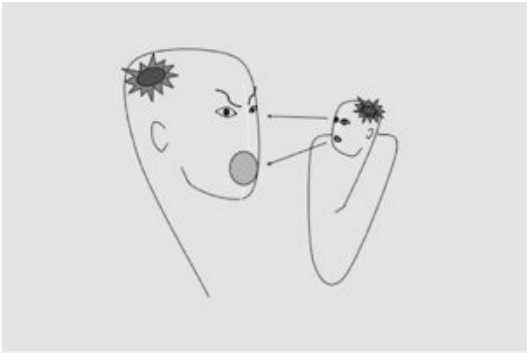
Bruce D. Perry, MD, Ph.D.©

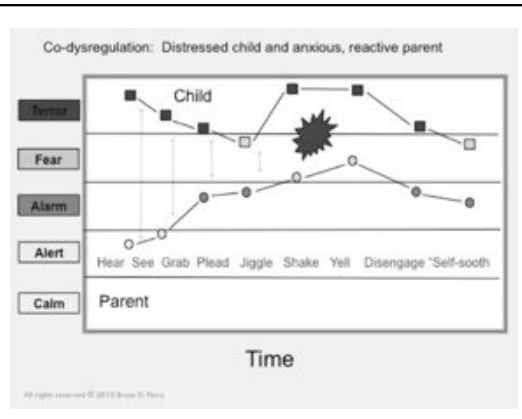
www.ChildTraumaAcademy.org






Co-regulation: Distressed child and well-regulated parent
Terror
Fear
Alarm
Alert
Calm
Child
Hear
See
Touch
Hold
Rock
Multisensory, repetitive
Parent
Time



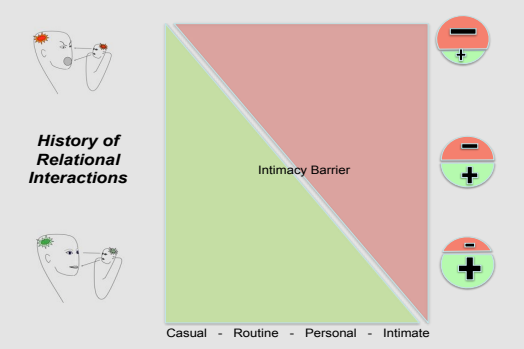

Co-dysregulation: Distressed child and anxious, reactive parent
Terror
Fear
Alarm
Alert
Calm
Child
Hear
See
Grab
Plead
Jiggle
Shake
Yell
Disengage
Self-sooth
Parent
Time

With repeated experiences, associations are made between the pattern of neural activity in the *reward* systems of the brain and the pattern of neural activity in the human *relational system*.

Later on just the hearing of the mother's voice can make the baby feel joy.

This gets generalized to other human beings.

Bruce D. Perry, MD, Ph.D.©
Christine Dobson, Ph.D., LMSW ©



Limbic – Relational

Positive early childhood experiences are the foundation of relational health.

Our stress response system is intimately attuned to the social and emotional context – interactions with safe, nurturing, familiar individuals create calm, regulated stress response systems – unfamiliar or hostile social interactions increase the tone and reactivity of the stress response system.

Bruce D. Perry, MD, Ph.D.©
Christine Dobson, Ph.D., LMSW ©

CTX - Cognitive

Cognitive functioning includes activities such as attending, perceiving, learning, thinking and remembering

Children who have experienced early, developmental trauma and live in a persistent state of arousal also experience changes in cognition, literally retrieving information from the world differently than children who feel calm.

Therapeutic activities will be most effective if they are provided in the sequence that reflects normal development, from the brainstem up.

Therapeutic Interventions

Should:

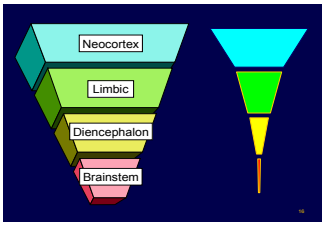
- Be based on the unique strengths and vulnerabilities of each child
- Have the primary objective of therapeutic activities to ensure that experiences are "*relevant, relational, repetitive and rewarding*" (Perry, 2009)
- Ensure that activities are provided within the context of healthy relationships with safe, predictable and nurturing adults

Impacting the Brain

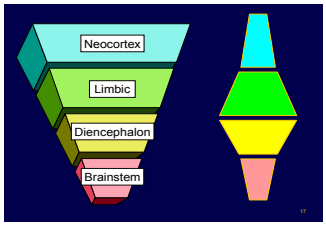
Patterned, Repetitive,
Sensory-Motor Activities

- Stimulate the brain
- Affect foundational systems
- Create change and new templates

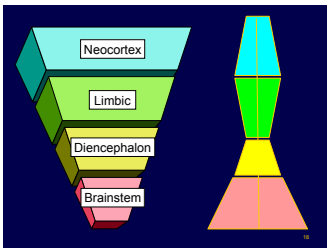
Cognitive or Insight-oriented



Music and Movement



Therapeutic Massage



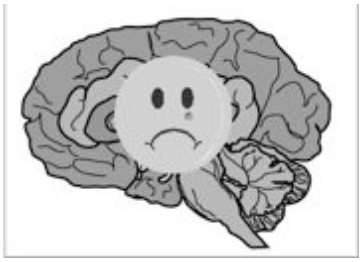
Bruce D. Perry, MD, Ph.D.©

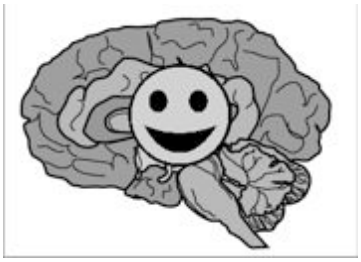
www.ChildTraumaAcademy.org

ChildTrauma Web Site
www.ChildTrauma.org

Online Education and Training Materials
www.ChildTraumaAcademy.com

www.ChildTraumaAcademy.org



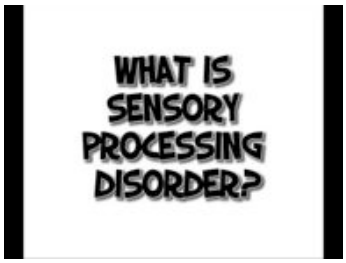


Integrating Sensory & Cognitive

Overview of Sensory Processing

Overview of Sensory Processing

- Sensory processing refers to the ability of the nervous system to manage and interpret incoming sensory information from the seven sensory systems.
- We are constantly taking in information from our senses and using this to organize behavior and successfully interact with the world.



Sensory Systems

- Visual
- Auditory
- Gustatory
- Olfactory
- Tactile
- Vestibular
- Proprioception

Vision

- Function - interprets what we see, alerting
- Receptors - in the eyes, retina
- Visual processing includes
  - Motor control, eye movements, what we visually perceive.
- Vision is used for
  - Alerting & orienting, finding and tracking, scanning the environment, sustained eye contact, shifting focus, eye hand coordination, depth perception, figure ground

Auditory

- Function - interprets what we hear
- Receptors in ears, middle/inner ear
- Auditory processing includes the perception of and the ability to understand sound
- Audition is used for - Sound discrimination, localization, orientation, decoding, remembering what is heard

Taste & Smell

- Function of gustatory/olfactory systems is for taste & smell of environment
- Receptors in tongue and nose
- Used for tastes of food, smell of foods/ environment
  - Smell has a powerful effect on our emotions and evokes powerful memories

Tactile

- Function – Information gathering from objects
- Skin receptors, tactile receptors in mouth
- Tactile is used for:
  - Protective– "fight or flight"
    - pain, pressure, temperature
  - Discriminative – info re: shape, size, texture
    - Light touch, 2 point discrimination, temperature
    - Essential for coordinated manipulation

Vestibular

- Function – awareness of body movement through space
- Receptors- inner ear
- Vestibular is used for determining:
  - Where head/body is in relation to earth
  - Whether body or other objects are moving or standing still
  - Helping to maintain a stable base of support
    - Balance
    - Coordination of both sides of body
- Input primes the entire nervous system

Proprioception

- Function – Awareness of body and limb position in space
- Receptor – joints, ligaments & muscles/ tendons
- Proprioception is used for determining
  - Joint angles
  - Muscle tension and amount of pressure
  - Rate of movement

Interaction Between Sensory Systems

- Vestibular, proprioceptive, visual & tactile inputs work together
- Interact to develop:
  - Body awareness
  - Motor control and planning
  - Grading of movement
  - Postural stability/Balance
  - Emotional security

Foundation for Learning

When the child's sensory systems are in balance, the nervous system is in an optimal state for alertness, attention and learning.

Over-aroused State

- Active to hyper (jumpy/over excited)
- Tense, on edge in appearance
- Loud excited vocalizations
- Aggressive behaviors
- Fidgety, difficulty keeping still
- Meltdowns

Hypersensitive Child

- Tactile Defensiveness
  - Difficulty with touch
- Auditory Defensive
  - Difficulty tolerating noisy environments, unexpected sounds, loud noises
- Movement Sensitivities
  - Uncomfortable with movement, feet off the ground, posture and balance

Under-aroused State

- Overly relaxed/sleepy
- Fatigued appearance
- Boredom/withdrawn
- Quiet, overly calm
- Difficult to engage

Just Right State

- Alert, rested, ready to learn
- Not too calm or excited
- Appropriate tone and speed of speech
- Interacts appropriately with others
- Body position appropriate for activity

Sensory Diet

- We all require a certain amount of sensory input and movement to function.
  - By providing a person with correct amount and type of input, prepares to be alert, active and ready to learn.
- Sensory diet is individualized.
  - Specific to the environment, activity and one's temperament.
- Part of a normal routine.
- Includes scheduled activities with child including:
  - Changes in environment
  - Calming strategies
  - Alerting strategies

Intervention Strategies:

Calming strategies for the Over-aroused Child

- Visual - Auditory
  - Soft lights, dim lights, no lights
  - Minimize clutter
  - Block distractions
  - Play soft classical music or nature sounds
  - Sing and speak softly

Intervention Strategies:

Calming strategies for the Over-aroused Child

Touch Pressure

- Hugs
- Lap pad, pillow, weighted blanket
- Beanbag chair, box, break area
- Warmth
- Heavy/weighted clothing
- Heavy/weight blanket, comforter, sleeping bag
- Rhythmic patting on child's back/leg

Intervention Strategies:

Calming strategies for the Over-aroused Child

- Movement
  - Slow, rhythmic swinging/rocking
  - "Heavy work"
  - Weight bearing activities
  - Movement opportunities throughout the day

Intervention Strategies:

Calming strategies for the Over-aroused Child

- Oral Motor Strategies
  - Chewing
  - Sucking
  - Blowing
  - Vibration

Smell: Lavender, vanilla, sweet smells

Intervention Strategies:

Calming strategies for the Over-aroused Child

- Environmental Strategies
  - Quiet area
    - Beanbag chair
    - Large box with pillows
    - Decreased clutter
  - Be aware of the effects of TV on behavior
  - Visuals for communication
  - Consistency and Structured Routines

Intervention Strategies:
Alerting Activities for the Under-aroused Child

Visual & Auditory
- Bright lights
- Focused lights
- Bright colored toys
- Music with varied pitch, uneven or fast beat
- Varied speech intonation
- High contrasts

Intervention Strategies:
Alerting Activities for the Under-aroused Child

- Touch
  - Light, quick, and/or vigorous rubbing
  - Cold temperature
  - Toys with various textures
  - Vibrating toys
  - Tactile play

Intervention Strategies:
Alerting Activities for the Under-aroused Child

- Movement
  - Movement opportunities throughout the day
  - Quick, fast, and change in speed/direction
  - Jumping/bouncing
  - Running, climbing, tumbling

Intervention Strategies:
Alerting Activities for the Under-aroused Child

- Oral Motor Strategies
  - Crunchy snacks
  - Salty, sour, smoky, tart, tangy
  - Cold- ice, popsicles, ice water
  - Blowing whistles, bubbles

Smell: Citrus, savory smell

Intervention Strategies: Hypersensitive Child

- Environmental Strategies
- Visual & tactile boundaries
- Comfortable tactile input
  - Clothes, mats, sitting in a lap
- Auditory reduction - Earphones
- Preparation of child for a sensory input
- Visual Structure
  - Charts, checklists, schedules
  - Opportunities for choice

Evaluation

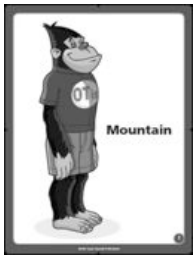
- History – Developmental & Sensory
- Standardized tests based on parent and/or teacher report (Sensory Profile)
- Observation of child's behavior/activity

We are detectives trying to figure out what the child is feeling and perceiving.

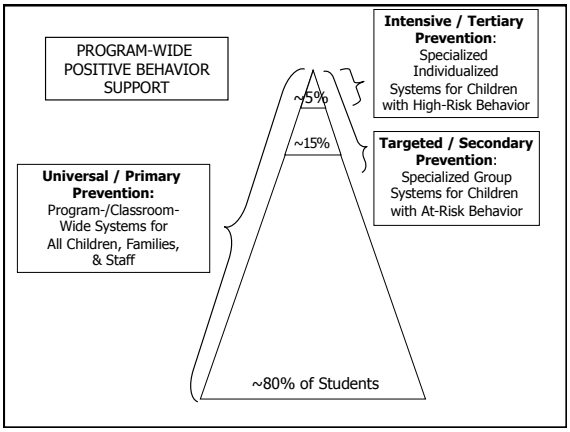
Yoga

- physical movement
- holding poses
- breathing
- body awareness

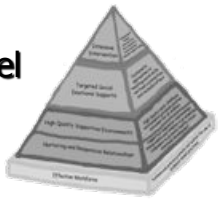
Yogarilla



Impact on Children's Behavior & Treatment and Intervention Strategies



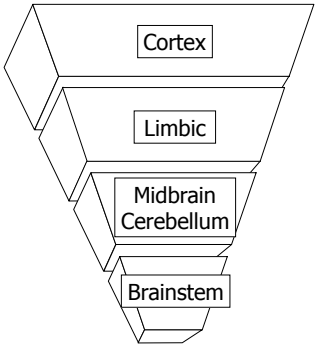
PBS Model



- Nurturing and Responsive Relationships
- High Quality Supportive Environments
- Social Emotional Teaching Strategies
- Intensive Individualized Interventions

Function of Behavior

- Functional Behavior Assessment
- Observation and Interview
- Used to determine the meaning or purpose behind a child's behavior
- Leads to a behavior support plan



Cognitive

Relational

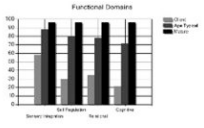
Self Regulation

Sensory Integration

Bruce D. Perry, MD, Ph.D.©
Christine Dobson, Ph.D., LMSW ©

General Summary

- Enrichment
- Therapeutic
- Essential



Sensory Integration

- Enrichment
  - healing touch/massage (hand, neck, back)
  - sand and/or water tables
  - jumping on a trampoline
  - Swinging
  - walking or running
  - Yoga
  - Swimming
  - Martial Arts

Sensory Integration

- Therapeutic
  - music
  - movement
  - yoga
  - drumming
  - massage

*woven throughout the child′s day

Sensory Integration

- Essential
  - massage (pressure point, Reiki touch)
  - Music
  - movement (swimming, walking/running, jumping, swinging, rocking)
  - yoga/breathing
  - animal assisted therapy (includes patterned, repetitive activities such as grooming)

Do Try This At Home

- Woven throughout the child's day
- Built into routines and rituals
- Scheduled
- Trained

Integrate Sensory Strategies

- Include sensory activities in the child's treatment plan
- Embed sensory elements in the everyday activities and routines
- Provide parents and other caregivers with a rationale for sensory strategies

When Attitudes Interfere

- Sensory needs perceived as "misbehavior"
  - Reframe the behavior as meeting a need
  - Teach the parent and the child
  - Try sensory strategies first, then re-assess
- Sensory strategies perceived as play
  - "Everyone's working on something different"
  - Erika needs glasses to see. Trey needs a lap pad to sit at the table

Reducing Resistance to Messy Activities

- Model and contribute
- Suggest appropriate materials
  - Washable
  - Contain the mess (ex. tray, drop cloth)
  - Recipes

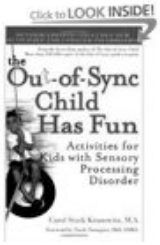
Reducing Resistance to Messy Activities

- Coach parents about the importance of sensory activities
  - Send letter home explaining
  - Ask parents to dress children accordingly
- Set up the activity strategically
  - Reasonable expectations, explicitly taught
  - Adequate supervision
- Set-up and clean-up as part of the activity

Enhancing Follow-Through

- The Fun Factor
- Follow up:
  - How is it working?
  - Fine tuning
- Involve teachers, other service providers, and other family members
- Emphasize the payoff

The Out-of-Synch Child



Resources

- Make a referral to Early Intervention
  - Occupational Therapy
  - Behavior Support

A new website

SensoryLane

sensorylane.wordpress.com

Contact Information

Gerry Morgan
Behavior Specialist
541-912-9586
geraldamorgan@mac.com
gerryskids.com