Using Sensory Interventions to Support Recovery

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What is Sensory Modulation?
What are the principles of SM intervention?
How can SM be used to support people in their occupational engagement and performance?
How can SM be used within inpatient settings to reduce seclusion and restraint?

“\The experience of being human is embedded in the sensory events of our everyday lives.\”

Winnie Dunn

\textit{Maurice Merleau-Ponty}

\textit{The body is our general medium for having a world.}

- **Interoception** - awareness of one’s internal state (e.g., hunger, tiredness, illness)
- **Exteroception** - awareness of the world in relation to one’s self: ‘Distal’ senses (sight, hearing, smell, taste, touch)
- **Proprioception** – awareness of one’s body in relation to the world (works with vestibular and tactile input): ‘Proximal’ senses - body scheme, movement, orientation
Sensory Processing Issues

- Sensory Modulation Disorder
- Sensory Over-responding
- Sensory Under-responding
- Sensory Craving/Seeking
- Sensory-Based Motor Disorder
  - Postural Disorder
  - Dyspraxia
- Sensory Discrimination Disorder
  - Visual, Auditory, Olfactory, Gustatory, Vestibular, Proprioceptive, Tactile, Interoceptive

(Miller et al., 2007)

Sensory Modulation

- The ability to regulate and organize the degree, intensity and nature of responses to sensory input in a graded and adaptive manner.
- Strongly influences arousal levels
- Allows people to maintain an optimal range of performance and to adapt to challenges in everyday life

A Model of Sensory Processing

(Winnie Dunn, 1997)

<table>
<thead>
<tr>
<th>Passive Behavioural Response</th>
<th>Active Behavioural Response</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Under-Reactive System</strong></td>
<td><strong>Sensation Seeking</strong></td>
</tr>
<tr>
<td>High neurological threshold:</td>
<td>Sensation Avoiding</td>
</tr>
<tr>
<td>'Big glass'</td>
<td>Limits exposure to sensory</td>
</tr>
<tr>
<td></td>
<td>stimuli</td>
</tr>
<tr>
<td><strong>Low Registration</strong></td>
<td></td>
</tr>
<tr>
<td>Misses sensory stimuli/</td>
<td></td>
</tr>
<tr>
<td>slowed responses/</td>
<td></td>
</tr>
<tr>
<td>doesn’t notice what others</td>
<td></td>
</tr>
<tr>
<td>do</td>
<td></td>
</tr>
<tr>
<td><strong>Sensation to Stimuli</strong></td>
<td></td>
</tr>
<tr>
<td>Distractibility or discomfort with sensation</td>
<td></td>
</tr>
<tr>
<td><strong>Sensation Avoiding</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sensation Seeking</strong></td>
<td></td>
</tr>
<tr>
<td>Enjoys sensory stimuli /</td>
<td></td>
</tr>
<tr>
<td>creates sensation in the</td>
<td></td>
</tr>
<tr>
<td>environment</td>
<td></td>
</tr>
</tbody>
</table>

Sensory Modulation and Mental Health Practice

The lived experience...

“Part of the illness for me is hypersensitivity to light, to noise and to people. I couldn’t bear people around me, couldn’t bear the noise of television, even music which I adore - couldn’t bear the sound, it just sounded like distortion. Television is the enemy, because it is loud, phones, phones, phones - I just wanted to have it cut off. I couldn’t read - even a book would become an enemy, when I picked it up it proved that I couldn’t do it”.
The lived experience...

“I think that is what people think ‘Oh she or he is just sitting in the corner saying nothing’, but believe me, you may be numb to the world but in actual fact there are other parts of you, like your subconscious, your protection side is all working overtime because you are in a vulnerable position. When people are vulnerable like that - your sensors are out so much and you pick up a lot of what happens almost by - it is a vibe thing, an emotional thing - you are picking up all the vibes. You seem as though you are cut off, but at the same time, you have this heightened awareness at an emotional level….”

Finding the ‘Just Right’ Arousal

- Arousal levels
- Tense alert
- Calm alert
- Tense drowsy
- Calm drowsy

- Optimal arousal for every day functioning is a calm and alert state

Arousal changes through the day and in different circumstances...

![Arousal Graph]

Time of Day

0 1 2 3 4 5 6 7 8 9 10 11

Low

Optimal

Too High

Too Low

Associated with:
- Receptivity
- Slowness
- Relaxation
- Scope
- Divergent thinking
- Process-oriented
- Presence
- Elaboration

Associated with:
- Activity
- Speed
- Tension
- Focus
- Convergent thinking
- Goal-oriented
- Agency
- Direction

Response to Threatening Sensory Stimuli

![Response Diagram]

Stimulus

Cortex

Sensory Thalamus

Hippocampus

Amygdala

Response appropriate to circumstance

Trauma and Sensory Processing

![Trauma Diagram]

Stimulus

Cortex

Sensory Thalamus

Hippocampus

Amygdala

Response flight and fight reaction.

Anxiety and Sensory Processing

Emotional Regulation Strategies

- Situation Selection
- Situation Modification
- Attentional Deployment
- Cognitive Appraisal
- Response Modulation


The Senses and Emotion

- Our senses can be used to help us
  - relax / calm down
  - be more alert / energised
  - be in tune with our body and the world
  - feel more organized
- Sensory preferences are individual, what calms some may irritate others.
- Sensory input is especially helpful when our ability to think clearly is impaired (i.e., when we are upset, distracted, stressed or ill).

The ‘Powerhouses’ for Calming

- Tactile, vestibular and proprioceptive functions are the building blocks for emotional stability.
- Touching and being touched is central to
  - Sucking, eating, comfort & security
  - Emotional attachment from bodily contact
- Vestibular & proprioceptive input is essential for
  - Development of eye movements
  - Postural control
  - Awareness of where body is in space.

Characteristics of Calming and Alerting Sensations

<table>
<thead>
<tr>
<th>CALMING</th>
<th>ALERTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slow</td>
<td>Quick paced</td>
</tr>
<tr>
<td>Simple</td>
<td>Complex</td>
</tr>
<tr>
<td>Soothing/relaxing</td>
<td>Irritating</td>
</tr>
<tr>
<td>Soft/Mild Intensity</td>
<td>Pronounced/High intensity</td>
</tr>
<tr>
<td>Rhythmic</td>
<td>Non-rhythmic</td>
</tr>
<tr>
<td>Positive associations</td>
<td>Negative associations</td>
</tr>
<tr>
<td>Predictable</td>
<td>Unpredictable</td>
</tr>
<tr>
<td>Familiar</td>
<td>Novel</td>
</tr>
<tr>
<td>Low demand</td>
<td>High demand</td>
</tr>
</tbody>
</table>

Proprioceptive Input

- Receptors in muscles, tendons, ligaments, joints
- Sense of:
  a) Where the various parts of the body are located in relation to each other
  b) Whether the body is moving with required force
Proprioception

**CALMING**
- Isometric ms. contraction
- Movement against resistance
- Heavy work: digging, sweeping
- Balance trainer
- Exercise bands and equipment
- Medicine and Swiss Ball
- Stress ball – squeezing
- Climbing – push-pull activities
- Hiking
- Clay work / putty
- Kneading dough
- Yoga, Tai chi, Haka

**ALERTING**
- Fast movement
- Jogging
- Jumping
- Aerobics

Vestibular input

<table>
<thead>
<tr>
<th>Vestibular system contributes to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sense of body position in space</td>
</tr>
<tr>
<td>Sense of acceleration/deceleration</td>
</tr>
<tr>
<td>Posture and muscle tone</td>
</tr>
<tr>
<td>Maintaining a stable visual field</td>
</tr>
<tr>
<td>Balance</td>
</tr>
</tbody>
</table>

Touch

**VESTIBULAR**

**CALMING**
- Linear input
- Slow rhythmic movement
- Rocking
- Swaying
- Gliding

**ALERTING**
- Sudden acceleration or deceleration
- Angled movements
- Spinning
- Uneven or unstable surfaces

Skin contains receptors for: Light touch, Pain, Temperature, Deep touch, Vibration, Stretch

- Has protective and discriminative functions
- Light touch is alerting – may provoke strong response
- Deep touch is calming – slower and longer lasting input

Oral – Motor Input

**CALMING** (DEEP PRESSURE TOUCH)
- Strong hugs
- Firm touch on the shoulder
- Massage
- Weighted blanket, lap pad, soft toy
- Squeezing a stress ball
- Use of hand lotions
- Neutral warmth
- Vibration

**ALERTING** (LIGHT TOUCH)
- Tickling
- Light stroking
- Prickly or squishy
- Unfamiliar or unexpected touch
- Cool room
- Fiddling with a stress ball
- Snapping a rubber band on the wrist
- Use of fidget items

- Signals the vagus nerve to prepare to digest
- Supports sympathetic inhibition, thus dampening arousal and providing a calming effect
- Oral motor stimulation helps with comfort, attention and overall organisation
### ORAL MOTOR

<table>
<thead>
<tr>
<th>Calming</th>
<th>Organising</th>
<th>Alerting</th>
<th>Breathing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sucking</td>
<td>Chewing</td>
<td>Crunching</td>
<td>Support</td>
</tr>
<tr>
<td>Hard sweets</td>
<td>Chewing gum</td>
<td>Yawning</td>
<td>Blowing</td>
</tr>
<tr>
<td>Thick liquid through straw</td>
<td>Bagel</td>
<td>Popcorn and pretzels</td>
<td>Pinterested</td>
</tr>
<tr>
<td>Orange slices</td>
<td>Gummy bears</td>
<td>Raw vegetables</td>
<td>Blow bubbles</td>
</tr>
<tr>
<td>Lollipops</td>
<td>Dried fruit</td>
<td>Crunchy vegetables</td>
<td>Abdominal breathing</td>
</tr>
<tr>
<td><strong>caution: check status of dentures or fillings</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Olfaction (Smell) & Taste

Olfactory system is primitive, protective & powerful

Directly connected to the limbic system

Tastes that are calming are generally pleasant and familiar

Tastes such as mints, citrus and spice tend to be alerting

<table>
<thead>
<tr>
<th>SMELL</th>
<th>TASTE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CALMING</strong></td>
<td><strong>CALMING</strong></td>
</tr>
<tr>
<td>Soothing scented candles – vanilla, lavender</td>
<td>Mild</td>
</tr>
<tr>
<td>Mild fragrance</td>
<td>Sweet</td>
</tr>
<tr>
<td>Scented bath powder</td>
<td>Lollipops</td>
</tr>
<tr>
<td>Pleasant smell</td>
<td>Pleasant</td>
</tr>
<tr>
<td>Potpourri</td>
<td>Porridge and brown sugar</td>
</tr>
<tr>
<td>Positive associations</td>
<td>Apple juice</td>
</tr>
<tr>
<td></td>
<td>Sweet fruits</td>
</tr>
<tr>
<td><strong>ALERTING</strong></td>
<td><strong>ALERTING</strong></td>
</tr>
<tr>
<td>Citrus, Peppermint</td>
<td>Strong or spicy</td>
</tr>
<tr>
<td>Strong fragrances</td>
<td>Sour or bitter</td>
</tr>
<tr>
<td>Perfume</td>
<td>Lemon drop</td>
</tr>
<tr>
<td>Noxious odour</td>
<td>Strong peppermints</td>
</tr>
<tr>
<td>Room fragrance spray</td>
<td>Chilli</td>
</tr>
<tr>
<td>Negative associations</td>
<td>Lemonade</td>
</tr>
<tr>
<td></td>
<td>Pickles</td>
</tr>
</tbody>
</table>

### Auditory and Visual Input

- Can help
  - ease transition
  - reduce stress
  - increase organisation and directionality
  - provide distraction or a soothing focus
  - provide positive associations
  - affect muscle tone and equilibrium
  - affect biological rhythms (entrainment)

### Hearing and arousal...

During fear, anger, rage, alarm (stress) muscles squeeze the ossicles together

Under conditions of arousal we hear:

- Low, rumbling noises
- Sudden hi-pitched tones
- Background sounds

But not the human voice

Porges, 2009a, 2009b
## AUDITORY

### CALMING
- Soft slow music
- Classical or new age music
- Humming
- Simple, melodic
- Repetitive sounds (ocean waves)
- Relax/Meditation CD’s

### ALERTING
- Offbeat, loud, quick paced music
- Whistling
- Singing loudly
- Hand held instruments
- Rock music

## VISUAL SENSATIONS

### CALMING
- Soft warm colours
- Natural or dim lighting
- Serene paintings
- Pleasant scenery
- Flickering candle
- Fish aquarium
- Bubble lamp
- Clean and sparsely furnished room

### ALERTING
- Bright colours / lights
- Movt. in Peripheral vision
- Abstract art
- Complex visual images
- Changing patterns of light
- Video game
- Movies, you tube videos
- Messy and cluttered room

## Sensory Modulation Intervention

- Sensory Modulation intervention uses the environment, activities and objects to help people regulate their physiological/emotional arousal
- Identify individual sensory sensitivities and needs
- Provide education about sensory processing & arousal
- Identify individualised sensory strategies
- Build sensory strategies into crisis and recovery plans
- Use sensory strategies earlier rather than later
- Support self-management of arousal in daily life

## Sensory-Focused Assessment

- Sensory Profiles (available from Pearson)
  - Adolescent/Adult -11yrs plus (Dunn & Brown, 2004)
  - Child - 3-10yrs (Dunn, 1999-2001)
  - Infant/Toddler - 0-3yrs (Dunn, 2002)
- Non-standardised assessment
  - Sensory modulation screening tools
  - Checklists - sensory responses, sensory tools & activities
  - Practical exploration of different modalities
  - Interview & observation

## Sensory Intervention Planning

- Is individualised & developed proactively by service user with staff support
- A therapeutic process that is trauma sensitive
- Considers life stage, gender, culture
- Written in easy to understand language
- Includes identifying:
  - SENSORY TRIGGERS
  - EARLY WARNING SIGNS OF SENSORY OVERLOAD
  - SENSORY BASED STRATEGIES
- May focus on crisis prevention and management and/or everyday functioning and wellbeing
- Considers safety and precautions

## Grounding Techniques

- Simple strategies for self-regulation
- Helps orientate and focus on the present
- Helps restore ‘balance’ or sense of stability
- Calming stimuli – weighted blanket, massage, wraps, rocking chair, breathing, warm face cloth to neck and face
- Alerting stimuli - Ice, strong smells (citrus), pain (rubber band)
Integration with Treatment & Everyday life

- Incorporate sensory strategies into individual treatment and crisis plans
- Try using first before PRN medication
- Integrate into DBT, CBT, OT
- Perfect for teaching Distress Tolerance Skills
- Incorporate into everyday life (sensory diet)
- Create sensory area in own home
- Use individualised kits and daily activities

Sensory Diets (Wilbarger, 2007)

- The preferred sensori-motor experiences that help individuals function optimally within their environments.
- People modify their sensory ‘diet’ automatically throughout the day to suit their needs, without necessarily being conscious of doing so
- Individuals with trauma histories, mental illnesses, or addictions, or who have developed problematic behaviour patterns, are sometimes unaware of their particular sensory needs or stress responses. (Champagne 2003, Cool 1990, Reisman and Blankey 1991)

Overall benefits of sensory modulation

- Increased self-awareness
- Increased resilience and ability to self-nurture
- Increased self-esteem and body image
- Increased ability to engage in therapeutic activities
- Increased ability to engage in self-care activities
- Increased ability to engage in meaningful life roles
- Increased ability to engage in social activities
- Increased ability to cope with triggers

From: Champagne available at www.ot-innovations.com

Practice Example: Seclusion & Restraint Reduction

The Six Core Strategies to Reduce Restraint and Seclusion (NASMHPD, 2005)

- Focus on organisational change for S & R reduction
- Based on trauma informed and recovery model of care

1. Leadership towards organizational change
2. Using data to inform practice
3. Workforce development
4. Use of seclusion and restraint reduction tools (Sensory Modulation)
5. Consumer roles in inpatient settings
6. Debriefing

Creating Calming Sensory Spaces

- Redesigning ward spaces – for soothing, alerting and grounding
- Designated sensory modulation rooms
- Mobile Sensory Carts
- ‘Coping through the senses’ groups
- Individualised sensory kits for soothing, sleep, sobriety, alerting, grounding
Sensory Tools and Equipment

- Colour wall wash
- Portable DVD player and calming DVD’s
- Quiet music and calming sounds
- Aromatherapy - electric burner or scented spray
- Rocking/recliner chair
- Massage Chair
- Bean Bag chair
- Small balls – pressure
- Weighted lap blankets
- Faux-fur blankets
- Neck and Shoulder wraps
- Variety of candies: hard / chewy / minty / tart / fruity
Service User’s Experience of Sensory Modulation

Key Processes
- Grounding
- Soothing
- Shifting attention
- Shifting affect

Immediate impact
- Sense of safety
- Sense of control
- Expression/release
- Interpersonal trust

Longer term impact
- Self-management of arousal
- Shift of power within service delivery
- Capacity for greater participation in life

Service User Feedback

- (Self harm) was one of the main reasons I was here on the ward, and for me, most of the time that’s a way of grounding myself. The massage chair was actually a great safe alternative. It reduced the self harm behaviours quite dramatically.

- It’s sort of like focusing on the here and now...So I had control over what I wanted to feel. I knew that was going to make me feel good and relaxed, and so in a way I was in control of my environment.

- It made you stop long enough to calm down and think about what you were doing...I mean it was far more beneficial learning how to cope with it than to pop a pill.
Service User Feedback

“It’s totally changed my experience of being on the ward. Previously, the ward has been like a holding pen for me, it hasn’t been a helpful place, ‘cause there’s no therapy takes place there, no intervention really that assists. It’s sort of like a waiting, waiting, waiting until something happens. But I actually found I was a lot more aware, you know, around, having the room, having had the experience of the room”.

Resources

- Tina Champagne’ website ol-innovations.com
- Karen Moore’s website sensoryconnectionprogram.com
- NZ Mental Health Workforce Development and Research organisation (Te Pou) tepou.co.nz