The use of Sensory Stimulation in Rehabilitation

Dr Lesley Collier
What do we mean by sensory stimulation and Snoezelen

Snoezelen

Sensory stimulation
Development of the multisensory environment

Key areas of practice

- Learning disabilities (Autism, Downs syndrome)
- Older persons mental health (Dementia, depression)
- Acute mental health settings (Stress management, Schizophrenia)
- Palliative care (pain management, end of life care)
- Maternity care (pain management, stress management)
- Neurology (acquired brain injury, sensory retraining)
Evidence supporting a sensory approach

Brain injury

- Poza, Gomez, Gutierrez et al. (2013) Effects of MSE on brain injured patients. Medical Engineering and Physics


Pain management


Dementia cognitive impairment


Learning Disability

- Castelhano, Silva & Rezende et al. (2013) Ludic content in multisensory stimulation environments. OT International


Sensory stimulation and Snoezelen in rehabilitation & special education for children with special needs – assessment and treatment planning in the classroom

Dr Lesley Collier
Senior Lecturer
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Snoezelen

Sensory stimulation
Development of sensory stimulation and Snoezelen

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Problems identified in children with physical disability and special needs

- Dyspraxia / apraxia
- Hypotonus/hypertonus
- Poor motor control
- Ataxia
- Unable to engage in purposeful activity
- Poor communication
- Poor information processing
- Sensory processing disorder
- Over / under arousal
Sensory challenges experienced by children with special needs

- Sensory processing
- Environmental demand
- Just right challenge
Environmental demand
Adapted from the model of sensoristasis

Antecedent
Neuro-physiological factors
Environmental psychological decline
Human intervention

Sensory imbalance
High-stimulus Stress Imbalance exceeded threshold
Low-stimulus Sensory Imbalance deprivation

Cortical sequelae
Psychic discomfort

Behavioural sequelae
Agitation
Decline in activities of daily living
Decline in social functioning and play
Tenets of the model

• An imbalance may occur as a result of neurophysiological or environmental factors

• Too much high-stimulus activity can result in stress threshold being exceeded

• This will occur at a lower level if activity is unpleasant or processing is too fast.

• Too lower stimulus activity may lead to sensory deprivation.
Looking at skill levels

- Sensory level
- Perception
- Skill acquisition

(Normal development)
(Delayed development)
(Deteriorating conditions)
Sensory integration is critical for human development and function.
Five basic assumptions

- Potential for neuroplasticity
- Interaction between higher order (cortical) and lower order (subcortical) areas to modulate sensory input
- Neurophysiological development of sensory integration follows a sequential pattern
- Adaptive response – ability to adjust performance according to environmental demand
- Presence of inner drive to meet and master a challenge
Flow
Csikszentmihalyi, 1975
Assessment tools to assess sensory needs

- Sensory profile (Brown & Dunn)
- Sensory profiling tool (Rompa)
- Sensory preference tool
Sensory profile
The model of sensory processing
Dunn, 2002

Sensory processing patterns are based on how the nervous system reacts to input and how the person responds to that input.

**Nervous system thresholds** – thresholds for responding along a continuum based on sensory preference

**Self regulation strategies** - active management of sensory input
Patterns of sensory processing assessed by the Sensory Profile

<table>
<thead>
<tr>
<th>Threshold / reactivity</th>
<th>Passive</th>
<th>Active</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High threshold with low reactivity</strong></td>
<td>Bystander</td>
<td>Seeker</td>
</tr>
<tr>
<td>Does not notice sensory events or is slow to respond</td>
<td>Looks for sensory experiences</td>
<td></td>
</tr>
<tr>
<td><strong>Low threshold with high reactivity</strong></td>
<td>Sensor</td>
<td>Avoider</td>
</tr>
<tr>
<td>Readily notices sensory stimuli, may be distracted by them</td>
<td>Deliberately acts to reduce or prevent exposure to sensory stimuli</td>
<td></td>
</tr>
</tbody>
</table>
The sensory profiling tool
The sensory tool box

- Sight - visual
- Sound - Auditory
- Touch - Somatosensory / vibration
- Taste - Gustatory and texture
- Smell - Olfactory
- Movement - Vestibular / proprioception
Analysing the Snoezelen environment

- Intensity
- Amount
- Consistency
- Any competing stimuli
- Familiarity
- Level of arousal
- Environmental cues
Organising a session

- Identifying focus for the session based on assessment outcomes
- Techniques for specific needs
- Timing and the therapeutic intervention
- Measuring outcome
- Reflection on the session
Achieving sensory modulation within session

Balance of excitation & inhibition

**Excitation** – over-response eg. release phenomena in brain injury & stroke.

**Inhibition** – under-response, fail to notice stimulation eg. Neglect

Role of feedback system to regulate balance
## Arousal & alerting systems

<table>
<thead>
<tr>
<th>Sensory system</th>
<th>Arousal / alerting descriptors</th>
<th>Discriminating/ mapping descriptors</th>
</tr>
</thead>
<tbody>
<tr>
<td>For all systems</td>
<td>Unpredictable – unfamiliar, cannot anticipate the sensory experience</td>
<td>Predictable – familiar, can anticipate what will happen next</td>
</tr>
<tr>
<td>Somatosensory</td>
<td>Light touch</td>
<td>Pressure touch</td>
</tr>
<tr>
<td></td>
<td>Pain – sharp, pinch</td>
<td>Long duration stimuli</td>
</tr>
<tr>
<td></td>
<td>Temperature</td>
<td>Large body surface contact</td>
</tr>
<tr>
<td></td>
<td>Small surface contact</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vestibular</td>
<td>Head position change</td>
<td>Linear head movement – rocking, bouncing</td>
</tr>
<tr>
<td></td>
<td>Speed change</td>
<td>Repetitive</td>
</tr>
<tr>
<td></td>
<td>Direction change</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rotary head movement</td>
<td></td>
</tr>
</tbody>
</table>
# Arousal & alerting systems

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</thead>
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<tr>
<td>Proprioception</td>
<td>Quick stretch – brisk tapping</td>
<td>Sustained tension – constant action on muscles, heavy objects</td>
</tr>
<tr>
<td>Visual</td>
<td>High intensity – bright visual stimulus</td>
<td>Pressure touch</td>
</tr>
<tr>
<td></td>
<td>High contrast – difference between stimulus &amp; environment</td>
<td>Long duration stimuli</td>
</tr>
<tr>
<td></td>
<td>Variable – changing characteristics</td>
<td>Large body surface contact</td>
</tr>
<tr>
<td>Auditory</td>
<td>Variable – changing characteristics</td>
<td>Linear head movement – rocking, bouncing</td>
</tr>
<tr>
<td></td>
<td>High intensity – loud</td>
<td>Repetitive</td>
</tr>
<tr>
<td></td>
<td>Competitive – conflicting sound</td>
<td></td>
</tr>
<tr>
<td>Olfactory / gustatory</td>
<td>Strong intensity</td>
<td>Mild intensity</td>
</tr>
</tbody>
</table>

*Source: Centre for Innovation and Leadership in Health Sciences, University of Southampton*
Incorporating sensory qualities into integrated therapy programmes

**Visual**

**Arousal**
- High intensity – to increase arousal & attention
- High contrast – to enhance location & attention
- Variability – Maintain alertness & attention

**Discrimination**
- Low intensity – generate searching behaviours
- Low contrast – discrimination
- Competitive – increase tolerance and inhibitory response
## Auditory

### Arousal
- Variable – maintain arousal or interest in the task
- High intensity – Alerting, location

### Discrimination
- Rhythmic – predictable / organising / orientation
- Constant – Environmental orientation
- Competitive – Orientation & tolerance
# Olfactory / Gustatory

<table>
<thead>
<tr>
<th>Arousal</th>
<th>Discriminatory</th>
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<tr>
<td>Strong intensity - arousal</td>
<td>Noncompetitive – focus attention</td>
</tr>
<tr>
<td>Low intensity – generate searching behaviour</td>
<td></td>
</tr>
<tr>
<td>Mild intensity – recognition &amp; memory</td>
<td></td>
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</tbody>
</table>
Activity format - emotional and behavioural problems

- Main problems may include: inability to learn, inability to develop relationships, inappropriate behaviour, autistic behaviours, withdrawn.

- Programme may include gentle reintroduction of sensory stimulation, being responsive to preferences. Increasing complexity of stimulus

- Enhancing communication and using alternative systems
Activity format - learning disability

- Develops a variety of skills including sharing, leisure and recreation, stimulation of the senses.
- Reduces behavioural problems.
- Enhances communication with an enabling approach.
Activity format - physical disability

- Identify physical limitations
- Using Snoezelen to facilitate normal movement
- Management of tone
- Normalisation and play
- Enhancing communication
Activity format - Visual disability

- Providing visual stimulation – stimulating visual pathways
- Encouraging visual attention
- Making the stimulation more complex
- Visual perception
Sensory magic

Reduce agitation / education / increase arousal...

Sensory Magic offers the individual a safe sensory environment which is structured and predictable. The sensory room can be set according to each individual’s needs and preferences, so that each and every time the experience is identical, providing continuity and stability. In this way, anxiety levels are kept to a minimum. The MSE can be subtly and slowly altered over time to introduce new colours, images and sounds at the individual’s own pace.

www.rompa.com/sensorymagic
Research


Thank you for listening

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