Making sense of sensory processing problems: Assessment & Treatment strategies

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Learning Objectives

- ✓ Overview of Sensory Processing in children
- ✓ Sensory behaviour vs other comorbidities
- ✓ Findings of sensory assessments from systematic review
- ✓ Alert program
- ✓ Our research &findings
- ✓ Sensory strategies
- ✓ Case study
- ✓ Further Resources and training

What is Sensory Processing Disorder (SPD)

" Difficulty in the way the brain takes in, organises and uses sensory information, causing a person to have problems interacting effectively in the everyday environment. Sensory stimulation may cause difficulty in one's movement, emotions, attention, relationships, or adaptive responses. " (Kranowitz, 2005)

- A neurophysiologic condition in which sensory input either from the environment or from one's body is poorly detected, modulated, or interpreted and/or to which atypical responses are observed. (Miller 2013)

Indicators of SPD

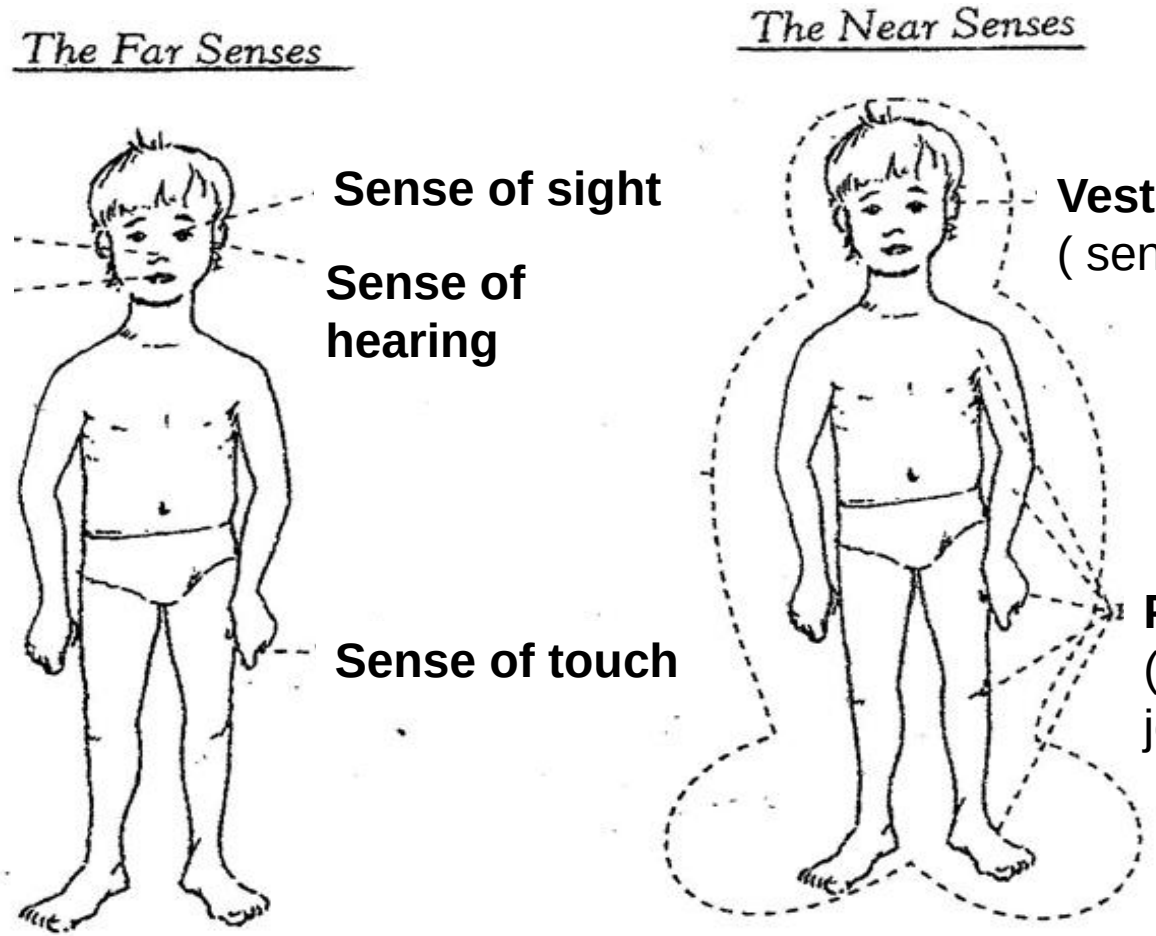
Include inappropriate or problematic motor, behavioural, attentional, or adaptive responses following or anticipating sensory stimulation

We all have sensory preferences.

- Sensory differences are only considered a "disorder" when significant difficulties with daily function and tasks are experienced.

- Quality of life is key in understanding the significance of sensory impact on an individual

8 Sensory Systems

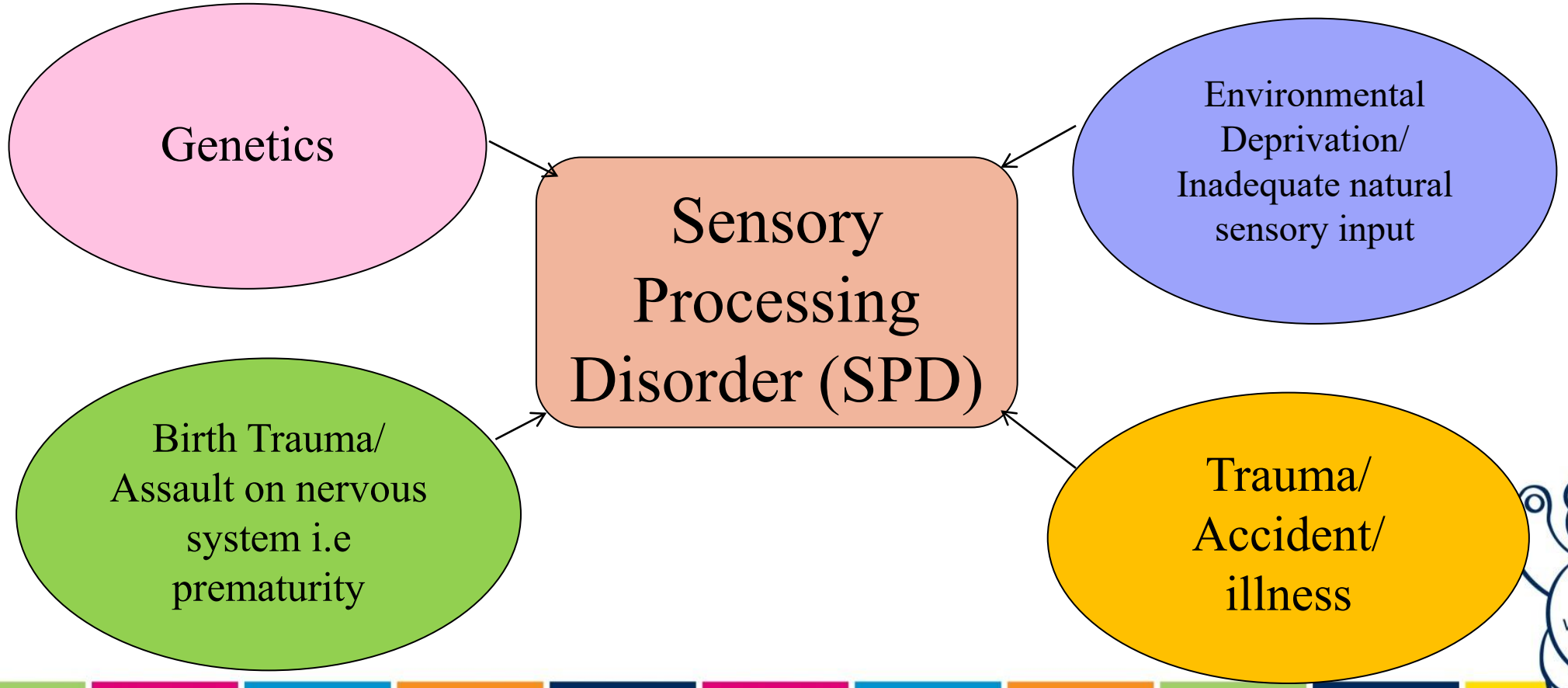


Prevalence of SPD

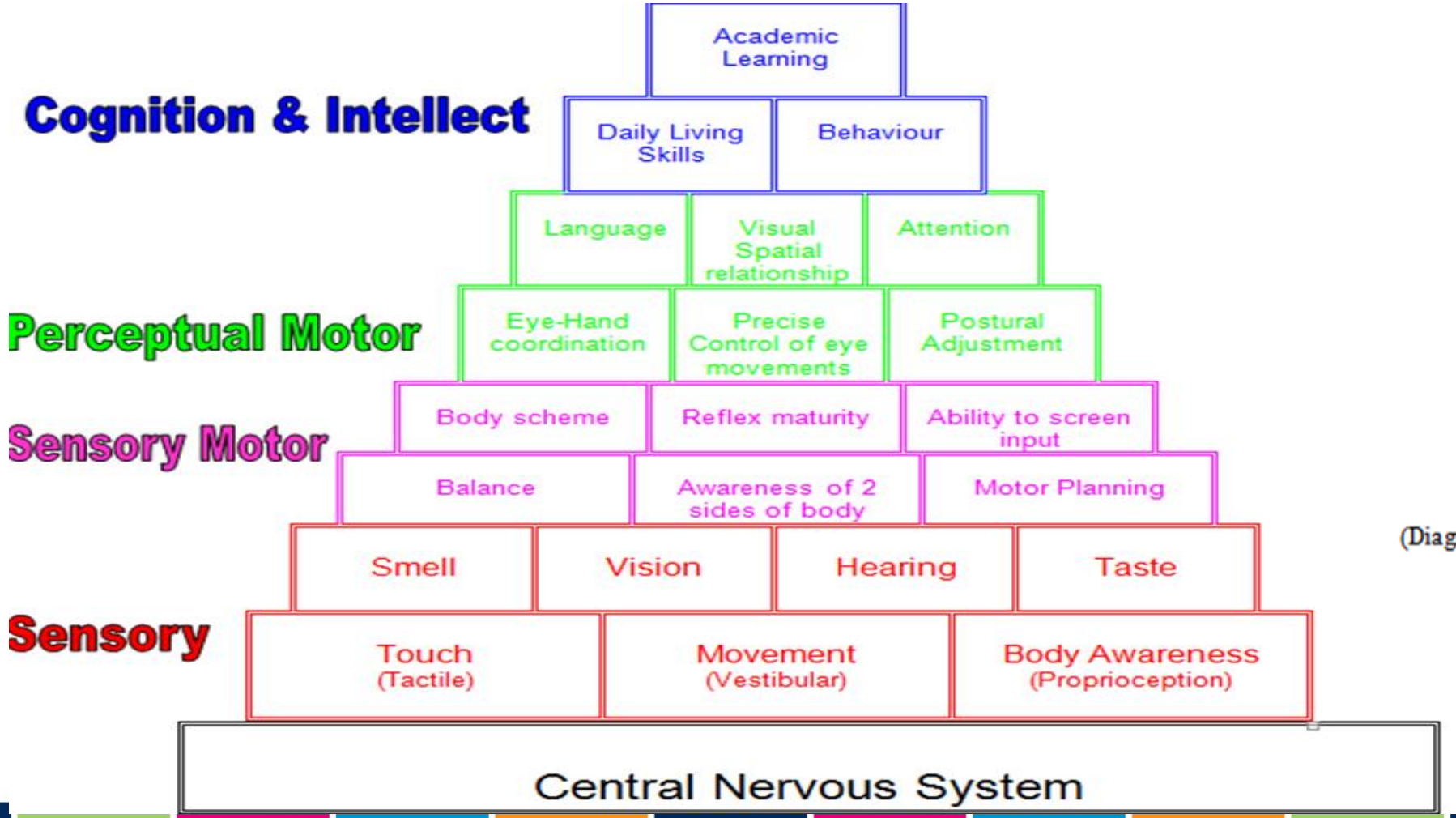
- 5-16 % of typically developing children have SPD (Schaaf & Miller, 2005)
- 80-90% of children with ASD have SPD (Kientz & Dunn 1999)
- 71 % of children with ASD have hypersensitivity to sound, 45 % have touch sensitivity, 41 % smell sensitivity, 40 % taste sensitivity (Bromely, Hare, Davidson & Emerson, 2004
- 40- 60 % of children with ADHD have SPD
- N. Soler et al 2018 : 88 % of children with tic disorder and comorbid neurodevelopmental disorders experiences sensory, emotional dysregulation and decreased quality of life.

Etiology

Exact cause of SPD is not identified but preliminary studies suggest a role of:



Building Blocks of Development



(Diagram Compiled by Karina Temme, 2000)

Influence on Development

Self-care

Fine motor skills

Gross motor

Speech –Language

Motor planning

Self regulation

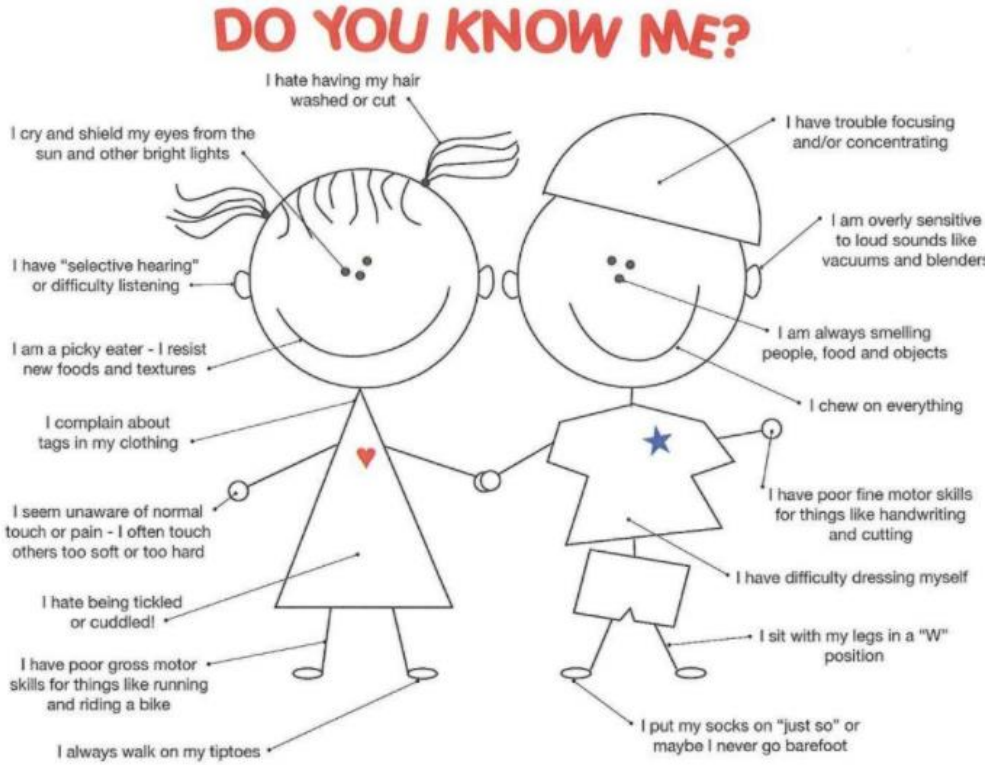
Social-Emotional Skills

Lucinda Mora, 2008

Children with SPD

- Difficulty self-regulating may contribute to behaviours such as:
  - Exaggerated responses to sensory input
  - Difficulty attending / Distractibility/ Difficulty paying attention
  - Poor impulse control
  - Poor frustration tolerance
  - Fluctuating emotional reactions
  - Inconsistent or confused responses to situations
  - Unusually high or low activity level
  - Regular emotional meltdowns
  - Delayed motor skill development
  - Slow to perform tasks e.g. dressing, writing
  - Poor coordination
  - Reduced self esteem

Common sensory complaints



https://www.google.com/search?q=common+sensory+complaints+in+ASD+image&rlz=1C1GCEB_enAU839AU839&source=lnms&tbm=isch&sa=X&ved=2ahUKEwjvvqic2fzvAhXuzDgGHdOuBGkQ_AUoAXoECAEQAw&biw=1920&bih=937#imgrc=26ZVb8oTNYBwWM

Terminology

- **Lucy Miller: (SPM)**

Sensory over-responsivity

Sensory under-responsivity

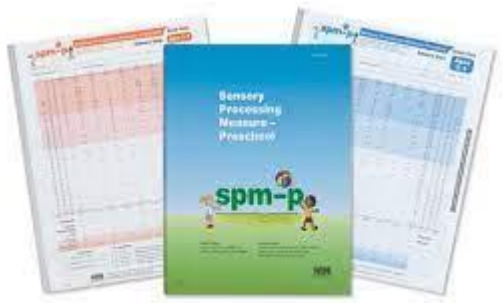
Sensory craving

Winnie Dunn (SP2)

Avoider & Sensor

Bystander

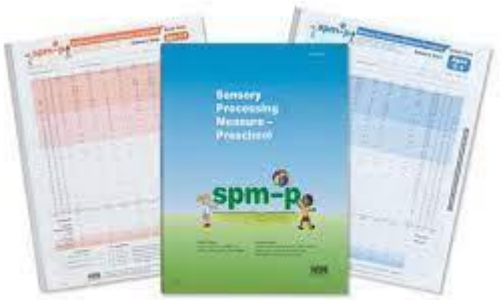
Seeker



kids Westmead

Multi-sensory PROM Ax

- Sensory Profile 2
- Short Sensory Profile 2
- Sensory Processing Measure



12 PROMS

OTA conference 24th June 2021 & Publication

- Participation and Sensory Environment Questionnaire (Home & Community): https://participationandsensoryenvironment.weebly.com/

kids Westmead

Things to note:

- No play skills / ID can present as sensory seeking behaviour (Prof Karen Stagnetti)
- Seeking behaviour may be seizures (case)
- Comorbidities can also present as sensory (and incorrectly scored on Ax tools)
- Impact of trauma on sensory dysregulation symptoms
- Sensory symptoms not scored on tools (own research)
- Need to intervene asap for strategies to be effective (Preventive approach)
- Need to address / rule out underlying medical conditions
- Address sleep hygiene
- NB: OCD needs to be addressed first (from experience)

Our research relating to Prevalence of sensory symptoms

RESEARCH ARTICLE

Sensory Dysregulation in Tic Disorders Is Associated With Executive Dysfunction and Comorbidities

Nicolette Soler, BSc(OT),[1,3] Chris Hardwick, BA (Hons), MClinPsych,[1] Iain E. Perkes, BMedSc, BMed, FRANZCP,[1,3,5] Shekeeb S. Mohammad, FRACP, PhD,[2,3] David Dossetor, MD, MA, MBBChir, FRCPsych, FRANZCP,[1,3] Kenneth Nunn, MBBS (Hons), FRANZCP, FRCPsych, PhD,[1,3] Paula Bray, PhD, BOT(Hons),[4] and Russell C. Dale, MBChB, MSc, MRCPCH, PhD[2,3,6*]

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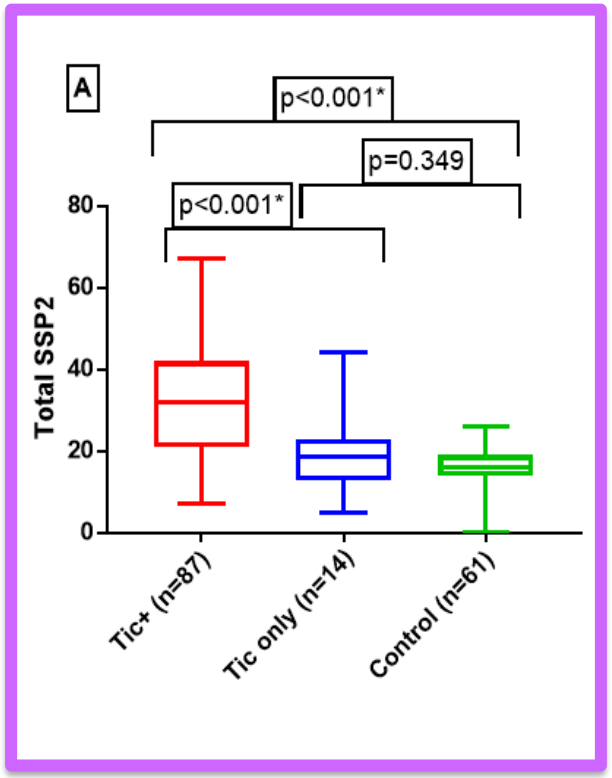
[6]Kids Neuroscience Centre, and Brain and Mind Centre, Sydney, Australia

ABSTRACT: **Background:** Tics are conceptualized as a sensorimotor phenomenon with a premonitory urge typically described by patients. As observed in other neurodevelopmental disorders, we have observed sensory dysregulation symptoms, such as tactile hypersensitivity to clothing, in children with tic disorders; however, formal clinical correlation between sensory dysregulation and global executive difficulties in children with tics and comorbidity ($n = 87$; rho = 0.716; $P < 0.001$) and a negative correlation of sensory dysregulation with quality of life ($n = 87$; rho = -0.595; $P < 0.001$). In children with tics, there was an association between sensory dysregulation and number of

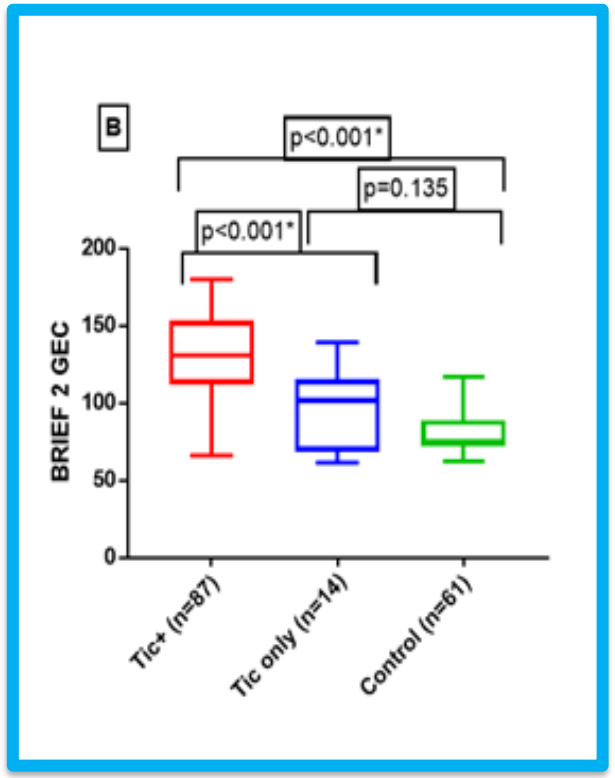
Recruited 163 study participants

Tic disorders (102)	Healthy Controls (61)
Parents completed: BRIEF2, SPM, SP2, SDQ & PedsQl	
Clinician completed YGTSS	N/A

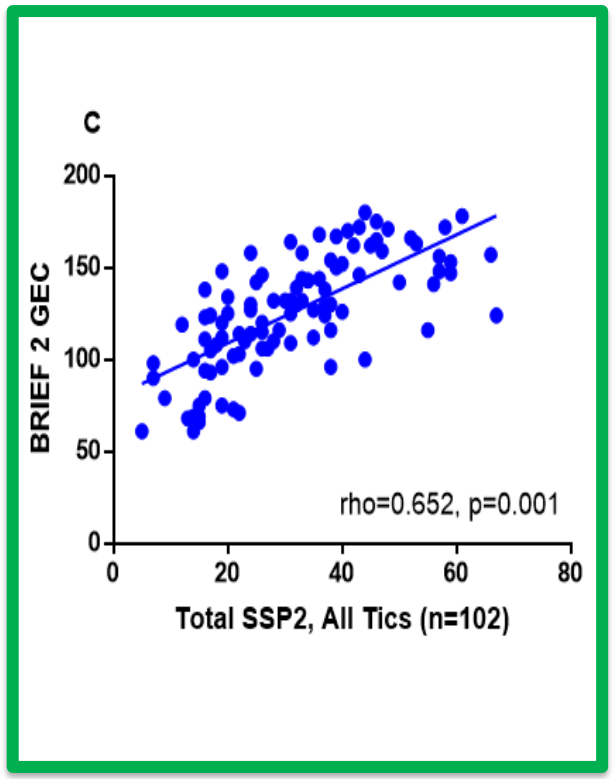
Findings



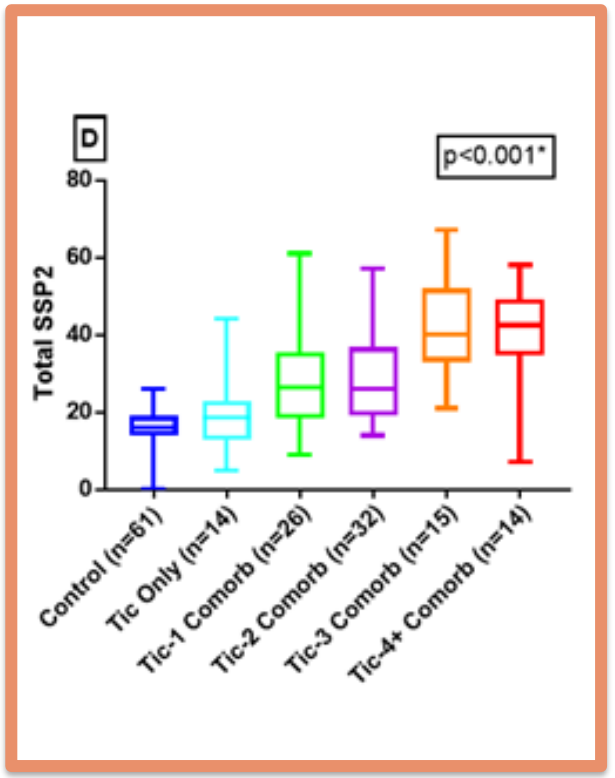
Sensory dysregulation



Executive dysregulation



Correlation between Sensory dysregulation & Executive dysregulation



Increase sensory dysregulation* with increase in Comorbidities

Arousal

- Arousal is our state of alertness.

- An appropriate level of arousal is necessary for the development of:
  - Impulse control
  - Frustration tolerance
  - Balance of emotional responses
  - On-task attention

- At school every day children must "regulate"
- Their state of alertness to suit the different times of the day

The Alert Program

By Mary Sue Williams & Sherry Shellenberger since 1990

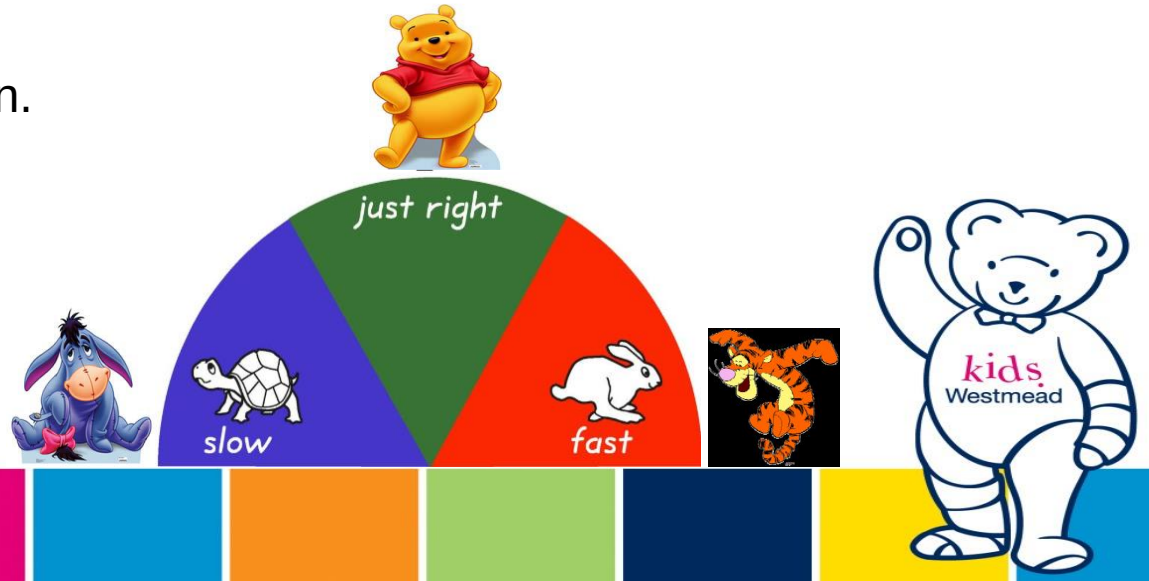
85 countries, user-friendly, low-budget approach to teaching self-regulation

Evidence based practice :
https://www.alertprogram.com/wp-content/uploads/2019/03/AP-Literature-and-Research-3-26-19.pdf
New online training: https://www.alertprogram.com/new-to-alert-program/?doing_wp_cron=1617759341.7124950885772705078125

‘’When we all understand how to be alert, attentive, and focused, life is better for children, parents, caregivers, teachers, therapists, administrators, veterans, seniors, etc.’’

Implements sensorimotor strategies for emotional regulation.

Engine analogy



Our research using Alert Program®

AUSTRALASIAN PSYCHIATRY

Regular Article

An exploratory study into an adapted use of the Alert Program for tic disorder in children

Australasian Psychiatry
1–8

DOI: 10.1177/1039856218815750
journals.sagepub.com/home/apy
SAGE

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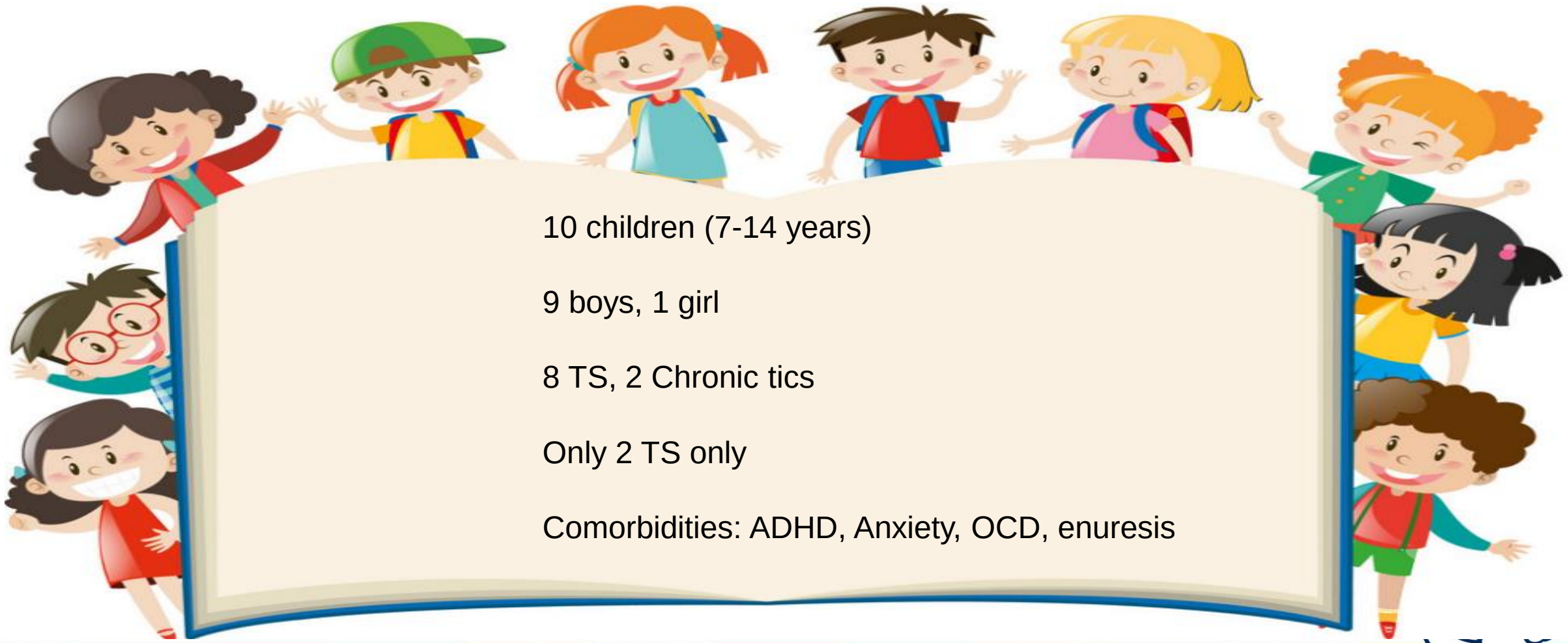
Paula Bray Senior Occupational Therapist, Faculty of Health Sciences and Sydney Medical School, The University of Sydney, Sydney, NSW, Australia

Russell C Dale Paediatric Neurologist, Department of Paediatric Neurology, The Children's Hospital at Westmead, Sydney,

Who we recruited:



10 children (7-14 years)

9 boys, 1 girl

8 TS, 2 Chronic tics

Only 2 TS only

Comorbidities: ADHD, Anxiety, OCD, enuresis

What we did

Body focussed	With Tools
Sport *	Chewing gum
Movement breaks	Moh Doh (precaution hypermobility)
Breathing exercises (Whistles?)	Theraputty
Progressive muscle relaxation	Theraband
Smiling minds app	Weighted lap & Weighted blankets
Eye exercises (eye writing)	Compression clothing & gloves
Swallowing water	Chair push ups / pull downs
Pressing tongue to roof of mouth	Music (calming)
	Whistles
	Pull up bar
	Disc n sit cushion
	Crunchy food & straws

Environments

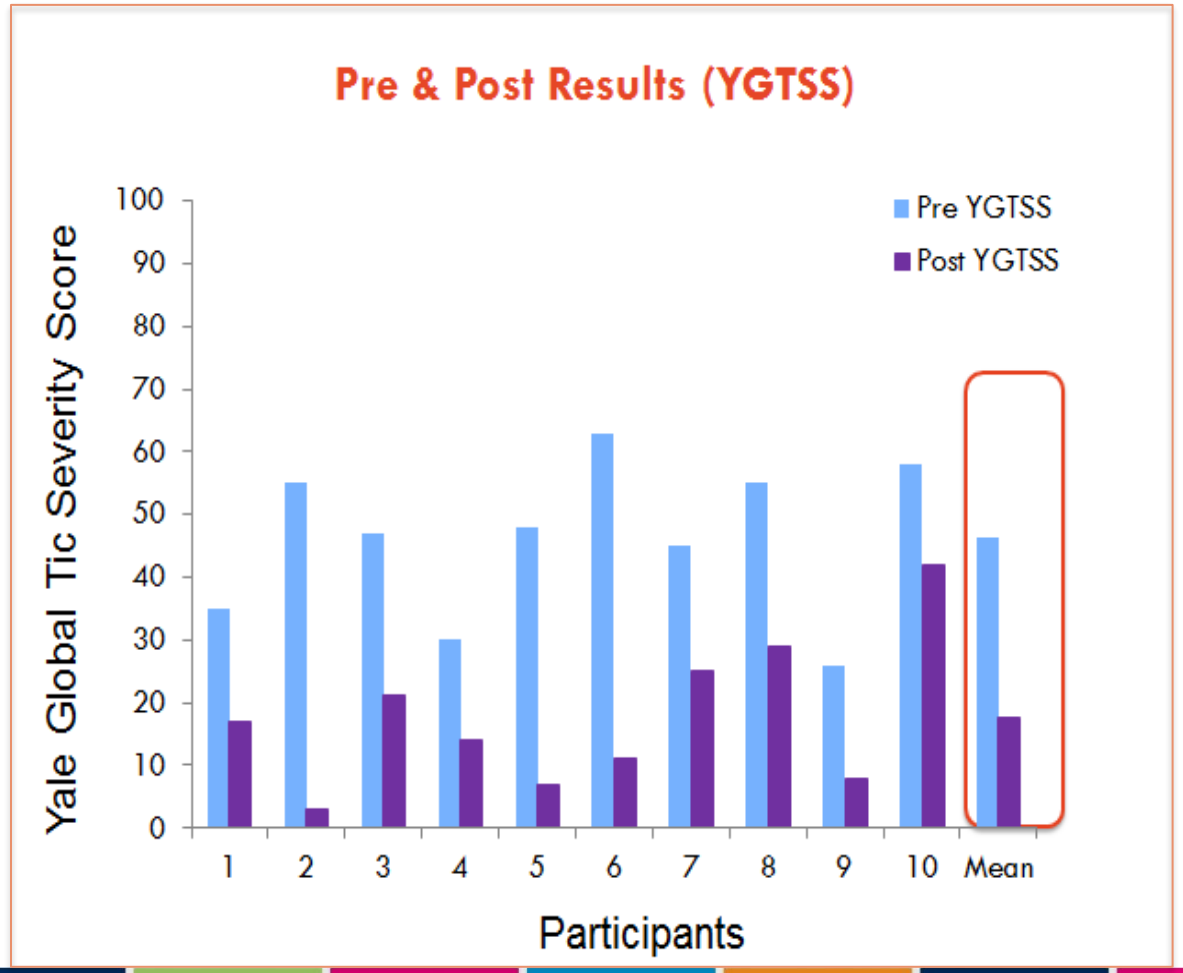
Home

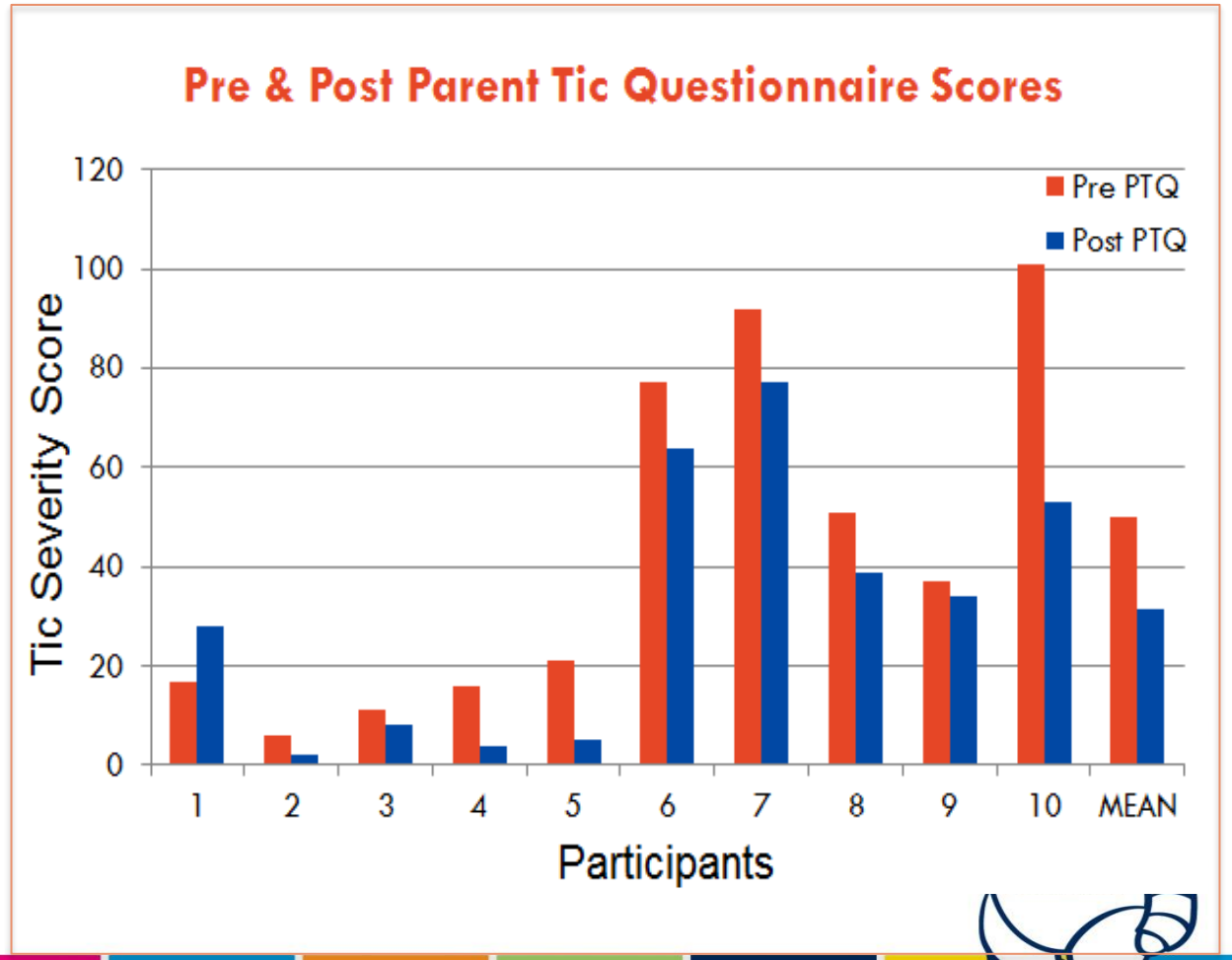
School

Community

Car / transport

Findings:


Pre & Post Results (YGTSS)
Yale Global Tic Severity Score
100
90
80
70
60
50
40
30
20
10
0
Pre YGTSS
Post YGTSS
1
2
3
4
5
6
7
8
9
10
Mean
Participants


Pre & Post Parent Tic Questionnaire Scores
Tic Severity Score
120
100
80
60
40
20
0
Pre PTQ
Post PTQ
1
2
3
4
5
6
7
8
9
10
MEAN
Participants

Sensory Diets

- Strategy for developing individualized programs that are practical, carefully scheduled and based on the concept that controlled sensory input can affect functional abilities.

Things to consider when planning a sensory diet!

- Create a safe play area or a sensory controlled environments . This is a hide out for the child to have there our place to be used as required.
- Heavy work to muscles & joints helps when our engines are in high or low states.
- Develop consistent routines for daily activities
- Increase predictability of schedule and routines.
- Prepare for upcoming events or transitions.
- The activities chosen need to be repeated during the day and easy to complete.

Impact of the Sensory Activity:

Some sensory activities include:

- Vestibular activities such as swinging or jumping can have a calming effect that can last from 4 to 8 hours.
- Proprioception activities can last from 1.5hrs to 2hours
- Heavy muscle action can have a lasting effect on the person anywhere from 1.5 to 2 hours.
- Deep Pressure touch can have the lasting effect again from 1.5 to 2hours.

Fidget Toys

- Object used to obtain sensory stimulation to help regulate student in a less distracting way.
- Can assist improve concentration & attention to tasks by allowing the brain to filter out the extra sensory information
- Good fidget = effective at helping student concentrate + easily fit into classroom environment
- Good Fidget: Safe, small, quiet, inexperience, used without distracting others

Choosing a Fidget Toy:

- Which time of the day is it most needed?
- What is the student's fine motor skills like?
- Does student have hand strength to manipulate the toy?
- Does the student have hypermobility?
- What sensations & textures do they seek out?
- Which do they avoid?
- Do they tend to put objects in their mouth?
- Is the fidget a choke hazard?
- Does the student throw items?

Proprioception

Sense whereby we are aware of the position of our body parts without vision.

Receptors in the muscles and joints activated by:

"heavy work" and Push & pull

- Help to:

✓ build up muscle tone,

✓ essential for execution of smooth & co-ordinated movement

✓ give a good awareness of where ones body is in space,

✓ gives us information about our body parts & their relation to each other, to people and objects.

✓ Calming and alerting effects on nervous system

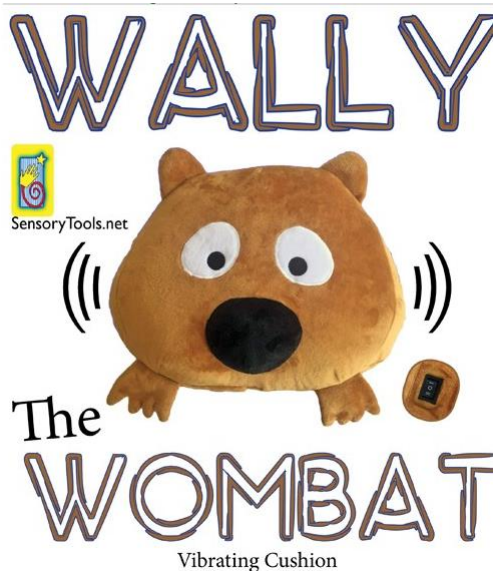
Weighted items

- Weighted lap blankets / toys (no more than 5-10 % of child's body weight)

- In current study, children stop using these- check weight.
- **The weighted blanker is NEVER to be used as a restraint.**
- **Child must be able to remove the item themselves.**
- **Never allow the person using it to place it over their head.**

Vibration

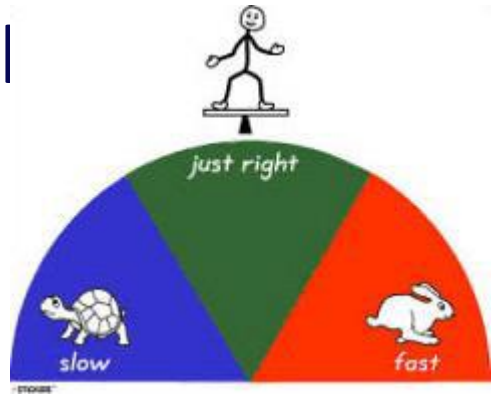
- Electric toothbrush (home use)
- Massager
- Vibration cushion



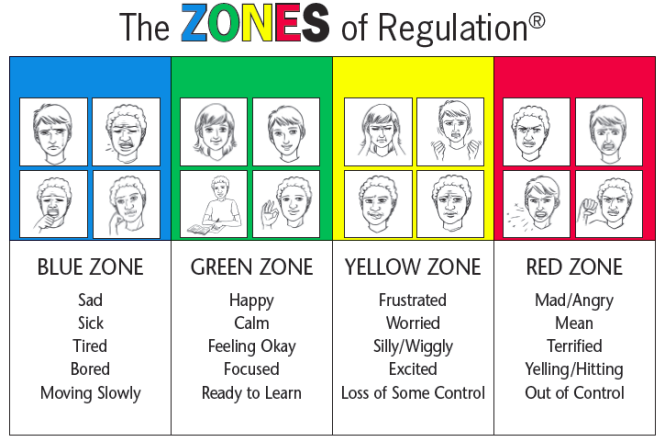
Oral Motor / M.OR.E Program

- Chewi's
- Chewing Gum
- Straws
- Crunchy food
- Whistles
- Breathing activities

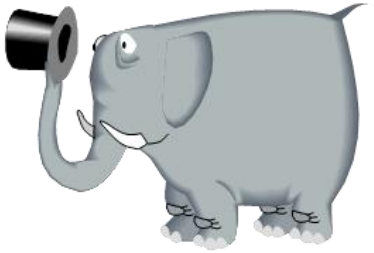
Sensory Accommodations at School



- Fidgets
- Wiggle cushion / Jari Stool
- Noise reduction headphones (Timing of use NB)
- Weighted lap pads, vests (Text book / weight in laptop bag)
- Weighted pencils, utensils
- Theraband, blue tac, Moh Doh
- Brain Breaks
- Heavy work
- Alternate seating & Suggest desk arrangement
- Provide education on sensory regulation tools -The Zones of Regulation / The Alert Program
- Look at lighting & visual



THINGS TO REMEMBER!



- Children may have strategies (i.e. gloves, pop corn)
- Every child is different- different likes & dislikes to sensory input & activities– respect their individuality
- Children may need rest breaks from sensory input.
- Be aware of movement stimulation with children with heart problems / known medical conditions (need GP approval) –then proceed with caution.
- Monitor child's skin colour, sweating, dizziness, fatigue & eye movement. Some children can not tell you if they have had enough. Over stimulation may be harmful & can cause reactions such as vomiting.
- Be cautious of sensory stimulation with children with seizures

De-escalating Meltdowns (Jed Baker, PhD)

- Distraction is a key tool
- Types of distractions & calming strategies:
  - Using interests or hobbies;
  - Humour
  - Validating feelings so child feels understood
  - Playing with stuffed animals / favourite toy (* Move to the out door play area)
  - Looking out the window
  - Bouncing on parents lap Using books, videos
  - Getting hugs (*)
  - Note distraction allows for avoidance of task. Over use could encourage melt downs.
  - Prevention best strategy

Myles and Southwick (2005) De-escalation strategies

- Have child be a messenger
- Get closer to the child. Use a secrete signal
- Use written schedule of routines (*Time Timer)
- Just walk and don't talk

Case study

- 9 yr old male
- Refusing to wear clothing
- School refusal-Good school support
- Dx: ASD, Language Delay, SPD
- Daily activities: reluctant to shower, wash hair & groom due to touch sensitivities
- No therapies involved
- No NDIS
- Ax (BOT 2 & FM): average range: balance

  below average: FM Skills, manual dexterity, aim & catching, core strength

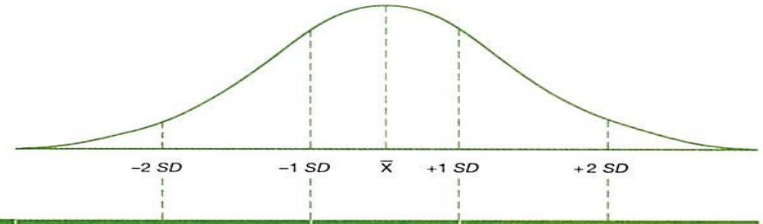
Summary Scores

structions

ansfer each Quadrant Raw Score Total from the Quadrant grids to the corresponding Quadrant Raw Score Total box. ıen, transfer the section Raw Score Totals from the Caregiver Questionnaire to the corresponding Raw Score Total box. ot these totals by marking an X in the appropriate classification column (e.g., Less Than Others, More Than Others, ıst Like the Majority of Others).

he Normal Curve and Sensory Profile 2 lassification System

ores one standard deviation or more from the mean e expressed as More Than Others or Less Than thers, respectively. Scores two standard deviations or ore from the mean are expressed as Much More Than thers or Much Less Than Others, respectively.



		Raw Score Total	Percentile Range[a]	◄ Less Than Others: Much Less Than Others	Less Than Others	Just Like the Majority of Others	More Than Others ►: More Than Others	Much More Than Others
Quadrants	Seeking/Seeker	50 /95		0-------6	7-------19	20-------47	48-X---60	61-------95
	Avoiding/Avoider	69 /100		0-------7	8-------20	21-------46	47-------59	60-X---100
	Sensitivity/Sensor	46 /95		0-------6	7-------17	18-------42	43-X---53	54-------95
	Registration/Bystander	40 /110		0-------6	7-------18	19----X-43	44-------55	56-------110
Sensory Sections	Auditory	29 /40		0-------2	3-------9	10-------24	25----X-31	32-------40
	Visual	10 /30		0-------4	5-------8	9-X----17	18-------21	22-------30
	Touch	36 /55		0	1-------7	8-------21	22-------28	29-X---55
	Movement	17 /40		0-------1	2-------6	7------X18	19-------24	25-------40
	Body Position	22 /40		0	1-------4	5-------15	16-------19	20-X---40
	Oral	11 /50		**	0-------7	8-X----24	25-------32	33-------50
Behavioral Sections	Conduct	20 /45		0-------1	2-------8	9------X22	23-------29	30-------45
	Social Emotional	51 /70		0-------2	3-------12	13-------31	32-------41	42-X---70
	Attentional	20 /50		0	1-------8	9-----X24	25-------31	32-------50

For percentile ranges, see Appendix A in the Sensory Profile 2 User's Manual.
No scores are available for this range.

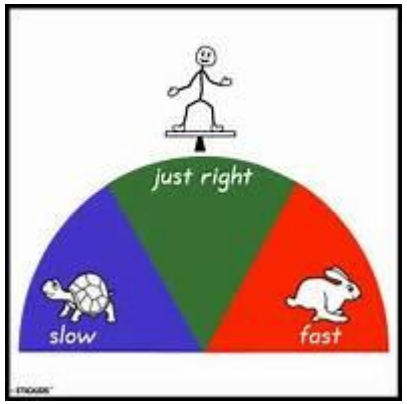
Quadrant Definitions	
Seeking/Seeker	The degree to which a child *obtains* sensory input. A child with a Much More Than Others score in this pattern seeks sensory input at a higher rate than others.
Avoiding/Avoider	The degree to which a child is *bothered* by sensory input. A child with a Much More Than Others score in this pattern moves away from sensory input at a higher rate than others.
Sensitivity/Sensor	The degree to which a child *detects* sensory input. A child with a Much More Than Others score in this pattern notices sensory input at a higher rate than others.
Registration/Bystander	The degree to which a child *misses* sensory input. A child with a Much More Than Others score in this pattern misses sensory input at a higher rate than others.

Case study continued

- Medication by Psychiatrist
- Brushing program
- Weighted lap blanket
- Modifications to how she washed her hair
- Different hair brush
- Moh Doh
- Swing & movement breaks
- Tight clothing, compression clothing

- Additional support with social skills
- Handwriting support (pencil grip, slant board) etc.

Training / Course



- Alert Program
- M.O.R.E
- Therapeutic Listening Program
- DIR Floor time Approach

Developmental, Individual Difference, Relationship Based Approach (DIR)

- Wilbarger/ Therapressure Program
- Suggested Resources: https://www.alertprogram.com/suggested-websites/
- No more meltdowns by Jed Baker, PhD.

Suppliers

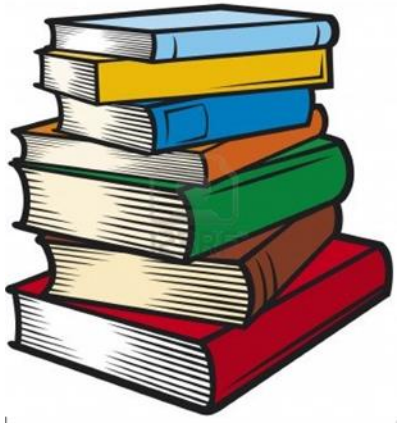
- Autism Speaks https://www.autismspeaks.org/family-services/resource-library/sensory-tools-products
- Calming Clothing: info@thebrainary.com / thebrainary.com/shop/calming-clothing
- CHEWIGEM: www.chewigem.com.au
- Greeper Laces (Shoelaces) www.chewigem.com.au
- Nana's weighted blankets and toys: www.nanasweightedblankets.com.au
- Sensamart http://www.sensamart.com.au/
- Sensory Tools: http://shopau.sensorytools.net/

Websites

- Alert Program https://www.alertprogram.com/
- Aspect: https://www.autismspectrum.org.au/
- www.autism.org/si.html
- Kid Power https://www.kidpower.org/
- SPD Australia http://www.spdaustralia.com.au/
- www.sensory-processing-disorder.com/sensory-processing-disorder-checklist.html
- The KID Foundation's SPD Network https://autismawarenesscentre.com/shop/books-products/
- Pocket Full of Therapy http://www.pfot.com/
- Victoria state Government: www.education.vic.giv.au/autism
- Fidget toys: www.snagglebox.com

Book Suppliers

- Book Supplier- Silvereye email: info@silvereye.com.au / Ph: 02 8090 5395 – Large volume of Books on ASD
- ACER : www.acer.edu.au / 03 9277 5220
- www.bookinhand.com



Books & Resources

- Koomar, K., Kranowitz, C., Szklut, S., Balzer-Martin, L., Haber, E., & Sava, D.I. (2007). Answers to questions teachers ask about sensory integration. Texas: Future Horizons Inc.

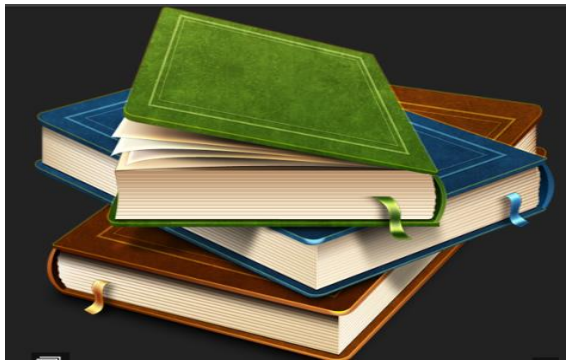
- Kranowitz, C.S. (2005). The out-of-sync child: Recognising and coping with sensory integration dysfunction. NY: The Berkley Publishing Group.

- Kranowitz, C.S. (2003). The out-of-sync child has fun: Activities for kids with sensory integrative dysfunction. NY: Perigree.

- Miller, L.J. (2006). Sensational kids: Hope and help for children with sensory processing disorder (SPD). NY: Penguin Group.

Books continued

- Auer, C.; Blumberg, S. Parenting a Child with Sensory Processing Disorder
- Biel, L.; Peske, N. Raising a Sensory Smart Child
- Larkey, S. Practical Sensory Programmes
- Pascale, K. (2010). Can't you see I'm Sensational. Australia: Pearson



Books for children

- All cats have Asperger's Syndrome by Kathy Hoopmann
- All dogs have ADHD by Kathy Hoopmann
- All Birds have anxiety by Kathy Hoopmann
- Pepperpot by Philippa Cleall, A children's picture book about a cat who doesn't like change.

Resources- Video's / Movies

- Early intervention Indigenous Liaison Program: The same but different, Being Ned: https://youtu.be/FOqP3jsJaUg
- Laser Beak Man by Tim Sharp
- Jack of the red hearts: www.jackofthe the redhearts.com.au

Where can I find an OT?

1. Autism Spectrum Australia (Aspect)

   http://www.aspect.org.au
   Ph: (02) 8977 8300 Fax: (02) 8977 8399

2. OT Australia NSW – private OTs

   http://www.otnsw.com.au/index.php
   Phone: 02 9648 3225
   Fax: 02 9737 0023

3. NSW Health http://www.health.nsw.gov.au/services/index.html

4. National Disability Insurance Scheme (NDIS)

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- Dunn, W. & Brown, C. 1996, 'Factor Analysis on the Sensory Profile from a National Sample of Children without Disabilities', *The American Journal of Occupational Therapy*, vol. 51, no.7, pp.490-495.
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- Haack, H. & Haldy, M. 1995, *Occupational Therapy Practice,* Therapy Skill Builders, San Antonio.
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- Townsend, K., Wells, M. & Scicluna, T. 1999, *Sensory Learning Package: Based on the Principles of Sensory Integration*, University of South Australia, Adelaide.
- Trott, M. C., Laurel, M. K. & Windeck, M. S. 1993, *Understanding Sensory Integration*, Therapy Skill Builders, Tucson.
- Sensory Integration International – The Ayres Clinic (n.d.) [Online, accessed 14 Mar. 2002]
- URL: http://www.sensoryint.com/faq.html
- Stephens, L. C. 1997, 'Sensory Integration Dysfunction in Young Children', AAHBEI News Exchange, vol. 2, no. 1, Winter.
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- URL: http://www.sinetwork.org/whatisdsi.htm

Discussion & Questions

Thank you

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