# Developing a Feeding Plan for Young Children with Autism and Other Sensory Processing Disorders

Community of Practice in Autism Staunton, VA

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## Feeding is:

- ➤ Necessary for growth and survival
- > An interactional event
- > A sensory event
- ➤ Emotional
- > Behavioral
- ➤ Cultural

## A Holistic Feeding Observation Includes the Following Components:

- ➤ Respiratory Concerns
- ➤ Physical Development/ Positioning
- > Sensory Issues
- > Oral Motor Skills
- > Communication & Socialization
- ➤ Behavioral Concerns
- ➤ Appropriate Equipment & Materials
- ➤ Nutrition

## Always Start by Collaborating with the Family:

- > Start a positive dialogue about family's concerns and goals
- Gather information about past experiences and feeding routine(s)
- ➤ What is pleasurable?
- ➤ What is difficult? What does the family want to change?
- ➤ What cultural aspects have implications?

## Respiration:

- ➤ Coordination between breathing & swallowing
- ➤ Gag reflex present
- ➤ Congestion
- ➤ Feeding pace
- ➤ Reflux/aspiration concerns

## **Indicators of Aspiration**

- Positive history of pneumonia/URI
- Coughing, gagging
- ➤ Wheeze/asthma
- ➤ Rapid breathing/ fatigue with meals
- ➤ Reflux/vomit/ regurgitation

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- > Drooling/ food falling out of mouth
- > Difficulty handling liquid
- Mealtime behaviors

## Normal Development

- > The newborn arrives ready to eat!
- > Stability Mobility
- > Physiological Flexion
- Sucking pads
- > Primitive reflexes
- ➤ Oral and facial musculature initially move together as one unit. Then, each muscle groups begins to move separately: Jaw, lips, cheeks, tongue
- ➤ Direct correlation between gross motor development and maturation of oral motor skills.

# Review of typical gross motor development as it relates to oral motor development

In typical development, as one area begins to develop active movement, something must happen/develop in another area to maintains body balance.

#### Newborn

#### Gross Motor:

- physiological flexion
- limited ROM, closely packed soft tissue
- head rarely in middle, turns head to maintain open airway
- weight bearing on face
- rib cage high and wide/asynchronous belly breathing
- increased stability/decreased mobility
- total pattern of movement

#### Oral Motor:

- total pattern of sucking
- primitive reflexes for survival
- deep pressure to cheeks/lips/jaw
- eat and breathe simultaneously
- jaw stable on chest

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- "sucking pads"
- tongue fills 80% of oral cavity

#### Speech

- reflexive sounds with movement
- monotonous cry

The newborn is mostly a nose breather who initially shows random disorganized, undirected, and uncontrolled movements.

#### **Two Month Old**

#### Gross Motor:

- loss of physiological flexion; appears to have low tone
- shoulder elevation helps head control
- ATNR; helps elongate pecs
- asymmetry, uses it for stability
- total head lag in pull to sit

#### Oral Motor:

- suckling
- liquid loss is common
- less coordination of breathing/sucking

#### Speech:

- begins some facial expression
- increase duration of phonation
- sound with body movement
- greater differentiation of cry with loudness, pitch, duration

The 2 month old looks as if they have lower tone. This is not a good diagnostic month.

#### Four Month Old

Gross Motor:

symmetry

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- prone on elbows
- stuck in positions placed in
- swimming
- accidental rolling
- supported sit with trunk support
- plays in side-lying

#### Oral Motor:

- hand to mouth with object
- longer suck sequence before pause
- new oral mobility with head/neck control
- drooling while teething
- introduce spoon feeding; uses suckle

#### Speech:

- inititation of phonation without as much body movement
- guttural sounds/bilabial sounds; depends on position
- may being babbling

The mouth is their world and the way they learn about their world.

This is the point where we really begin to see the affects of developing stability in shoulder girdle allows for oral mobility in feeding and speech.

#### Six Month Old

#### Gross Motor:

- extended arm play/reach
- prone to supine, supine to prone, supping to side w/rotation
- pushes backwards
- Landau response
- plays in side lying
- hands to feet/feet to mouth
- independent sit for brief period
- stand with support/bounces

#### **Oral Motor:**

- spoon feeding
- munching
- accepts more solids; gag, cough, spit out

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- emerging tongue lateralization
- good, strong, effective suck

#### Speech:

- babble variety of sounds (universal), babbling chains
- intonation change with position change; needs less body movement
- begins sound imitation

#### The 6<sup>th</sup> month is the most critical month:

- Uses widest range of movement before mid-range control (graded) begins to develop
- Complete extension and now will balance extension and flexion, lateral, and begin diagonal
- Trunk activity brings rib cage down and initiates thoracic breathing and allows for long chains of babbling
- · Trunk stability allows for oral mobility
- Stranger anxiety

#### **Eight Month Old**

#### Gross Motor:

- uses movement to interact with environment "on the move"
- commando crawl with rotation, creeping emerging
- mostly independent sitter with arms free
- sit to all 4's and back
- good proximal stability, increased graded control
- trunk rotation emerging
- stand with wide based

#### Oral Motor:

- lips around spoon
- lip closure with cup, bites cup for stability
- munching
- eats more table foods
- tongue and jaw move separately (tongue clicking)

#### Speech:

babbling in shorter chains

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- vocalizes in imitation of familiar sounds
- produces/differentiates sounds with same articulatory placement (m/b, d/t)

"On the move"

#### **Ten Month Old**

#### Gross Motor:

- pull to stand with more LE involvement (may half kneel)
- wide variety of sitting positions (long, side, tailor)
- cruising, walk with 2 hands held
- supported stand
- play in W sit due to increased hip mobility
- bear stand/crawl
- climbing emerging

#### **Oral Motor:**

- tongue movement isolated
- fewer sucks/suckles before pulling away from cup
- upper lip more active with spoon
- begins closing lips on swallow
- gag/choke on new textures (moves gag back)
- · uses wrist to break off soft solid

#### Speech:

- closely approximates adult inflection
- sound separate from body movement
- long chains of different CV combinations
- 1 to 2 word approximations

Variety of positions is key, as is the ability to transition in and out of positions.

#### **Twelve Month Old**

Gross Motor:

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- independent stander
- may take independent steps
- cruises well with trunk rotation
- up to stand with minimal UE assistance
- climbing
- tall kneeling
- independent standing; uses knees & feet for balance

#### Oral Motor:

- wean for bottle
- drink from cup with less tongue stability needed
- refines jaw movement
- sustained bite on soft solids
- phasic bite on hard solids
- chewing with tongue lateralization across midline

#### Speech

- jargon with embedded words
- plays with controlled oral movement due to stable base
- 3-5 words
- Combines many modes of communication
- Speech may plateau as child learns to walk

Independent mobility sets up major cognitive growth. Language takes off.

## **Atypical Patterns**

- > Tone
- Positioning
- Absent/delayed reflexes
- Negative experiences
- Increased length of feeding time; decreased amount of feeding
- > Bonding/attachment

#### **Sensory-Based Motor Disorders**

- •Postural Tone: many have low tone
- •Motor Planning:
  - very poor gross and fine motor skills

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- difficulty imitating movements
- trouble w/ balance, sequences, bilateral coordination
- prefers familiar activities like lining up toys
- prefers sedentary activities
- may frustrate easily & seem manipulative/controlling
- may compensate with language skills
- may prefer fantasy games

## Positioning

- Postural alignment
- > Feet & knees
- Hips & trunk
- > Head
- Goal is proper positioning/stability that allows for improved oral mobility.

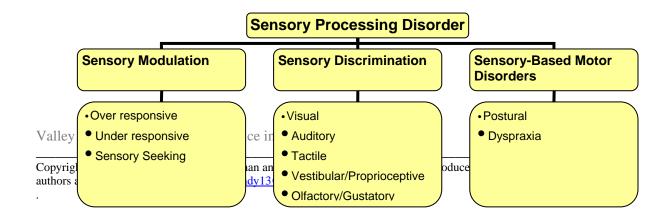


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## Sensory Implications: Consider the "Four Ts"

## **Sensory Processing Disorder (SPD)**

(Miller, Cermak, Lane, Anzalone, & Koomar, 2005) http://www.sinetwork.org/aboutspd/defining.html



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## Overview of the Sensory Systems Related to Eating

Children receive information from many sensory systems; all of these sensory systems play an integral part in the feeding experience:

#### Visual

The visual presentation of food will provide a sensory expectation for the feeding experience of the child. The color of the food, the placement of the food on the serving dish, and the amount of food offered to a child can produce positive or negative responses. The visual stimulation within the room as well as the color of clothing worn by the feeder can also result in a response from the child.

#### **Auditory**

The sounds within the feeding environment can play a major role in the feeding process. Auditory input cannot be ignored or shut out by those who have difficulty filtering out unwanted stimuli. The environment where a child is fed must be carefully monitored for auditory volume and distractibility. Once a more comforting sound level is achieved, sound can be used to soothe and organize the child as well as to establish appropriate feeding rhythms.

#### Olfactory

The sense of smell is closely linked to taste. Smells are interpreted in the brain and are part of the limbic system, which is the system that regulates body functions, emotions and the sense of smell. Smell has a strong emotional component and is strongly attached to memory storage. Therefore, both positive and negative experiences are associated with feeding and the sense of smell. Odor from food, the environment, or even the perfume of the feeder can have a dramatic effect on a feeding session.

#### Gustatory

This information is received by way of the taste buds in the mouth. Taste buds are found on specific areas of the tongue. The feedback is interpreted as bitter, sweet, salty, sour or a combination of these tastes. Taste varies with each individual. Sweet tastes are detected on the anterior third of the tongue. Salty tastes are detected on the anterior lateral borders. Sour tastes are detected on the posterior lateral borders, while bitter tastes are detected on the posterior portion of the tongue. Children who are hyper reactive will often respond best to more bland foods while those who are hypo reactive often respond better to

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spicy foods. Children who have received tube feedings or who have had tracheostomies, will often prefer spicy foods that have more sensory input. Sweet tastes have been linked to increased drooling and are thought to be one of the most powerful of the tastes. Taste sensation changes as we age as taste buds are lost.

#### **Tactile**

The sense of touch is very complex and is received through receptors on the skin. The various types of touch are light touch, deep touch, temperature, and pain. There are many touch receptors in the face and mouth. This helps to establish awareness of the oral muscles while eating. Some touch stimuli is arousing and can put a child on alert, while other stimuli helps the child to organize and calm himself.

#### **Proprioceptive**

The perception of joint or body movement, or position of the body that is received through the muscles, tendons, and soft tissue is known as proprioception. The proprioceptive input provides feedback to the central nervous system that tells what the muscles and limbs are doing at any time. Necessary adjustments in posture are then made as movement and activities are carried out. Children with proprioception problems often appear clumsy and may have trouble sitting in a chair or using eating utensils correctly.

## An Overview of Three Theories of Sensory Processing

Self-Regulation Behavior Response Continuum (W. Dunn)

Winnie Dunn is an occupational therapist who has studies how different children react to sensory stimulation. Dr. Dunn has discovered that children have different thresholds to sensory stimulation. Threshold refers to the point at which a child will respond to sensory information (Dunn, 1999). For example, each child may have a different threshold for sound. At what point does the noise become too loud for each child in the room? Children with a high threshold tend to be hyposensitive or under-responsive, which means it takes more sound or noise for the child to react. This child might need for the music to be louder to react. Children with a low threshold tend to be hyper-sensitive or overly responsive, which means they react to just a little sound or are distracted by every noise. This child might need for the music to be softer. Dr. Dunn says that children with difficulty

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processing sensory information might have one of the following four types of responses to senses from the environment:

#### High Threshold

#### - Poor Registration

Children with poor registration have difficulty reacting to stimuli because of a high threshold. This means these children need more stimuli to react. These children might not react to a whisper, but rather need to loud call to come.

#### - Sensation Seeking

Children who are sensation seeking will look for many sensory experiences. They have be constantly moving, or touching or chewing on everything because they need a lot of stimulation to notice, feel or react to the stimulation.

#### Low Threshold

#### - Sensitivity to Stimuli

Children who are sensitive to stimuli might not be able to block out stimuli and may get overwhelmed by lots of stimuli or even by stimuli which others may think is not too much. These children may have trouble in a crowded room with lots of people talking.

#### - Sensation Avoiding

Children who are avoiding sensations might be unwilling to try new things or to participate in unpredictable situations.

## Sensory Defensiveness (P. Wilbarger)

Pat Wilbarger developed the "brushing program" and first coined the phrase "sensory diet." She defines sensory defensiveness as the over activation of our protective sense (flight, fright, or fight reaction). Imagine you are walking to your car late and night and someone touched your shoulder. The brain would send a message to your autonomic nervous system preparing the body to protect itself. . . you would either run, freeze, or turn around kicking. However, for the child with severe sensory defensiveness, standing in line and being touched from behind might have the same response.

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She emphasizes that children with severe sensory defensiveness view stimulation not as unpleasant but as DANGEROUS! This might be why children with sensory defensiveness are not willing to try anything new (and are actually afraid of anything new).

## Arousal Modulation (L. Miller)

Dr. Lucy Miller is an occupational therapist and researcher who is currently conducting a considerable body of research on sensory processing orders. Dr. Miller has discovered that children with sensory processing disorders, when faced with novel events, might exhibit both physiological over arousal and slower habituation rates. Habituation refers to how long it takes your body to "get used to" a new sensation. For example, if you take a whiff of a new perfume, it might smell strong. However, after each whiff, the perfume appears to smell less strong. You are habituating to that smell. Children with sensory processing disorders might react very strongly (over arousal) to that smell and will take much long to "get used to" (or habituate to) the smell. This might explain why stimulation the child has been exposed to over and over again still brings a negative, and sometimes strong, reaction.

## Arousal Levels Through-Out the Day

Arousal level refers to how alert you feel (Williams & Shellenberger, 1996). Throughout the day, you must be able to concentrate and attend to various tasks which require different levels of alertness. You must have a different level of alertness to play soccer than you do to listen to soft music. In addition to different tasks, different times of the day also affect arousal level. Have you ever turned on the car in the morning and been startled by how loud the radio is? You need the louder sound late in the day because it takes more to arouse you (when you were tired) than you do first thing in the morning (when you are fresh).

Self-regulation refers to how your nervous system maintains and changes arousal levels to match each task that you do throughout the day (Williams & Shellenberger, 1996). For example, what do you do to pep yourself up or to calm yourself down? What do you do to stay awake in a training workshop after a big lunch?

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## Sensory Motor Preference Checklist (Williams & Shelenberger)

- What calms your engine down?
- What "revs" your engine up?
- How can you help children attain and maintain the appropriate arousal level?

## Abnormal Sensory Reactions During Feeding

- Picky eating
- Refusing food
- Gagging
- Vomiting
- > Stuffing food into mouth
- Sucking/holding food

## **Oral Stimulation**

There are a few techniques for providing oral/facial stimulation that help ensure greater success at feeding time. These techniques will be discussed briefly and should be experienced by the feeder first in order to achieve a greater understanding of the effects of sensory stimulation.

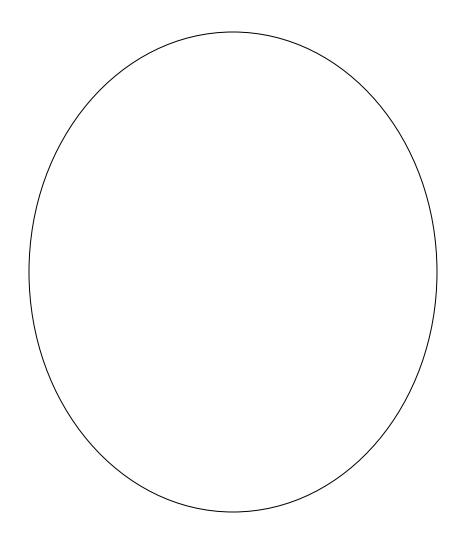
- **Distal to Proximal** Stimulation should start away from the face and gradually move toward the face. Touch on the hand or arm is very natural while touch around the face is reserved for those with whom we know intimately. Stimulation that begins with the hands will often help the child prepare for self-feeding later. Progression towards the mouth will take time and the child should not be rushed to accept the stimulation. Patience will pay off in the end.
- **Deep, Firm Pressure** This is the technique best tolerated by most children. Light touch is arousing to our system. Deep, firm pressure works best to activate the sensory system and allow input into the joint and muscle receptors.
- **Symmetrical Input** Stimulation done on the body should be done in a symmetrical fashion. Whatever stimulation we provide to one side of the body,

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we want to provide to the other side of the body. A deep touch is very powerful and the resulting reactions are strong and often last for several minutes. Symmetrical input will help insure that you are keeping the head and body in neutral alignment and will allow muscle groups to work together more harmoniously.

- Smooth, Continuous Contact You want to make the stimulation as pleasurable as you can. By using the palm of your hand instead of your fingertips, you will provide a more continuous, smooth input. This will help the sensory system to become more organized and prepared for feeding. A child with decreased muscle tone will typically benefit more from quick strokes to help increase tone, while the child with increased muscle tone will typically benefit from slower strokes that help decrease muscle tone.
- **Use of Gloves** Gloves should be utilized whenever working in or around a child's mouth. Be aware of the type of glove you are using. Some gloves are made from latex while other gloves have a noxious odor or may leave a bad taste in the mouth. Glove to skin contact is often irritating so wrapping your gloved hand or finger in a washcloth, towel, or cloth diaper may be helpful. These materials should preferably be soft and dry.
- **Distraction** The importance of the use of distraction cannot be minimized. Many children are fearful of touch and watching as a hand or towel slowly approaches their face must be very scary. Make stimulation pleasant and enjoyable, as this is an essential part of the daily feeding program. Singing, talking soothingly, or playing games are wonderful forms of distraction and ways to move the focus off of the stimulation. The child often gets so caught up in the activity that they are aware that sensory stimulation is being provided.
- **Control**: When a child feels in control, he or she will cooperate more willingly. Much of the child's day is determined by others and they have little input into the decision-making. By allowing the child to make choices in the stimulation process, you will most likely find a more cooperative and active participant.



## **Providing Oral Stimulation**

- ▶Be sure to use deep, firm pressure
- ◆Always work from distal to proximal
- →Always provide symmetrical input
- →Stimulate cheek/lip muscles
  - →With your palm, stroke down on cheek from the ear to the mouth
  - ➡With your index finger, stroke down from the nose to the upper lip and up from the chin to the lower lip
  - ➡With your index finger, go around the lips/mouth
- ◆To increase tone, use fast strokes

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◆To decrease tone, use slow strokes

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## Suggestions for Integrating the 4 Ts into Mealtimes for Children with ASD and SPD

- > Touch
- **≻** Taste
- **≻** Temperature
- ➤ Texture

## ■ Begin as soon as possible

- most children will show early sensory problems
- try a variety of food groups
- work on transitioning from activities early
- alternate home-made food with store bought food (may feel safer with earlier exposure)
- positive oral experiences (kissing, touching, blowing bubbles)
- variety of cups, toys, clothes, spoons, plates, etc.

#### ■ Treat the child as a whole

- team approach
- tactile and vestibular input before meals
- use oral stimulation at the same time as other pleasurable stimulation
- look at all senses
- reduce stress and help organize (rhythmical movement, music)

## Identify sensory causes

- accept concerns are real and present
- discover what aspects of meal are being rejected
- have any variables changed? (rate, amount, size, color, temp)

## ■ Introduce change within routine

- make minute changes to acceptable foods
- change only one variable
- begin making small changes as soon as possible
- look closely at transitions

## Mealtime vs. snack/therapy

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- mealtime social, nutritional, safety, comfort
- offer new foods/techniques at snack time or during therapy
- some do better with peers than by themselves and vice versa

#### Portion size and bite size

- also shapes

## Slowly make changes

- start with familiar food
- make small changes
  - -> add 2 eggs to pancake batter
  - -> add pureed carrots, squash, applesauce to meatloaf/casserole
  - -> peanut butter on bottom of graham, then cream cheese, then jelly, then spreadable cheese, etc.

## Begin with a familiar and accepted food

- small incremental changes
- different flavored ice cube added to drink...melts and slowly changes
- sparkling water with flavor instead of soda
- increase with healthy alternatives slowly to add nutritional benefits

#### ■ Hide smell and look of new foods

- prepare food away from child
- food sitting away from child; bring it to child
- warmer food has stronger smell, may need to chill food

#### Mask nutritional additions

- sometimes every spoonful makes a difference; make it count
- remember vitamin and mineral supplements have strong odor
- try mixing Ovaltine, Pediasure, Instant Breakfast with another liquid and freeze in ice cubes

## Quality vs. quantity initially

- work on small changes and then increase amount slowly over time

#### Distraction

- providing visual and tactile stimulation helps tremendously
- immediately take focus away from food

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## Communication & Socialization

- ➤ Does child have the maximum control possible?
- ➤ Are opportunities provided for making choices? (Provide as many choices as possible.)
- ➤ Does the child have a way to say "I'm hungry, stop, slow down, I want more, I'm finished, etc..?"

## What is the child's behavior telling us?

- Refusal
- Request
- Socialization
- Protest
- Sensory

## Implementation of Feeding Plan

- > Involved all team members
- ➤ Gathered all medical information
- > Considered nutritional needs
- ➤ Considered all feeding equipment
- > Determined most appropriate feeding sequence

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## Resources

**The Educator's Guide to Feeding Children with Disabilities** by Lowman & Murphy

Feeding and Nutrition for the Child with Special Needs: Handouts for Parents by Klein & Delaney

Feeding with Love and Good Sense by Ellen Satter

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Feeding Young Children in Group Settings: The Six Principles for Feeding Young Children in Group Settings by Branen & Fletcher

The Get Permission Approach to Mealtimes and Oral Motor Treatment by Klein

*Handling the Young Child with Cerebral Palsy at Home*, 3<sup>rd</sup> ed. by Finnie, Bax, Browne, and Gardner

Just Take a Bite: Easy Effective Answers to Food Aversions and Eating Challenges by Ernsperger & Stegen-Hanson

Motor Skills Acquisition in the First Year: An Illustrated Guide to Normal Development by Lois Bly

Normal Development of Functional Motor Skills: The First Year of Life by Alexander, Boehme, and Cupps

The Out of Sync Child: Recognizing and Coping with Sensory Integration Dysfunction by Carol Kranowitz

**Pre-Feeding Skills** by Suzanne Evans Morris

Sensational Kids: Hope and Help for Children with Sensory Processing Disorder by Lucy Miller

## **Helpful Websites**

How Does Your Engine Run? The Alert Program for Self-Regulation <a href="http://www.AlertProgram.com">http://www.AlertProgram.com</a>

The Out-of-Syn Child: Recognizing and Coping with Sensory Integration Dysfunction

http://www.out-of-sync-child.com

Sensorimotor History Questionnaire for Parents of Preschool Children <a href="http://www.spdnetwork.org/aboutspd/questionnaire.html">http://www.spdnetwork.org/aboutspd/questionnaire.html</a>.

Sensory Processing in Everyday Life

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http://classes.kumc.edu/sah/resources/sensory\_processing/learning\_oppo\_rtunities/concepts/sp\_concepts\_main.htm

Sensory Processing Disorder Network http://www.spdnetwork.org

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