Occupational Therapy

Activities of Daily Living

Activities of daily living include a wide variety of activities that involve taking care of oneself. Self-care skills are a reflection of one's ability to utilize all of the above skills to perform activities such as feeding, using buttons and zippers, tying one's shoes, dressing/undressing, bathing, and toileting. The Morris Center uses sensory-based occupational therapy evaluation and intervention to help children and adults function more effectively and efficiently in their daily environments at home, work, school, recreational pursuits and social interactions.

Sensory Processing refers to the ability of the nervous system to register, organize, and use sensory information. This includes information from the three "body senses," which are the foundation for other sensory skills as well as the integration of sensory and motor systems and the integration of perceptual and motor systems at the base of the Pyramid of Learning (Williams & Scellenberger). If any of the steps in the pyramid are weak or have not developed efficiently, it can cause difficulties and challenges in the higher levels of learning.

Sensorimotor and developmental approach to occupational therapy

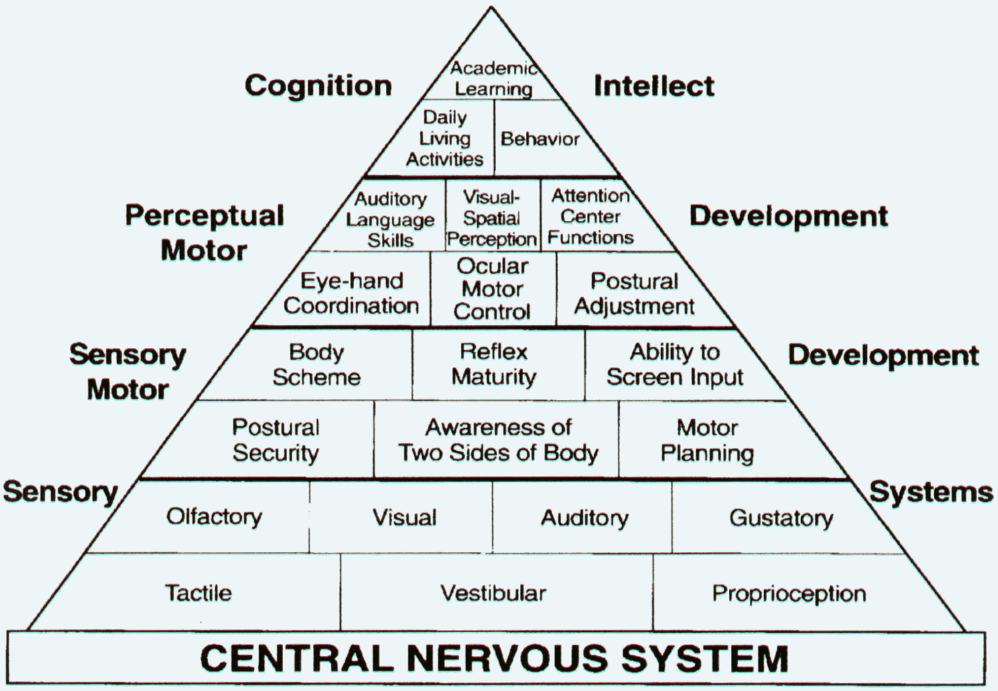

Figure 5. Pyramid of Learning. (Williams & Shellenberger, 1-4)

Vestibular system (balance and sense of movement and gravity) is the most powerful and crucial part of the sensory system. It provides information about where one's head is in relation to the earth's surface and whether we are moving, falling, upright, or horizontal. An under-developed vestibular system can impact higher-level skills such as coordination, balance, posture, sense of direction, eye control, attention, and aspects of language development.

Proprioceptive system (position sense) refers to the sensory input and feedback that tells us about our body's movement and position in space based on information from our muscles, joints, ligaments, tendons, and connective tissues. It is an essential part of body awareness and contributes information for motor planning, postural stability, motor control, grading of movement, and coordination.

Tactile system processes information from our environment based on our sense of touch. There are many types of touch receptors including deep pressure/light touch, temperature, and pain receptors. The tactile system is composed of a *discriminative system*, which allows us to determine where we are being touched and what is touching us, and a *protective system*, which tells us when we are in contact with something dangerous and triggers a flight or fight response. The discriminative and protective systems must perceive information and work in balance for the tactile system to function optimally. Oral tactile senses are also part of touch senses. When over or under-sensitive, tactile sensations in or around the mouth can interfere with the enjoyment of a variety of foods and drinks and can impact self-care tasks. Decreased or over-sensitive oral tactile processing can impact and is an essential part of oral motor skills, language development, and oral facial awareness.

These three "body senses" along with the more traditional sensory systems – auditory (hearing/listening), visual (sight), gustatory (taste) and olfactory (smell), – give the brain and body information about the external environment (the world outside the body) as well as the internal environment (what is happening within the body). These sensory systems begin to develop in utero and continue to mature as the child learns to respond to sensory input and begins moving to explore the world.

Auditory processing is related to listening and discriminating the differences in sounds. Even though hearing may be normal, when there are difficulties with auditory processing there is a mismatch in the ability to interpret or discriminate sounds. This can impact academic skills including language development, reading, spelling and being able to follow directions.

Visual Perceptual Skills involve the ability to organize and interpret the information that is seen, and give that information meaning. Some examples of visual perceptual skills include those that are important in navigating everyday life and academics:

Visual Discrimination – recognizing differences between similar objects

Visual Memory – being able to hold the visual image of an object in memory for a brief period of time and choose it from among similar items.

Spatial Relations – accurately perceiving the position of objects in relation to oneself or other objects

Visual Form Constancy – recognizing an object despite changes in size, shape, or orientation

Visual Sequencing – being able to remember (the order or sequence) of a series of forms or characters

Figure-Ground – finding an object in a complex background

Visual Closure – being able to infer what an object is based on by seeing partial information about that object.

Reflexes are involuntary and nearly instantaneous movement in response to a stimulus. Children progress through a developmental series of primary reflexes beginning in utero continuing for twelve months after birth. For this reason, examination of reflexes is routinely used by pediatricians to assess the neurological and motor development of children. Early reflexes usually integrate and develop into more mature movement patterns within the first year of life. When these reflexes do not integrate efficiently, they can interfere with the development of vestibular/proprioceptive processing, postural control, and more mature movement patterns. Reflexes that can frequently interfere with learning and academics include:

The **Moro Reflex** occurs in response to loss of support of the head and upper body. It involves spreading out the arms to the sides (abduction) with hands open, then pulling the arms back in to the body (adduction). A child who has not integrated the Moro reflex efficiently will often be in a high-alert or stressed state. The child may be hyper-sensitive to sound, light, touch or sudden changes in position. This can cause some children to be over-excitable, over-active and/or aggressive. Other children may be fearful, cautious or withdrawn. The Moro and the TLR are also closely linked and involved in vestibular (balance) processing.

The **Tonic Labyrinthine Reflex (TLR)** comes in two forms in response to movement of the head (vestibular/proprioceptive processing). When the head is bent forward, the back arches forward and the arms, legs and torso curl inward into a fetal position. When the head is bent backward, the back arches backward and the arms, legs and torso straighten and stiffen. When not integrated efficiently, the TLR can impact motor development, muscle tone, postural control and gravitational security. The lack of head control, involuntary postural responses, fluctuations in muscle tone, and excessive eye (ocular motor) adjustments associated with the TLR can lead to fatigue and interfere with the development of fine motor and visual perceptual skills that support academic skills such as reading, copying, handwriting, and mathematics tasks. The TLR supports the development of other reflexes into more mature movement patterns including the STNR and the ATNR.

The **Symmetrical Tonic Neck Reflex (STNR)** involves the bending of the elbows when the neck is flexed and knees are bent. This reflex helps prepare babies for learning to crawl on hands and knees. When present in older children, the STNR may interfere with postural control, gross and fine motor movement and ocular motor control.

The **Asymmetrical Tonic Neck Reflex (ATNR)** occurs when the head is turned to the side and the arm on the same side extends outward. This reflex assists an infant when reaching for objects and for learning to roll over. When not integrated efficiently, it may contribute to head-turning during visual motor activities, difficulty with motor planning and praxis with activities off of mid-line as well as rotational activities. When present in older children, the ATNR may interfere with daily performance in movement, activities of daily living and academic activities.

Postural control is the ability of the body to stay upright against the pull of gravity and to adjust one's posture to keep from falling down. Postural control, joint stability, and strength and endurance are heavily reliant upon respiration efficiency, visual, vestibular, and proprioceptive information. The vestibular system unconsciously detects where the body is in relation to gravity and sends information to the muscles responsible for keeping the body upright and vision aligned with the horizon. Postural and joint stability provide a stable base for the eyes, mouth, arms, and legs to work from in order to perform skills. Weaknesses in this area often result in difficulty staying in one position for long periods of time. Postural control provides a base of support for the arms and legs to work from and provides the stability for ocular motor and visual perceptual skills to develop in order to perform activities of daily living, movement and coordination activities, as well as academic skills (cutting, drawing, writing, copying from the board or book/paper at a desk).

Praxis is the ability of the brain and body to use sensory information in order to perform activities and involves a number of skills and abilities. *Motor planning is* one of those abilities and involves having an idea, planning the movements, and executing the plan. Once a movement pattern for a new skill becomes proficient, motor planning becomes automatic.

Motor skills generally refer to a learned sequence of movements that combine to produce a smooth, efficient action to accomplish a specific task. There are generally two types of motor skills:

Gross motor skills require use of large muscle groups to perform tasks such as walking, balancing, and crawling

Fine motor skills require use of smaller muscle groups to perform tasks that are precise in nature, such as writing and typing. Two fine motor skills important for learning and academic success are oculomotor control and graphomotor production.

Oculomotor control refers to the ability of the eyes to locate objects in the environment, and maintain focus on a moving object. It is important for the eyes to be able to move and work together while the head, face and mouth are still as well as for the eyes to be able to maintain focus on objects while the head/body is in motion. The ability of the eyes to work together is important for visual tracking and scanning, which occurs when reading left to right, and up and down when doing math. It is also important for the eyes to be able to move together while making quick shifts (saccadic eye movement). This type of ocular motor skill is essential when finding the next line during reading or when looking up and down while copying from the board. Deficits with these skills will likely impact visual attention to tasks and activities as well as performance in academics.

Graphomotor production refers to the quality of handwriting/drawing/copying. Pencil grip and the pressure used when writing can affect the quality and speed of grapho-motor production.

Visual-motor integration refers to the ability to use visual information to motor plan and to execute motor movements. Tracing, copying designs, taking notes from a blackboard and physical education activities are a few of the academic tasks that require solid visual-motor integration skills. Integrating visual information with motor skills often relies heavily upon one's posture to provide joint stability for the hands to perform intricate movements and sensory processing of vestibular, proprioceptive, tactile, and visual information. For example: Being able to discriminate objects held in the hand and use the appropriate amount of pressure from the muscles, such as when picking up a glass of water, handwriting, etc.