

RELATIVE STRENGTHS AND WEAKNESSES

FINE MOTOR

	Rapid alternating movement (22)
	Writing
	Cutting
	Small object manipulation

GROSS MOTOR

	Balance (23)
	Flexors (24)
	Extensors (24)
	Muscle Tone (25)
	Coordination (26)

VISUAL SYSTEM

	Figure ground (7)
	Shifting gaze (left/right) (8)
	Fixation (9)
	Fixation/head movement (9)
	Convergence (10)
	Divergence (11)
	Tracking H pattern (12)
	Tracking O pattern (12)

SIDEDNESS

Dominance	Right/Left/Ambidextrous
right	EYE
right	EAR
Left ambidextrous	HAND
right	FOOT

COGNITIVE/MEMORY

Sequencing (ordered)	5 Steps (27)
Processing (non-ordered)	4 Steps (28)

REFLEXES

	TLR (3)
	ATNR (1)
	SPINAL GALANT (4)
	STNR (2)
	Palmar Reflex (4)

BODY AWARENESS AND SENSORY

	Verbal praxis (Following verbal directions) (13)
	Visual sequencing (Visually copying movements) (14)
	Postural Praxis (Visually copying static position) (15)
	Oral Praxis - Copying tongue movements (16)
	Tactile awareness (touch) (1 point = area of difficulty) (2 point = area of difficulty) (17)
	Vestibular (movement registration) (18)
	Grading movement (erratic vs smooth) (19)
	Crossing midline (20)
	Body awareness in space (kinesthetic praxis) (21)

Legend

Area of Difficulty
 Mild Impairment
 Relative Strength

Handwriting

The quick red fox jumped over the lazy brown dog.

The quick red fox jumped over the lazy brown dog.

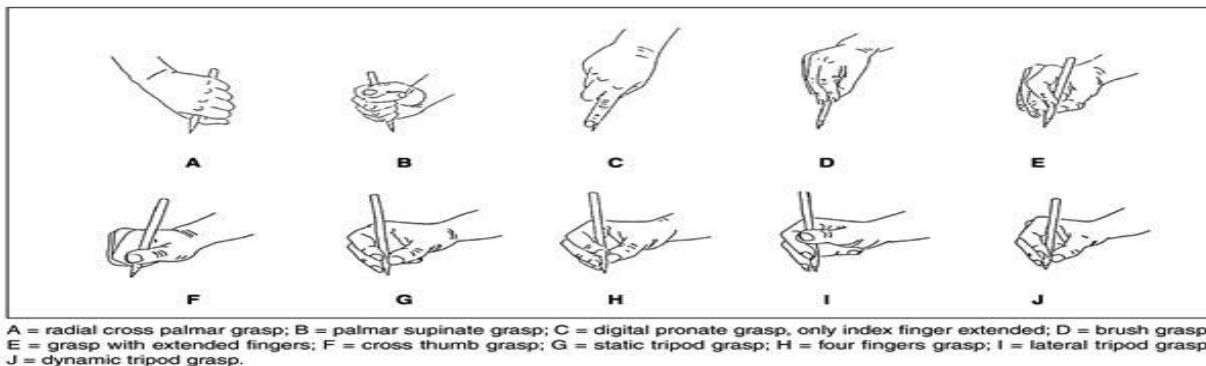
1 2 3 4 5 6 7 8 9 0

1 2 3 4 5 6 7 8 9 0

The following handwriting areas of difficulty were noted:

- Does not stay within boundaries of the page (runs out of room on right)
 - Does not stay within the boundaries of the coloring/drawing area or writing line.
 - Does not space evenly.
 - Difficulty with letter/number formation
 - Does not maintain space when copying/writing.
 - Frequently stops or looks up when copying.
- Pressure: low

Grasp used: (select letter from image below): E Grasp with extended fingers.



The handwriting evaluation revealed several findings that impact John's ability to effectively perform written tasks. Firstly, the assessment identified a positive presence of the unintegrated Asymmetrical Tonic Neck Reflex (ATNR), commonly associated with challenges in handwriting, such as difficulty writing on the non-dominant side of the page. Additionally, the evaluation highlighted mild sensory difficulties across other areas related to handwriting:

1. **Postural Praxis:** John may struggle with copying body postures, affecting activities like learning dance routines or participating in sports.
2. **Crossing Midline:** Difficulty moving from one side of the body to the other, impacting tasks such as visually tracking from left to right or reaching across the body.
3. **Kinesthetic Praxis:** Limited body awareness in space, leading to restlessness and difficulties in activities like handwriting and sports.

Furthermore, the assessment revealed moderate visual system difficulties, including tracking impairments. These challenges can affect John's ability to maintain focus and track objects accurately during visual tasks (i.e., copying from a book or board).

In terms of fine motor function, John demonstrated difficulty with Rapid Alternating Movement (RAM), indicating coordination issues that may manifest as poor coordination of limbs and difficulties in writing.

Regarding writing-specific challenges, John exhibited difficulty staying within page boundaries, spacing letters unevenly, struggling with letter/number formation, and applying low pressure while writing. John employs a grasp with extended fingers. He demonstrates functional fine motor finger movements.

Based on these findings, the occupational therapy intervention is recommended to focus on addressing the underlying sensory, visual, and fine motor difficulties to improve John's handwriting skills and overall functional performance in academic and daily living tasks.

Glossary of Terms

Retained reflexes can affect all function:

- (1) **Asymmetrical Tonic Neck Reflex (ATNR):** is often related to difficulties with handwriting (eg, difficulty writing on the non-dominant side of the page), bilateral integration, eye-hand coordination, lateral eye movement, reading and laterality (do not have a dominant side of the body).
- (2) **Symmetrical Tonic Neck Reflex (STNR):** ability will be essential for being able to read without losing the words at the middle of the line and to visually follow the moving hand when writing. Other symptoms include poor posture, tendency to slump when sitting, particularly at a desk, poor hand-eye coordination, messy eating, clumsiness, problem catching balls and slow at copying from blackboard.
- (3) **Tonic Labyrinthine Reflex (TLR):** difficulty with balance, muscle tone, poor posture, tendency to walk forward on toes, weak at ball skills, and poor articulation.

- (4) **Spinal Galant**: bedwetting, difficulty concentrating, short-term memory issues, or fidgeting
- (5) **Palmar Grasp Reflex**: poor fine motor skills, sticks out tongue when concentrating or speech problems, poor handwriting and reversing letters when writing.
- (6) **Moro**: known as the startle reflex, if a child retains this reflex, he may become over sensitive and over reactive to sensory stimulus resulting in poor impulse control, sensory overload, anxiety and emotions and social immaturity. Some additional signs of a retained Moro reflex are motion sickness, poor balance, poor coordination, easily distracted, unable to adapt well to change, and mood swings.

A key need for school and sport function is a strong visual system:

- (7) **Figure Ground**: the ability to visually see one item in a field of multiple objects
- (8) **Shifting gaze**: the ability to look from one object to another (e.g., reading from left to right).
- (9) **Fixation**: the ability to keep looking at an object (with or independent of head movement).
- (10) **Convergence**: the simultaneous inward movement of both eyes to work together to look at nearby objects (i.e., have trouble reading/writing, double vision, become tired or have trouble concentrating).
- (11) **Divergence**: simultaneous outward movement of both eyes away from each other to look at far away objects (i.e., have trouble reading/writing, double vision, become tired or have trouble concentrating).
- (12) **Tracking (H O)**: the ability of both eyes to follow vertical, horizontal, and circular movements to visually track an object.

Sensory function summary:

- (13) **Verbal Praxis**: The ability to listen and follow a teacher's verbal directions (e.g., hearing and executing a teacher's oral instructions).
- (14) **Visual Sequencing**: The ability to observe and follow a teacher's visual directions (e.g., copying multiple items from a board).
- (15) **Postural Praxis**: The ability to copy body posture (e.g., learning a dance or playing sports).
- (16) **Oral Praxis**: The ability to plan and execute tongue movements (e.g., speaking, swallowing, as well as a good indicator of ability to coordinate body movements).
- (17) **Tactile Awareness**: The ability to identify 1-2 point touch without vision (e.g., to comb hair, buttoning or find items in a backpack without vision).
- (18) **Vestibular**: This test gives us information about how a child can orient themselves upright against gravity, their ability to stay alert, and how they combine sensory information to understand where they are in space (e.g., visually follow the teacher and her directions as she walks in front of the room while talking, sitting upright at a desk to complete seatwork, and paying attention in school).
- (19) **Grading Movement**: the ability to use the appropriate amount of force to complete motor skills (e.g., too little/much pressure when writing).

- (20) **Crossing Midline:** The ability to move body from one side to the other (e.g., visually track from left to right or reach toward the left using the right hand).
- (21) **Kinesthetic Praxis:** Body awareness in space: a person's ability to sense and understand the position, movement, and orientation of their body parts in relation to each other and the surrounding environment without relying on visual cues. A student with body awareness difficulties may present themselves as restless because they need to constantly move to know where they are in space. They may also have difficulty with handwriting and sports.

After a child develops sensory processing skills, they progress on to developing Gross Motor skills (large muscle movement) and fine motor skills (small muscle movement):

- (22) **Rapid Alternating Movement (RAM):** The RAM test assesses hand coordination by prompting individuals to swiftly touch each finger with their thumb on both hands, evaluating rhythm and any discrepancies between hands. Students who have difficulty with this skill may have difficulties with: Balance and coordination problems, Poor coordination of hands, arms, and legs., Slurring of speech., Difficulty with writing and eating., Slow eye movements.
- (23) **Balance:** reduced balance may affect your child's ability to sit or walk. Children with balance difficulty may have difficulty with sports and school function.
- (24) **Extensors/Flexors:** may appear distractible because they're focusing more on staying upright, present with poor seated endurance, may have sloppy handwriting due to poor posture or appear clumsy.
- (25) **Muscle Tone:** affects a student's ability to hold, grasp and maintain posture (e.g., floppy or hyper-extending body parts).
- (26) **Coordination:** the ability to coordinate different parts of the body.

Cognition represents a variety of skills. Here, we address only memory and processing of information that is stored in memory:

- (27) **Sequencing:** arranging and recalling information in a particular order.
- (28) **Processing:** recalling information stored in memory in an order different from the order it was memorized in. Students struggle with this type of memory with new information.

Proposed Occupational Therapy Program

8-week Goals

John will demonstrate integration of the ATNR reflex.

John will trunk strength/tone (flexors and extensors) to improve his sitting posture.

John will improve body awareness:

- Touch registration.

- Body positioning in space

- Crossing midline

John will improve visual eye movements and bilateral tracking.

Proposed therapy:

1x weekly 30-45 minute session to update home exercise program

3-4x week 15-minute sessions to ensure daily home exercise compliance

Sessions to be carried out virtually. Sessions will be recorded, and password protected to allow for revisiting and reinforcing instructions.

Rates based on \$45 per 15-minute intervals.

Alexander Minevich, OTR