Title: The Neurology of the Pepper Stress Test or What can we learn from the Emerging field of Functional Neurology?

INTRODUCTION: Dr Bob Pepper Stress Test

Dr. Bob Pepper demonstrated the connection between body and vision by asking amblyopic patients to describe any observed acuity changes when viewing an eye chart with their "lazy eye". He would then stabilize the patient's shoulders and ask them to attempt to twist their torso. (Isometric motor effort) Often the patient would report an improvement of acuity in the amblyopic eye as well as breaking down suppression with patients with binocular disorders with with this added motor stressor.

Drs. Roger Dowis and Steve Cool's interaction with the Pepper treatment. Steve, "how can you make me believe that the shoulders have anything to do with eye functions" Roger" Hey man, I'm just the clinician, you say you are the vision scientist, you tell me why it works!"

Emerging Work of Functional Neurology with visual applications

Dr. Eric Cobb with Z Health, Dr Centric Noel with Focus Builder, Dr. DeAnn Fitzgerald, President of Nora with Eye2Brain academy. In the emerging field of functional neurology, movement practitioners have developed unique neurocentric approaches to connect the visual/vestibular/proprioceptive inputs to cause better motor outputs.

So today we re-ask the question, "Neurologically, how does the Pepper Stress Treatment work?"

Neurology Overview: At its basics: Input-interpretation-output (usually motor), the brain needs fuel and activation, adjacent areas activate together

1. The Brain is oriented towards Survival
   a. Pattern recognitions allows us an ability to predict threats
   b. Flexion with fear causes a fetal position. Neuro-integrators in the midbrain, pons and medulla show why do we need 3 cranial nerves to control eye muscles.
   c. Muscles ability to extend and flex can indicate level subconscious threat.

2. Movement is essential for Survival and reproduction
    a. Proprioception maps of every joint reduces threat of injury and increases performance in space
    b. The eye is on only part of the brain that moves and its proprioception and retinotopic maps are integrated into every area of the brain
    c. The visual system serves as the chief controller of the brain's function of motor planning with numerous connections between the visual system and auditory, vestibular, and somatosensory inputs.

3. Cerebellar (Cb) is integrated with all motor activities and is a main modifier of eye movements along with the brain stem visual neuro-integrators. The “Little Brain” has 75% of surface area, 70% of the neurons.
    a. Research of Tara A AOA meeting
    b. Cb disruption causes ESOT
    c. Cb diagnosis in the RightEye Scans

4. General Guidelines in Cb bases assessment and treatment. Causes hypermetric eye movement responses. Connection point with the vestibular system. Storage of visual motor learning

    a. Fastigial ocular motor regions which control the initial acceleration and terminal deceleration of smooth pursuits. Activities

    b. The flocculus and paraflocculus regions which maintain fixations and pursuit speed. Activities

    c. Cb nodulus and uvula regions which integrate canal and otolith inputs adjusting and adapting the tVOR. Activities

CONCLUSION: Developmental Optometrists have long used movement and motor activation to make sure that vision" leads and guides" proprioception, anti-gravity, and locomotion. In the training room, movement is often added to activities to integrate and automate visual tasks. There is a shoulder/neck/eye connection…MANY! Research vindicates the Pepper Test and what we clinically do.