



Why Symmetry May Be Your Biggest Enemy

The Neurology of Unilateral vs. Bilateral Training

Exercise OFTEN Hurts



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According to the American Academy of Sports Medicine 42% of exercisers injure themselves each year.

Exercise In The Real World

- **17% - Super-Responders**
- **63% - Normo-Responders**
- **20% - Non-Responders**

Scientists say that 82% of people will believe anything you tell them if you start the sentence with "Scientists say"



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What Does That Mean?

Strength Training Research Example

- 16 Weeks of Training
- 3 Hrs/Week
- 48 Hours Training Time

Super-
Responders

- 200lb Bench Press Start
- 316lb Bench Press Finish

Normo-
Responders

- 200lb Bench Press Start
- 234lb Bench Press Finish

Non-
Responders

- 200lb Bench Press Start
- 184lb Bench Press Finish

Exercise In The Real World

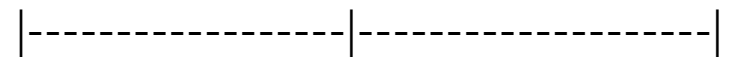
WHY?

Minimal Effective Dose



For doctors prescribing medications, effective dosing is **VITAL!**

Too Little M.E.D. Too Much



No
Effect

Deadly
Effect

Does It Matter?

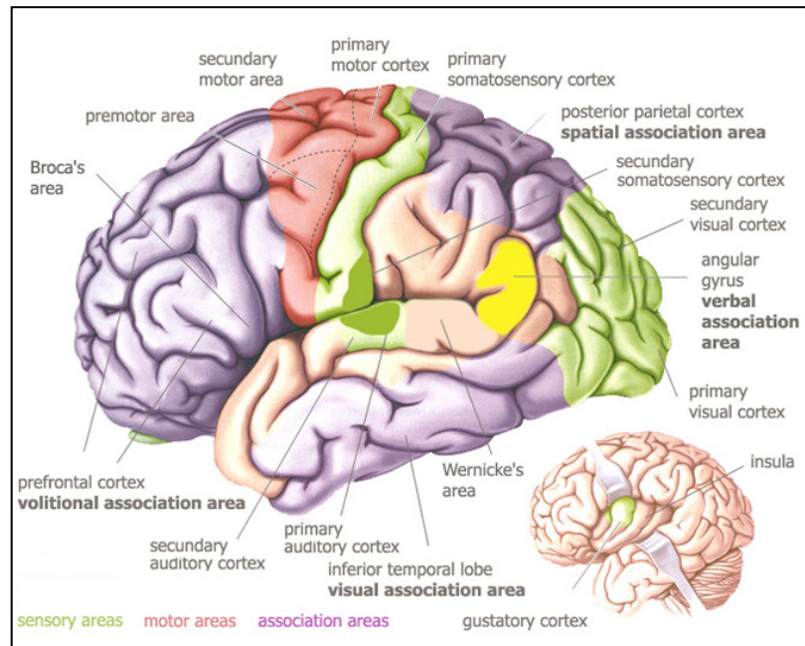
Bilateral



Unilateral



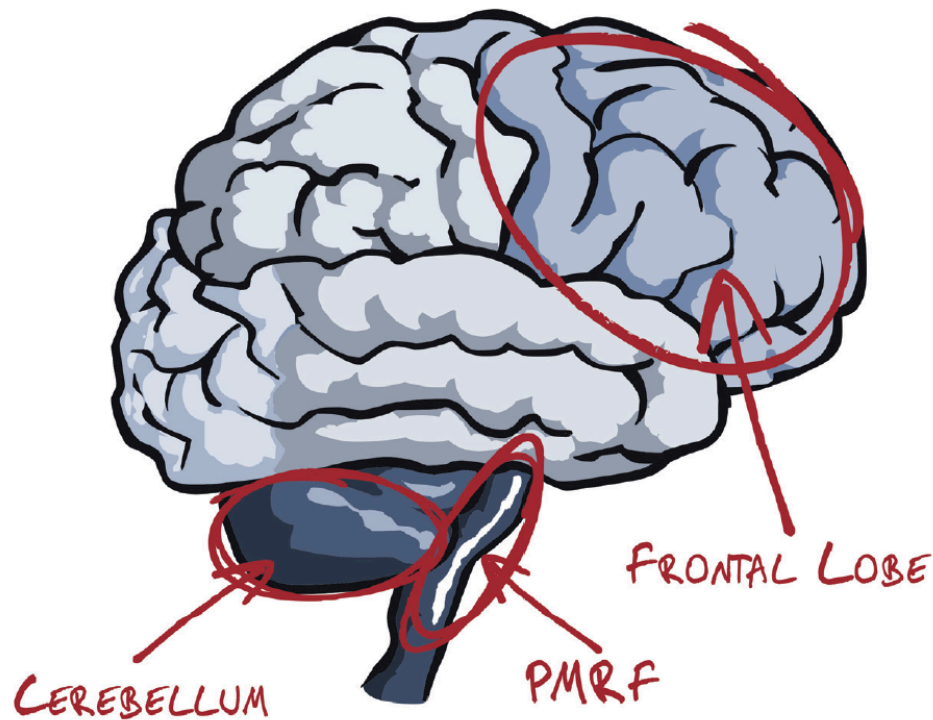
Foundational Brain Concepts



Two Things Your Brain Needs To Stay Alive:

1. Fuel (Oxygen, Glucose)
2. Activation

Movement Neuroanatomy 101

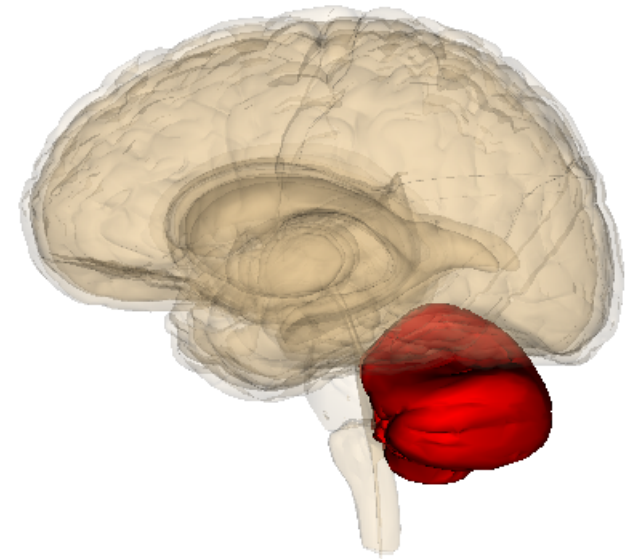


- In terms of strength training in this course, we are primarily interested in 3 different brain regions:
 1. Cerebellum – Coordinates and “Fixes” Movement Errors
 2. Frontal Lobe (Cortex) – Initiates Movement
 3. Pontomedullary Reticular Formation (PMRF) – Posture, Global Muscle Tone, and Autonomic Control

The Cerebellum

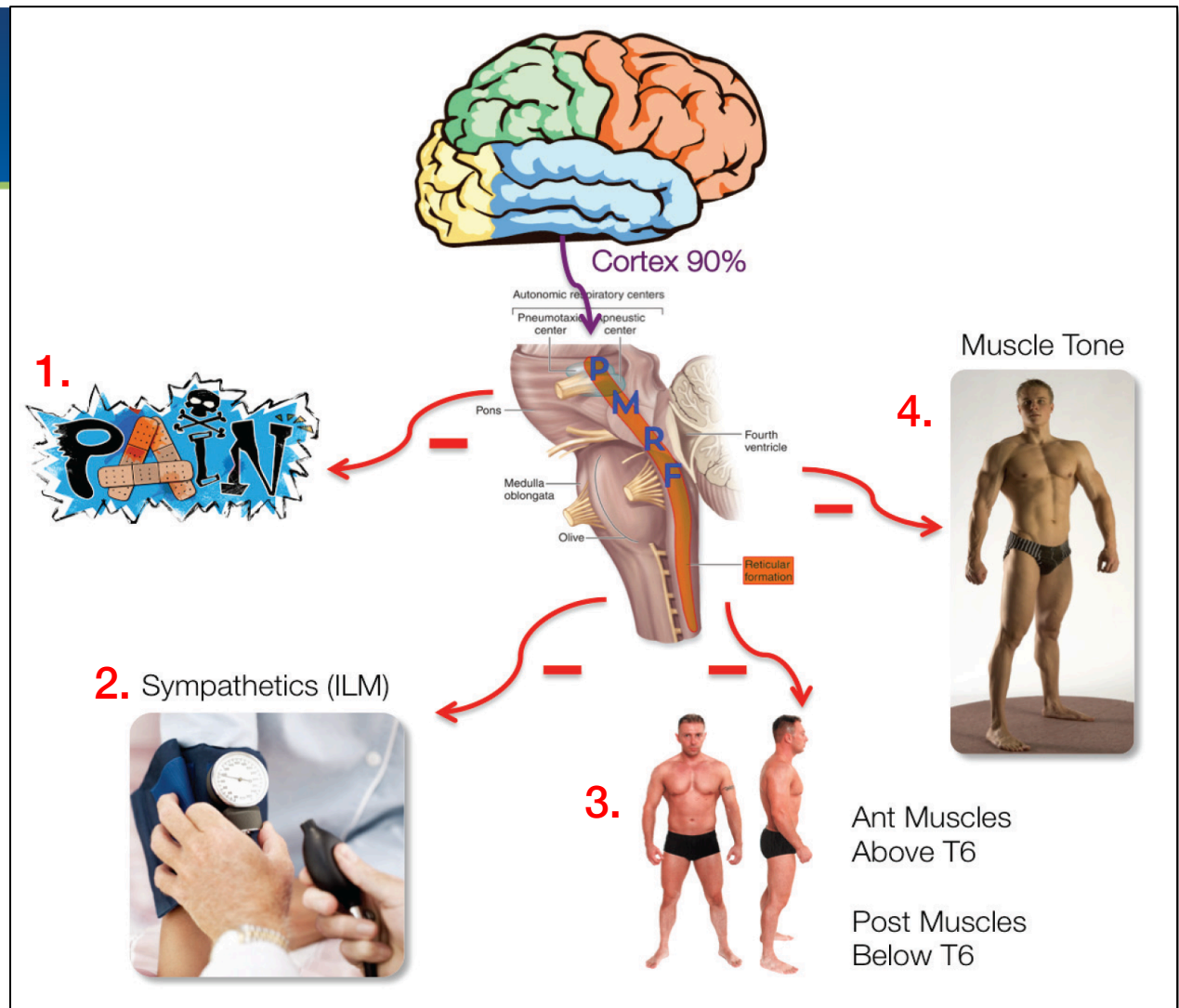
Cerebellum – Integrates (and simplifies) the complex data generated from all of our body systems and cognition. The cerebellum performs these tasks in movement:

1. Coordinates complex movements ipsilaterally.
2. Is in direct communication with the ipsilateral vestibular system.
3. Directly stimulates the contralateral cerebral cortex (frontal lobe)



The PMRF

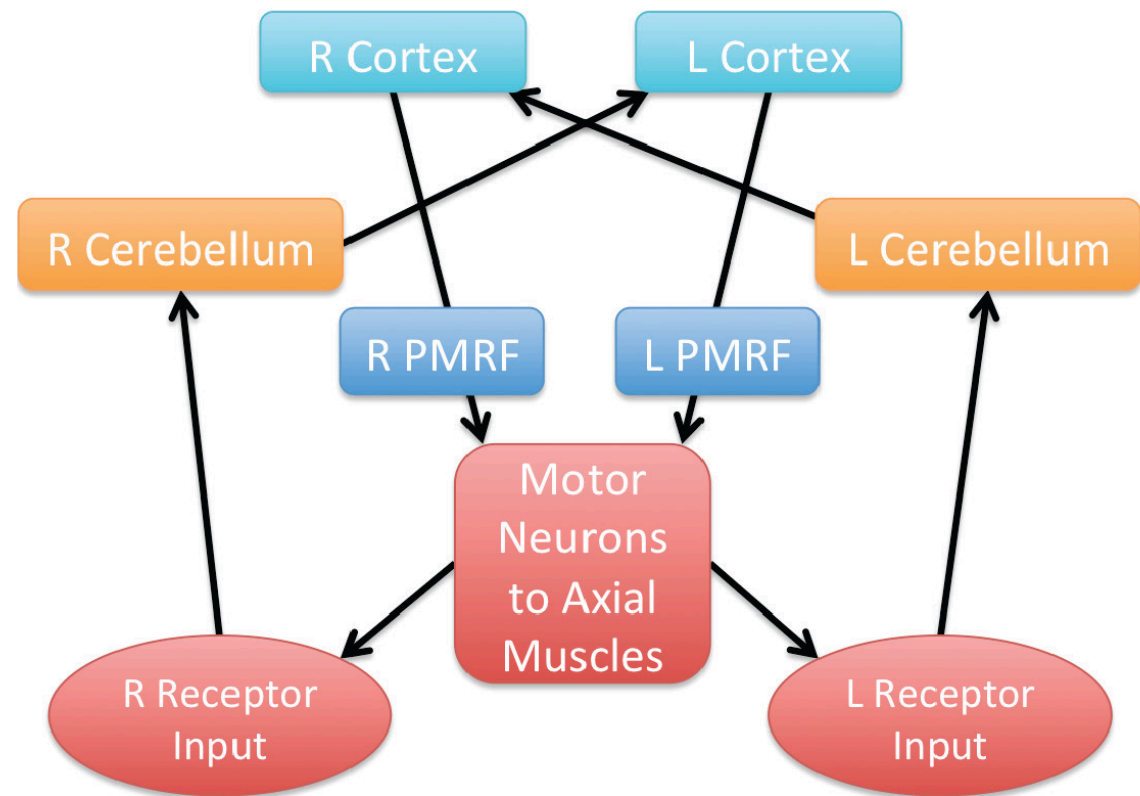
1. Inhibits pain on ipsilateral side of the body.
2. Inhibits the ipsilateral IML (Inter Mediolateral)
3. Inhibits the ipsilateral anterior muscles above T6 /Inhibits the posterior muscles below T6
4. Inhibition of Inhibitory Motor Interneuron (Renshaw Cells)



Understanding the Neurology of Movement

- Healthy, strong movement requires healthy, active neurologic signaling
- If deficits exist in the Cerebellum, Cortex, or PMRF then movement and strength suffers!

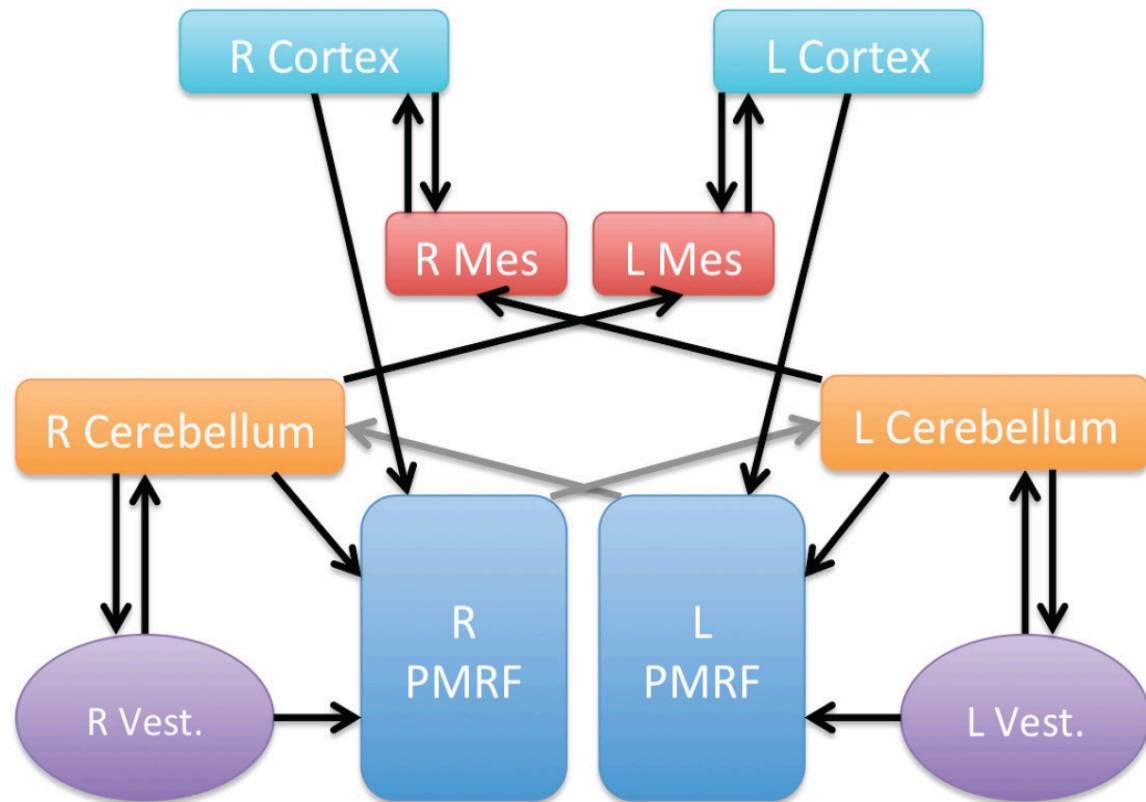
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Inputs to the PMRF

Increase activation of the PMRF by stimulating:

1. Ipsilateral Cerebellum
2. Ipsilateral Cortex
3. Ipsilateral Vestibular System



Two Vital Assessment Concepts

1. Screen the cerebellum to establish a “likely” starting point.
2. Use practical intra-session assessments to see how your client is responding to the exercises.

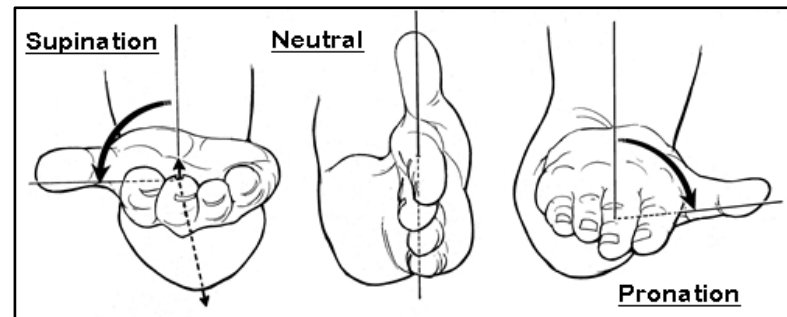
4 Practical Intra-Session Assessments

- 1. Active Range of Motion (AROM)**
- 2. Strength (RPE 1-10)**
- 3. Balance (15 Seconds)**
- 4. Functional Activities (Sports or ADL)**

Screening the Cerebellum

**Upper Body:
Rapid Alternating Pronation/
Supination**

**Lower Body:
Toe Tapping**



Practical Intra-Session Assessment #1

Active Range of Motion (AROM)

1. Shoulder Flexion (Arm To Front)
2. Shoulder Abduction (Arm To Side)
3. Shoulder Extension (Arm Behind)
4. Trunk Forward Bend
5. Trunk Rotation



Practical Intra-Session Assessment #3



Single-Leg Balance

Eyes Open

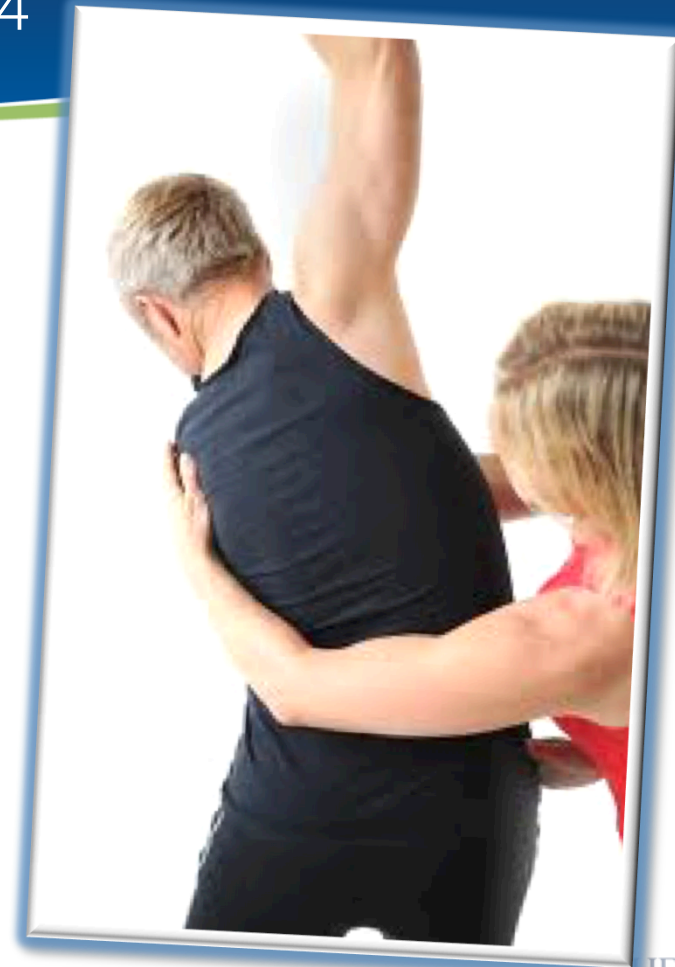
or

Eyes Closed

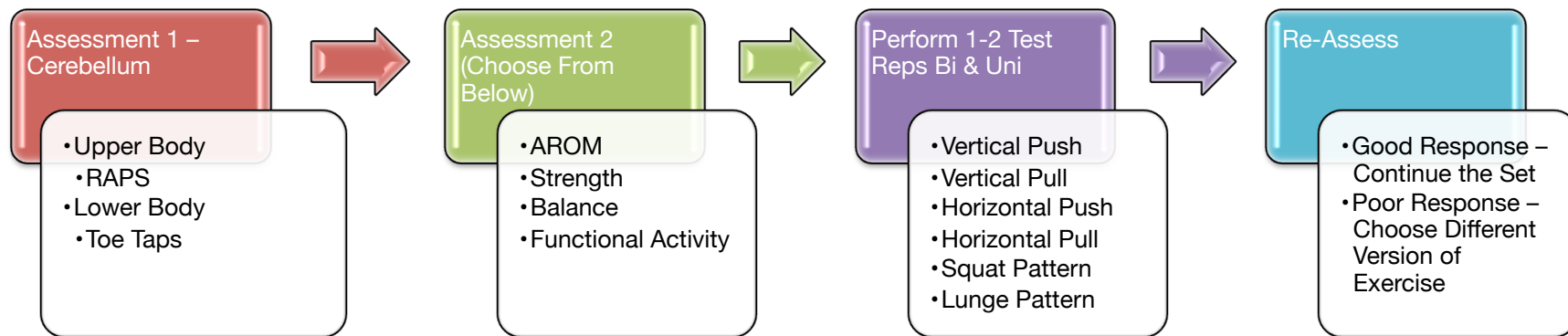
Functional Activities

Indicators of positive adaptive response in the nervous system:

- Improved quality of movement
- Decreased pain
- Increased movement speed



Bilateral vs. Unilateral Testing Protocol



Testing Protocol Chart

Exercise Variation	Bilateral	Right	Left	Unilateral With Rotation
Vertical Push				
Vertical Pull				
Horizontal Push				
Horizontal Pull				
Squat Pattern				
Lunge Pattern				

- = Poor Response

+ = Good Response

++ = Best Response

Cerebellum Upper: Sym Asym R or L

Cerebellum Lower: Sym Asym R or L

Z-Health 9S Athletic Development Model



For More Information
Please Contact Us
www.zhealtheducation.com
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Next Steps

1. Keep an open mind and approach this as a scientific experiment.
2. Next, print the PDF of the presentation provided.
3. Also, print the PDF of the Testing Protocol Chart.
4. Review any of the practical areas from the video that you feel will be helpful.
5. Try one full training session this week **ON YOURSELF** to see how it feels and what you learn.
6. Next, choose one of your best/favorite clients who is open to new things and try a full session with them this week. Assess the results.
7. Contact us if you questions or feedback.