MAC UP Convention

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Brain Based



They Knew

Not Miracles, Chiropractic at it's best



Treating the Cause



What is Neuro Performance?

Optimal functioning of your nervous system

Manipulations Light up the Brain

Everything old is "Neuro Again"

Changes coming to the profession

Time to leave the "bone out place" theory

Become Brain Based



Barbara's Story

1

Presenting Complaints

Barbara presents with left-side lower back pain radiating into the left S/I, buttock, and down the left thigh.

Consistent dull ache with spikes of sharp pain

Surgical History

L3/4 L4/5 Vera Lift fusion 10/20/2022 Laminectomy L3/4 - 06/01/2023"

Yellow Flags

I feel downhearted, blue, and sad.

I Cannot Live With This Pain

Questions

- Why is Barabara still in pain?
- What is the anatomical structure causing her pain?
- Can we help her?

We Need To Get Deep In The Weeds

- Barbara is neurologically starved
- We cannot think mechanically or structurally (orthopedically)





Action Potentials





What Happens When We Palpate?

- From a neurological standpoint
- What are you thinking when palpating?



What Happens When We Adjust?

Neurologically



Muscle Spindles

Provides the nervous system with information concerning static & dynamic length and velocity of muscle movements.

MAJOR	PROPRIOCEPTIVE RECEPTORS
	Muscle spindle
	<u>Golgi tendon organ</u>



Joint Receptors

Mechanoreceptors

Supply	Supply feedback for both static and dynamic position of joints
Туре	Type I Tonic
Туре	Type II Similar to Pacinian
Туре	Type III Similar to Golgi Tendon
Туре	Type IV Nociceptive







Brain Internal Model Faulty information = faulty model

Central Nervous System

Can modulate pain



Afferentation

The sum total of sensory input from a body part or region



Deafferentation

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Not Moving Weak Brain



Disorganized and blurry maps



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Pain becomes a low usage meter

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Pain is now a behavior



Blurry Brain Maps




Pain Neuromatrix



Our Job

Identify the factors that drive a patient's pain Neuromatrix

Stiff Mode

Blurry maps leads to a stiffened motor control pattern





Leads to greater compressive loads on the following

- Discs
- Joints
- ➤ Tendons
- > Ligaments

Incorrect Diagnosis

Mechanical diagnosis—the cause is in the body parts



Afferentation

The sum total of sensory input from a body part or region

New Paradigm for Chiropractic





Get the signals back up to the Brain

The First Visit

The first visit is crucial for a successful clinical outcome

What we say, how we examine, and how we explain has a therapeutic impact on the patient We are treating a patient, not a problem

Perception is Reality

Our minds interpretation of the stimulus becomes our perception and thus our reality

Contextually Aided Recovery

In short, how a patient understands and interprets the words and actions of a clinician and the clinical environment within a clinical encounter, can switch on or off neurobiological pathways that directly reduce or enhance pain.

The First Visit

- Skillful interview—not all histories should be the same
- Begins the Physical & Educational Intervention
- Educate intervention throughout the entire visit
- Physical during the examination

The First Encounter

- Consistency in language terminology and concepts
- Listening is therapy
- Go ahead and use the word diagnosis





Garbage Out, Garbage In

- Damaged Parts
- In & Out

Talk Neuro To Me







Brain Plasticity "neuroplasticity" Clearer Smudge Free Brain Maps

De-educate to Reeducate

Mechanical

Change The Focus

Structural

Bone out of place

Educational Intervention

This does not include the following:

- \checkmark Your mission as a Chiropractor
- ✓ Your reason for being a Chiropractor
- ✓ How you became a Chiropractor
- ✓ Explaining the subluxation

I Have Two Visits

From the moment she entered there were factors already determining the clinical success for her condition

FIRST IMPRESSIONS ARE HUGE

Barbara's Report of Findings

- You do not need to live this way
- As you can see our examination was different
- Then I told her the "F" word

FIX

The Treatment Visits 1-5

• Hivamat to reduce the edema next to her scar



BioWave Pro

For Pain Relief



Cox Flexion-Distraction



Visits 6-12

ARP Neurological Therapy(Accelerated Recovery Performance)



Cox Flexion-Distraction



NormaTec Compression Therapy



ICD-10 Codes

- M99.03 Segmental Dysfunction Lumbar Spine
- M51.17 Intervertebral Disc Disorder with Radiculopathy, Lumbosacral
- M99.05 Segmental Dysfunction Pelvic Region
- M53.87 Other Specified Dorsopathies, Lumbosacral Region
- M79.18 Myalgia
- M99.04 Segmental Dysfunction Sacral Region

CPT Codes

- 99204 Evaluation & Management
- 98941 CMT 3-4 Regions
- 97104 Electrical Muscle Stimulation (BioWave)
- 97110 Therapeutic Exercises 1-Unit

Clinical Outcome

- Seen a total of 16 visits
- Pain from a 10 to a 2
- Playing Golf
- Looking forward to their winter trip to Florida

Break Time



Gage's Story

When They Say You Can't, We Say You Can



First Game of The Football Season

- Torn ACL
- Out for Hockey
- Out for Track in the Spring



Parental Trust

Can you help my son return to sports this year?

If so, what do we need to do?

No Promises

I think we can get back to hockey

For sure back for track

ARP Neurological Therapy

Direct Current

Neuromuscular Stimulation
RX Clinical Unit



Home Based Therapy Unit



Hivamat 200





RX Clinical Unit





November On The Ice



SKATING IN A STRAIGHT LINE



December Drill Time



Gage Was Back

In early January everyone knew he was ready



The Petoskey Game

- First game back
- Player introductions
- Gage was back



ICE HOCKEY

Gaylord's Looker Shows 'Different Type of Tough' in Return from Knee Tear "I am overjoyed to have him back on the ice," Harding said. "At least he is getting in a few games and is out there making a difference.

"The smile on his face is priceless," she continued. "Perhaps he'll continue with track as he is set to break records there too."

Rehab fresh out of surgery was "very boring," so Looker started intensifying his recovery with therapy four days a week for a few months.



"It was a lot of commitment, but I needed my senior year of hockey," Looker said. "I was doing the basic things, and then I had a machine that could stimulate my muscles and pump blood to my knee.

"It is called ARPneuro," he continued. "I was skating with that on my leg as well as doing mini workouts at home."

ARP – accelerated, recovery and performance – reportedly accelerates recovery time by decreasing chronic pain and increasing range of motion without the use of medications.



ICD-10 Codes Used

- M99.06 Segmental Dysfunction Lower Extremity
- M62.50 Muscle Wasting and Atrophy
- M99.03 Segmental Dysfunction Lumbar
- M99.04 Segmental Dysfunction Sacral Area
- M99.05 Segmental Dysfunction Pelvic area
- M79.18 Myalgia
- M54.50 Low Back Pain

CPT Codes

- 99213 Established Patient
- 98940 1-2 Areas Manipulation
- 97110 Therapeutic Exercises
- 97112 Neuromuscular Re-education

Clinical Outcome

- Gage was released from active care at the end of January
- Went to the state track meet for discus
- No residuals

Clinical Questions

- Why did Gage progress so rapidly
- Can you provide me a neurological explanation for his care?

Muscle Spindles

Provides the nervous system with information concerning static & dynamic length and velocity of muscle movements.

MAJOR	PROPRIOCEPTIVE RECEPTORS
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Not Moving Weak Brain





Afferentation

The sum total of sensory input from a body part or region

Pain Neuromatrix



Break Time



Tom's Story

Excruciating Lower Back Pain

- Walked in very antalgic
- 3rd episode of lower back pain in the past 18 months

Past Treatment

- Laser
- Multiple Sessions of Spinal Decompression

"The pain keeps coming"

Examination Findings

- Walked with right antalgic posture and limp
- Range of motion restricted and painful
- Bechterew's positive on the left
- Left Glute 4/5
- Tight left hamstring



Clinical Questions

- What anatomical structure is causing the pain
- Why does his pain keep occurring?
- What can we do from a neurological perspective?



HERNIATION AND FREE FRAGMENT

HERNIATION AND FREE FRAGMENT












The Cerebellum

Cerebellar Functions

- Volitional & Non-Volitional Motor Activity
- Unconscious Proprioception
- Thought & Emotion
- Intrinsic link to the spine
- Eye Movements (Vestibular Balance)
- Gait
- Posture
- Coordination
- Respiration
- BP/HR

Afferent Input

Receives afferent from the spinal cord & sensory receptors via spinocerebellar tracts

Connect By Peduncles



Functional Anatomy of the Cerebellum The Flocculonodular Lobe

The Spinocerebellum

The Cerebrocerebellum (Lateral Aspect)

The Vestibulocerebellum

Flocculonodular Lobe

Control of posture Eye movements Some autonomic responses



Symptoms:

✓ Difficulty with balance, or balance is worse on one side

 \checkmark A need to hold on to handrails

✓ Feeling unsteady

✓ Prone to swaying

Examination Findings

✓ Wide stance gait, ataxia and instability with ambulation
✓ Desitive Dembers's Test

✓ Positive Romberg's Test

Treatment

- ✓ Postural balance exercises
- ✓Core stability



Cerebrocerebellum

Symptoms

✓ Recent clumsiness in the hands✓ Recent clumsiness in the feet or tripping

✓ A slight handshake when reaching

Cerebrocerebellum

Examination Findings

✓ Intentional tremor

✓ Termination tremor with end stage targeting (finger to nose)

- ✓ Dysmetric (hypometric and hypermetric targeting
- ✓ Dysdiadochokinesia

✓ Ataxia dysarthria

Cerebrocerebellum

Treatment

✓ Coordinated motor activities specific to limb and side of involvement

- ✓ Proximal for interpose region
- ✓ Spinal and midline cerebellar
- ✓ Hand specific for dentate

Vestibulocerebellum

Symptoms

✓ Dizziness & Disorientation

✓ Back muscles tire quickly with standing or walking

✓ Chronic neck or back muscle tightness

✓ Nausea, car and sea sickness

✓ Crowded places cause anxiety

Vestibulocerebellum

Examination

✓ Wide stance gait

✓ Ataxia

 \checkmark Instability with ambulation

✓ Dysautonomia

Vestibulocerebellum

Treatment

✓ Bosu Ball

✓ ARPneuro PRS with Motion Guidance

✓ ARPneuro PRS with Blazepods

Intrinsic Spinal Muscles Activated by the Vestibulospinal Tract



Cerebellar Testing





Gracie Caverson

Knee Left 85% Knee Right 91%





🗋 Notes

Subjective

C Objective

Assessment

Plan









Leads to greater compressive loads on the following

- Discs
- Joints
- ➤ Tendons
- > Ligaments



Receives information from muscle spindles Very important for tone of the intrinsic muscles

Tom's Pain

- Due to instability
- Instability due to weak multifidus
- Deafferentation
- Cerebellum Not Functioning As It Should









Clinical Outcome

- Six weeks of care
- 14 Visits
- No Pain
- Walking Normal



ICD 10

- M99.03 Segmental Dysfunction Lumbar Spine
- M51.17 Intervertebral disc with radiculopathy Lumbosacral
- M99.05 Segmental Dysfunction Pelvic
- M79.18 Myalgia

Question: Why did I leave out the pain diagnosis?

CPT Codes

- 99204 Evaluation & Management
- 98940 1-2 CMT
- 97014 Electrical Stimulation (BioWave)
- 97012 Mechanical Traction
- 97110 Therapeutic Exercises
- 97112 Neuromuscular Re-education

Mechanical

Change The Focus

Structural

Bone out of place

Diagnosis

Bringing it all together

Tell the patient what it is NOT

Tell the patient what you think it IS

Imaging

Why imaging?

Will it change your diagnosis and treatment?

Potential harm

Becoming Their X-Rays



DE-EDUCATE

RE-EDUCATE






Patients Are Not Their Diagnosis

They are:

➤ Hurting

- Scared
- Frustrated

Case Study

Cerebellar Degeneration





Roger presents with constant blinking, slurring of this speech, balance issues, and stiffness in the entire spine in the mornings.

He has been under the care of a neurologist at the University of Michigan, who diagnosed him with Cerebellar Ataxia.



Treatments

Spinal manipulations

ARPneuro sessions

NormaTec & BrainTap

19-Visits

ARP Century Club

Reached 100 on the RX Unit



Differentiate Your Approach

"Pain can be learned by the brain and persist long after an injured tissue has healed. This is where we may be able to help when other approaches have not".

Sensorimotor Control





Muscle Movement Control

Plasticity in Neural Networks

What is the dominant pain mechanism? Nociceptive

Peripheral Neuropathic

Central Pain

The Treatment

Spinal Manipulations using Cox Flexion-Distraction Technique

2-Different electrical muscle stimulation therapies

Active rehabilitation utilizing ARPneuro

NormaTec & BrainTap Sessions

PRS home therapy

Break Time

Jake's Story



Jake's Story

Jake is an 18-year-old football player who is a senior in high school. He presented with right inferior gluteal region pain that he points to the area between the ischial tuberosity and hip joint as the site of pain.

His initial injury came in the spring during a track meet when running the 400 meter. As he started to accelerate, he described a pulled muscle sensation and immediately eased up for the rest of the race.

For the next few weeks, he rested and applied ice to the area and slowly began to work back into running.

No Improvement

Over the ensuing weeks, every time he attempted to go full speed, he felt pain in the right posterior thigh and hip. He changed his warm-up routine to a more dynamic approach and stretched vigorously following practice. While there was some improvement, he kept feeling soreness and pain when attempting to go 100%.

After track season was over, he was seen by his family physician, who ordered Physical Therapy. He was seen for 4-weeks, with ultrasound, laser therapy, and stretching with some benefit being achieved.

Football Season

During the first live scrimmage, he caught a pass and after running down the sideline, felt what he described was a pulling sensation. He immediately went out bounds and then came over to the sideline for evaluation.

There was tenderness to palpation in the right gluteal region, with some increase pain on flexion and adduction of the hip and buttock region. He once again was seen by his family physician who ordered another round of PT.

MRI Results

Even though he continued to play football, before every game he complained about right hip pain. He had been going 3 x per week for 2 weeks at PT, but no improvement.

He was sent for an MRI of the lumbar spine and right hip area. There was some mild degenerative changes in the L4-S1 disc, but no other significant pathology was visualized.

There was no evidence of injury to hamstring tendon or othe proximal muscle tissues.

What Are The Pain Generators?

- Lumbar Disc
- S/I joint
- Facet Joint
- Myofascial
- Tendon

Clinical Questions

- What is the most common mechanism of inferior gluteal pain like Jake?
- What is the most common site of hamstring injury?
- Tendinosis or Tendinopathy?
- Why has Jake's symptoms become chronic?
- What should your treatment focus on?

Mechanism of Injury

- High tensile loads
- Breakdown in the muscle to absorb forces

Site of Injury



Tendinosis

• Pathological changes in the tendons

Tendonopathy

Must have clinical symptoms



How did it become chronic?

- Physiological---activation of nociceptors
- Pathophysiological---pain associated with functional changes in the CNS. "Centralization"

Focus of Treatment?

- Restoring load bearing capabilities to the muscle
- Afferentation to the sensory homunculus
- Stress reduction

The Treatment

- Spinal Manipulation
- ARPneuro Therapy
- RockTape
- NormaTec
- BrainTap



- Centralization
- Peripheralization
- Autonomic Nervous System

THE NEURO WAY TO PRACTICE

Isaac's Story

Kendra's Story

Kendra's Story

Kendra is a 16-year-old who continues to experience right knee pain and a feeling of instability for several months.

She had ACL reconstruction surgery over a year ago and went through rehabilitation with no issues.

She presents today with medial aspect knee stiffness and soreness and a feeling of instability

Kendra's Story

The symptoms of stiffness and soreness come on with walking especially at school when going up and down stairs. She also cannot participate in PE class and must sit out all running and jumping activities.

Applying ice and resting when she gets home brings on only temporary relief.

She is becoming more withdrawn from her friends and family, with bouts of depression

Examination Findings

- She ambulated with a slower than usual gait, clearly guarding the right knee.
- Range of motion testing revealed restrictions on flexion and extension
- Orthopedic testing were all negative
- There was tenderness to palpation in rectus femoris and vastus medialis with both eliciting "hot spots" on muscle scanning
- Overhead squatting and reverse lunge movements were severely restricted on the right.

Two Orthopedic Surgeon Visits

Knee is stable

Don't know why she is experiencing symptoms

What is the dominant pain mechanism?

Nociceptive

Peripheral Neuropathic

Central Pain
Causation for her symptoms

- Lack of afferentation to the Parietal Lobe
- Her brain has not recalibrated what is happening with the knee since the surgeries
- Mechanoreceptors not firing
- Muscle spindles not firing
- A breakdown of neurological communication with the muscles due to inflammation and scar tissue



The Treatment

- Instrumented assisted adjusting to the right knee joint (98943)
- 2-different types of electrical muscle stimulation therapies (97014)
- Active rehabilitation with ARPneuro therapy (97110 & 97112)
- NormaTec & BrainTap Sessions
- PRS home therapy

Autonomic Nervous System

Functions of ANS	
Sympathetic	Parasympathetic
► Heart	▶ Heart
► ↑ heart rate	► ↓ heart rate
• \uparrow force of contraction	▶ ↓ force of contraction
 Blood vessels 	 Blood vessels
► Constriction	▶ No effect
▶ Lungs	► Lungs
 Bronchodilation 	 Bronchoconstriction
► GIT	► GIT
▶ ↓ motility	▶ ↑ motility
 Sphincter contraction 	 Sphincter relaxation
 Decreased secretions 	Increased secretions This Photo by Unknown Author is licensed under CCRV.SA

Sympathetic



Parasympathetic



Patients





Parasympathetic dominant

Spinal Areas

Sympathetics---T1 to L1 or L2

Parasympathetics---Cranial Nerves and S2-S4





Break Time

Don's Story

Donald's Story

Don is a 62-year-old who works in the construction industry. This requires him to be constantly working above his head and lifting objects. Every winter he is laid off until the spring. Recently the lay off began and he presents with what he describes as a persistent pain in his right shoulder. It has been present for years, but recently it has become worse to the point that the past few weeks of work have been extremely difficult.

Current History

He points to the top of his right shoulder as the site of the pain. He describes a sharp pain with raising his arm above his head and with lifting objects from his chest to above his head. He applies ice at the end of the work shift, which allows him to sleep at night.

He did go to a walk-in clinic in the town they were working in a few months' past. X-rays were taken and he was diagnosed with arthritis and bursitis in the right shoulder. He was given a steroid injection on the same visit.

Pain Continued

He stated he was pain free for about a week and the pain returned. He was then seen by an Orthopedic specialist who ordered an MRI.

The MRI revealed a small partial tear in the right supraspinatus, with thickening of the subacromial bursa. Degenerative changes were also noted in the A/C joint.

Diagnosis of Impingement of Shoulder

The Orthopedic surgeon recommended surgery and for Donald to seriously think of retiring.

Donald loves what he does, and retirement was out of the question. Since he has been laid off, the shoulder pain has become worse with all movements, which is puzzling to him.





What is the Pain Mechanism?

- Nociceptors
- Peripheral Neuropathy
- Centralization

Free Nerve Endings





Free Nerve Endings

Nociceptors Cell Bodies Live Where?



Let's Talk Neurology



3-Types

- Mechanical
- Thermal
- Polymodal (Chemical & Mechanical)







Treating The Homunculus





How to Manage?

Reframe—Remap—Re-learn Not Degenerated, just Deconditioned

Our Treatment

- ARPwave neurostimulation to the right shoulder
- Extremity Adjustments
- NormaTec Compression (Shoulders)
- RockTape

Treatment Outcome

- 6 Visits Pain Free
- Range of Motion Normal
- Muscle Strength Normal
- Able to return to work

Isaac's Story

- Fractured left clavicle in October 2022
- Home Therapy PRS unit
- Over the next few months, we put 12 pounds of muscle
































 Heidi ai Scribe
Examination
Orestration Time
StretchN Brief Routine
ARP Treatment



Look At The Person

Through the lens of their nervous system

If they are in your office, other treatment measures have failed

You must talk, examine, and treat differently



Be The Safest

Develop a treatment coalition with the patient, but keep in mind:

- Words Matter
- Your Attitude Matters
- Your Caring Touch Matters
- > Your use of therapies matters

Multi Modal Approach

- Teach
- Touch
- Treat
- Move



Questions?

STO



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