### Modern Advancements in **Outpatient Physical Therapy** 34th Annual Magic City Sports Medicine Conference

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### About me:

- Regional Vice President with
  - Work with 112 clinics across 25 states
  - Partnered with
- Physical Therapist 13+ years
  - DPT @ University of Evansville IN
  - 6 years clinic director (outpatient/HH) in Chicago and Cincinnati

**ORTHO MONTAN** 

- 2 years independent practice owner of 2 clinics
- 4 years Regional VP
- Outdoor enthusiast
- Wife and Dog Mom in Louisville, KY
- Pregnant with twins!



2 + years



### Learning Objectives

#### •Emerging Treatment Modalities

- Laser Class IV
- •Pulsed Direct Current Electric Stimulation
- Innovation in Objective Analysis Tools
- •Fixed frame Dynamometers
- •Hand-Held Dynamometers
- •Force Decks
- •RTM remote therapeutic monitoring
- •Al and it's implication and impact on Physical Therapy

### Conflicts of interest - none

PRS, OM, nor myself receive any financial compensation or business incentives associated with information in these slides

### What is it? (6,7,8,9,11, 12,13)

#### •Light Therapy using process called Photobiomodulation

- 1. Targets cytochrome C complex in inner membrane of mitochondria
- 2. Absorbed light in mitochondria leads to increased production of ATP, free nitric oxide, reactive oxygen species stimulation of inflammatory process and cell proliferation resulting in :
  - A. Analgesic effect (Increase in dopamine, beta-endorphins, nitric oxide)
  - B. Decreased inflammation (decrease in bradykinin, prostaglandins)
  - C. Decreased pain perception (Afferent conduction rate of C and A-delta fibers slowed)
- D. Tissue healing (increased fibroblastic, osteoblastic, & tenocyte activity)
  - Promotes lay down of new collagen
  - Faster healing defends against chronic dysfunction
  - Microcirculation and neovascularizaton both increase

#### •Two different Types: Class 3b and Class 4

- 1. Main difference = power output
- A. Class 3b max power of 0.5 watts
- B. Class 4 power of 0.5 25 watts
  - •Higher wattage allows greater therapeutic depth of treatment and shorter delivery time as it covers wider area



### How does it work? (9,10)

- •Power = Energy/time
- 1. Power: 1 watt = 1 joule/second
- 2. Energy: 1 joule = 1 watt x 1 second

Dosage equation

- 1. Dosage =  $J/cm^2$
- 2. Joules = watts x seconds
- 3.  $Cm^2 = area treated$
- 4. Rule of thumb: area of DVD or open palm is 100cm<sup>2</sup>
- Example (Treating triceps)
- 1. Tricep area =  $3 \text{ CDs} (3 \times 100 = \text{cm}^2)$
- 2. Desired dosage: 10 J/cm^2
- 3. Joules calculation (dose x area): 10 J/cm<sup>2</sup> x 300 cm<sup>2</sup>
- 4. Total Joules needed = 3000 J
- 5. At 10 W would take 5 minutes to deliver treatment



### Indications (10) (6)

- Treats acute and chronic conditions
- Non-invasive pain control which can reduce needs for NSAIDs and opiates
- Increase microcirculation
- Anti-Inflammation
- Accelerated Tissue Repair and Cell Growth
- Improved vascularity
- Improved nerve function/healing
- Analgesic effect/Trigger points and acupuncture points
- Adjunct to traditional treatment with potential to enable treatment sessions to be progressed faster/ 2° pain reduction.

#### Current CPT codes for Laser (97039, 97032)

- •Not currently reimbursed by any insurances (select work comp negotiations)
- Typically performed as additional cash pay service
  - •Offer packages with 1 visit, 3, 6, 10 visits
  - •Cumulative effect: Average # sessions needed 4-6.

#### Common Conditions that MAY Benefit from Laser Therapy





### Contraindications (6-13)



### What does the Research say? (14-22)

#### **APTA - Clinical Practice Guidelines**

- •Acute ankle swelling initial phase of lateral ankle sprain 2021
- •Acute cervical nerve pain 2017
- •Chronic neck pain (OA) 2017
- •Heel pain/plantar fasciitis (2014)

#### **American College of Physicians - Clinical Practice Guidelines**

•Conservative care for chronic, non-radicular low back pain (2017)

#### Physiotherapy Evidence Database (PEDro) - Systematic Reviews

- •Carpal tunnel (high power, high dose) 2020
- •Plantar fasciitis 2018
- •Lymphedema (post breast cancer) reduction in arm circumference and volume, improvements in shoulder mobility and pain (2022)

#### **Cochrane Systematic Reviews**

- Frozen Shoulder pain reduction 15-23% further reduction in pain scores (2014)
- Rot Cuff Disease (2016) short term benefits managing pain



### What is it? (24-26)

	<b>Direct Pulsed Current</b>	Direct Galvanic Current	Alternating Current
<b>Direction of flow</b>	One direction	One Direction	Alternative (reversing)
Waveform	Constant (straight line)	Constant (straight line)	Sinusoidal (wave-like)
Frequency	High (above 100 Hz)	Low to Medium 20-100Hz	Low to Medium 20-100Hz
Type of Contraction	Eccentric	Concentric	Concentric
<b>Common</b> <b>applications</b>	biofeedback neuromuscular retraining, tissue healing	Pain relief, tissue healing, into	Pain relief, muscle strengthening
Tolerance	Lower, can cause tissue changes	Higher, less tissue stress	Higher, less tissue stress

How does it work? (24-26)

- Allows muscles to move through electrical signal via eccentric contractions
- Breaks down neurological barriers (guarding, spasticity) to reduce tone
- •Re-educates the muscle and nerves via sensory stimulation to the brain
- Longer lasting effect than traditional AC stim treatments
- Process always paired with active functional movements

### **Alternating Current (AC) Vs Direct Current (DC)**

#### Alternating Current (AC)

Current reverses direction in equal intervals of time

#### Direct Current (DC)

Current flows only in one direction



**Positive Polarity** 



**Negative Polarity** 



Polarity remains same







### Indications/Contraindications (24-26)

#### Indications

- Prevention of muscle atrophy
- •Relaxation of muscle spasms
- •Enhanced range of motion
- Immediate post-surgical stimulation
- Muscle re-education

#### **Considerations**

• Obesity

#### **Contraindications**

- Pregnancy
- •Pacemakers and implanted medical devices
- Severe cardiac conditions
- Active cancer



### What does the research say? (27-30)

#### Case Studies (2023, 2024)

- Decreased spasticity, improved ROM in shoulder and hip, reduction of pain with 1 ALS patient (2024)

#### Randomized Control Trial (2024): Diabetic Peripheral Neuropathy - 150 participants

pain via visual analog scale and nerve conduction velocity compared to patients receiving traditional TENS.

#### Systematic Review (2023): Stroke

- Focused on RCTS 2019-2023, with 7 studies included
- quality of life. No changes in grip strength or functional movements assessment UE scale.
- •All interventions were accompanied by exercise-based intervention

#### Further larger sample sizes needed to determine efficacy

•Reduction of hypertonicity, improvements in dorsiflexion strength, gait speed patients with 7 progressive MS patients (2023)

• Statistically significant improvements in Toronto Clinical Neuropathy Score for both feet, two-point discrimination of dominant foot,

•Benefits in post-stroke individuals in reducing pain, increasing range of motion by decreasing spasticity and motor function for

### **Objective Analysis Tools**

- Insurances base reimbursement on objective, functional improvements
- How do we objectively show progress?
- Better objective tools:
  - Hand held dynamometers strength and ROM 1.
  - Fixed-frame dynamometry 2.
  - Force Plates 3.



TIT

Handheld Dynamometers (HHDs) e.g., DynaMo









### Hand-Held Dynamometers (31)

- HHD have existed for over a century
- Used for isometric testing different body parts via "make" or "break" tests
  - 1. Make tests = most common, patient maximally contracts against HHD in stationary position
  - 2. Break tests = patient maximal contraction against HHD but therapist overpowers through range instead of holding in fixed position
- Limitations in assessor control and test position with traditional HHD resulting in poor intra and inter-reliability





### Hand Held Dynamometers

### Modern Advancements (31)

- Advancements in HHDs allow for improved reliability with fixed-point compression and tension tests removing requirement for therapist to resist movement.
  - 1. Compression tests used for pushing movements
  - 2. Tension tests used for pulling movements /high force tests (inline)
  - 3. Grip testing most common, highly reliable



Supine Plantar Flexion



Prone Y (ASH)



Seated Shoulder Extension



Prone Knee Flexion



Seated Knee Extension



Standing Shoulder External Rotation



Seated Hand Grip Squeeze (Elbow at 90°)



Standing Hand Grip Squeeze (Elbow at 90°)



Seated Pinch Grip Squeeze (Elbow at 90°)



### Fixed Frame Dynamometers (33)

- Similar to HHD but feature frames and mechanical features that tightly control the positioning and anchoring of sensors
  - 1. Largely removes "human factor" = more reliable results than HHD
  - 2. Not as portable as HHD
- Modern equivalent of isokinetic dynamometers
  - 1. Not only for labs and research
  - 2. New engineering and software allow ability to use in clinic settings
  - 3. Can be used for evaluation and biofeedback training





ISO 30° Hamstring assessment performed on NordBord

### Isometrics

Why so important? (34)

- Muscle Hypertrophy & Tendon Morphology
  - 70-75% MVC sustained 3-30 seconds per rep. Total contraction duration of >80 -150s per session for > 36 sessions.
  - 2. Performed in different joint angles and muscle lengths
- •Safe
  - 1. Self-limiting
  - 2. Can be used soon after surgery to reduce atrophy
- Reduce pain and muscle inhibition

### Force Plates (32)

- Force Plates have existed for 50 years
- Mainly used in laboratory settings for research
  - 1. Expensive
  - 2. Cumbersome setup
  - 3. Time consuming
  - 4. Data required skill to analyze

### ears for



### Force Plates

### Modern Advancements (32)

- Lightweight & Portable
- Affordable
- Quicker Testing capabilities
- Software that analyzes data for you via algorithms

Measures Force (F) and Time (t):

- Known acceleration of gravity (g), can use forward dynamics and Newton's laws to calculate other derivatives:
  - 1. Body mass (BM) = F/g
  - 2. Impulse (Ns) = F x t
  - 3. Acceleration (a) = (F-BW)./m
  - 4. Velocity (v) = v0 + a.t
  - 5. Power (W) = F.v
  - 6. Change in displacement (s) = v.t

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### Force Plates, how do they work? (32)

- Each plate contains 4 sensors (load cells) and solid flat surface force is applied to
- Load cells measure vertical GRF
  - 1. GRF = body weight (Newton's 3rd law)
  - 2. Measures GRF as patient moves
  - Measures changes in force over time (1,000 times per second)
- Can also calculate center of pressure
  - Asses balance or instability







### Force plates, and fixed dynamometry

### For ACL Return to sport testing (35, 36, 37)

•Isokinetic testing = gold standard for ACLR RTS testing

- 2024 research shows inline dynamometry (pulling) is a valid substitute
- Most common quad strength deficits post ACLR between 50-80 degrees 2. knee flexion
- Greater symmetry in quadriceps strength associated with reduced risk of 3. injury prior to RTS
- •Hamstring muscle fascicles commonly shortened post ACLR
  - 1. Nord Board can show eccentric knee flexor strength variances
- •Most common limb symmetry analysis for RTS = horizontal hop tests.. Yet, quad force production significantly greater in vertical jumping compared to horizontal jumping.
  - 1. Force plate testing particularly Countermovement jump (CMJ) and single leg jump (SLF) tests rapid eccentric and concentric actions and can analyze compensation strategies in knee kinetics during different phases (eccentric, concentric, flight phase, landing phase) as well as atypical landing mechanics.
  - 2. Inter limb compensations commonly develop



### Force Plates

### For chronic conditions (32)

- •Not just for athletes
- Help identify changes that may be insensitive to change with traditional testing

#### Example:

- 31yo Male severed peroneal nerve c R foot drop
- Reported "unsteadiness" on R foot
- B SLS 45 seconds
- Displayed significant asymmetry between limbs in AP CoP and Ellipses CoP
- Help design more targeted treatment plan
- Show medical necessity to insurance for continuation of therapy

Metric	Left	Right
No force plates Single Leg Stand <b>Duration</b>	<b>45</b> s	<b>45</b> s <sup>*</sup>
With ForceDecks Area of CoP Ellipse	<b>954</b> mm²	<b>2,488</b> mm²
With ForceDecks CoP Range Anterior-Posterior	<b>50</b> mm	<b>104</b> mm
With ForceDecks CoP Range Medial-Lateral	<b>31</b> mm	<b>32</b> mm
With ForceDecks Total <b>Excursion</b>	<b>903</b> mm	<b>1,619</b> mm



Total Excursion with Area of 95% CoP Ellipse.

\* Client felt 'less steady' on right





### How to implement in the clinic

- Can use with wide variety of patients
- More sensitive and accurate objective testing results
- Help justify medical necessity to insurance
- Can be billed for under physical performance test (97750)
  - 1. Can't be billed on same day as eval or re-eval
  - 2. Can be utilized during progress notes
  - 3. Timed code
  - 4. Requires separate report (other than EMR) to bill for this code A. Need vendor software that uploads into separate platform.

### **RTM - Remote Therapeutic Monitoring**

### What is it? (5)

- Not same as Telehealth
- CMS released 2022 final rule that it became billable for Rehab Therapists
- RTM VS RPM
  - services provided by physicians or healthcare providers.

1. RPM - remote patient monitoring: monitoring and transmission of physiologic data from a patient (HR, BP). Evaluation and management codes can be billed as "incident to" other

2. RTM monitors non-physiologic data (therapy adherence and response). General medicine codes must be conducted by billing practitioner, or under supervision (OTAs and PTAs)

### RTM codes (5)

Treatment	<b>CPT code</b>	Description	<b>Billing frequency</b>	MT 2025 Reimburseme amount
Initial Setup and Patient Education	98975	RTM (respiratory system status, musculoskeletal system status, therapy adherence, therapy response); initial set-up and patient education on use of equipment	Billed once during the episode	\$19.72
Supply of Device for Monitoring Musculoskeletal System	98977	RTM; device supply with scheduled (daily) recording(s) and/or programmed alert(s) transmission to monitor musculoskeletal system, each 30 days. Must meet FDA standards: 1: recognized in the official national formulary, or the United States Pharmacopoeia, o any supplement to them" 2: intended to diagnose or help cure, mitigate, treat, or prevent disease or other conditions 3: intended to affect the body without (or nearly without) chemical action 4: not reliant on metabolization	Can be billed every 30 days	\$43.01
Monitoring/Treatment Management Services, First 20 minutes	98980	RTM treatment management services, physician/other qualified healthcare professional time in a calendar month requiring at least one interactive communication with the patient/caregiver during the calendar month; first 20 minutes	Can be billed every calendar month	\$50.11
Monitoring/Treatment Management Services, Each Additional 20 minutes	98981	RTM treatment management services, physician/other qualified healthcare professional time in a calendar month requiring at least one interactive communication with the patient/caregiver during the calendar month; each additional 20 minutes (list separately in addition to code for primary procedure)	Can be billed every calendar month	\$39.11



### Pros vs cons of RTM

#### Pros

- More insurance carriers reimbursing (Aetna, Cigna, UHC, State Farm, Humana, Mutual of Omaha, and Medicaid in 42 states as of Jan 2025)
- Reach inaccessible/immobile patients
- Fill in cancellations
- Improved therapy adherence
- Additional revenue stream (additional \$160 per patient)

#### Cons

- Reimbursement has historically decreased Y/Y globally per code since implementation in 2022
- Coverage and reimbursement rates vary depending on insurance contracts, tiers, plans and state regulations
- ROI questionable, not always "extra revenue" once factor in costs to deliver the service
- Patient struggles with technology
- Schedule management further administrative burden

### Al in Physical Therapy

#### **Key Features and Benefits**

- Automated documentation

  - 2. Increased documentation compliance and quality
  - Data-driven insights helping with personalized treatment plans and patient progress 3.
  - Decreased clinician burnout 4.

- Machine Learning and ability to continuously adapt to insurance and regulation changes



transcribe sessions and generate SOAP notes real time freeing up Therapists' time for patient care

• Patient engagement - communication tools can improve patient engagement and adherence to treatment plans

• Streamlined workflows - automation of scheduling, billing, insurance verification, improving overall practice efficiency

### Al in Physical Therapy

#### Limitations

- Documentation tools still developing and not perfect
  - Potential computer/microphone/wifi issues resulting in discussions not being picked up
  - Al recommendations overly generic or incorrect for certain patient scenarios 2.
- Patient engagement
  - 1. Some patients mistrusting of Al
  - Potential HIPPA issues depending on AI software development parameters 2.
  - 3. patient populations
- Streamlined workflows
  - Scheduling and billing still largely require human involvement for accuracy and various nuanced situations 4.



Patient struggles with technology in regards to different tele-communication platforms, in-person communication still superior for some

5. Insurance verifications are becoming more automated, but online insurance systems not updated enough yet to truly automate

## Current AI platforms in therapy setting

- ScribelQ Raintree Systems
- Prediction Health WebPT
- HENO
- Stride
- Prompt EMR
- Empower EMR
- SPRY PT
- PtEverywhere







### **ScribeIQ**<sup>™</sup>







# SDRY



### Dark side of Al (2,3)

- Class action lawsuits on court dockets:

#### Cigna summer 2023

involvement.

#### **UHC November 2023**

off claims and/or patients paying bills out of pocket or forgoing necessary treatment

#### Humana December 2023

<u>CMS Estimates that providers nationwide spending \$7.2 billion in administrative costs each year</u>

• Insurances began using AI in 2020 to assist with Utilization Management (UM) with goal of expediting responses with staffing shortages

• Developed algorithm tool "PXDX" allegedly allows MDs to automatically reject claims on medical grounds without ever opening patient files. 300,000 requests for payments denied using this method. On average MDs spent 1.2 seconds "reviewing" each request. MDs signed off on denials in batches. Cigna did not disclose that claims were being reviewed by PXDX algorithm without any real Doctor

• AI model "nH Predict" prematurely stopped covering care without considering an individual patient's needs. Alleged nH predict has 90% error rate (meaning 9/10 denials are reversed upon appeal) only 0.2% of patients appeal their denied claims leading to companies writing

• Alleged breach of contract, breach of implied covenant of good faith and fair dealing, unjust enrichment, and insurance bad faith



### Advocacy efforts (1)

"The speed of technological advances in AI is far outpacing the changes in state and federal health insurance regulation and oversight needed to protect consumers."

- National Association of Insurance Commissioners statement November 2024

- requires physicians to have final say in determining medical necessity.
- interacting with AI and not a human.

1. <u>California</u> 10123.135 Sep 2024: State insurance code requires AI tools be open to audit by State department of health and make overage decisions based on enrollee's medical history and clinical circumstances, not solely on group dataset on which the tool is trained. Also

2. <u>Colorado</u> SB 169 July 2021: holds insurers accountable for testing their data systems to ensure systems do not go unchecked and perpetuate discrimination against protected classes

3. <u>Utah</u> SB 0149 March 2024: Created state office of AI policy. Disclosure requirements that compel businesses that use AI tools to clearly disclose to the consumer that they are

### AI - ARE WE DOOMED? (4)

- Is AI replacing Therapists? NO
- How can we fight back against insurance misuse of AI?
  - Concise and defensible documentation
  - 2. Appeal Denials, don't just accept them
    - A. Help patient's appeal denials. Resource: ProPublica (4) https://projects.propublica.org/claimfile/form/

  - 4. Encouraging self-pay when more appropriate
  - 5. Advocate Professional and State Level



3. Educate patient's on their insurance benefits and how to navigate the insurance system

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# Thank you!

# Questions?