1

Dara Weger, M.S., CCC-SLP
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IM360

IM Instructor since 2007

- Undergraduate & Masters degree from the University of Central Arkansas & a Certificate of Clinical Competence issued by the American Speech-Language-Hearing Association
- Employed at Novant Health Rehabilitation Hospital, an affiliate of Encompass Health
- Serves as the National Program Champion for Interactive Metronome within Encompass Health Corporation, previously HealthSouth Rehabilitation
- Contributed to the development of the IMC Virtual Certification Course for Encompass Health, Adult Best Practice Certification Course, Fall Prevention Protocol and numerous adult-oriented webinars.
- Extensive expertise & experience in the field of neurological disorders, with IM and other modalities, successfully integrating it into practice by modifying it to individually meet patient's needs.

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Live Course Agenda

*Today's course agenda (8.5 total hours *1.5 hours for breaks= 8 contact hours):*

Start Time	End Time	Total Time	Description
07:15 am EST	*07:45 am EST*	*30 minutes*	*Registration & Continental Breakfast*
07:45 am EST	10:30 am EST	2 hours, 45 minutes	Introduction, Research, Case Discussion and Q & A
10:30 am EST	*10:45 am EST*	*15 minutes*	*Break*
10:45 am EST	11:15 am EST	30 minutes	Introduction to IM: Hardware/Software Features
11:15 am EST	01:15 pm EST	2 hours	IM Assessment, IM Training Phase 1 Instruction and Labs
01:15 pm EST	*02:15 pm EST*	*1 hour*	*Lunch Break*
02:15 pm EST	03:15 pm EST	1 hour	IM Training Phase 2 Instruction and Labs
03:15 pm EST	04:00 pm EST	45 minutes	IM Training Phase 3 Instruction and Labs
04:00 pm EST	*04:15 pm EST*	*15 minutes*	*Break*
04:15 pm EST	04:45 pm EST	30 minutes	IM Training Phase 4 Instruction and Labs
04:45 pm EST	05:15 pm EST	30 minutes	Closing Thoughts and Post-Test
Total Live Course Time		9.5 hours	*Includes 1.5 hours for breaks
Total Course CEUs		8 Contact Hours	

Today you are with me (YAY) a total of 9.5 hours, which includes an hour and 30 minutes of break time.

Your course CEUs will be 8.0 Contact Hours.

THANK YOU for investing your time to learn about IM! We are confident that we can help your clients achieve the outcomes your clinic excels to achieve.

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Interactive Metronome

- Used by medical, rehab, educational & sports professionals in over 50 countries around the globe
- Used in 90+ Encompass Health Facilities
  - Under the current contract, all new EH hospitals will add IM.
- Evidence-based, objective biometric assessment & treatment tool
- Improves neural timing, rhythm & brain network synchronization
- Actively engages patient in the process of rehabilitation
- Flexible settings and clinical utility to meet individual needs & provide the just-right challenge
- Implemented in clinic, at home or combination

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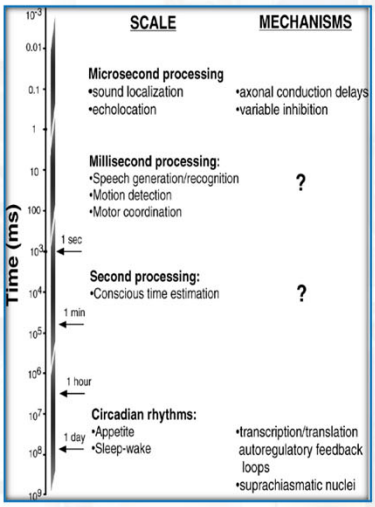
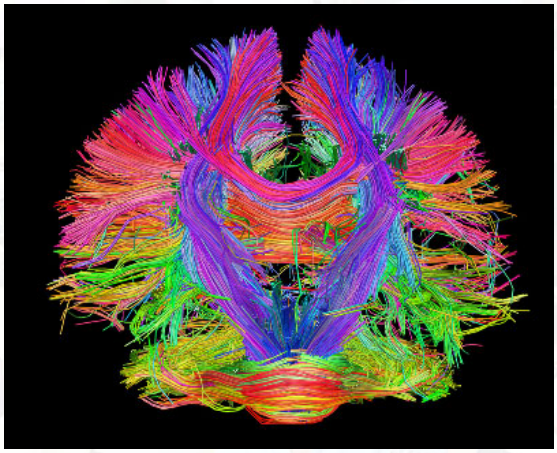
Timing in the Brain





Neural network synchronization …

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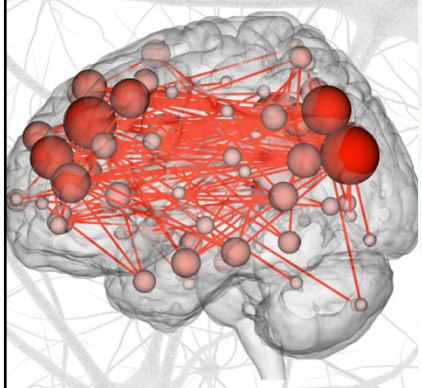
Power of Millisecond Feedback



Through intense repetition & millisecond feedback, IM synchronizes neural networks vital for…

- Auditory processing
- Expressive/receptive language
- Reading comp/fluency/rate
- Fine/gross motor coordination & balance
- Processing speed
- Attentional control
- Working memory
- Executive functions

Increased synchronization → → → Increased efficiency and speed of communication along white matter tracts → → → Improvement in cognitive, sensory & motor skills

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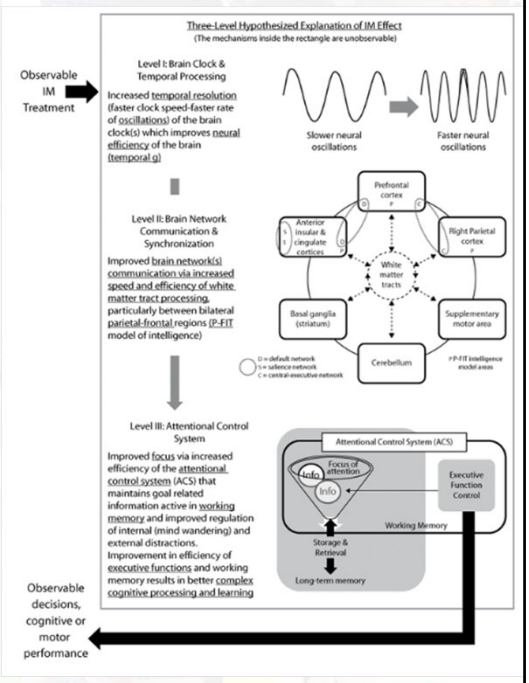
Research Supports "The IM Effect" Principle:

1. IM increases the speed & synchronization of neural oscillations … improving neural efficiency
2. IM increases the speed & efficiency of white matter tract processing resulting in increased brain network communication … particularly between parietal & frontal regions
3. IM increases the efficiency of the attentional control system, working memory & executive functions for better focus, more complex cognitive processing & learning.



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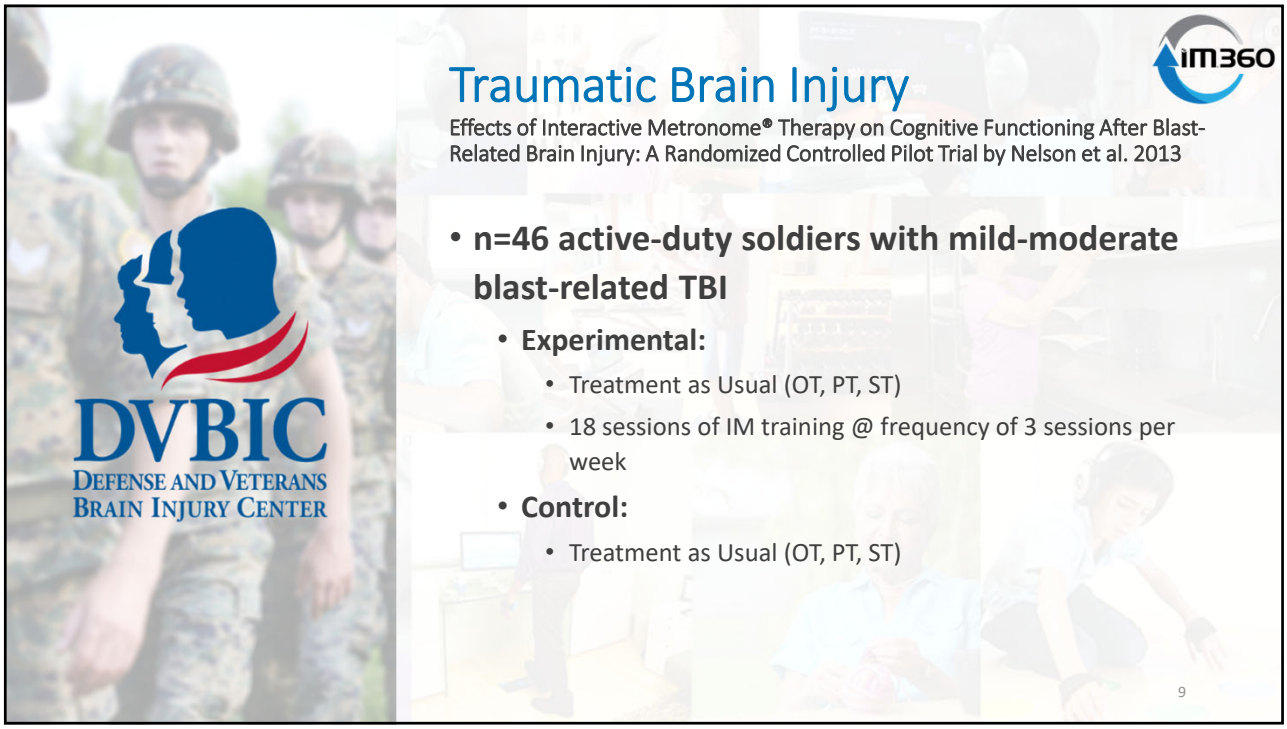

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DVBIC
DEFENSE AND VETERANS BRAIN INJURY CENTER

TRAUMATIC BRAIN INJURY
PUBLISHED RESULTS

ASSESSMENT	SKILLS MEASURED	OUTCOME
DKEFS: Color Word Interference	Attention, response inhibition	Cohen's d= .804 LARGE p=.0001
RBANS Attention Index	Auditory attention, auditory memory & processing speed	Cohen's d= .511 LARGE p=.004
RBANS Immediate Memory Index	Auditory attention, auditory memory & processing speed	Cohen's d= .768 LARGE p=.0001
RBANS Language Index	Confrontation naming, verbal fluency, & processing speed	Cohen's d= .349 MED p=.0001
WAIS-IV Symbol Search	Processing speed, short-term visual memory, visual-motor coordination, cognitive flexibility, visual discrimination, speed of mental operations, & psychomotor speed	Cohen's d= 0.478 MED p=.0001
WAIS-IV Coding	Visual attention, processing speed, short-term visual memory, visual perception, visual scanning, visual – motor coordination, working memory, & encoding	Cohen's d= ..630 LARGE p=.0001
WAIS-IV Digits Sequencing	Auditory attention, working memory, cognitive flexibility, rote memory & learning,	Cohen's d= .588 LARGE p=.021
DKEFS Trails: Motor Speed	Motor speed, executive functions	Cohen's d= .790 LARGE p=.015
DKEFS Trails: Letter Sequencing	Processing speed, working memory, and executive functions	Cohen's d= .626 LARGE p=.0001

IM group demonstrated substantial improvement on 21 of 26 neuropsychological measures

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Traumatic Brain Injury

Effects of Interactive Metronome Therapy on Cognitive Functioning After Blast-Related Brain Injury: A Randomized Controlled Pilot Trial by Nelson et al. 2013

EEG findings…

- IM group showed re-myelination and reestablishment of critical white matter tracts and neural synchronization of bilateral prefrontal & parietal cortices
- Control group demonstrated further decline

IM training substantially improved…

- Auditory and visual attention
- Processing speed
- Working memory
- Response inhibition
- Executive functions

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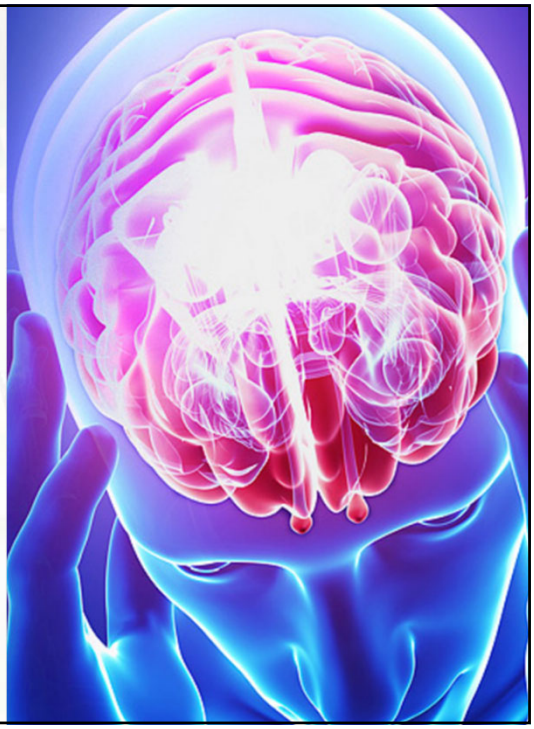
Traumatic Brain Injury

Effects of Interactive Metronome® Therapy on Cognitive Functioning After Blast-Related Brain Injury: A Randomized Controlled Pilot Trial by Nelson et al. 2013

"The addition of IM therapy to SRC [standard rehab care] appears to have a positive effect on neuropsychological outcomes for soldiers who have sustained mild-to-moderate TBI and have persistent cognitive complaints after the period for expected recovery has passed."

Lonnie Nelson, PhD



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Hemiplegia

Computer-Based Rhythm and Timing Training in Severe, Stroke-Induced Arm Hemiparesis by Beckelhimer et al. 2011

- **n = 2 (68 & 75 yrs)**
  - 68-year-old male:
    23 years post ischemic stroke with R hemiplegia
  - 77-year-old male:
    2 years post ischemic stroke with L hemiplegia
  - Both with minimal active movement of affected arm/hand prior to study

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Hemiplegia

Computer-Based Rhythm and Timing Training in Severe, Stroke-Induced Arm Hemiparesis by Beckelhimer et al. 2011

Intervention:

- 30 min of IM training
- 25 min of traditional OT targeting practice of meaningful functional movement based upon patient goal-selection

Results:

- ↑ ability to grasp, pronate, and supinate arm & hand
- ↑ ability to perform ADLs
- ↑ self-efficacy
- ↑ self-report of quality of life

"IM does not require active, distal movement to be effective (most other technologies do)."

"IM training is easily incorporated into traditional treatment where patients can practice functional movement."

Quotes by lead researcher,

Sarah C. Beckelhimer

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Upper Extremity Function

Effects of Interactive Metronome training on upper extremity function, ADL and QOL in stroke patients Ga-Hui Yu et al. 2017

- **n=30 adults, 6 months post-CVA**
  - **EXPERIMENTAL:**
    - **n=15**
    - **IM training for 15 weeks**
  - **CONTROL:**
    - **n=15**
    - **Completed bilateral arm exercises independently for same time period**
- **IM group demonstrated greater improvement in:**
  - **Finger control**
  - **Self-care ADLs**
    - **feeding, toileting, dressing & transfers**
    - **most notable change in dressing**
- **Overall motor function**
- **Quality of life**

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Parkinson's Disease

Computer-Based Motor Training Activities Improve Function in Parkinson's Disease: a Pilot Study by Togasaki

Parkinson's Institute and Clinical Center

"In this controlled study computer directed rhythmic movement training was found to improve the motor signs of parkinsonism."

n=36 individuals with mild-moderate Parkinson's

- **Control Group:** rhythmic movement and clapping to music, metronome, or playing videogames
- **Experimental:** Interactive Metronome training x 20 hours (rhythmic movement + feedback for timing)

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Balance & Gait

The only true way to practice walking is to walk…

The smooth transition between phases of the gait cycle is an integrated activity that is difficult to learn through practice of individual parts.

- **Goals for gait training with IM in-motion trigger:**
  - improve biomechanics
  - alter gait speed
  - increase stride length…

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Healthy Aging Fall Risk

Effects of the Interactive Metronome on Memory Process and Balance with Aging Adult 60+ Population by Leonard G. Trujillo 2015

- **n= 9 healthy aging adults age 60 – 80 years**
- **IM training**
  - 12 IM sessions over 8 weeks*
  - 6-week break
  - 6 IM sessions over 4 weeks*

  *max 275 reps per session, upper extremity exercises only while seated
- **Cognitive & balance tests administered:**
  - Pre-intervention
  - After initial 12 sessions
  - After 6-week break
  - At conclusion of study

EAST CAROLINA UNIVERSITY

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Healthy Aging Fall Risk

Effects of the Interactive Metronome on Memory Process and Balance with Aging Adult 60+ Population by Leonard G. Trujillo 2015

Assessment	Overall Improvement
Modified IM Long Form Assessment	77%
Short Form Test	31%
Math Fluency (WJII)	23%
Reading Fluency (WJII)	12%
Decision Speed (WJII)	5%
Visual Matching (WJII)	4%
The d2 Test of Attention	16%
Four Step Square Test	88% *
The 9 Hole Peg Test	3%

Most notable effect on Four Step Square Test despite ONLY UPPER EXTREMITY EXERCISES, indicating improved…

- Balance
- Motor speed
- Decreased fear of falling

Results of Math Fluency, Reading Fluency & d2 Test of Attention indicate increased …

- Attention
- Cognitive speed

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Fall Risk Reduction

Interactive Metronome addresses fall risk reduction by improving:

- Attention in distractions
- Executive functions, including impulse control
- Cognitive & motor speed
- Motor control & coordination
- Weight-shifting, balance & dynamic gait

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Ongoing Research

www.interactivemetronome.com

HARVARD MEDICAL SCHOOL

NORTHWESTERN UNIVERSITY

WASHINGTON STATE UNIVERSITY

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Julie: Severe Concussion

IM360

VIDEO

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Diana: TBI

- 23 yr old college senior majoring in business admin
- Olympic level synchronized swimmer & coach
- Severe TBI: Fell from golf cart at fundraiser for friend who survived plane crash

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Life After TBI …

Diana was unable to return to college and struggled with…

- Attention & concentration
- Cognitive speed
- Cognitive fatigue
- Significant sensory overload (Easily overwhelmed with noise, lights, visual stimuli…)
- Memory
- Language (expressive & receptive aphasia)
- Executive functions
  - Impulsive
  - Disinhibited
  - Socially inappropriate
  - Problem-solving
  - Organization
  - Time management
  - Etc…..
- Balance

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Recovery of Function

It took 24 sessions of IM, 45 min each, over a period of 2 months for Diana to regain cognitive & motor skills, successfully returning to…

- College part-time with goal of transitioning to full time
- Social life
- Synchronized swimming
- Coaching
- Driving

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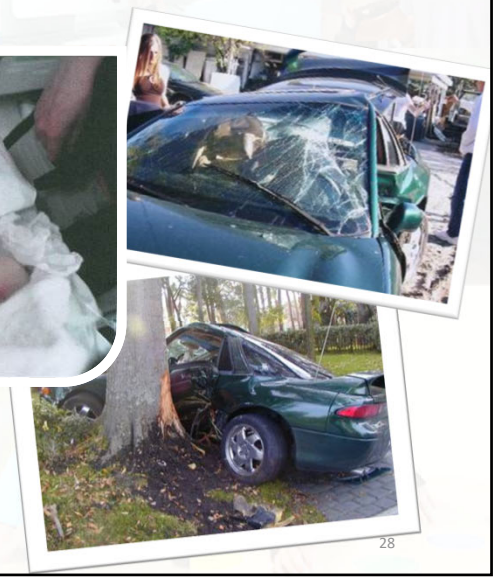
Kelly: Severe TBI

- Severe TBI
- Moderate Impairments:
  - Cognitive speed
  - Attention
  - Perseveration
  - Executive functions
  - Memory
  - Language processing
  - Visual processing



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Kelly Recovers

Kelly Buggle, TBI Patient

- Few ST sessions for strategy-training early on in recovery
- 18 sessions of IM
- Completed HS diploma
- Off to college
- Driving
- Straight-A student

VIDEO

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John: CVA

- **47 yr old father of 4 teenagers & primary source of family income suffered a right hemisphere stroke**
- **Very anxious to return to independence & work**
- **Impairments in…**
  - Self-care
  - Activities of daily living
  - Balance
  - Mobility
  - Left upper extremity function (significant tremor & spasticity)
  - Cognitive abilities

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Return to Independence

As John's timing improved with each IM session, so did his cognitive & motor skills. After 19 sessions, he…

- regained independence with self-care, activities of daily living and management of medications & checkbook
- demonstrated significant improvement in balance & coordination to vacuum, grocery shop etc.
- successfully passed a driver's evaluation & resumed driving
- returned to work full time and his normal routine

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Stroke: Terry

VIDEO

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Richard: Parkinson's

- 81 yr old ALF resident
- Fallen 5 times over the past year
- complains of difficulty initiating mobility with impact on transfers, walking, ADLs, & leisure activities like bowling and golf.
- Indep w extra time: supine-to-sit
- SB assist w cues for safety & weight shift: sit-to-stand
- Ambulates 400 feet with short, shuffling steps – lacks heel strike on L foot – unable to clear obstacles
- Requires assistive device for safety but refuses use

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Richard: Parkinson's

TREATMENT:

- 12 IM sessions (700-800 reps each) using In Motion Trigger

RESULTS:

- Fewer freezing episodes
- Returned to bowling, golfing, & group exercise classes
- Ambulates on all surfaces with modified independence
- No assistive device

VIDEO

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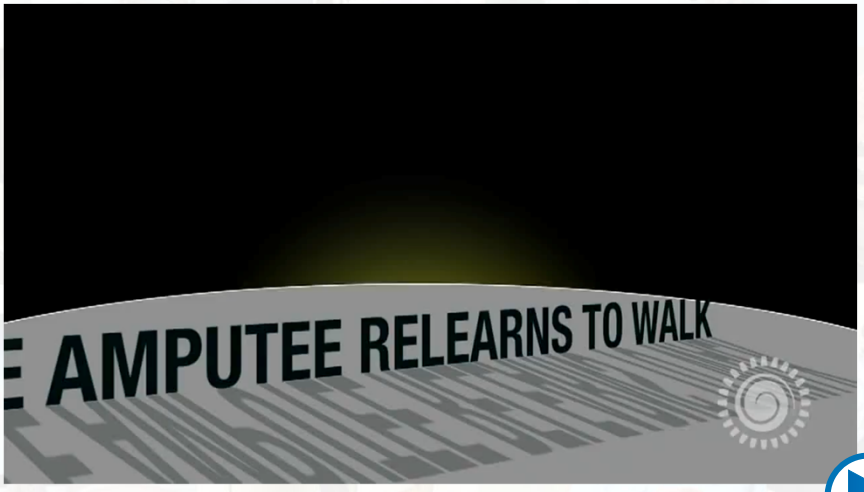
Amputee: Fredrick



VIDEO

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IM Demo

VIDEO

Encompass Health Videos

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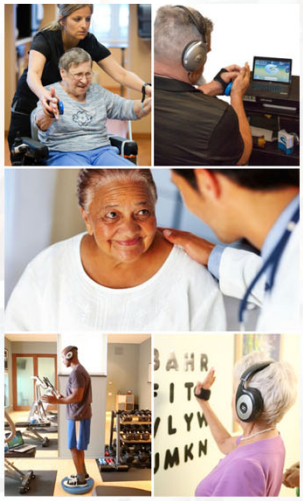
Who Benefits from IM?



- Stroke & Other Neurological Impairments
- Concussion
- Traumatic Brain Injury
- ADHD
- Craniotomy (brain aneurysm, tumor…)
- Chemo Brain
- Prosthetic Limb
- Multiple Sclerosis
- Parkinson's
- General Debilitation
- Fall Risk Reduction
- Healthy Aging
- Sports Performance/ Enhancement
- Executive Function Disorder
- Auditory Processing Disorder

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Seizure Precautions

There are no documented cases of IM contributing to seizures in epileptics, but it is possible if seizures are not medically controlled.

Stress, fatigue, & stimuli that are auditory, visual, vestibular, &/or rhythmical can elicit seizures in individuals with epilepsy.

Avoid known triggers if using IM with an individual who has epilepsy and proceed only with physician's approval.

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Implanted Pacemaker & Defibrillator Precautions

When worn on the head, **headphones do not pose a health risk** to individuals with implanted pacemakers & defibrillators. All headphones (wired and wireless) contain a magnetic substance called neodymium for the purpose of sound reproduction which may cause electromagnetic interference with these implanted devices **if the headphones are placed within 3 centimeters of the surface of the chest**. Keeping the headphones at least 3 centimeters away from the surface of chest is considered safe, at which point experts say there is *no longer any electromagnetic interference.*

Individuals with implanted pacemakers & defibrillators should avoid draping headphones around the neck to avoid direct contact with the chest.

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Let's Get Started

- Quiet space
- No distractions
- 'Do Not Disturb' sign
- Cell phone turned OFF
- Internet access
- Chair(s) without arm rests
- Speaker

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LAB 1: Set Up Equipment

Follow Along as Your Instructor Guides You…

1. Open IM software on desktop
2. Plug USB cord into computer and MCU
3. Plug headphones into MCU
4. Plug splitter into MCU
5. Plug button trigger into splitter
6. Plug tap mat into splitter
7. Start a NEW FILE

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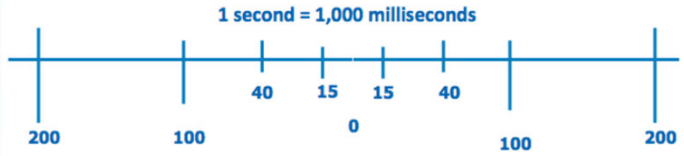
IM Auditory & Visuals

Cowbell

Lower millisecond scores are better!



0 - 15 ms Perfect
16 - 40 ms Above Average
41 - 100 ms Average

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Short Form: Task 1 Demo

IM Demo
Short Form Test (SFT): Task 1
Both Hands without Guide Sounds

Note: Visual Indicator is used for demonstration purposes of the IMC course. SFT should NOT be performed with the Visual Indicator on, unless patient is hearing-impaired.

VIDEO

Visit our YouTube Channel for More Best Practice Videos: **YouTube.com/IMetronome**

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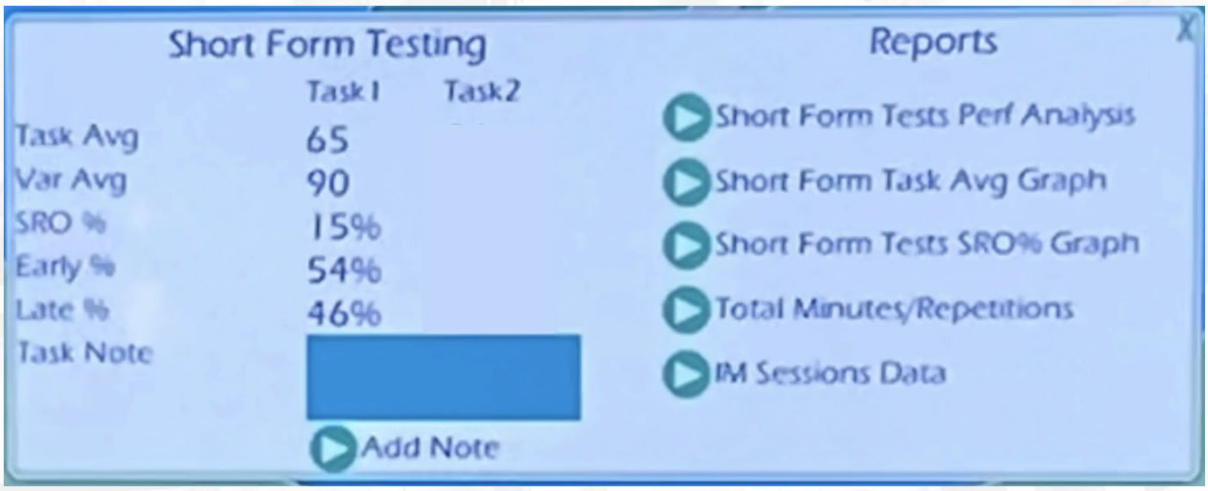
Short Form 1 Results View



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Short Form Task 2: Demo

IM Demo
Short Form Test (SFT): Task 2
Both Hands with Guide Sounds

Note: Visual Indicator is used for demonstration purposes of the IMC course. SFT should NOT be performed with the Visual Indicator on, unless patient is hearing-impaired.

VIDEO

Visit our YouTube Channel for More Best Practice Videos: **YouTube.com/IMetronome**

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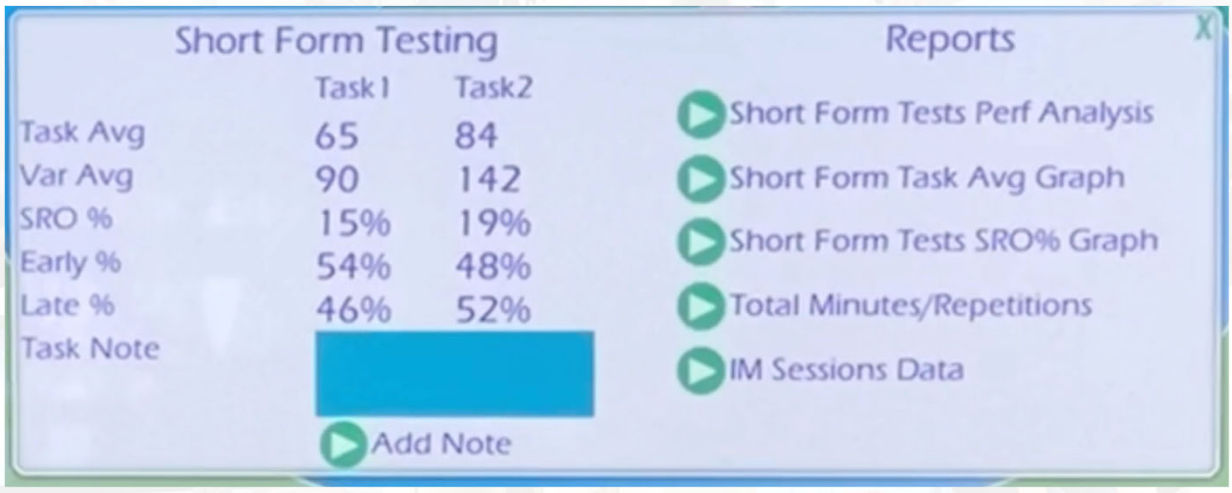
Short Form 2 Results View



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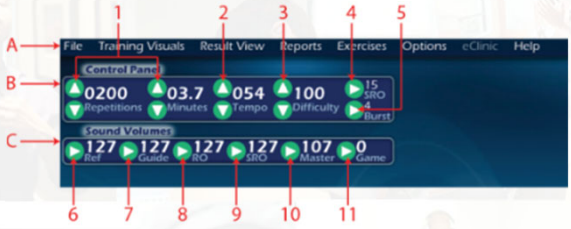
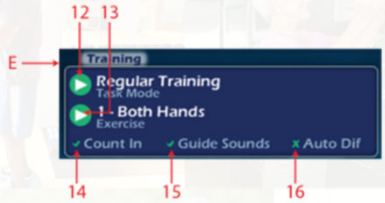
LAB 2: IM Software Features

Watch as your instructor tours you through the software…





*View IM Program Features Appendix Page A-7

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Pre, Interim & Post Assessments

- **Select from 3 IM assessments**
  1. Short Form Test (SFT)
  2. Long Form Assessment (LFA)
  3. Attend Over Time (AOT)
- **IM assessments will provide you with objective millisecond scores for timing & rhythm**
- **Opt for LFA & AOT if your patient can do it**
- **SFT is more of a screening or quick assessment & can be used a warm-up or quick progress check each session**
- **Functional assessment (available on IM website – log in with provider UN and PW)**
- **Standardized assessment:**
  1. Cognitive
  2. Speech-language
  3. Reading
  4. Social/behavioral
  5. Sensory
  6. Visual-motor
  7. Coordination/Praxis
  8. Academic achievement…

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Patient Instructions for SFT

SF Task 1 (Both Hands):

- You are going to hear a metronome beat through these headphones ***(show headphones)…***
- You will have a trigger strapped to the palm of your hand ***(place glove & trigger on dominant hand)…***
- As soon as you hear the metronome beat, start clapping your hands together like this right on the beat ***(say "bing" and model clapping right on the beat)…***
- Keep clapping on every beat until you no longer hear the beat.

SF Task 2 (Both Hands with Guide Sounds)

- This time, you will hear the same metronome beat and some other sounds that are called Guide Sounds. They tell you whether you are getting closer to the beat or whether you are way off the beat…
- Focus on the metronome beat and clap right on the beat like you did last time…
- Keep clapping until you no longer hear the beat.

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LAB 3: Complete SFT

HOW TO ADMINISTER

- As a screening or brief assessment
- As a warm-up or quick assessment at start or end of IM training sessions
- Do not allow patient to practice before
- Do not allow patient to look at computer screen
- Upon completion, compare Task Average (MS) to Indicator Table for patient's age
- If repeat SFT, also compare to previous SFT scores

LAB

- Select Short Form Test
- Complete it
- Write down your scores
- Compare your scores to Indicator Table (see Appendix)

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LAB 4: SFT Reports & Data Interpretation

SELECT

- Reports
- Short Form Test Reports
  - Short Form Test Performance Analysis
  - Short Form Test Task Average Graph
- For these reports to populate, you must have data from at least 2 Short Form Test administrations.
- Compares MS Task Average scores to show improvement in synchronization over time
- If score for SF Task 1 is better than SF Task 2, what does that mean?
- What if SF Task 2 is better than SF Task 1? What does that indicate?

You cannot view YOUR Short Form Test Reports today because you only have one set of data for today.

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*View Sample SFT Reports Appendix Page A-18 – A-19

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Patient Instructions for LFA

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- As with SFT, explain that the person will hear a steady metronome beat through the headphones
- **Prior to each LFA task**, explain & model the correct movement
- Tasks 1-13 are WITHOUT guide sounds. Task 14 is the only one WITH guide sounds. Instructions for this task are the same as SFT Task 2.

DO NOT ALLOW YOUR CLIENT TO LOOK AT THE COMPUTER SCREEN!

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LAB 5: Complete LFA

HOW TO ADMINISTER

- Before IM training starts, at interim re-assessment, and at discharge
- Do not allow patient to practice before
- Do not allow patient to look at computer screen
- Upon completion, compare Task Average (MS) to Indicator Table for patient's age
- If repeat LFA, also compare to previous LFA scores

LAB

- Select Long Form Assessment
- Complete it
- You do not need to write down your scores

Compare your scores to Indicator Table (see Appendix)

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LAB 6: Pull Up Your LFA Report

SELECT

- Reports
- Long Form Assessment
- LFA Calculations

NOTE:

- AOT score is reported at the bottom of the LFA Calculations Report

You cannot view YOUR AOT report today because you did not complete it

*View Sample LFA Reports Appendix Page A-20 – A-22; Sample AOT Reports Appendix Page A-23

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LAB 7: LFA Calculations Report Interpretation

- **Compare MS scores to Indicator Table** *(lower scores are better)*
- **Compare Early to Late %**
  - Balanced (close to 50-50) may indicate good rhythm
  - Predominantly Late may indicate slow cognitive processing or coordination issue
  - Predominantly Early is somewhat typical – check DATA LIST view to see if hits are EARLY or VERY EARLY. Predominantly **very early** hits may indicate impulsivity.

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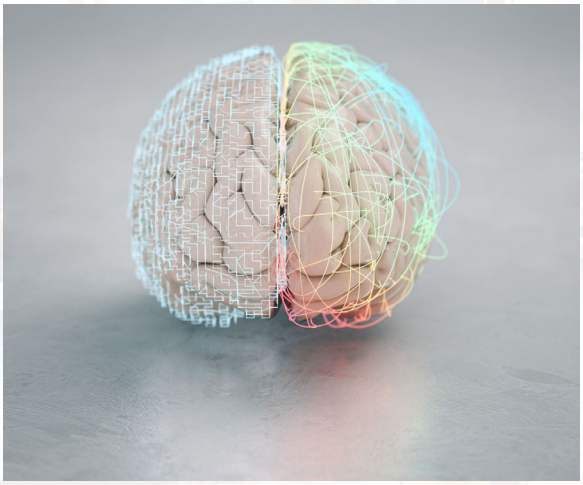
LAB 8: LFA Calculations Report Interpretation



- Compare MS Task Average score for LFA Task 1 (without guide sounds) to Task 14 (with guide sounds)
- What does it mean if score for Task 14 is better than Task 1?
- What does it mean if score for Task 14 is worse than Task 1?

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ATTEND OVER TIME TEST

- 10-minute assessment (Both Hands without Guide Sounds)
- Complete immediately following the LFA on the same day
- Measures ability to self-monitor & sustain attention/concentration over longer period of time without prompts
  - Does your patient lose focus during this time?
  - Does he recognize he is off track and self-correct?
- Objective MS scores are reported at the bottom of the LFA Report for Attend Over Time

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LAB 9: Data List View

Data List View is useful to look at % VERY EARLY & % VERY LATE as this may indicate impulsivity or processing delay

SELECT

- Result View
- Data List View
- Select date
- Look at your LFA data % very early and % very late (most of the hits should fall in early, SRO and late)

*View Sample Data Report Appendix Page A-24

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IM Assessment Modifications

- Skip IM assessment (i.e., infant, toddler, low functioning) & go directly to total hands-on IM
- Seated or assist for balance
- Skip certain tasks if unable to complete
- Rest breaks
- Complete over more than one session
- Speakers
- Placement/type of headphones
- Alternative triggers/switches
- Decrease volume
- Visual mode (only if hearing loss)

RECORD MODIFICATIONS FOR LATER COMPARISON

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Quick Review of IM Settings and Definitions

IM360

REF: Reference Tone (Cowbell)

GUIDE: Buzzer sound when you're way too early or way too late

RO: Rubber Band Twang that tells you when you're within the set difficulty range of training

SRO: Reward tone that tells you if you are within the set SRO range.

IAR: Highest number of consecutive SRO hits during a task

BURST: A setting to help motivate your clients to get SRO hits! Several bursts can be earned during each task. The more bursts achieved, the more neural synchronization is taking place!

DIFFICULTY: The setting that determines when your client hears the "Guide" sound

TEMPO: Beats per minute or speed of the metronome (default is 54 bpm)

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*View IM Settings & Definitions Appendix Page A-6

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Frequency, Intensity & Duration

- Repetition is required in order to make lasting, functional changes in the brain.
- Performing a little IM here and there or for a short period of time will not lead to functional neurological change.
- Aim for 3x/week with minimum of 30 minutes of active IM training per session **(i.e., within 45 min session, 30 min is on the machine actively training)**. Approximately 1400-1600 reps per session (adapt as appropriate according to age & tolerance).
- Duration varies depending upon baseline timing skills & other factors. Determine an interval for re-assessment and communicate that to students, patients, & caregivers (rather than telling them a predetermined number of IM training sessions).
- Interdisciplinary functional group activities in an inpatient setting has added a layer of treatment needed to exceed previously expected outcomes. Recognizing the average short length of stay requires therapist to maximize treatment time to increase opportunities for repetition and task practice.

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IM Training Overview

Phases 1-2	**Learn IM Ref Tone & Auditory/Visual Guides with Hand Exercises**
Phases 3-4	**Use Auditory/Visual Guides to Improve Timing & Rhythm with Hands first, then with Foot & Bilateral Exercises**

62

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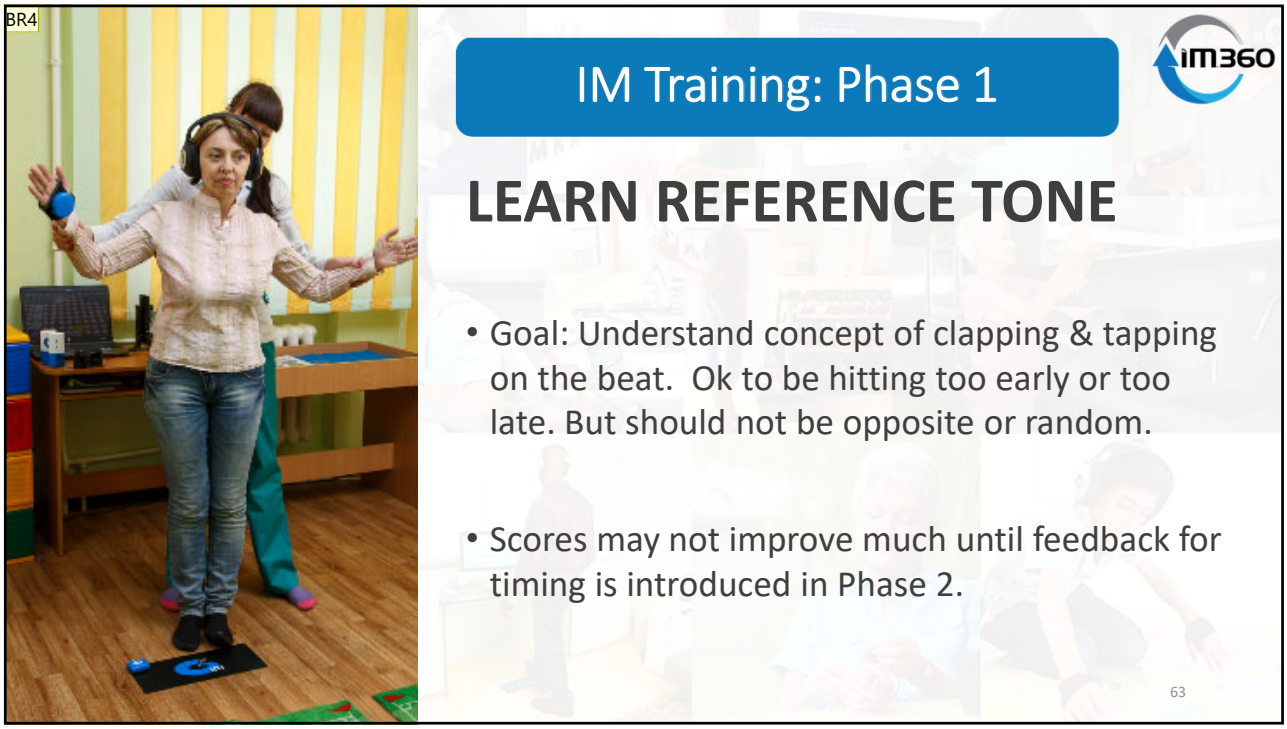
BR4
IM Training: Phase 1
LEARN REFERENCE TONE
• Goal: Understand concept of clapping & tapping on the beat. Ok to be hitting too early or too late. But should not be opposite or random.
• Scores may not improve much until feedback for timing is introduced in Phase 2.
63

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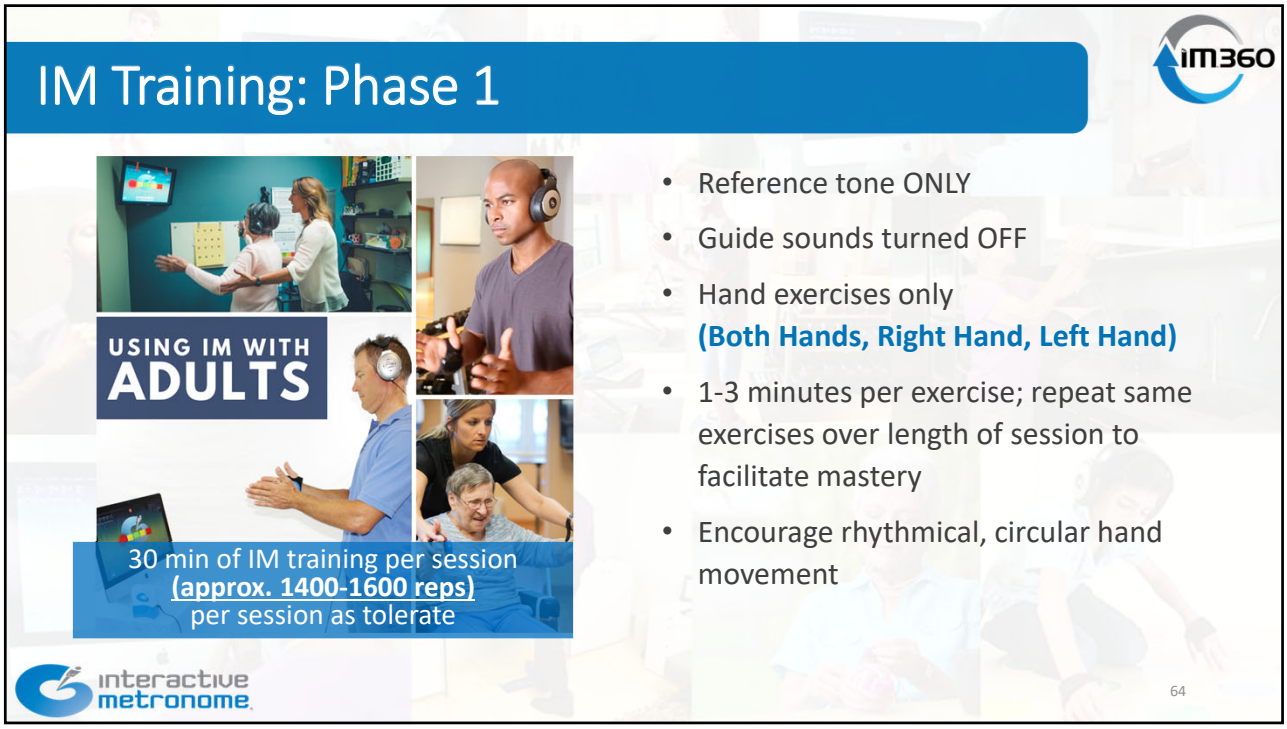
IM Training: Phase 1
USING IM WITH ADULTS
30 min of IM training per session
(approx. 1400-1600 reps)
per session as tolerate
• Reference tone ONLY
• Guide sounds turned OFF
• Hand exercises only
(Both Hands, Right Hand, Left Hand)
• 1-3 minutes per exercise; repeat same exercises over length of session to facilitate mastery
• Encourage rhythmical, circular hand movement
interactive metronome
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Slide 63

BR4 Make Picture all the way shown
Bricole Reincke, 6/16/2021

Strategies to Facilitate Timing

- Prime with 54bpm metronome playing in background at home
- Hands-on assistance from IM provider to give a sense of timing & rhythm **(best of provider has completed IM and established good timing)**
- Whole body movement to the beat rather than isolated body part **(rocking on ball to the beat, etc..)**
- Increase tempo initially if individual is hitting way too fast – go with flow, then gradually decrease to 54 bpm

- Manage sensory needs **(lighting, noise, sensory inputs, sensitivities, cravings)**
- Reward to motivate individual toward training!!

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Dyspraxia

- If impaired motor planning & sequencing, may exhibit:
  - Linear rather than circular movements
  - Trouble sequencing both toes, both heels, and/or bilateral tasks
- Motor planning & sequencing issues will cause problems with responding to guide sounds & will interfere with progress
- Needs to be addressed in Phase 1 with reference tone only before moving to Phase 2 where guide sounds are introduced

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Helping the Person with Dyspraxia

- Stay in Phase 1 longer…auditory ref tone only. NO guide sounds.
- Hand exercises only **(Both Hands, Right Hand, Left Hand)**; alternate throughout session
- Increase length of exercises to 10 minutes to capitalize on motor learning **(person often begins to show improvement in motor coordination & rhythm more than 5 min into an individual exercise)**
- Decrease tempo (48-52 bpm) to find just right pace where can make circular, rhythmical movements with greater ease. As rhythm improves, gradually increase tempo by 2 bpm until at 54 bpm. **Do not tell patient you are adjusting tempo.**
- Hand over hand assist, weaning to modeling, then no cues (your timing must be good) to facilitate consistent rhythmical movement. **Make sure your own timing is good (20ms)**
- Avoid verbal cues & praise … gestures only. Avoid IM training visuals & games.

Move to Phase 2 when making circular movements and good rhythm at 54 bpm … even if millisecond scores are still not very good … now ready for guide sounds so can further improve timing & rhythm.

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Training Visuals in Phase 1

Training Visuals may be necessary for some individuals in Phase 1 if…

- Hits are consistently very early and need visual cues to slow down the pace (i.e., impulsive)
- Hits are opposite of beat and need visual cues to sync with the beat
- Hits are random/dissociated from the beat and need cues to sync with the beat
- Severe hearing impairment in one or both ears

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Training Visuals in Phase 1

Stationary backgrounds are better than dynamic games in Phase 1 as they are less distracting …

Adjust the intensity of feedback for timing so that training is not too hard:

- **Difficulty**
  - Default is 100ms
  - Increase to make easier and give more room for error (up to 300ms)
- **SRO**
  - Default is 15ms
  - Increase up to 50ms to make easier to achieve SRO hits (green)

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Adjusting Difficulty Level

DIFFICULTY RELATES TO THE YELLOW ZONE

DIFF 100 challenging

101+	16 – 100	0 – 15	16 – 100	101+

DIFF 200 easier

201+	16 – 200	0 – 15	16 – 200	201+

DIFF 300 easiest

301+	16 – 300	0 – 15	16 – 300	301+

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Recommended Difficulty Settings

Patient's MS Average	*Suggested* Difficulty Setting
More than 300 ms	300 (easiest setting)
200 ms……add 100 to range	300
150 ms……add 100 to range	250
100 ms……add 50 to range	150
50 ms……add 50 to range	100
Less than 25 ms	Auto (most challenging)

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Adjusting SRO Level

SRO RELATES TO THE GREEN ZONE

SRO 15 challenging

101+	16 – 100	0 – 15	16 – 100	101+

SRO 30 easier

201+	30 – 200	0 – 30	30 – 200	201+

SRO 50 easiest

301+	50 – 300	0 – 50	50 – 300	301+

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Recommended SRO Settings

Patient's MS Average	*Suggested* SRO Setting
More than 300 ms	50 (easiest setting)
Between 200 ms and 300 ms	45 - 50
Between 150 ms and 200 ms	30 - 45
Between100 ms and 150 ms	25 - 35
Under 100 ms	15 - 25
Less than 25 ms	10 - 15

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Helping the Person with Hemiplegia

- Learn ref tone with intact hand first – then progress to affected hand with tempo adjustment and self-assist or hands-on assist from provider
- Work on bringing affected hand to midline when clapping during Both Hands exercise
- Gravity-assisted movement

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Total Hands-On Assist May Be Necessary for Some …

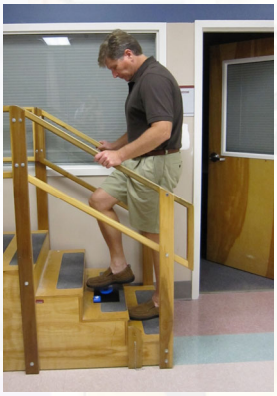
- If working with a more impaired individual address upper and lower extremities in Phase 1 (Exercises 1-10).
- Adjust approach, positioning and trigger placement as needed (i.e., provider may wear trigger instead of patient)
- Proprioceptive input for good timing & rhythm is POWERFUL!!! Most effective if the IM Provider has good timing (20 MS range)
- Don't worry about your patient's MS scores as they will not reflect his/her performance when you are doing hand over hand…evaluate progress via observations and other assessments (i.e., changes observed in behavior, communication, motor and/or sensory processing skills)
- Look for opportunities to hand over the reigns a little and let your client complete IM exercises with less and less assistance as appropriate (i.e., and infant will not be able to do this, but a 5-year-old may)

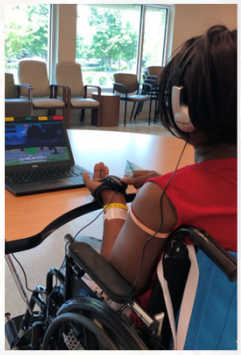
75

POSITIONING …

Balance Ball

Stairs





Wheelchair

Gait Belt

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TRIGGER LOGISTICS …

Therapist wears trigger

and couples patient's hand…

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ENGAGING ATTENTION

- Counting
- Word Labeling
- Vocabulary Building
- Melodic Intonation
- STROOP
- Patterning
- Automatic Speech Task
- Alternative Triggers
- Working with a Partner

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Group Training

VIDEO

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Group Training with IM Pro 10.0

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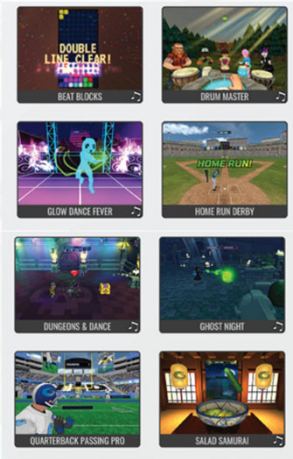

IM Pro 10.0 Games

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IM Set-Up for Group Training

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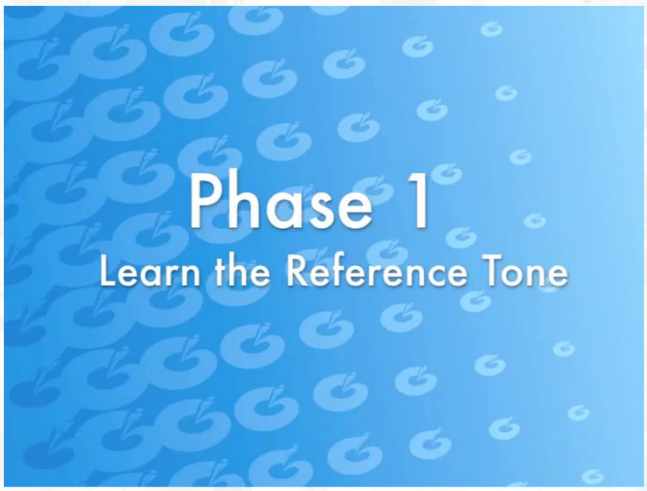
More Phase 1 Examples …



VIDEO

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LAB 10: Phase 1 with Default Settings

A sample of AUDITORY IM without adjusting to make training easier…

SELECT:

- Regular Training
- Both Hands
- 1 minute
- Tempo 54
- Guide sounds OFF (x)
- Visual Indicator Selection: Auditory
- Background: Default
- Complete the exercise without looking at computer screen.

Compare Task Average (MS) to Indicator Table

*View Indicator Table Appendix Page A-14

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LAB 11: Phase 1 with Training Visuals
Diff 100 & SRO 15

A sample of AUDITORY-VISUAL IM without adjusting to make training easier…

SELECT:

- Regular Training
- Both Hands
- 1 minute
- Tempo 54
- Difficulty 100
- SRO 15
- Burst threshold 4
- Guide sounds OFF (x)
- Visual Indicator Selection: Enriched Score without Center Flash
- Background: Select a stationary background (shown in white font)

Complete the exercise while looking at the computer screen

Compare Task Average (MS) score to Indicator Table

*View Indicator Table Appendix Page A-14

84

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LAB 12: Phase 1 with Training Visuals Diff 300 & SRO 50

A sample of AUDITORY-VISUAL IM training with adjustment to the easiest settings…

SELECT:

- Regular Training
- Both Hands
- 1 minute
- Tempo 54 (default)
- Difficulty 300 (easiest)
- SRO 50 (easiest)
- Burst threshold 2 (easiest)
- Guide sounds OFF (x)
- Visual Indicator Selection: Enriched Score without Center Flash
- Background: Select a stationary background (shown in white font)

Complete the exercise while looking at the computer screen

Compare Task Average (MS) score to Indicator Table

*View Indicator Table Appendix Page A-14

85

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LAB 13: Phase 1 for Patient with Dyspraxia

A sample of AUDITORY IM with SLOWER TEMPO and NO FEEDBACK to facilitate timing, rhythm and coordination …

SELECT:

- Regular Training
- Both Hands
- 1 minute
  SLOWER Tempo 48
  (in real session you may need provide hand-over-hand assist to your patient)
- Guide sounds OFF (x)
- Don't worry about Diff, SRO or Burst Threshold since you will not be receiving feedback.

Complete the exercise without looking at the computer screen

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LAB 14: Phase 1 for Patient with Impulsivity

A sample of AUDITORY IM with FASTER TEMPO and NO FEEDBACK to facilitate timing, rhythm and synchronization …

SELECT:

- Regular Training
- Both Hands
- 1 minute
  FASTER Tempo 65
  (in real session you may need provide hand-over-hand assist to your patient)
- Guide sounds OFF (x)
- Don't worry about Diff, SRO or Burst Threshold since you will not be receiving feedback.

Complete the exercise without looking at the computer screen

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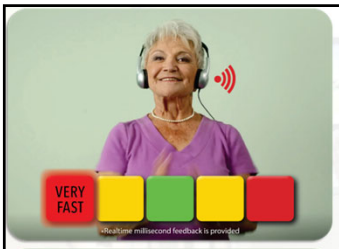

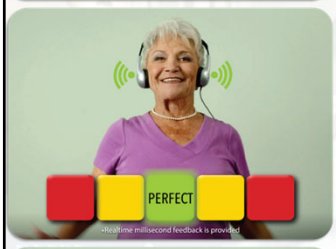

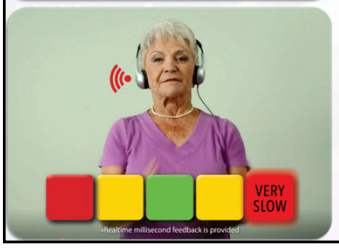

IM Training: Phase 2

IM360

LEARN GUIDE SOUNDS

- Goal: Learn to process the guide sounds and respond to them.
- Demonstrate emerging improvement in timing & rhythm with hand exercises as MS Task Average scores begin to improve.

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Explanation of Guide Sounds

A buzzer in the LEFT ear means you are WAY too early.
A buzzer in the RIGHT ear means you are WAY too late.

A rubber band bong sound in the LEFT ear means you close to the beat but are a LITTLE too early.
A rubber band bong sound in the RIGHT ear means you are close to the beat but are LITTLE too late.

A high pitch reward tone in BOTH EARS occurs when you are right exactly on the beat.

Your goal is to hear the high pitch reward tone in both ears as much as possible.

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Adjust Settings to Aid Processing

Better MS scores with guide sounds	Worse MS scores with guide sounds
DIFFICULTY → Keep at default 100	DIFFICULTY → Increase to easier setting
SRO → Keep at default 15	SRO → Increase to easier setting
BURST THRESHOLD → Keep at default 4	BURST THRESHOLD → Decrease to easier setting
VOLUME → No change	VOLUME → Decrease volume of guide sounds compared to Ref Tone so Ref Tone stands out more.
TRAINING VISUALS → Optional. See if MS scores improve further when looks at computer screen vs just listening to ref tone & guide sounds.	TRAINING VISUALS → Turn on simple Training Visuals to see if they aid processing of guide sounds (choose plain or still backgrounds…avoid dynamic displays and games for now).

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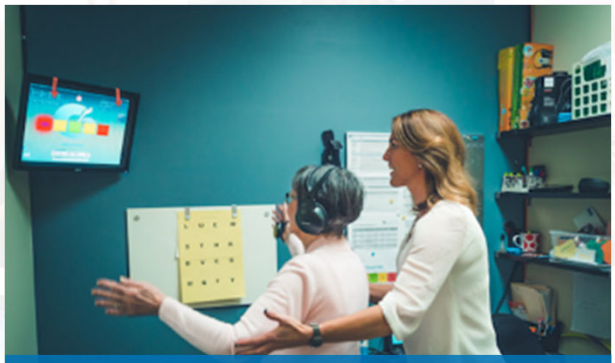
IM Training: Phase 2



Hand exercises

2-5 minutes per exercise

- Aim for 30 min of active training per session **(1400-1600 reps per session as tolerated)**
- Adjust IM settings & go with those that facilitate best performance
  - Difficulty
  - SRO
  - Auditory only or with Training Visuals
- Cue as needed (verbal, hands-on)

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Some Phase 2 Examples ...

Phase 2

Learn the Guide Sounds

VIDEO

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LAB 15: Phase 2 with Default Settings

A sample of AUDITORY IM without adjusting to make training easier…

SELECT:

- Regular Training
- Both Hands
- 2 minutes
- Tempo 54
- Difficulty 100
- SRO 15
- Burst threshold 4
- Guide sounds ON ✓
- Visual Indicator Selection: Auditory
- Background: Default
- Complete the exercise without looking at the computer screen.

Compare Task Average (MS) to Indicator Table

What is your timing tendency?

*View Indicator Table Appendix Page A-14

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LAB 16: Phase 2 with Training Visuals
Diff 100 & SRO 15

A sample of AUDITORY-VISUAL IM without adjusting to make training easier …

SELECT:

- Regular Training
- Both Hands
- 2 minutes
- Tempo 54
- Difficulty 100
- SRO 15
- Burst threshold 4
- Guide sounds ON ✓
- Visual Indicator Selection: Enriched Score without Center Flash
- Background: Select a stationary background (shown in white font)

Complete the exercise while looking at the computer screen.

Compare Task Average (MS) score to Indicator Table

What is your timing tendency?

*View Indicator Table Appendix Page A-14

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LAB 17: Phase 2 with Training Visuals
Diff 200 & SRO 30

A sample of AUDITORY-VISUAL IM training with adjustment to the easiest settings…

SELECT:

- Regular Training
- Both Hands
- 1 minute
- Tempo 54
- Difficulty 200
- SRO 30
- Burst threshold 3
- Guide sounds ON ✓
- Visual Indicator Selection: Enriched Score without Center Flash
- Background: Select a stationary background (shown in white font)

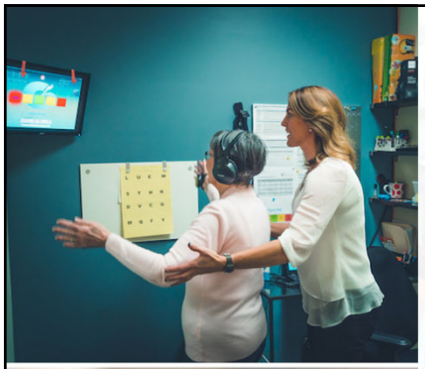
Complete the exercise while looking at the computer screen

Compare Task Average (MS) score to Indicator Table

*View Indicator Table Appendix Page A-14

95

95



IM Training: Phase 3

DEVELOP BASIC TIMING

- Goal: Now that your patient has learned how to respond to the guide sounds, continue to work on hand exercises to bring MS Task Average scores down further.
- Mastery with the hands will facilitate improvement in the lower extremities when you transition to Phase 4.

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IM Training: Phase 3

Introduce games

Aim for higher IAR, Bursts & SRO hits

- Continue with hand exercises to further refine timing & rhythm
- 3-5 minutes per exercise
- Aim for 30 min of active training per session (1400-1600 reps)
- Guide sounds remain ON
- Adjust IM settings to leverage performance (i.e., give more feedback as tolerated by adjusting Difficulty, SRO range to more challenging levels)
- Aim for best MS Task Average

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Introduce Games

- Use your judgment to determine when to introduce games
- Games facilitate
  - Higher IAR
  - More bursts
  - … and better MS scores
- Games are engaging and encourage completion of more reps leading to better outcomes.
- Games can be used as a reward for effort during IM sessions
- All IM games have POSITIVE reinforcement
- A few have NEGATIVE reinforcement **(consequence for very early or late hits) – see Appendix for more info**

*View Games Appendix Page A-11

98

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Counteract Timing Tendency

If your patient is able to do this it will accelerate outcomes …

- If hitting too fast (or ahead of the beat) …purposely maintain a slightly slower pace.
- If hitting too slowly (or after the beat) … purposely maintain a slightly faster pace.

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Some Phase 3 Examples …

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VIDEO

100

100

LAB 18: Phase 3 Select Your Own Settings

Based on your performance thus far, select your own settings to facilitate even better scores …

SELECT:

- Regular Training
- Both Hands
- 2 minutes
- Tempo 54
- SELECT Difficulty
- SELECT SRO
- SELECT Burst threshold
- Guide sounds ON ✓
- SELECT Auditory Only or Training Visuals
- Complete the exercise – remember to counteract your timing tendency!

Compare Task Average (MS) score to Indicator Table

*View Indicator Table Appendix Page A-14

101

101

LAB 19: Phase 3 Games with Positive Reinforcement

Based on your performance thus far, select your own settings to facilitate even better scores …

SELECT:

- Regular Training
- Both Hands
- 2 minutes
- Tempo 54
- SELECT Difficulty
- SELECT SRO
- SELECT Burst threshold
- Guide sounds ON ✓
- Visual Indicator Selection: Enriched Score without Center Flash
- Select a game with positive reinforcement – see Appendix for options

Complete the exercise

Compare your scores to the Indicator Table

*View Indicator Table Appendix Page A-14

102

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LAB 20: Phase 3 Games with Negative Reinforcement

Based on your performance thus far, select your own settings to facilitate even better scores …

SELECT:

- Regular Training
- Both Hands
- 2 minutes
- Tempo 54
- SELECT Difficulty
- SELECT SRO
- SELECT Burst threshold
- Guide sounds ON ✓
- Visual Indicator Selection: Enriched Score without Center Flash
- Select a game with negative reinforcement – see Appendix for options

Complete the exercise

Compare your scores to the Indicator Table

*View Indicator Table Appendix Page A-14

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Training Tip

An "off" session or two can be expected at some point in the training …

- Don't change plans just yet
- Some clients have a few poor scores right before they make a big gain in their timing
- Explore environmental and family changes that could be affecting overall behavior
- If lack of progress persists, it is time to reassess

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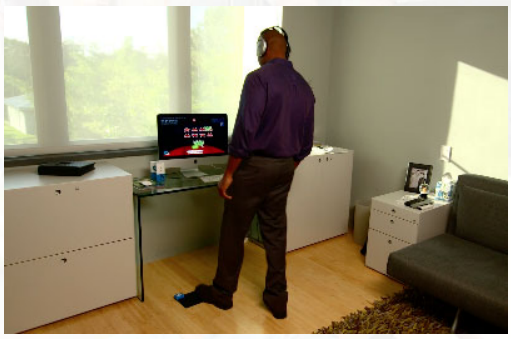
IM Training: Phase 4

Transition to Address More Advanced Skills
GENERALIZE TIMING SKILLS

Now that good timing has been established with hands, it's all about generalizing good timing to the rest of the body. At the same time, work on more complex processing, sustained attention, concentration and discipline specific task.



105

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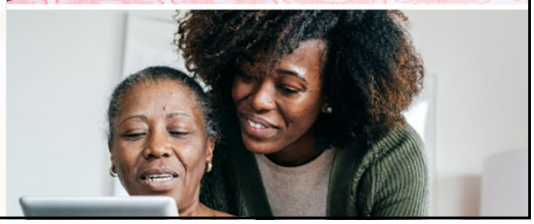
Speech & Language Activities

- Visual Attention
- Impulse Control
- Working Memory
- Bilateral Integration
- Sequencing
- Naming
- Word Finding
- Automatic Speech Task
- Verbal Fluency



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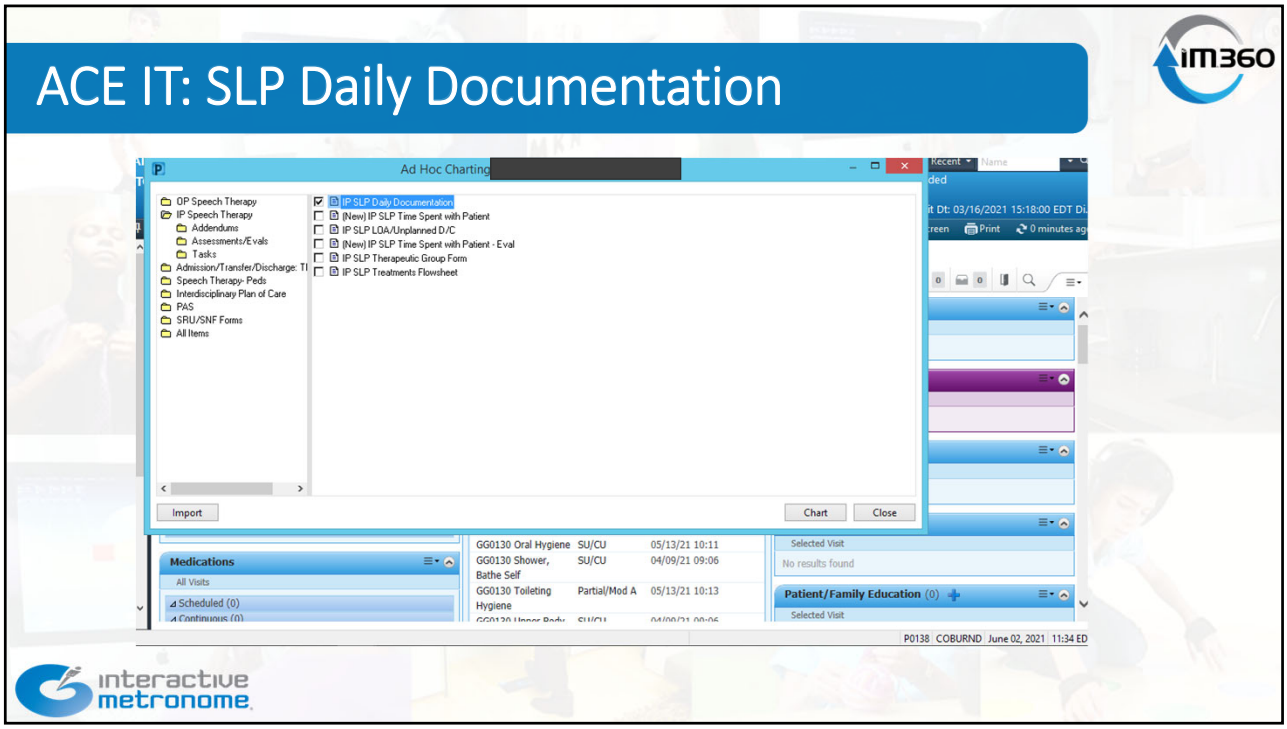
ACE IT: SLP Daily Documentation



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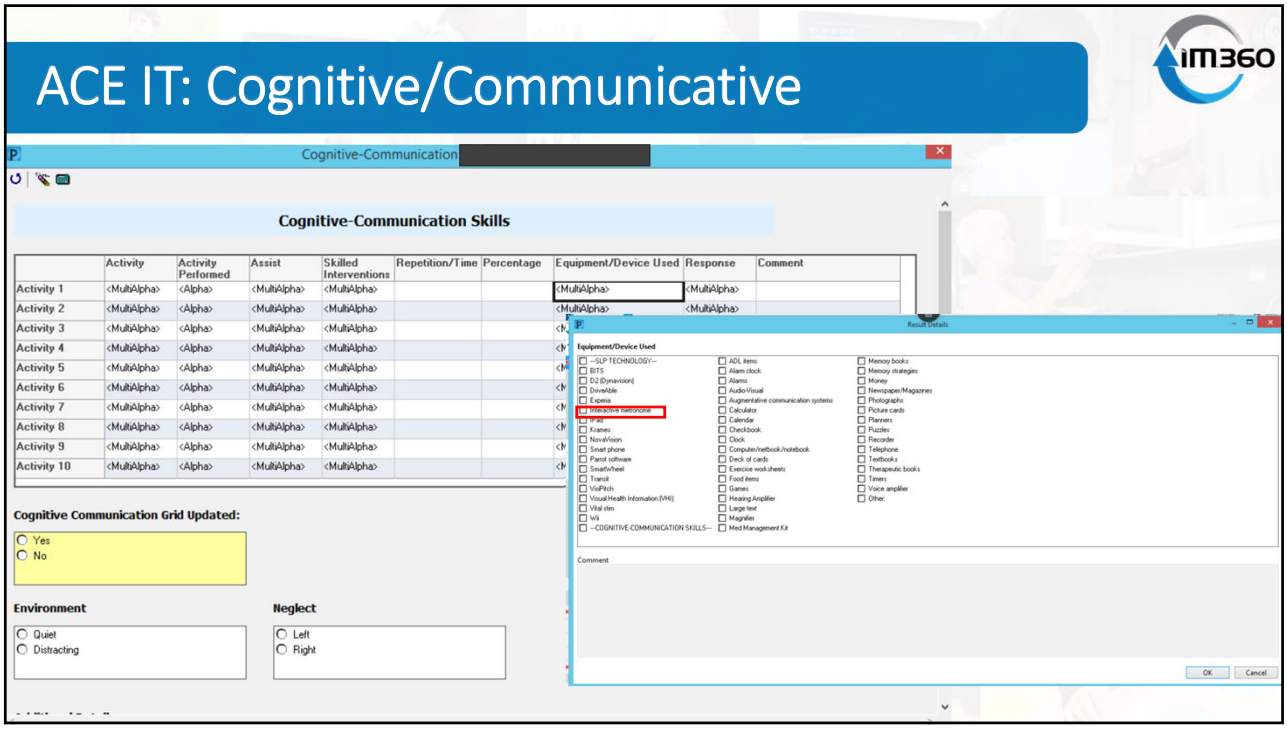
ACE IT: Cognitive/Communicative



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Occupational Therapy Activities

- Reaching
- Shoulder range of motion
- Trunk rotation
- Overhead reach
- Weighted upper extremity for increased proprioception
- Hand strengthening
- Balance while carrying an object
- Postural stability
- Shoulder girdle stability

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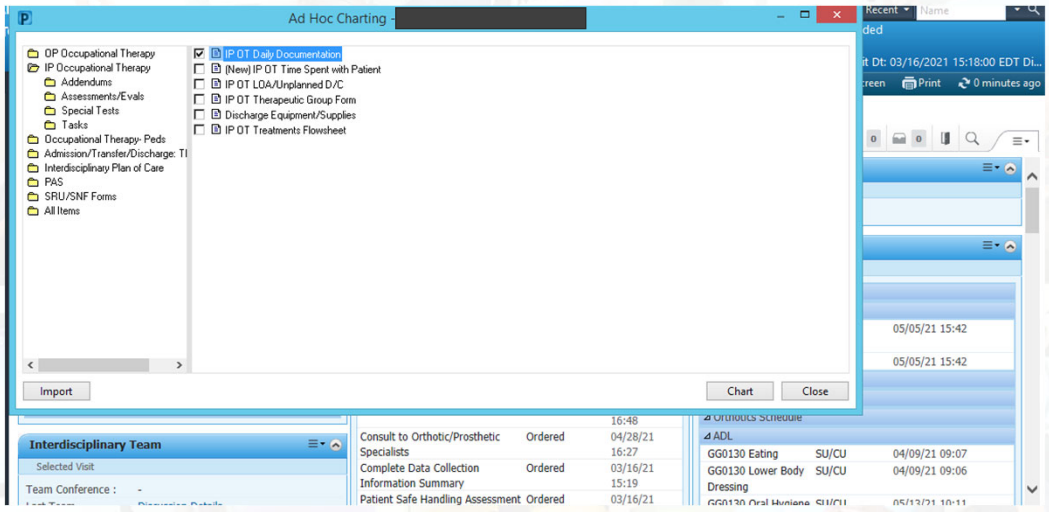
ACE IT: OT Daily Documentation



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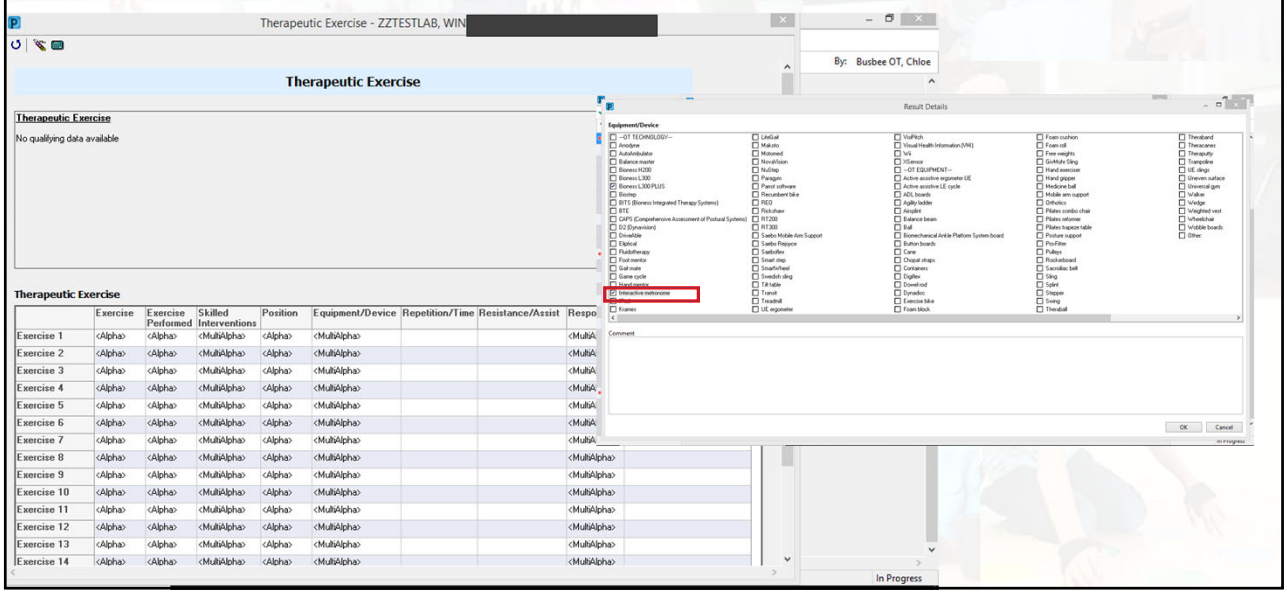
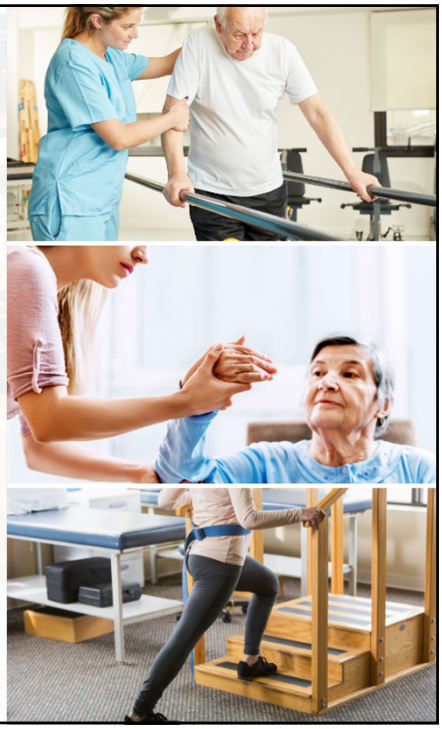
ACE IT: Therapeutic Exercise



111

Physical Therapy Activities

- Weight shifting
- Weight bearing
- Balance
- Quad Strengthening
- Mid-range control
- Balance displacement
- Lateral weight shifting
- Dorsiflexion
- Plantar Flexion
- Pre-gait
- Stair climbing
- Motor Planning



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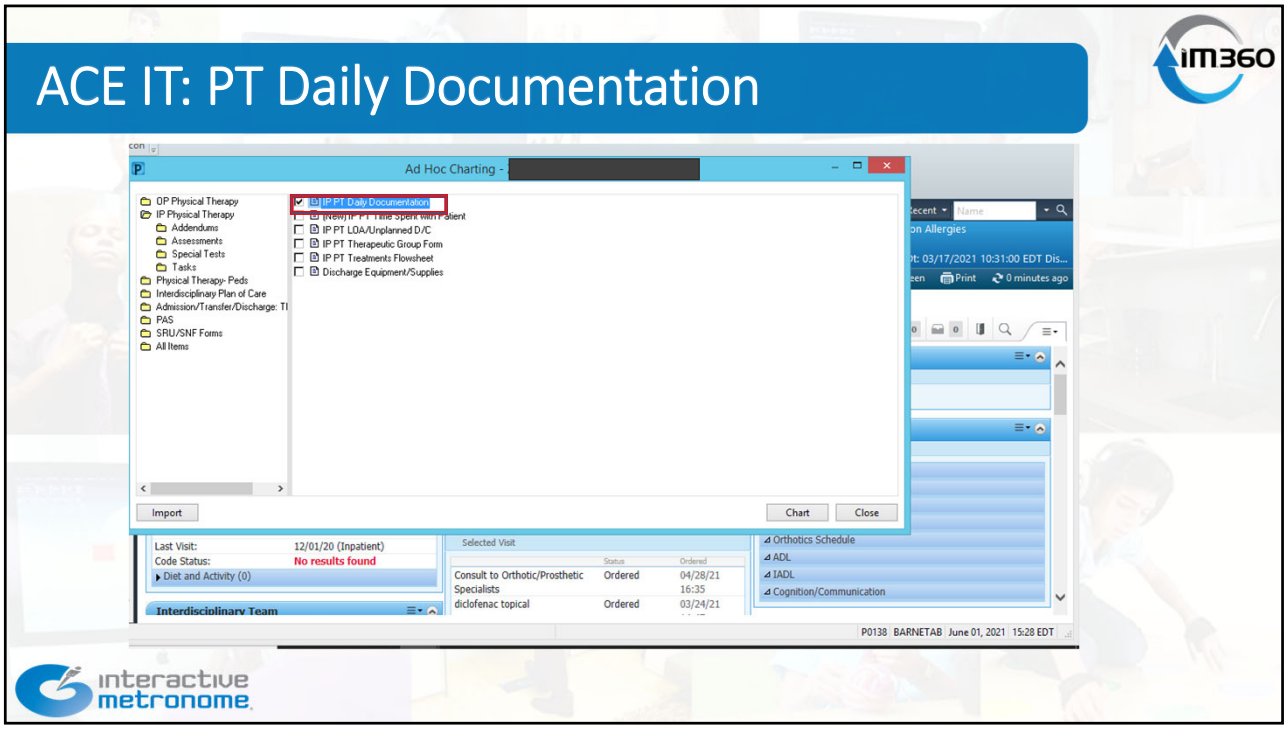
ACE IT: PT Daily Documentation



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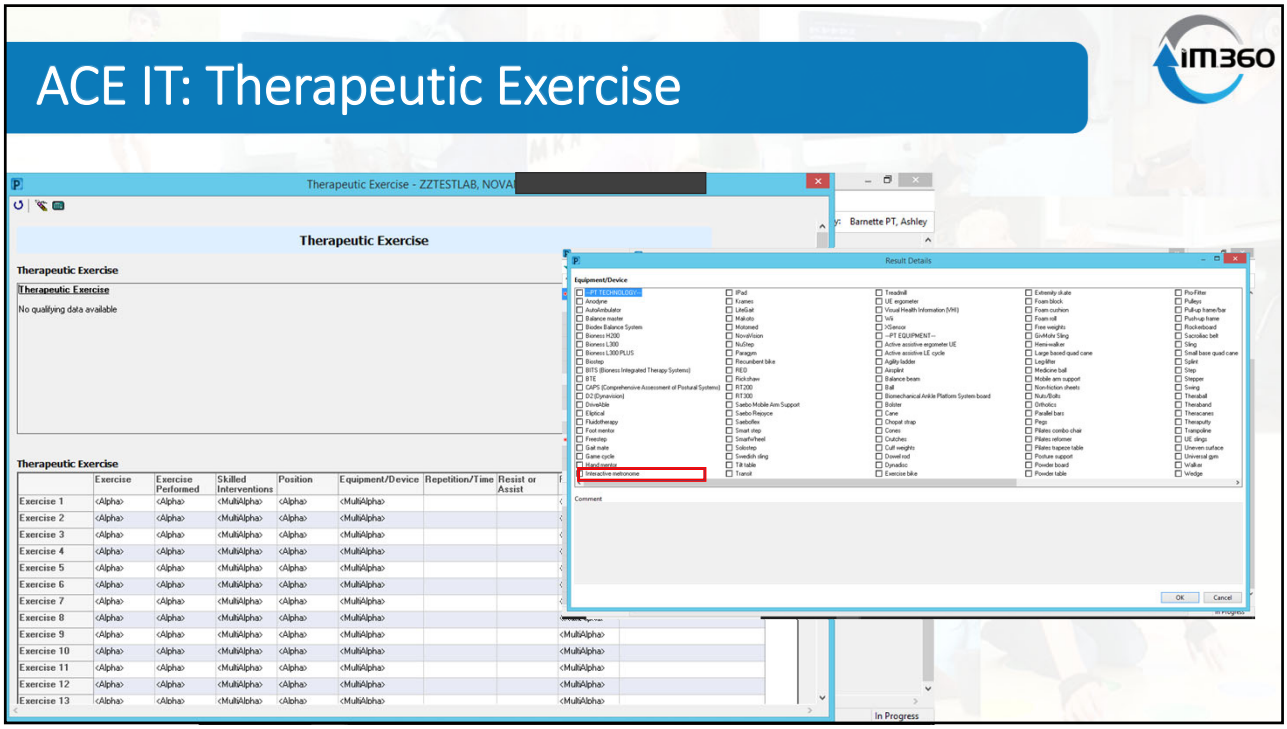
ACE IT: Therapeutic Exercise



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Domains of Challenge

- Postural Challenge
- Extremity Challenge
- Cognitive/Linguistic Challenge
- Computer Challenge

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Considerations When Grading the Task

IM360

Prepare to Adjust:

- Tempo
- Duration and Repetitions
- Type and Amount of Feedback
- Difficulty and SRO Settings
- Volume Levels (Including Game Background Volumes)

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*View IM Program Features Appendix Page A-7

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Treatment

- Weight bearing on foot trigger (sitting and standing)
- Adapted Side hit: Wrist
- Shoulder Shrug
- Synergy Hit
- Elbow Hit
- Table Slide
- Lower Extremity Weight Shift
- Balance With Affected Side Stomp
- Functional Reach

VIDEO

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Left Hemiparesis

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Use of Adaptive Equipment

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Treatment

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Treatment

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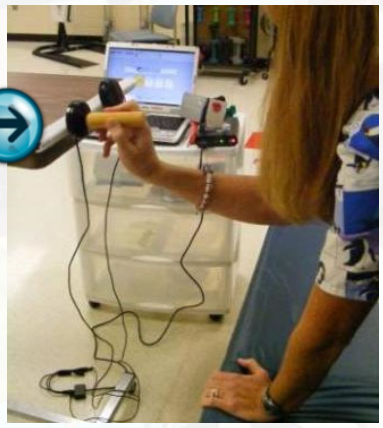
Treatment



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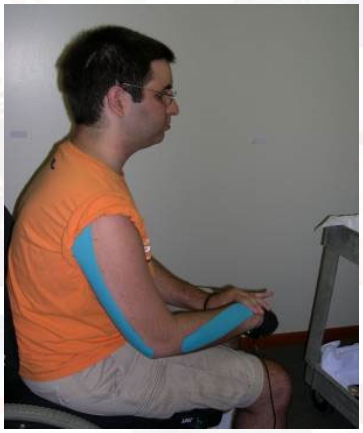
Treatment



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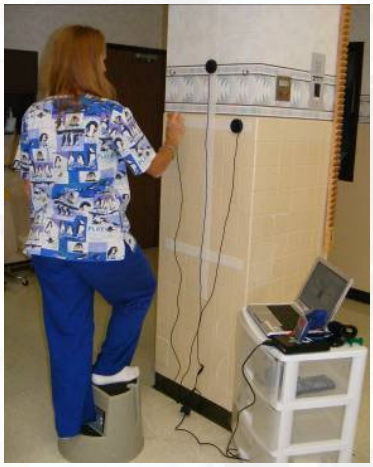
Treatment



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Treatment Ideas for Parkinson's

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Treatment with In-Motion Trigger

IM for Gait Training with In-Motion Triggers

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Balance on Bosu

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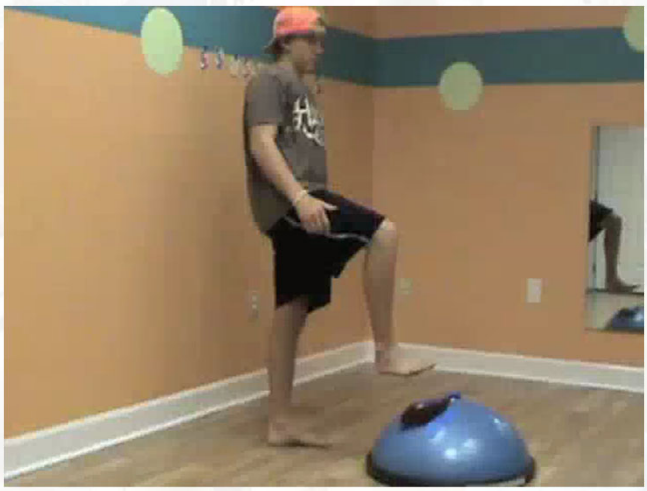
Unilateral Stance



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Crossing Midline

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UE and Grasp Activity

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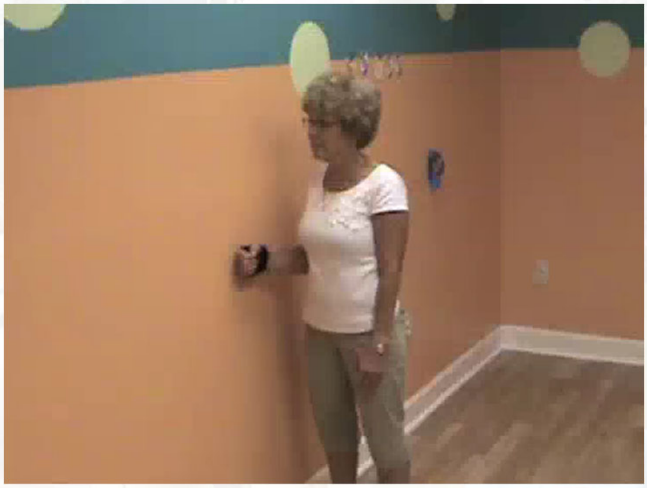
Shoulder External Rotation



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STROOP Exercise

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Cognitive Tasks

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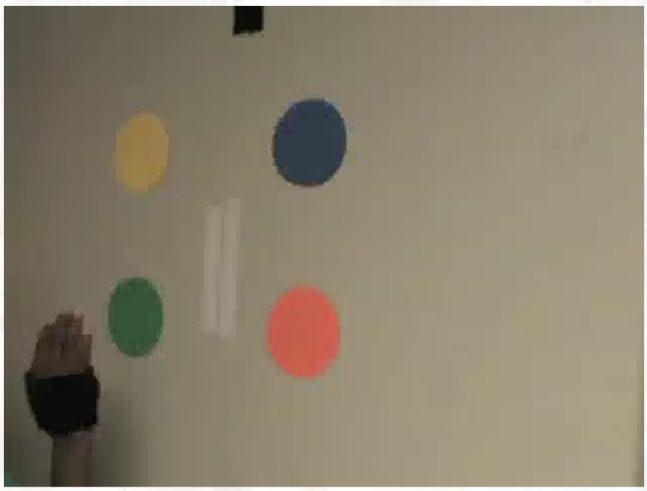
Cognitive Tasks



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Control of Movement & Working Memory

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Auditory and Cognitive/Motor Task

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LAB 21: Phase 4 AUTO Difficulty

A sample of IM training at the most challenging level …

NOTICE HOW DIFFICULTY LEVEL AUTOMATICALLY ADJUSTS TO YOUR BEST PERFORMANCE

SELECT:

- Regular Training
- Both Hands
- 1 minute
- Tempo 54
- Difficulty AUTO ✓
- SRO 15

- Burst threshold 4
- Guide sounds ON ✓
- Visual Indicator Selection: Enriched Score without Center Flash
- Background: Select a stationary background (shown in white font)

Complete the exercise while looking at the computer screen

Compare your scores to the Indicator Table

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*View Indicator Table Appendix Page A-14

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LAB 22: Phase 4 Select Your Own Settings

A sample of lower extremity IM training…

SELECT:

- Regular Training
- Both Toes
- 1 minute
- Tempo 54
- SELECT Difficulty

- SELECT SRO
- SELECT Burst threshold
- Guide sounds ON ✓
- SELECT Auditory or Training Visuals

Complete the exercise

Compare your scores to the Indicator Table

interactive metronome

*View Indicator Table Appendix Page A-14

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LAB 23: Phase 4 Create a Custom Exercise

Create a therapeutic goal.

Create an IM exercise to address that goal.

SELECT:

- Regular Training
- CREATE A CUSTOM EXERCISE
- 1 minute
- SELECT Tempo
- SELECT Difficulty
- SELECT SRO
- SELECT Burst threshold
- SELECT Guide sounds on or off
- SELECT Auditory Only or Training Visuals

Complete the exercise

Compare your scores to the Indicator Table

*View Indicator Table Appendix Page A-14

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IM Training Reports

Click on **Reports** then **General Reports** and select from…

- **Session Data Report**
  - IM settings and performance data for each exercise for each assessment & training session
    Sample Session Data Report Appendix Page A-24
- **Session Calendar Report**
  - Calendar with total minutes of completed each session
    Sample Session Calendar Report Page A-28
- **Total Minutes/Repetitions**
  - Number of minutes of IM training completed each session and cumulative total over consecutive sessions
  - Number of reps completed per session and cumulative total over consecutive sessions
    Sample Total Minutes/Repetitions Report Page A-27

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IM Training Reports

Click on **Reports** then **Regular Training** for graphs…

- **Highest IAR Graph**
  - Ability to stay in the SRO zone for more consecutive hits, signaling improved synchronization
    Sample Session IAR Graph Appendix Page A-25

- **Burst Graph**
  - Ability to repeatedly adjust timing target the SRO zone, showing improved synchronization
    Sample Session Burst Graph Page A-25
- **SRO % Graph**
  - Improved ability to target SRO zone
    Sample Session SRO% Graph Page A-26
- **Best Task Average Graph**
  - Best Task Average of each training session over consecutive dates, a reflection of improved synchronization over subsequent training sessions
    Sample Best Task Average Graph Page A-26
- **Variability Average Graph**
  - Improvement in rhythm over subsequent training sessions
    Sample Variability Average Graph Page A-27

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Complete Review of Appendix

Encompass Health

APPENDIX

Contains:

Sample Reports:

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Next Level of Care using IM-Home & the

- Learn how to use the eClinic when you attend the IM-Home Certification Course
  - Quick Start
  - Create Templates
  - Assign Training Plans
  - Create Custom Exercises
  - Send Messages
  - View Reports
- Refer clients to the IM locator board to find an IM-Home Certified Provider

IM-HOME CERTIFIED
www.IMHOME.org

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IM Educational Offerings

- IM Certification
- IM Refresher Course
  **Created specifically for EH*
- IM-Home Certification
- Educational Webinar Library
- Specialization Courses
  - Pediatric Therapy
  - Adult Rehabilitation
  - Fall Risk Reduction

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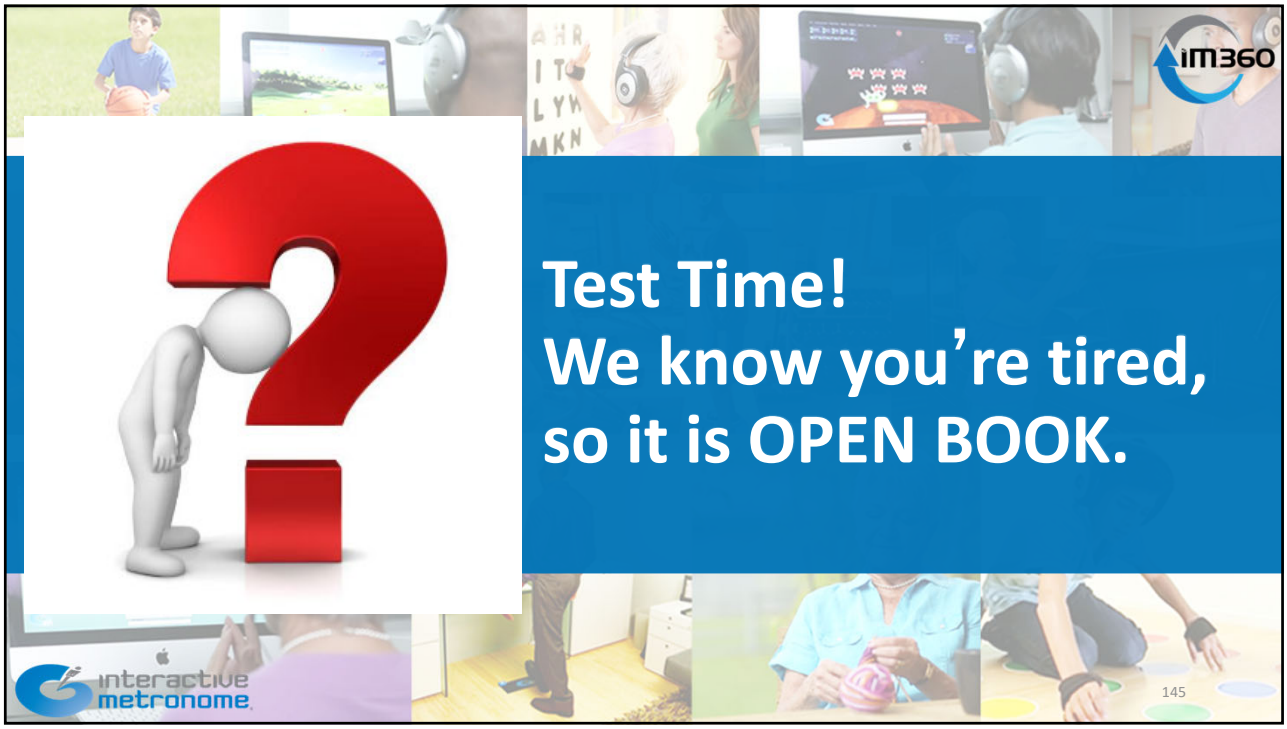

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1. Which of the following are allowed during the Long Form Assessment (LFA)?

a. your client is allowed to view the computer screen during the LFA if hearing impaired
b. the provider may provide cues during the LFA
c. your client may be seated during the LFA if unable to stand
d. Both A & C

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2. True or False.

It is recommended that providers assess their patients with discipline-specific assessments in addition to performing the Long Form Assessment pre & post-training.

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3. What are usually the easiest IM tasks to introduce in Phase 1 of IM Training?

a. Both Hands, Right Hand, and/or Left Hand depending upon physical capabilities
b. Bilateral Tasks: Right Hand/Left Toe and Left Hand/Right Toe
c. Both Heels, Right Heel, and/or Left Heel depending upon physical capabilities
d. Each of the 13 IM tasks should be introduced in Phase One

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4. What is the goal of Phase 2 of IM Training?

a. To begin improving rhythm and timing
b. To generalize rhythm and timing skills
c. To learn the reference tone
d. To learn the guide sounds

149

5. What IM feature should be adjusted if the metronome beat seems to be too fast for your client?

a. Tempo should be decreased
b. Volume of the guide sounds should be adjusted
c. Repetitions should be increased
d. Tempo should be increased

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6. What IM feature should be adjusted if your client is hypersensitive to sound?

a. Volume of the metronome and guide sounds should be increased
b. Volume of the metronome and guide sounds should be decreased
c. Tempo should be increased
d. Task duration should be increased

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7. What is the goal of Phase 4 of IM Training?

a. Learn the reference tone
b. Change the tempo
c. Generalize rhythm and timing skills
d. Learn the guide sounds

152

8. The very early/very late guide sounds like

a. a rubber band twang
b. a high pitch heard in both ears at the same time
c. a cowbell
d. a buzzer

153

9. At the default SRO setting, the high pitch reward guide sound is heard when your client just clapped or tapped within

a. 15 - 100 ms of the beat
b. 0-15 ms of the beat
c. 15 – 300 ms difficulty
d. 0 – 50 ms of the beat

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10. To make IM exercises easier or more challenging, the provider may adjust the following:

a. tempo
b. difficulty
c. task duration or number of repetitions
d. all of the above

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Contact Us

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Sunrise FL 33323

Dial (954) 385-4660,
then press desired option

Department and Option	
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Technical Support Education Support Hours Authorization	5
Clinical Support	6
Marketing	7
Accounting	8

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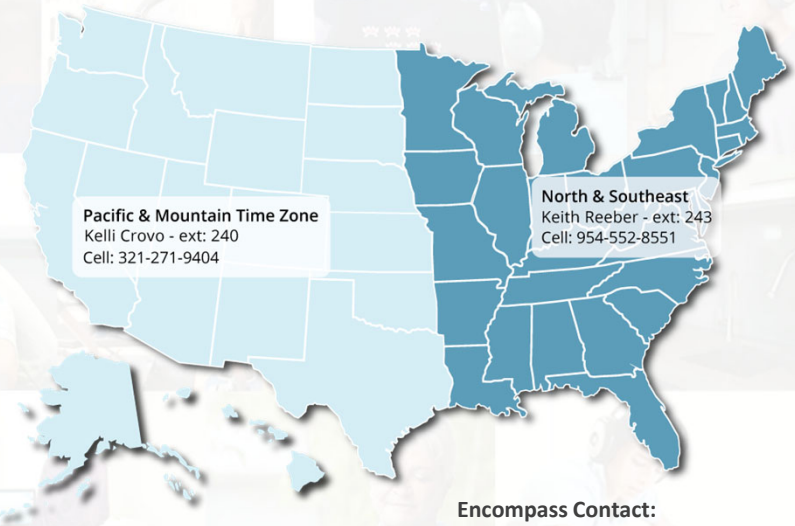

Encompass Contact:
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