

**interactive
metronome.**

**A REVOLUTION IN
DEVELOPMENTAL REHABILITATION**

INTERACTIVE METRONOME QUICK FACTS

- Offers a systematic method of improving patients' cognitive and physical deficits.
- Includes quantitative assessment tool.
- Provides measurable rehabilitation outcomes.
- Used by more than 2,500 occupational, physical, and speech therapists in over 1,700 clinics, hospitals, and universities in the US and abroad.
- Supported by published clinical research.

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INTRODUCTION

Interactive Metronome (IM) is a developmental and learning rehabilitation program used by therapists to improve:

COGNITIVE DEFICITS

Attention & Concentration
Motor Planning & Sequencing
Language Processing
Behavior (Aggression & Impulsivity)

PHYSICAL DEFICITS

Balance & Gait
Endurance
Strength
Motor Skills
Coordination

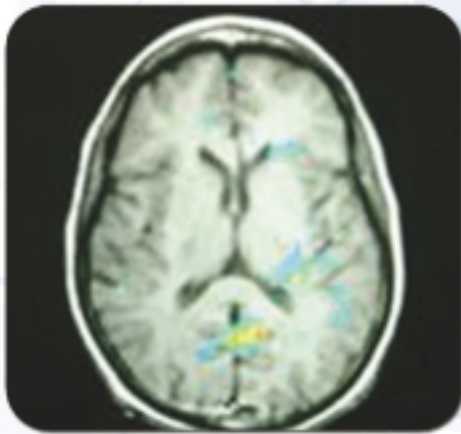
Patients who may experience positive results from IM include those with:

Sensory Integration Disorder
Asperger Syndrome
Autism Spectrum Disorder
ADD/ADHD
Cerebral Palsy



How IM WORKS

The Interactive Metronome is an advanced brain-based treatment program designed to promote and enhance brain performance and recovery. This is accomplished by using innovative neuropsychological and neuromotor exercises developed to improve the brain's inherent ability to repair or remodel itself through a process called neuroplasticity.



CLINICAL FOUNDATION

The human brain's efficiency and performance depend on the seamless transition of neuronetwork signals from one area of the brain to another. Findings in a recent study by Neal Alperin, M.D., "Functional MRI Study of the Effects of IM on Auditory-Motor Processing Networks", suggest that IM works by augmenting internal processing speed within the neuroaxis. The key regions affected appear to include the cerebellum, prefrontal cortex, cingulate gyrus and basal ganglia.

The IM program provides a structured, goal-oriented process that challenges the patient to synchronize a range of hand and foot exercises to a precise computer-generated reference tone heard through



headphones. The patient attempts to match the rhythmic beat with repetitive motor actions.

A patented audio and/or audio and visual guidance system offers immediate feedback measured in milliseconds and a score is provided.

Over the course of the treatment, patients learn to: focus and attend for longer periods of time, increase physical endurance and stamina, filter out internal and external distractions, improve their ability to monitor mental and physical actions as they are occurring, and progressively improve performance.

OCCUPATIONAL THERAPY



For many years, occupational therapists have observed the significant role that motor planning and sequencing play in helping patients become **more functionally independent in the activities of daily living (ADLs)**. 'out of sync' with the spatio-temporal aspects of their environments. They often lack the internal sense of timing that is necessary to regulate sleep as well as physical and social interactions with the world. In addition, they often have difficulty with visuospatial and constructional skills that are highly dependent on accurate perception of temporal and spatial cues..."

Clinical studies show that improving rhythmicity and timing through Interactive Metronome (IM) neurological and motor rehabilitation may result in significant improvements in cognitive and physical skills that are important for performance in many areas including:

"Clinical experience suggests that if IM is used as a technique along with sensory integration, there may be an improved ability to more fully benefit from the sensory integration approach. If IM is done when no further gains are seen with a sensory integrative approach, it is possible that IM may be effective in creating further gains."

- Motor function
- Balance
- Bilateral coordination
- Sensory integration
- Motor planning and sequencing

According to an article published in the American Journal of Occupational Therapy entitled "Theoretical and Clinical Perspectives on the Interactive Metronome - A View from Clinical Occupational Therapy Practice," "Many of the individuals [who] occupational therapists evaluate from a sensory integrative frame of reference are



"Attention, learning, and problem solving depend in part on the ability to plan and sequence actions and ideas. The Interactive Metronome ® helps individuals systematically exercise and often improve basic motor planning and sequencing capacities."

Stanley Greenspan, M.D., a noted child psychiatrist and former head of the NIMH as well as Chairman of IM's Scientific Advisory Board

"As occupational therapists, we have found the Interactive Metronome to be a very valuable tool for improving rhythmicity, timing, and sequencing in children and adults with sensory integration problems. Upon completing the IM program, our clients have noticed significant improvements in their coordination, focus, and ability to process information."

Jane Koomar, Ph.D., OTR/L, FAOTA Executive Director, Occupational Therapy Associates in Watertown, MA

PHYSICAL THERAPY

"I have found Interactive Metronome to be a useful modality to improve bilateral integration skills, sequencing, timing, ideation and to increase single limb stance time. The children displayed increased tolerance to engage in tasks which were longer in duration and more complex."

Tracy Cueli-Dutil, D.P.T.,
Miami Children's Hospital/Dan
Marino Center in Miami, FL

"By the third session we began noticing a change, Erik's balance seemed to be improving. By the fifteenth session, Erik was able to walk without his walker. We also saw improvements in his piano playing, coloring, handwriting, and attentional problems."

Thomas Eggleston, a parent of
a child with mild cerebral
palsy, fine and gross oral
motor issues, and a visual disability

Physical therapists use Interactive Metronome to assess and improve patients' motor planning and sequencing. This interactive process enhances the patient's **mobility and gross motor function**, which helps him/her become more functionally independent.

The IM program involves repeated hand, toe and heel exercises, weight shifting, and bilateral motor coordination. These exercises are performed during treatment visits and are increasingly varied and extended so that most patients are able to perform thousands of repetitions. Since the training requires a high level of concentration, it provides the patient an opportunity to maintain a level of endurance not typically reached with exercises such as walking up and down hallways.

Those with limb amputations, developmental coordination disorder

or other balance-related diagnoses are also helped by the repetition of IM exercises, which bring about progressive improvements in their motor control ability. Functional motor control gains are achieved within a short period of time.

IM neurological and motor rehabilitation helps improve patients':

- Endurance and strength
- Gait Symmetry
- Coordination
- Motor skills
- Balance



SPEECH THERAPY

Practitioners in the field of speech-language pathology recognize the role of motor planning and sequencing in the acquisition of **speech, language, communication skills, and cognition.**

IM is a unique application of technology that can improve those underlying capacities, which are essential to patients' development of speech-language and cognitive skills. Through neuroplasticity, the neuromotor exercises that make up IM tasks stimulate the brain to adapt or create new neural pathways that compensate for injury or developmental delay, which results in functional outcomes.

IM neurological and motor rehabilitation can bring about or contribute to improvements in:

- Language processing
- Social communication
- Planning and sequencing
- Attention and concentration
- Control of impulsivity and aggression



"As for the clinical usefulness of the IM, I have found the IM to be an extremely helpful intervention for motor planning and sequencing problems. It is helpful in the motor and sequencing aspects of language as well as attention and motor coordination. I strongly recommend that speech language pathologists take a closer look at motor planning and sequencing when assessing and treating communication disorders in children."

LorRainne Jones, Ph.D., CCC-SLP, Director, Kid Pro Therapy Services and author of "The Source for Expressive Language Delay" (Linguisticsystems, 2003)

I was particularly interested in IM because, like some of the other intensive modalities with which I work, IM can help to drive changes in the brain. The result is that clients can make excellent progress in short periods of time."

Aditi Silverstein, M.A., CCC-SLP, President of Center for Rehabilitation and Development, Inc. in Roanoke, VA

CASE STUDIES



ADHD & LEARNING DISABILITIES CASE RESULTS

D.C. was five years old when she was diagnosed with ADHD and severe learning disabilities. She had demonstrated poor attention and concentration and had great difficulty processing multiple instructions. At age eight, she was enrolled in IM treatment. During her first visit, her therapist reported, "She was bouncing off the walls. She got in the chair and tried standing on her head." After two weeks of IM treatment, she sat down and read her mother a book. D.C. was able to sit quietly for up to 20 minutes. "I couldn't believe this was my child," her mother stated.



SENSORY INTEGRATION DISORDER CASE RESULTS

A nine-year-old girl diagnosed with Sensory Integration Disorder, exhibited poor fine motor coordination and balance and had a history of multiple tantrums each day. She also had a D average in math. After five weeks of IM treatment, her parents reported she was riding her bicycle without training wheels for the first time. Her concentration had improved dramatically, and she earned an A and B on her next two math tests. Her parents also reported a drastic decrease in the frequency and duration of her emotional outbursts.



ASPERGER SYNDROME CASE RESULTS

An eight-year-old boy diagnosed with Asperger Syndrome was referred for Interactive Metronome treatment. This otherwise healthy patient had difficulty completing tasks, following directions, cooperating in a group environment, and often displayed tantrums. After completing therapy he demonstrated improved transitioning, greater independence, decreased frustration, and reduced tantrums (both in number and intensity).



LEG PROSTHESIS AND DCD CASE RESULTS

J.E. was born missing the portion of his right leg below the knee, with dislocated hips, and without ligaments in his left knee. Additionally he suffered from Developmental Coordination Disorder (DCD). He had severe motor deficits and poor balance and coordination. As a result, he often fell. He walked awkwardly and only with the use of his walker. At age eight, J.E. participated in IM treatment. During the early sessions J.E. showed dramatic progress with hand coordination but was easily frustrated by his balance deficit. After focusing his treatment on the use of his prosthesis, J.E. was soon shifting his weight with ease and could alternately tap his toes without holding on to anything for balance. Within a short time, J.E. could walk with ease without using any assistive devices. After IM, he began playing basketball, football, and soccer with his brothers for the first time.

RESEARCH



TIMING IN CHILD DEVELOPMENT STUDY

A correlation study of 585 children in a public school district found significant relationship between IM score and academic performance in reading, mathematics, language, science, social studies, and study skills. The researchers concluded that timing and rhythmicity play a foundational role in the cognitive processes underlying performance in these academic areas. The results were published by the High/Scope Foundation, a non-profit educational research institution.



MOTOR CONTROL STUDY

A comparison of a group of special education students who received treatment with IM to a control group found the IM group improved significantly in both motor control and motor coordination as measured by two independent tests (Bruininks-Oseretsky and SIPT Motor Accuracy).





ADHD STUDY

A double-blind, placebo-controlled study of nine to 12-year-old boys diagnosed with ADHD found those undergoing IM treatment showed significant patterns of improvement in attention, coordination, control of aggression/impulsivity, reading and language processing. This study was published in the American Journal of Occupational Therapy, March 2001.



ACADEMIC FLUENCY STUDY

More than 1,500 middle and high school students were pre-tested using form A of the Woodcock Johnson III (WJ III) standardized test. The students then completed 12 one-hour sessions of IM. Following the IM treatment sessions, the students were post-tested using form B of the WJ III. Analysis of the aggregate results showed statistically significant increases in student's grade equivalent (GE) performances in the following areas:

-  Reading Fluency increased by 2.25 (GE)
-  Math Fluency increased by 1.7 (GE)

For more information on IM-related research please visit our website at

<http://www.interactivemetronome.com>

ABOUT INTERACTIVE METRONOME, INC.



Interactive Metronome was developed in the early 1990s and immediately proved of great benefit to children diagnosed with learning and developmental disorders. Backed by years of clinical research and supported by prominent medical leaders in the industry, IM soon gained national attention as a breakthrough intervention to help those patients increase attention & concentration, motor control & coordination, language processing and control of impulsivity.

Today IM is a mainstream therapy tool used in clinics, children's hospitals and research universities to aid children born with developmental and learning deficits. IM has received widespread media attention because of the outcomes that therapists are able to achieve in such a short period of time with patients diagnosed with Sensory Integration Disorder, Asperger Syndrome, Autism Spectrum Disorder, ADD/ADHD, and Cerebral Palsy.

In recent years, innovative therapists have discovered the positive effects that IM can have on patients with acquired neurological and motor interruptions. Rehabilitation hospitals and clinics now use IM in much the same way as their learning and developmental colleagues, to care for patients diagnosed with Stroke,

Brain Injury, Balance Disorders and Parkinson's Disease.

Interactive Metronome's application is so broad because it measures and improves motor planning and sequencing, a critical part of the central nervous system. IM's Rehabilitation Technologies Division (RTD) was formed to enhance traditional approaches to rehabilitation.

Today, there are more than 2,500 certified IM providers in over 1,700 clinics, hospitals and universities throughout the United States, Canada, Europe, and Australia. Each day our community of providers continues to grow.

IM has received an abundance of media recognition including the CBS Early Show, CNN News, US News and World Report, as well as various segments that have aired on hundreds of TV affiliates, radio stations and national publications.

Practitioners in several rehabilitation disciplines may be able to obtain Continuing Education Credit for Interactive Metronome educational activities. These courses are conducted throughout the United States. It is our goal to educate therapists and contribute to the functional rehabilitation of their patients.



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