

# FINGER WEIGHTS WHITEPAPER

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Research is the key to unlocking new knowledge and advancing our understanding of our hands, fingers and wrists.

2024

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# Executive Summary

## Abstract

This white paper explores the benefits of Fingerweights, a simple device designed to enhance proprioception, kinesthetic awareness, and general hand functionality. We delve into the science behind these concepts and discuss the potential applications of Fingerweights for various populations, including athletes, musicians, rehabilitation patients, and individuals seeking to improve their hand dexterity. By understanding the principles behind Fingerweights and implementing them effectively, users can unlock the full potential of their hands and achieve improved physical performance and overall well-being.

## Introduction

The human hand is a remarkable tool, capable of intricate movements and precise interactions with the environment. However, many individuals do not fully utilize the potential of their hands due to lack of awareness and underdeveloped hand functionality. Fingerweights offer a unique solution to this problem, providing targeted exercises and resistance training to enhance proprioception, kinesthetic awareness, and hand functionality.

Proprioception refers to the body's ability to sense its position, movement, and force exertion. Kinesthetic awareness is closely related and involves the perception of body movements and positions in relation to the environment. These sensory functions are crucial for optimal motor control and coordination, and they play a vital role in hand functionality. Fingerweights leverage the principles of proprioception and kinesthetic awareness to improve hand performance.

Hand functionality encompasses a range of capabilities, including grip strength, finger dexterity, and fine motor skills. Fingerweights offer a comprehensive approach to developing these attributes by targeting specific muscles and tendons in the hand. Through regular use of Fingerweights, users can strengthen their grip, improve finger coordination, and enhance overall hand functionality.

### Current Applications of Finger Weights:

Rehabilitation Patients

Athletes

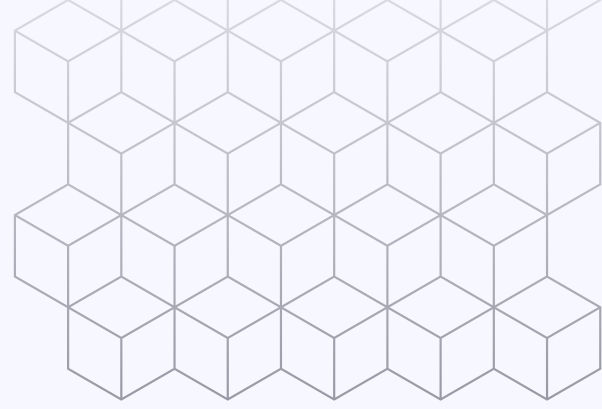
Musicians

ESports

Fingerweights offer a novel and effective approach to enhancing proprioception, kinesthetic awareness, and hand functionality. By understanding the underlying principles and implementing targeted exercises, users can unlock the full potential of their hands. Whether you are an athlete, musician, rehabilitation patient, or someone seeking to improve hand dexterity, Fingerweights can help you achieve your goals. Embrace the power of Fingerweights and unlock the true potential of your hands.

Fingerweights empower users to optimize finger and hand performance, whether for rehabilitation, musical prowess, or competition. Their versatility and effectiveness make them a valuable addition to any training regimen.

# History



## Background of Finger Weight Devices

The first known finger weight device dates back to 1804. Fast forward 200 years, when a mid-life amateur guitar player, attempting to improve his playing skills, taped coins to his fingers with electrical tape. The additional mass on his fingers produced immediate results. When presented to a nationally recognized hand surgeon, the doctor's response was, "I can only think of a billion people that could use something like this!"

This simple act of taping coins to the fingers has evolved into a series of unique products that are weight adjustable with anchoring methods that vary depending on application. Finger weights utilize the accepted principles of progressive weight training to improve performance, prevent injury, and rehabilitate.

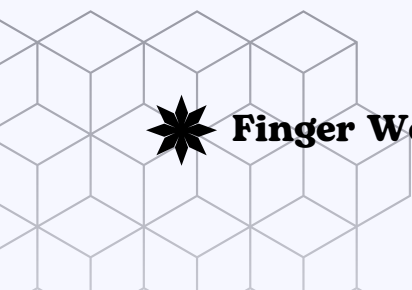
Under the guidance of a healthcare professional, FingerWeights can be part of a therapeutic program to treat a number of disorders of the hands and fingers and as part of a post-surgical rehab program. People with stroke, carpal tunnel syndrome, arthritis, Parkinson's Disease, and other medical conditions affecting finger strength, coordination, and proprioception can benefit from FingerWeights.

Along with the more obvious health and wellness aspects, musicians, athletes, and gamers, looking for that edge, will also benefit from utilizing FingerWeights to increase endurance, flexibility, dexterity, precision, gentle range of motion, and overall strength.

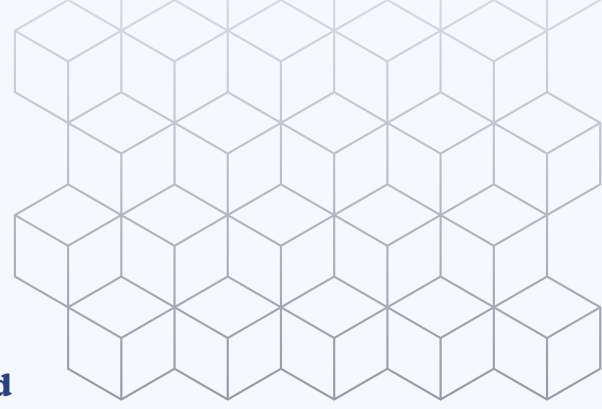
FingerWeights have come a long way since their humble beginnings with coins and tape. These innovative simple devices have been specifically designed to cater to a wide range of individuals seeking to improve their hand and finger strength. By utilizing the principles of progressive weight training, FingerWeights offer a versatile solution for enhancing performance, preventing injuries, and aiding in rehabilitation.

Whether you are recovering from a hand-related medical condition such as stroke, carpal tunnel syndrome, arthritis, Parkinson's Disease, or are simply looking to boost your finger strength and coordination, FingerWeights can be a valuable addition to your therapeutic program. These devices can play a crucial role in your recovery process.

Moreover, musicians, athletes, and gamers striving for excellence in their respective fields can also benefit from incorporating FingerWeights into their training routines. By using FingerWeights, individuals can enhance their endurance, flexibility, dexterity, precision, gentle range of motion, and overall hand strength, giving them that extra edge they need to excel in their endeavors.



# Background



## **Extrinsic Extensor and Flexor Muscles of the Hand**

A brief anatomical course about the extrinsic extensor and flexor muscles of the hand is below:

The extrinsic extensor muscles are located in the back of the forearm and have long tendons connecting them to bones in the hand, where they exert their action. Extrinsic denotes their location outside the hand. Extensor denotes their action which is to extend, or open flat, joints in the hand.

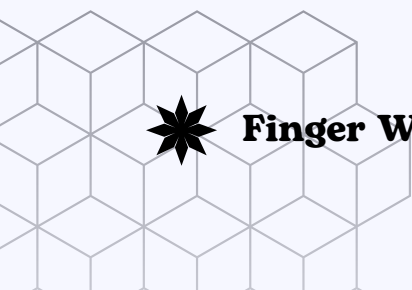
Situated in the anterior part of the forearm, the extrinsic flexor muscles possess elongated tendons that extend to the hand's bones, enabling them to exert force for gripping. These muscles are integral to hand functions such as grasping, holding, and gripping objects. Collaborating with the hand's intrinsic muscles, they contribute to the fine motor skills and precise movements necessary for diverse tasks. Their contraction facilitates flexion, enabling intricate finger and hand movements. The seamless coordination between these muscles enables us to effortlessly execute daily activities.

The most important are:

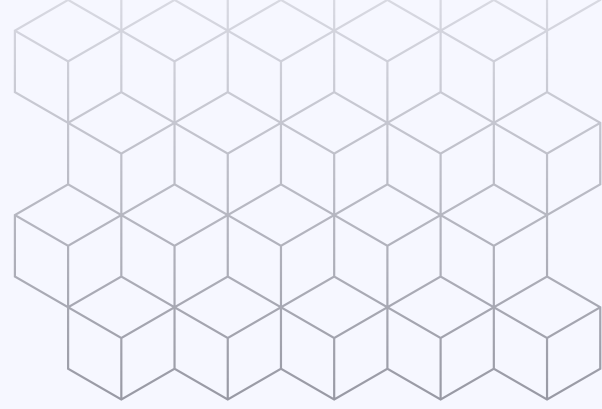
- Extensor carpi radialis longus: extends, abducts wrist
- Extensor carpi radialis brevis: extends, abducts wrist
- Extensor digitorum: extends fingers, wrist
- Extensor digiti minimi: extends little finger at all joints
- Extensor carpi ulnaris: extends, adducts wrist
- Abductor pollicis longus: abducts, extends thumb
- Extensor pollicis brevis: extends thumb at Metacarpophalangeal (MCP) joint
- Extensor pollicis longus: extends thumb at MCP and interphalangeal (IP) joint
- Extensor indicis: extends index finger, wrist
- Flexor carpal radialis muscle
- Flexor carpal ulnaris muscle
- Flexor digitorum profundus muscle
- Flexor digitorum superficialis muscle
- Flexor pollicis longus muscle
- Palmaris longus muscle

All these extensor and flexor muscles will contribute to flexion of the hand, wrist, and fingers.

The term “structural balance” describes an optimal interaction of muscles involved in movement in general or while performing a specific task (like grasping, pulling, pushing etc.)



# Problem



## Problem

Hand injuries are often perceived as minor, but if left untreated, these seemingly insignificant injuries can result in the loss of hand and finger function. Occupational Therapists worldwide emphasize the prevalence of traumatic injuries like falls, cuts, and workplace accidents. Repetitive stress injuries can also arise from overusing the hands, leading to reduced performance and various health issues.

To maintain optimal hand health and prevent long-term consequences, it's essential to prioritize hand health and take preventive measures. Recognizing the importance of hand injuries and repetitive stress allows individuals to address discomfort and strain proactively.

Conditions such as carpal tunnel syndrome, tendonitis, and arthritis can develop over time, impacting daily activities and work efficiency. Incorporating breaks, stretching exercises, and strength training can prevent long-term damage and promote hand health. Simple exercises and ergonomic adjustments can prevent strain and enhance overall performance, highlighting the significance of caring for our hands. While conditions like Carpal Tunnel Syndrome and Arthritis may not have definitive cures, exploring various products and therapies, such as physical therapy and specialized tools, can help manage symptoms and enhance quality of life. Being proactive about hand health enables individuals to engage in activities comfortably and efficiently for years to come.

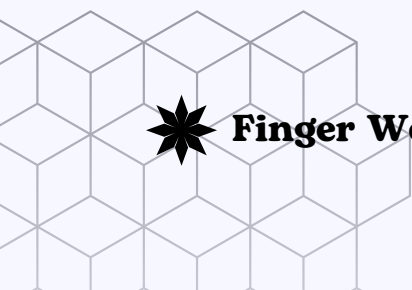
Competition continues to push the bounds forward of what is possible for sports, and as we know, humans are known for pushing the heights higher in competition. The hand is at the center of the majority of sports and most human activities.

Whether it's gripping a tennis racket, throwing a basketball, or even typing on a keyboard, our hands play a crucial role in our daily lives and activities. Athletes and sports enthusiasts understand the importance of hand health in maximizing their performance and preventing injuries.

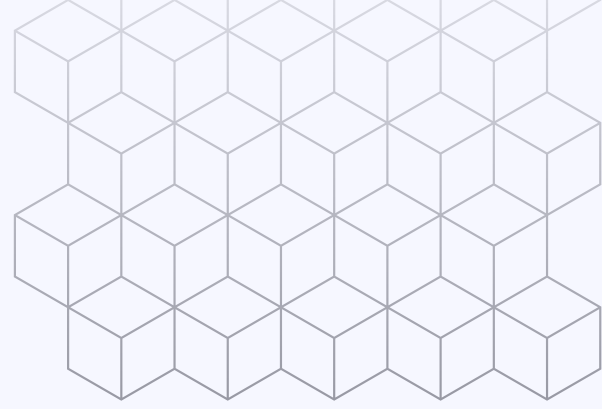
Proper hand care involves not only physical exercise but also mental focus and relaxation techniques. Athletes often incorporate hand massages, grip strength exercises, and hand-eye coordination drills into their training routines to enhance their skills and prevent overuse injuries.

In addition to athletes, musicians, artists, and individuals in various professions rely heavily on their hands for their craft. It's essential for everyone to prioritize hand health through proper warm-ups, cooldowns, and regular breaks to avoid strain and maintain dexterity.

By embracing a holistic approach to hand health that includes physical conditioning, mental awareness, and rest, individuals can ensure longevity and optimal performance in their chosen activities. Remember, our hands are our tools for interaction with the world, so let's take care of them to continue reaching new heights in our pursuits.



# Problem Cont.

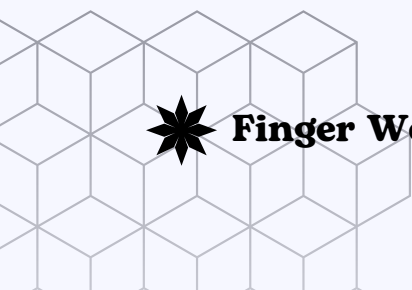


## Different Kinds of Hand Injury:

Although there are many different “types” of hand injuries, often times they will share the same symptoms, such as pain, loss of mobility, bruising and/or swelling. Some of those hand injuries include, but aren’t limited to...

- Tendonitis
- Fractures (Whether repetitive, or due to Sports / Rigorous Movement)
- Tendon & Nerve Injuries
- Sprains (Whether repetitive, or due to Sports / Rigorous Movement)
- Carpal Tunnel Syndrome (Symptoms)
- Arthritis (Symptoms)

Regardless of how the hand or finger injury occurs, either through playing sports, repetitive motion (Gaming, Typing), or a different activity all together, a painful hand injury requires treatment as quickly as possible to help prevent long-term effects and damage.



# Solution

## Mission and Vision

Globally improving hand, health & performance...one finger at a time.

Whether trying to prevent or rehabilitate a finger / hand injury, or looking to improve overall finger / hand performance, FingerWeights are a cross functional training device. Through the incorporation of adjustable resistance settings unique to each finger, FingerWeights target the fine motor muscles in the fingers / hands, allowing each finger to operate independently while using them. That further separates FingerWeights from other products is that they are the only device that can be both worn while practicing the chosen activity, or as a "stand alone" training tool. The primary objective is to help maximize finger - endurance, flexibility (range of motion), dexterity, finesse, overall strength and precision. With applications in music, athletics, gaming, and health/wellness, FingerWeights belong on the fingers of amateurs, professionals, and everyone in-between.

## Benefits

To maximize the benefits of Fingerweights, users should follow a systematic and progressive training program. This program should include exercises that target different hand muscles and incorporate various resistance levels. By gradually increasing the difficulty of exercises, users can continuously challenge their hand functionality and achieve long-term improvements.

Benefits of Exercise:

- Maintain Joint Flexibility
- Strengthen Muscles Surrounding Joint
- Sustain Proper Range of Motion
- Prevent Bone Loss
- Increase Ability to Perform Daily Activities
- Improve Quality of Life

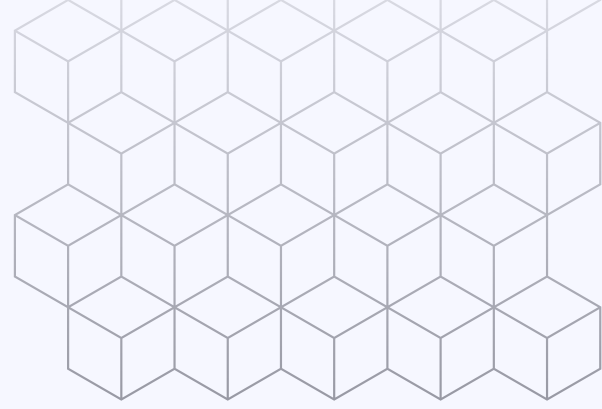
With the introduction of FingerWeights, the recommendations, and prognosis for patients with hand and finger conditions has improved dramatically. Patients can start a structured exercise program for their fingers, which they can use at home, work, or during physical therapy. Therapists can incorporate these into any treatment plan targeting the fingers and hands. Providing patients with an effective, uncomplicated and non-strenuous exercise program, FingerWeights can be used anywhere, any time. Not only do patients see an increase in endurance and flexibility, the hands feel stronger as the patient moves through the exercises. The added strength, and overall finger, and hand, performance, can help in activities like grooming, cooking, cleaning, or even something as simple as typing an email.

Although FingerWeights are not a "cure," they can help keep the fingers and hands, strong and flexible, allowing patients to continue being as independent as possible.

\*\*As with any exercise regimen, please stop using the Fingerweights at the first sign of fatigue, and for any customers with pre-existing conditions, please consult your medical professional prior to first use.



# Solution cont.



## Purpose and Functionality

Let's delve into the fascinating world of FingerWeights. These innovative devices are designed to enhance finger and hand performance for everyone, making them ideal for a wide range of users, including musicians, athletes, and gamers. Here's a concise technical assessment to help convey benefits:

- FingerWeights apply the principles of progressive resistance training to improve various aspects of finger and hand function:
  - Range of Motion: Gentle resistance aids in increasing flexibility and dexterity.
  - Endurance: Users can enhance finger stamina over time.
  - Precision: Improved control and accuracy.
  - Strength: Gradual resistance helps build overall finger and hand strength

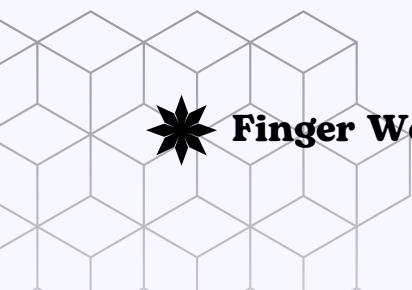
Fingerweights are a fantastic tool for individuals seeking to enhance their hand strength, dexterity, and overall performance. By incorporating fingerweights into your routine, you can target and strengthen the specific muscles in your hands, fingers, and wrists that are essential for various activities. Whether you are an athlete looking to gain a competitive advantage or someone aiming to improve their everyday dexterity, fingerweights can help you expand your capabilities and reach new levels of hand functionality. Remember, consistent practice and proper technique are key to maximizing the benefits of fingerweights and unlocking your full potential.

## Features and Users

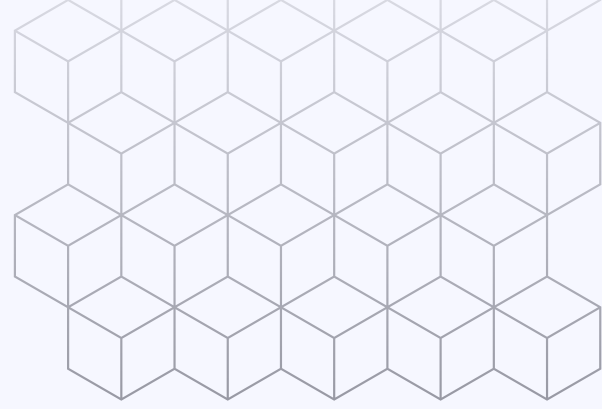
- Proprioceptive and Kinesthetic Input: FingerWeights provide sensory feedback, enhancing awareness of finger movement.
- Wearable During Activities: Users can wear FingerWeights during their chosen activities or as standalone training devices.
- Customizable Options: Available in 1, 2, 5-Set and 10-Set configurations.

People looking for an edge of competition or just looking to improve their overall dexterity find Fingerweights as a solution to ever expanding their reach and grasp of what's possible with their hands.

Fingerweights are a fantastic tool for individuals seeking to enhance their hand strength, dexterity, and overall performance. By incorporating fingerweights into your routine, you can target and strengthen the specific muscles in your hands, fingers, and wrists that are essential for various activities. Whether you are an athlete looking to gain a competitive advantage or someone aiming to improve their everyday dexterity, fingerweights can help you expand your capabilities and reach new levels of hand functionality. Remember, consistent practice and proper technique are key to maximizing the benefits of fingerweights and unlocking your full potential.



# Stretches



## Thumb Stretch:

- Start with hands and fingers relaxed.
- Touch thumbs to the base of the palm (near the pinky finger).
- Open hands to full range of motion (splay fingers and extend thumb).
- Touch thumb to pinky fingertip, splay and extend.
- Perform 10 repetitions and repeat the sequence 3 times.

Thumb stretches are a fantastic way to improve the flexibility and strength of your thumbs. Not only do they help prevent injuries, but they can also increase hand dexterity. As you perform this exercise, focus on the smooth movement of your thumb and fingers. Remember to breathe deeply and maintain a relaxed posture throughout. With consistent practice, you'll notice an improvement in your thumb mobility and overall hand coordination. Keep up the great work!

## Finger Stretch:

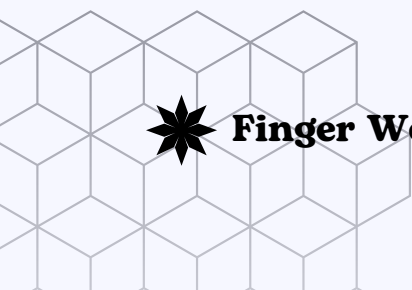
- Start with your hand relaxed and fingers slightly apart.
- Slowly and gently extend your fingers as far apart as comfortable.
- Hold the stretch for 10-15 seconds, feeling a gentle pull in your fingers.
- Relax and then repeat the stretch with the other hand.
- Perform 3-5 repetitions on each hand.

Finger stretches are a wonderful way to increase the flexibility and mobility of your fingers. These stretches can help alleviate stiffness and improve circulation in your hands. Remember to listen to your body and not push yourself too hard - the key is to stretch gently and gradually. Incorporating finger stretches into your daily routine can help keep your hands healthy and agile. Enjoy the benefits of improved finger flexibility and dexterity as you practice these stretches regularly. Keep up the great work on your hand exercises!

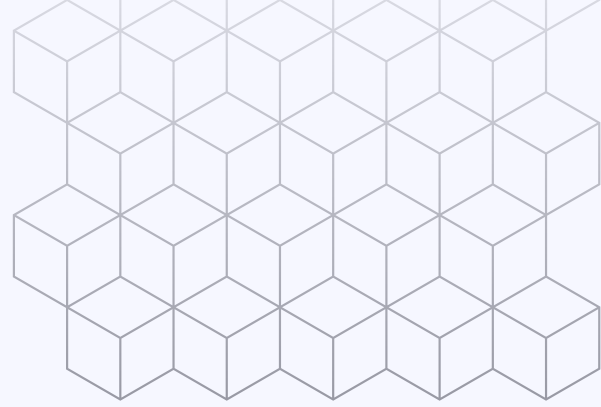
## Extensor Stretch:

- Begin by extending one arm in front of you at shoulder height, palm facing down.
- Use your other hand to gently press the fingers of your extended hand towards the floor.
- Feel a gentle stretch along the top of your forearm and fingers.
- Hold the stretch for 15-20 seconds, focusing on breathing deeply and relaxing into the stretch.
- Release and switch to the other arm, repeating the stretch on both sides 3-5 times.
- This stretch targets the extensor muscles in your forearms and can help alleviate tension and improve flexibility in your hands and wrists.
- Remember to maintain proper posture and avoid any pain during the stretch.
- Incorporate this extensor stretch into your hand exercise routine to enhance your hand mobility and prevent discomfort. Keep up the excellent work on caring for your hands and maintaining their strength and flexibility!

For full list of stretches and exercises please visit our exercises page on our website.



# Exercises



### FINGER MAP

### WEIGHT CONFIGURATIONS

Begin with 1 weight and the finger-weight device in Position A. Increase training level and repetitions as strength and endurance heighten.

**CHOKING HAZARD!** Keep finger weights and all components out of the reach of small children as they may present a choking hazard. We recommend keeping weights not in use in the pouch for safe storage.

**WARNING! Projectile Hazard— May Cause Serious Eye Injury.** Finger weights are not to be worn while playing sports or for activities requiring rapid movements of the hand, wrist, or arm. The entire finger-weight device may dislodge from the finger and cause serious eye injury.

Adult Supervision Recommended for Children Under 10 Years of Age.

**WARNING: Choking Hazard** – Small parts. Not for children under 3 years.

### SIX-LEVEL TRAINING SYSTEM

Designed for use with any practice or training regimen

- For Levels 1, 2, and 3 place ring in Position A. Increase one level every 4 weeks.
- For Levels 4, 5, and 6 place ring in Position B. Increase one level every 4 weeks.

LEVEL	DEVICE POSITION	WEIGHT CONFIG.	LEVEL DESCRIPTION
Level 1			Position A / 1 weight
Level 2			Position A / 2 weights
Level 3			Position A / 3 weights
Level 4			Position B / 1 weight
Level 5			Position B / 2 weights
Level 6			Position B / 3 weights

- After completing Level 6, decrease one level every 4 weeks.
- Repeat entire cycle

### HAND EXERCISE PROGRAM

Use Six-Level Training System in conjunction with this program

#### I. Wrist Curl

- Start with fingers relaxed
- Curl hands upward to full range of motion
- Hold for 3 seconds

- Reverse and curl downward
- Hold for 3 seconds
- Repeat 10 - 15 times

### 2. Fist To Claw

- Start with clenched fists
- Hold for 3 seconds
- Roll fingers to claw
- Hold for 3 seconds
- Return to fist
- Repeat 10 - 15 times

### 3. Roof Top

- Start with fingers at a 90° angle to hand
- Touch fingers to palms - hold for 3 seconds
- Return fingers to 90°
- Repeat 10 - 15 times

### 4. Finger Lift

- Start with hands on a flat surface fingers spaced evenly
- Lift each finger 5 - 10 times
- Reverse direction and repeat

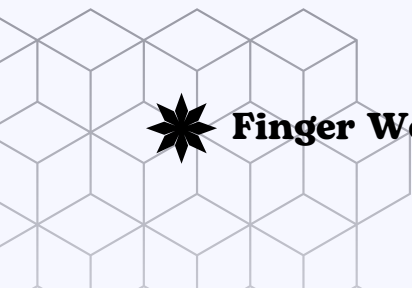
### 5. Finger Walk

- Start with hands on a flat surface fingers together
- Beginning with the thumb, walk each finger inward
- Reverse direction and walk outward
- Repeat sequence 5 - 10 times

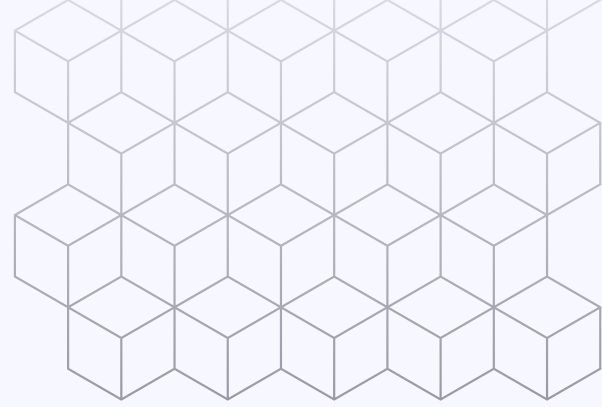
### 6. Finger Circle

- Start with hands on a flat surface fingers spaced evenly
- Beginning with little fingers, lift and circle inward 5 - 10 times
- Reverse direction and circle outward 5 - 10 times

For a full list of stretches and exercises please visit our exercises page on our website.



# Case Study



## Case Study Summary

### Executive Summary:

Within the realm of school occupational therapy practice, the focus was on a particular child facing challenges related to poor body awareness and proprioceptive input. The objective centered on improving the child's keyboarding skills through the utilization of FingerWeights.

### Introduction:

The study involved a child tasked with enhancing their body awareness and proprioceptive input. The child was instructed to incorporate FingerWeights into their daily routine and engage in regular activities at home to assess any discernible outcomes. Throughout the trial, the child provided feedback to their occupational therapist regarding their experiences and any discomforts encountered.

### Discussion:

The case study sought to address the challenges of poor body awareness and proprioceptive input. The primary goal was to ascertain whether utilizing FingerWeights could yield positive results and aid in improving the child's body awareness and proprioceptive input. The child's feedback indicated several benefits despite the meticulous reporting process.

### Findings:

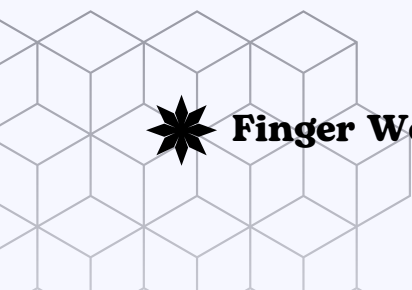
The child expressed increased confidence following the consistent use of FingerWeights, integrating them into various aspects of their daily life. The activities during the trial primarily focused on different categories and applications of FingerWeights.

### Conclusion:

Through a structured regimen encompassing daily FingerWeights usage and targeted exercises for the fingers, hands, and wrists, the child exhibited positive responses to the treatment. The child's enhanced confidence and willingness to continue incorporating FingerWeights into their routine underscored its efficacy in improving body awareness and proprioceptive input.

### References:

Tanya Feddern-Bekcan, MLIS, MOT, OTR/L, Dementia Capable Care Therapist  
Contact: tfeddern@gmail.com  
Occupational Therapist and Medical Librarian



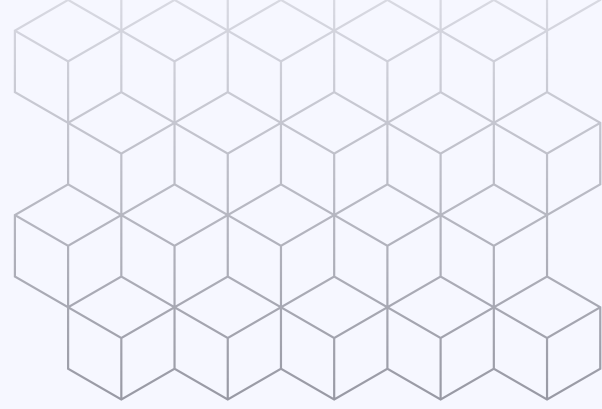
# Case Study Cont.

## Recommendations

To optimize the effectiveness of FingerWeights, consider the following suggestions:

- Experiment with alternating FingerWeights on different fingers to assess comfort levels.
- Position FingerWeights closer to the base of the fingers rather than the tips.
- During keyboarding tasks, try utilizing FingerWeights on specific pairs of fingers, such as 2 and 4, or 3 and 5.
- Incorporate FingerWeights into activities involving retrieving small objects from resistant materials, like dried pinto beans, to enhance tactile perception.
- Strengthen finger dexterity and grasp through activities such as popping bubble wrap with FingerWeights.
- Engage in organizing tasks like sorting items in a junk drawer or assembling flashlights with D-cell batteries using FingerWeights for skill development.
- Utilize foreign coins for sorting exercises, enhancing in-hand manipulation skills.
- Play games like Connect Four and work on school-related tasks like sorting letter tiles while wearing FingerWeights to promote skill development.
- Incorporate FingerWeights into everyday tasks like writing, typing, or playing musical instruments to strengthen finger muscles.
- Practice finger exercises with FingerWeights to improve hand coordination and agility.
- Use FingerWeights during activities that require fine motor skills, such as threading a needle or buttoning a shirt, to boost finger strength and control.
- Explore creative ways to incorporate FingerWeights into arts and crafts projects for a fun and engaging workout for your fingers.
- Consider consulting with a hand therapist or occupational therapist for personalized guidance on how to maximize the benefits of FingerWeights for your specific hand and finger needs.
- By incorporating these suggestions into your routine, you can make the most out of using FingerWeights to improve your finger strength, dexterity, and overall hand function.

# Conclusion



FingerWeights offer a distinctive approach by engaging both the extensor and flexor muscles in the fingers, hands and wrists through the fundamental principles of resistance training.

Irrespective of whether you are a physician, occupational therapist, rheumatologist, or a patient, FingerWeights not only prove beneficial but also establish themselves as a lasting innovation. The family of simple FingerWeight devices serve as resistance training tools for enhancing finger, hand and wrist strength. Each ring can be adjusted by adding or removing individual resistance rods (three per ring). What sets them apart is their dual-action mechanism targeting fine motor muscles, making them suitable for activities including warm-ups and practice sessions. Endorsed by medical professionals, FingerWeights hold a unique position as the sole product dedicated to finger and hand health, prioritizing muscle health over sheer strength.

## **Rehabilitation of the Fingers & Hands: A Pathway to Recovery**

Following treatments like splints, braces, casts, or surgeries for the fingers and hands, a crucial phase of therapy and rehabilitation typically ensues. While the guidance of an occupational therapist is advised, it is not mandatory. Rehabilitation of the hands and fingers aims to restore range of motion, prevent joint and tendon stiffness, and bolster muscle strength. Various procedures involved in this process include:

- **\*\*Mobilization Exercises\*\***: Incorporating FingerWeights during finger rotations to engage and strengthen the muscles.
- **\*\*Strengthening Exercises\*\***: Using FingerWeights in tandem with existing strengthening routines.
- **\*\*Heat Therapy\*\***: Post-rehab sessions, applying heat to relax muscles and enhance blood circulation for improved recovery.
- **\*\*Hand Therapy Balls\*\***: Utilized frequently to boost grip strength and dexterity during hand rehabilitation.
- **\*\*Scar Massage Techniques\*\***: Employed to stimulate healing and deter adhesions in healing tissues.
- **\*\*Fine Motor Skill Exercises\*\***: Using FingerWeights such as manipulating small objects or buttons to enhance coordination and precision.
- **\*\*Joint Protection Techniques\*\***: Educating patients on safeguarding joints to prevent further injury and ensure sustained hand health.

