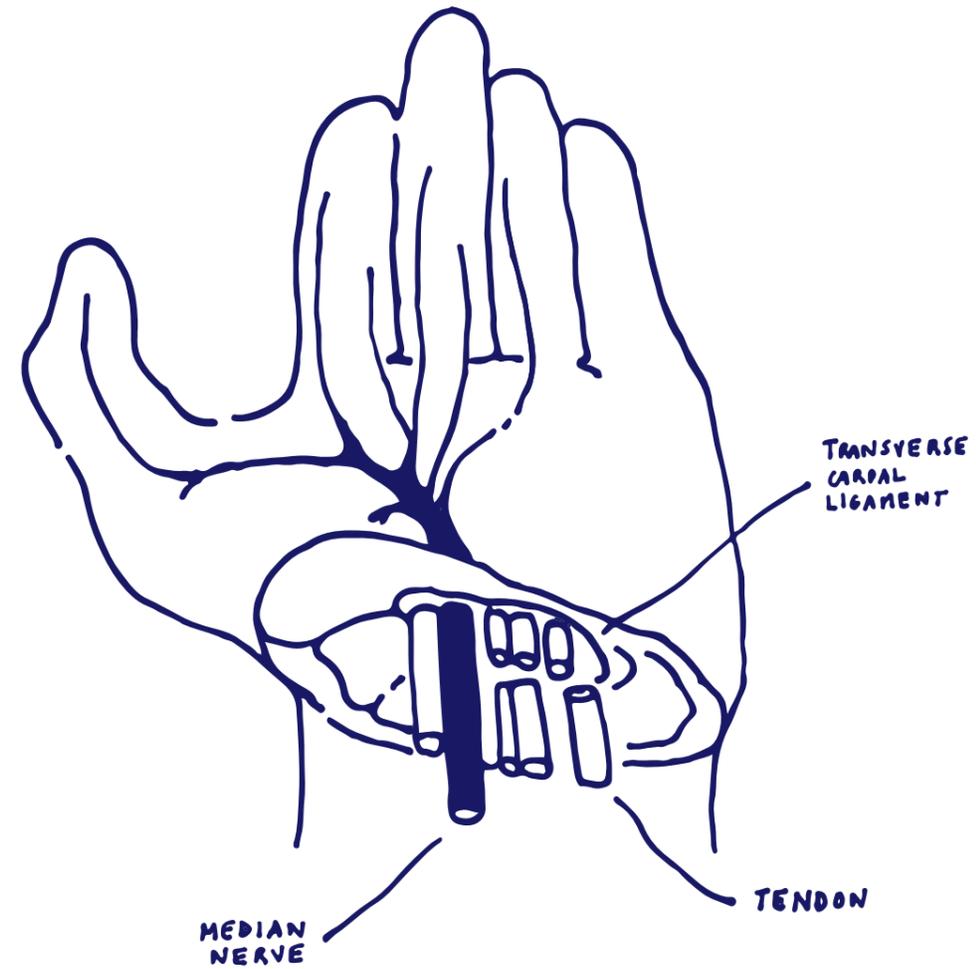


# DIPOLO

# 3-6% of the adult population suffers from Carpal Tunnel Syndrome

Carpal tunnel syndrome is often caused by repetitive motion of the wrist tendons. The disorder mainly affects people in the manufacturing industry and those who spend long hours in front of the screen. If left untreated, in the worst cases it can lead to loss of hand sensitivity.



## research

During the course of the research, several interviews were conducted with specialists from the medical and engineering fields to understand the key points of the project. The project was carried out in cooperation with COMPEX, a leading company in the field of electrostimulation for physical exercise. Below are some key points from the interviews conducted and the discoveries made during the research.

Interview.01  
Nicolas Fontaine - COMPEX Engineer

**“...transcutaneous  
-electrical nerve  
stimulation (TENS)  
is a noninvasive pain-  
relief technique...TENS  
machines may relieve  
pain caused by many  
conditions including  
nerve pain...”**

Interview.02  
Loana Donà - Physiotherapist

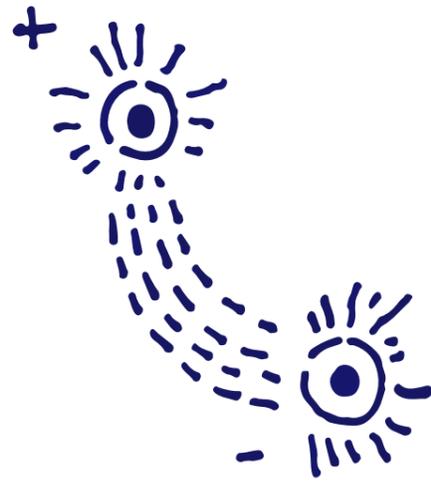
**“...electro-stimulation  
alone doesn't do  
much...the first thing  
you try to do is usually  
manipulation and give  
stretching exercises to  
the patient... to relieve  
and treat the patient  
you have to do both, it  
depends on the case...”**

Interview.03  
Anna Padovan - Physiotherapist and Personal Trainer

**“...people never feel  
like doing exercises at  
home...”**

## idea

Based on the information and insides from the specialist interviews, the idea to combine two of the treatments used to treat carpal tunnel syndrome emerged: TENS ('transcutaneous electrical stimulation') and stretching. How to do this?



ELECTRICAL  
NERVE  
STIMULATION

+



STRETCHING

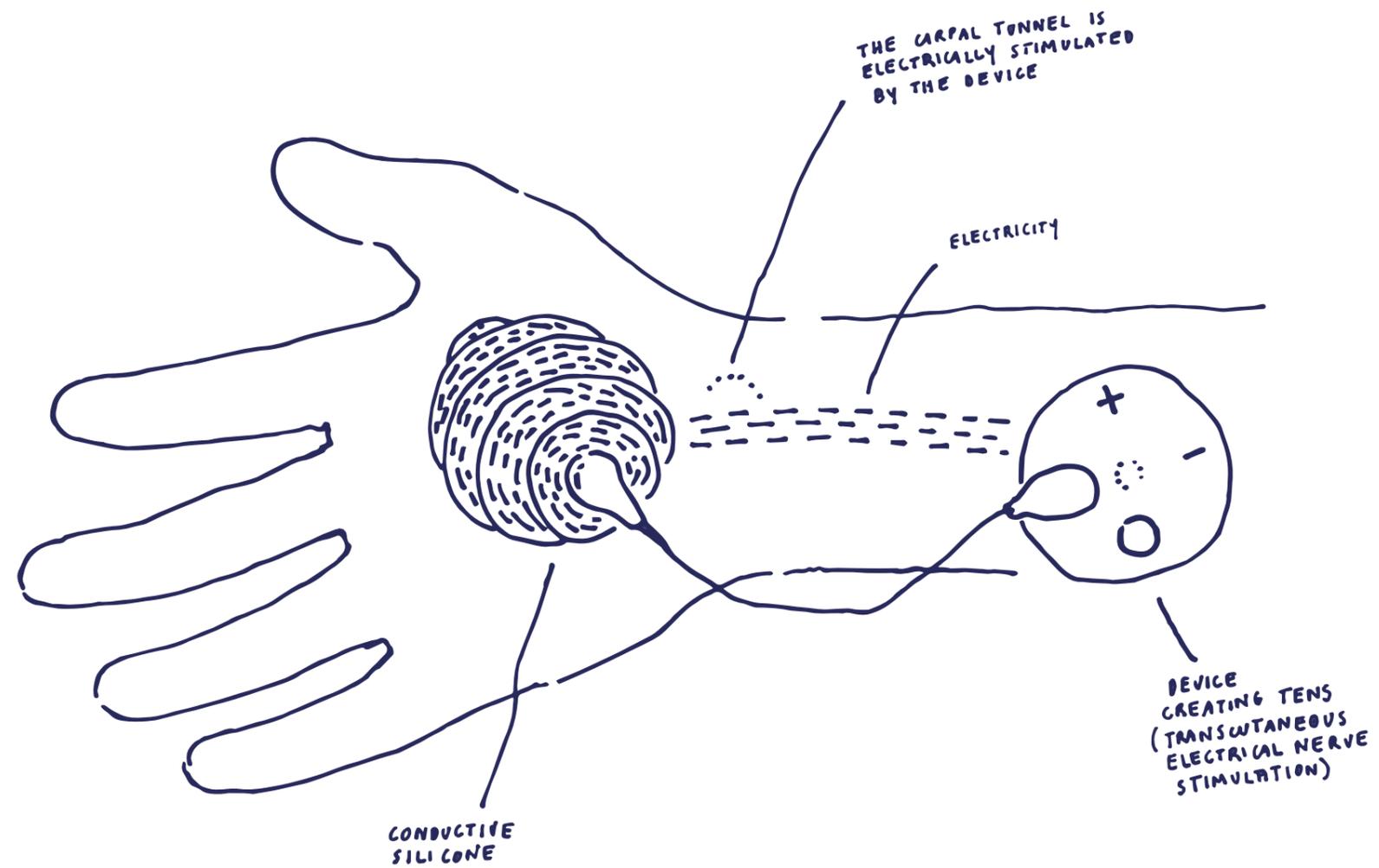
## stress ball + TENS unit

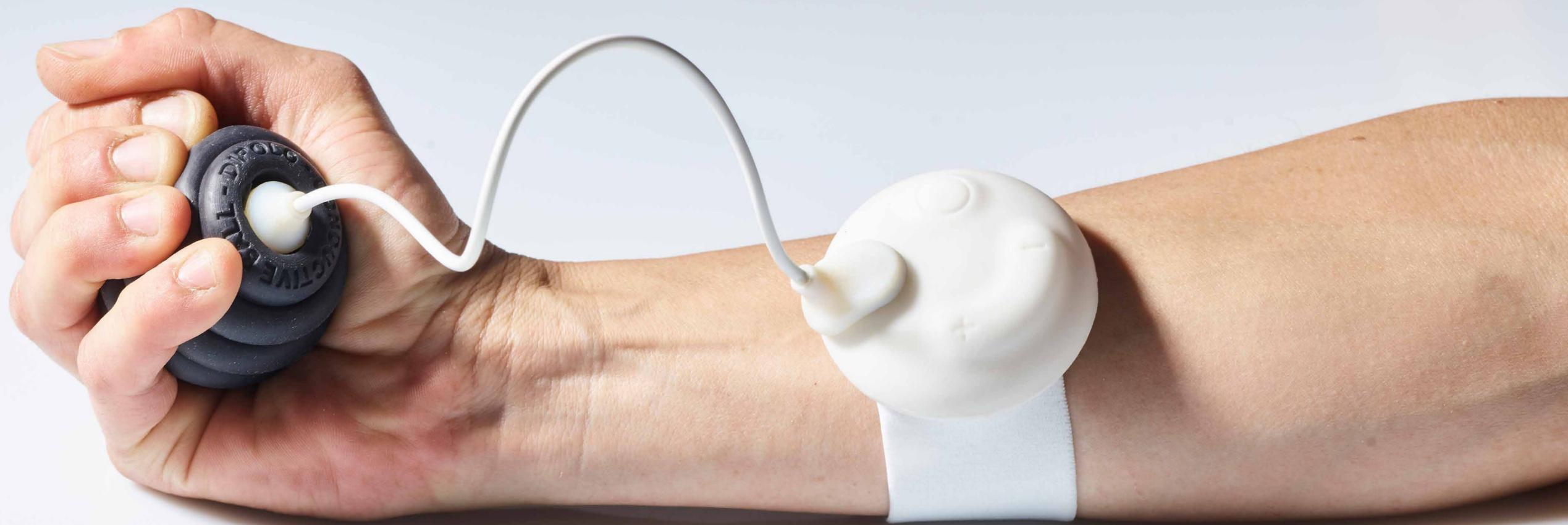
Dipolo is a device that can relieve and treat the pain caused by carpal tunnel syndrome. It consists of an electrostimulation unit strapped to the arm and a stress ball made of a conductive material.



## how does it work

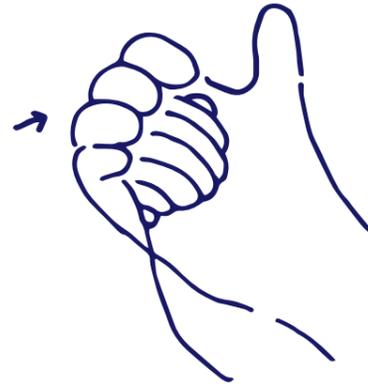
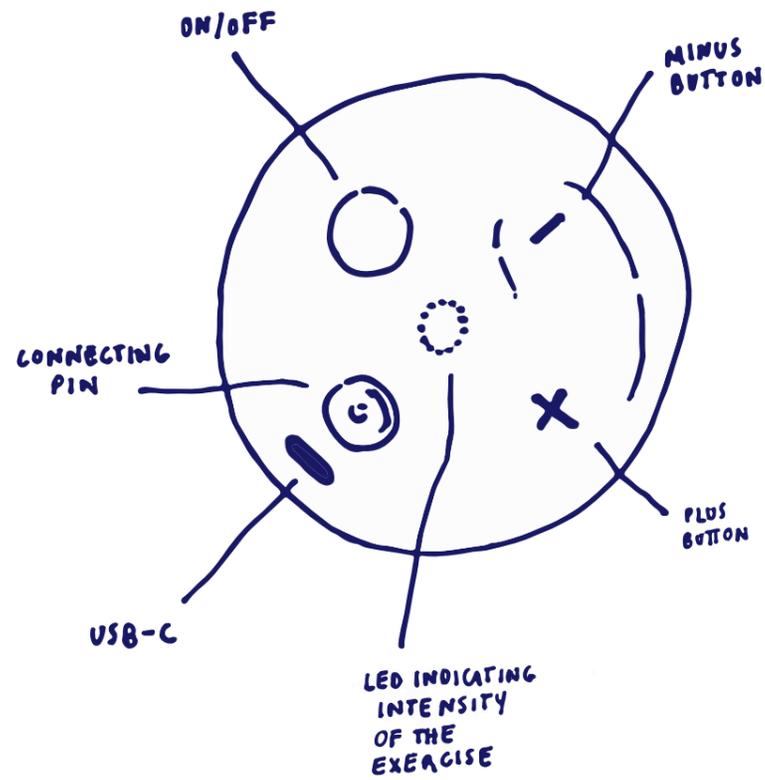
By creating an electric field between the two units, it is possible to stimulate the nerve in the wrist, relieving the user's pain. The body is used as a conductive element that receives the flow of current. The electro-conductive stress ball and the electrostimulation unit are connected together to close the circuit.





# user manual

The effectiveness of the treatment can be increased by adjusting the intensity of the electric field on the device. The user can actively contribute to the therapy through exercises that have been designed in collaboration with a physiotherapist. The shape of the stress ball is designed to be highly functional, as well as pleasant to touch and look at in order to encourage people performing the treatment.



**Ball Grip**

Grip ball in palm. Turn hand in so it faces down. Squeeze the ball in the palm. Hold and relax. Repeat.



**Finger Bend**

Place the ball in the palm of the hand with the fingers pressed into the ball. Push fingers into the ball as if you are bending your fingers. Hold and then relax. Repeat.



**Side Squeeze**

Place ball between any two fingers. Squeeze the two fingers together. Hold and relax. Repeat.



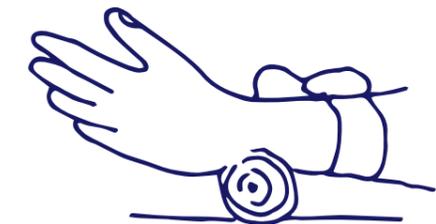
**Pinch**

Place ball between the thumb and index finger. Squeeze together. Hold and relax. Repeat.



**Opposition**

Place the ball in the palm of the hand. Keep between thumb and finger being exercised. Squeeze thumb and finger together. Hold and relax. Repeat.



**Roll**

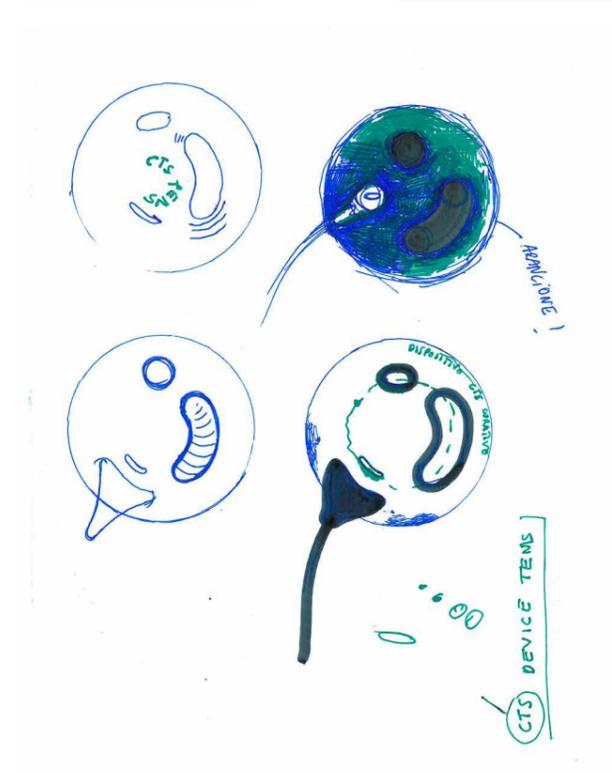
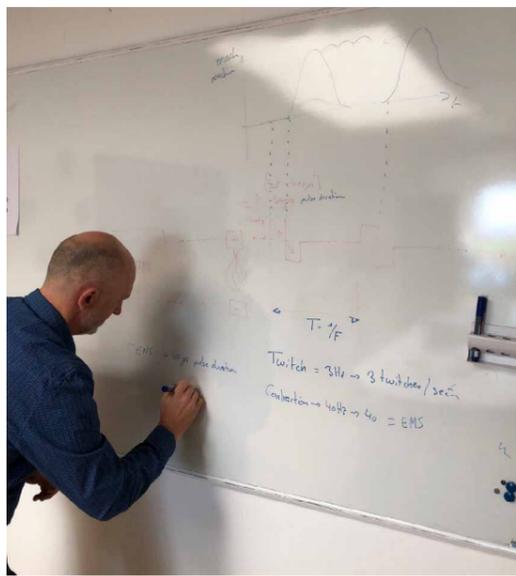
Place the ball in a flat surface. Slowly roll your arm back and forward on the ball. At the same time, gently rotate it from side to side to target different muscle groups.

## assembly and components

The parts in contact with the body can be washed and reused (exercise ball, elastic band, silicone cover for the device), unlike the adhesives currently used on the market which can only be used for 10 to 20 times and then need to be replaced. This leads to a much longer-lasting use of the product, through the use of a more eco-friendly material.



# process pictures



thanks

DIPOLO

Dipolo was developed and designed by Giacomo De Paoli as the graduation project at ECAL University of Lausanne in 2022. It was developed in collaboration with COMPEX.