BAREFOOT AND ITS ROLE IN PROPRIOCEPTION

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WHAT COMES TO MIND WHEN YOU HEAR THE WORDS **PROPRIOCEPTIVE TRAINING**?

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MUST WE ASSOCIATE
UNSTABLE SURFACES WITH
PROPRIOCEPTIVE TRAINING?

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GET READY TO **CHALLENGE** YOUR CURRENT APPROACH TO PROPRIOCEPTION TRAINING!

WHAT IS PROPRIOCEPTION?

PROPRIOCEPTION REFERS TO THE INTERNAL MESSAGING (THE NERVOUS SYSTEM) THAT DRIVES OUR MOVEMENTS – OFTEN ASSOCIATED WITH **JOINT POSITION SENSE**.

VS.

KINESTHETIC AWARENESS REFERS TO OUR ABILITY TO NAVIGATE SPACE AND THE AWARENESS OF HOW WE MOVE.

WHAT PROVIDES JOINT POSITION SENSE?

- Joint capsule
- Ligaments
- Retinaculum
- Fascia
- Myotendon junction
- Skin

All create a nervous system response.
But not all responses are the same!

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WHAT IS THE MOST IMPORTANT CONCERN WHEN IT COMES TO THE **NERVOUS SYSTEM** & MOVEMENT?

- **TIME!**

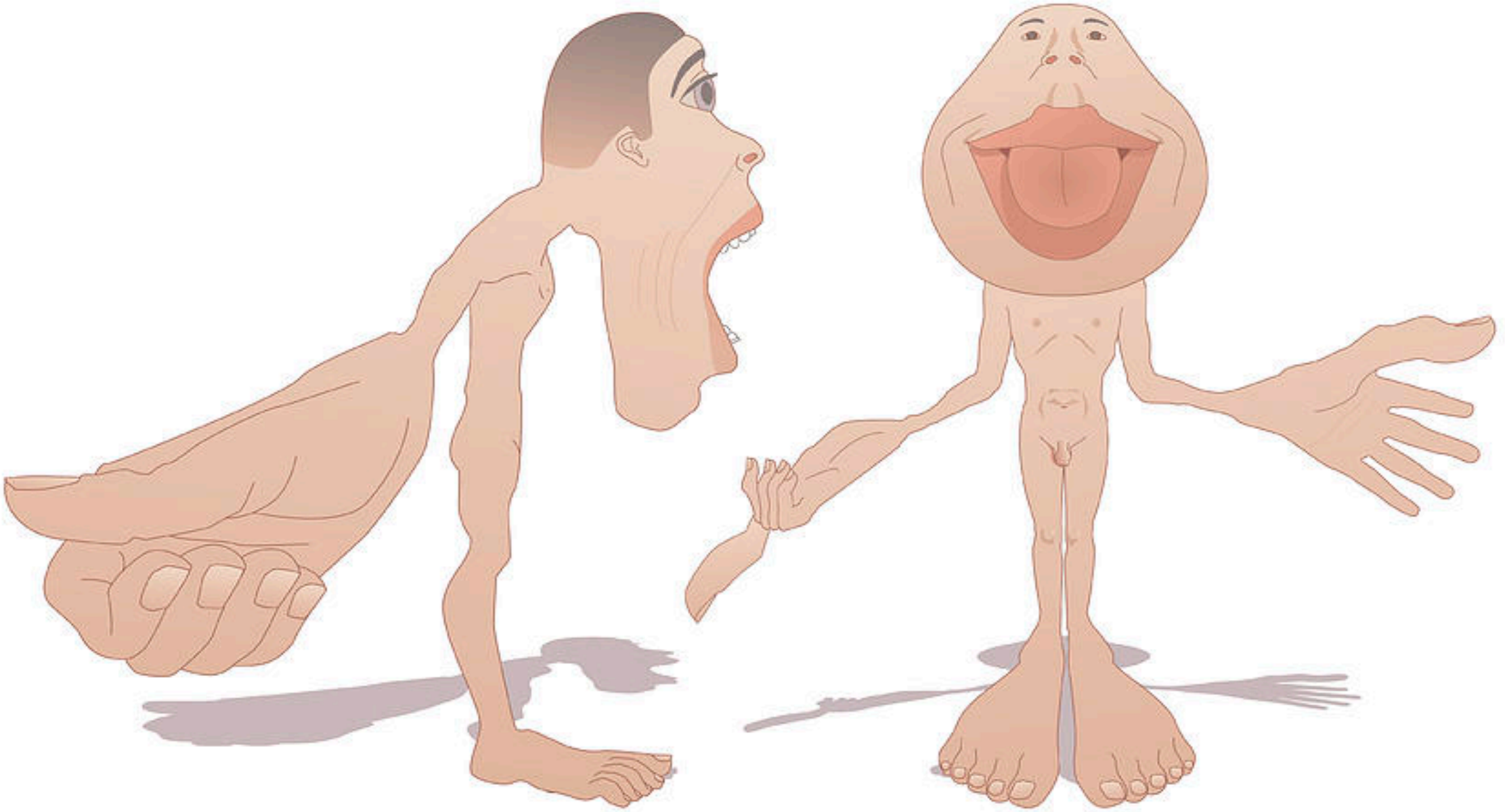
Nervous System

Sensory Nerves vs. Motor Nerves

Small Nerves vs. Large Nerves

TIBIAL NERVE BRANCHES

- 3X AS MANY **SENSORY** VS. MOTOR
- 4X AS MANY **SMALL NERVE** VS LARGE NERVE



Higher afferent input = Higher representation in the cortex

HANDS VS. FEET

- 13 different kinds of afferent fibers
- 17,000 mechanoceptors in hands
- Lower threshold of sensitivity
- Orientation nerves to acquire information
- during manipulation of object

- 13 different kinds of afferent fibers
- 104 mechanoceptors in foot
- Higher threshold of sensitivity
- 70% are rapidly adapting
- Receptor field 3x greater in foot
- Lateral border foot increased sensitivity
- Decreased distribution in the medial arch

Types of Sensory Nerves

- Nociceptors – Sharp vs. Dull
- Thermoceptors – Hot vs. Cold
- **Mechano (haptic) ceptors** – Shape, Texture, Vibration
- **Proprioceptors** - Stretch

Types of Sensory Nerves

- **Mechanoceptors (myelinated)**

  Proprioceptors (myelinated)

In fitness and rehab we focus on the myelinated mechanoceptors and proprioceptors.

Mechanoceptors (Haptic) - Touch

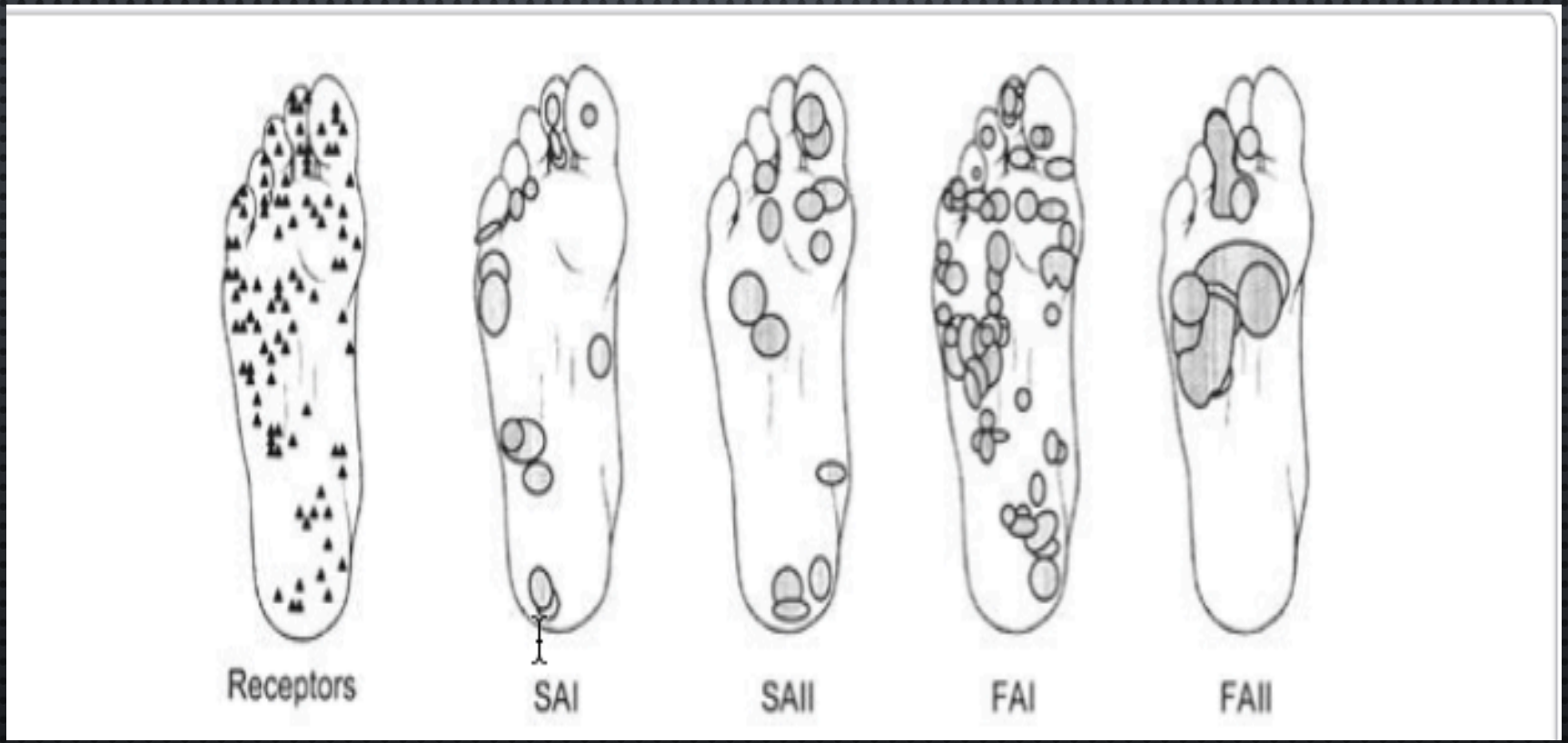
Slow Adapting: Responding throughout the stimulus

SAI (Merkel Disc) – Two point discrimination 1mm apart
SAII (Ruffini Endings) – Not found in primates – Skin stretch

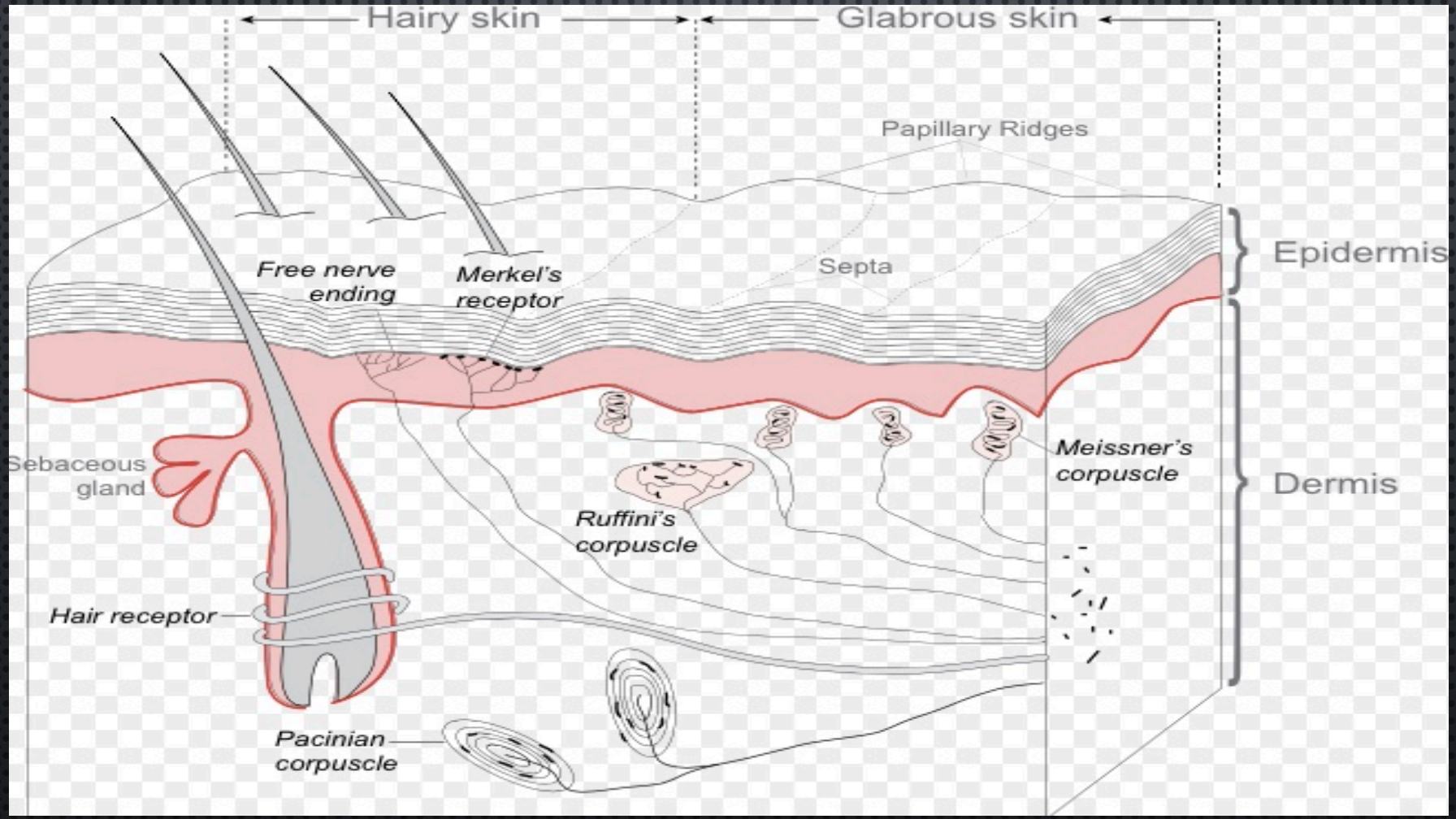
Fast Adapting: Responding at onset of stimulus

FAI (Meissner Corpuscle) – Low frequency vibration (flutter)
FAII (Pacinian Corpuscle) – High frequency vibration < 300 Hz

Receptor placement in the foot



Mechanoceptors in the foot



What is the sensory stimulation of locomotion?

VIBRATIONS

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Vibrations

1 – 1.5x our body weight in potential energy enters the body at a rate < 50ms

Why you can't rely on your reaction response

- IT TAKES 54 MSECS FOR YOUR PERONEAL MUSCLE PROPRIOCEPTORS TO DETECT THE STRETCH OF AN INVERSION ANKLE SPRAIN.
- IT TAKES ANOTHER 72 MSECS FOR THE PERONEALS TO REACTIVELY CONTRACT TO TRY AND PREVENT THE ANKLE SPRAIN.
- TOGETHER THAT'S 126 MSECS.
- IT TAKES ONLY 80 MSECS TO INVERT AND SPRAIN YOUR ANKLE.

Plantar receptors stats

- 80% of plantar receptors are sensitive to vibration.
- Plantar receptor density decreases and sensitivity threshold increases as we age.

What's the functional impact of cushion in footwear?

How do we damp vibrations?

Isometric contractions allow potential

energy to go to the fascia and tendons

How do we damp quickly?

React vs. Anticipate

- Pre-activation responses before foot contact
- Feed forward responses of cerebellum dictated

by the accuracy of previous experiences

Neuromuscular responses

Reactive vs Pre-active

Initiate Loading Response Faster

- Training the pre-activation system
- Improving proprioceptive awareness

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How do you train the (faster)

pre-active system?

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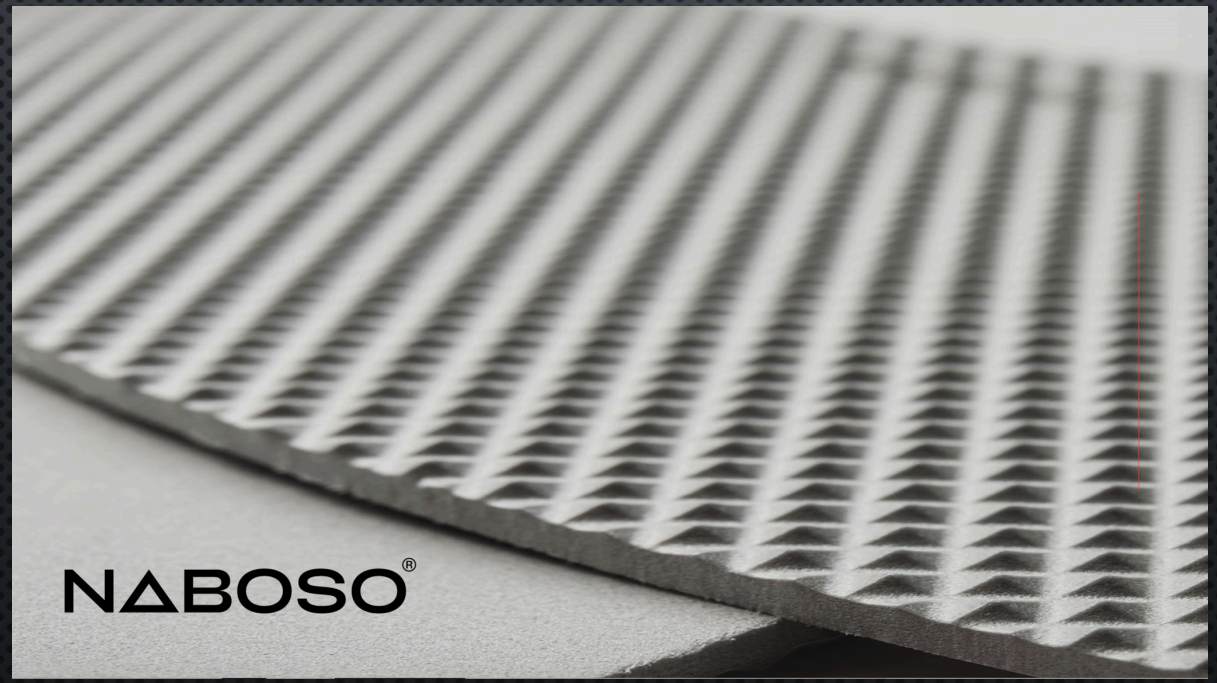
Naboso Proprioceptive Training

SAI (Merkel Disc) – Two point discrimination 1mm apart



Barefoot before shod

Small nerve

Large nerve

Intrinsic Strength & Stability

Increased intrinsic muscle strength led to

faster response time of ankle stabilizers

Let’s move

KEY POINTS ON HOW TO TRAIN PROPRIOCEPTION DURING REHAB?

- Barefoot Training
- Optimal feedback in your sensory system by using Naboso stimulation
- Intrinsic foot strength
- Training the preactivation

KEY POINTS ON HOW TO TRAIN PROPRIOCEPTION DURING REHAB?

- From the ground up
- Foot to core
- Variate in ground surface
- Add in eye movement training

UPCOMING SEMINARS IN 2022

- Barefoot Training Specialist in leuven 9-10 SEPTEMBER
- Naboso Neurosensory Certification in Antwerpen 19 NOVEMBER
- Barehand Training Specialist in Gent 25-26 NOVEMBER
- Pelvic Balance in Gent 26-27 NOVEMBER

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REACH OUT

- MORE INFO ABOUT OUR UPCOMING SEMINARS ON WWW.BAREFOOTBELGIUM.COM
- MORE INFO ON NABOSO AT WWW.NABOSO.COM
- FOR QUESTIONS, FIND ME ON **@BAREFOOT_BELGIUM**

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