



# Prospective Blinded Randomised Controlled Trial on the Long-term Effects of **Pulsed Electromagnetic Field Therapy** for **Achilles Tendinopathy**

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# Disclosures (as of Jan 2025)



**Ongoing research:** (*google scholar Aug 2024: +60 publications, citations:1826, h-index: 18*)

Achilles Tendinopathy / Hallux Valgus / Dance Medicine

## Public / Professional Service:

- President of the Hong Kong Foot and Ankle Society (HKFAS)
- President (Foot and Ankle Chapter) of the Hong Kong Orthopaedic Association (HKOA)
- Vice-President of the Hong Kong Association of Dance Medicine and Science (HKADMS)
- Honorary Secretary of the Hong Kong Association of Sports Medicine and Sports Science (HKASMSS)
- Board Member of the Asia-Pacific Knee, Arthroscopy and Sports Medicine Society (APKASS)
- Council Member of the Asian Federation of Foot and Ankle Surgeons (AFFAS)
- Commission Member (Scientific and Education Commission), Asian Federation of Sports Medicine (AFSM)
- Anti-doping Officer of the Asian Football Confederation (AFC)/Hong Kong Football Association (HKFA)
- Club Team Doctor for Kitchee Sports Club

## Academic Editorship:

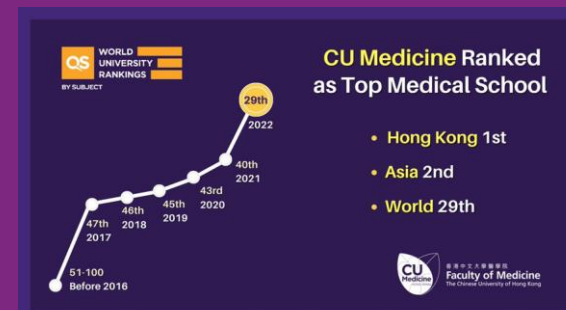
- Editor-in-Chief of Journal of Orthopaedics, Trauma and Rehabilitation (JOTR) – Official Journal of HKCOS and HKOA
- Managing Editor of the Asia-Pacific Journal of Sports Medicine, Arthroscopy, Rehabilitation and Technology (AP-SMART)
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- Editorial Board of PloS One

## External Appointments:

- Adjunct Assistant Professor, Hong Kong Polytechnic University
- Visiting Lecturer, Hong Kong Academy of Performing Arts
- Guest Lecturer, St Francis University

## Commercial:

- Smith and Nephew Consultant & Faculty / Arthrex Faculty / ReGenesis co-founder




# Dr Violet Ko



## REVISION

**OJSM/2024/068085**

**Short-Term Effects of Pulsed Electromagnetic Field Therapy for Achilles Tendinopathy. A Randomized Controlled Trial**

Violet Man-Chi Ko, Ssu-Chi Chen, Xin He, Sai-Chuen Fu, Alfredo Franco-Obregón, Patrick Shu-Hang Yung, and Samuel Ka-Kin Ling 

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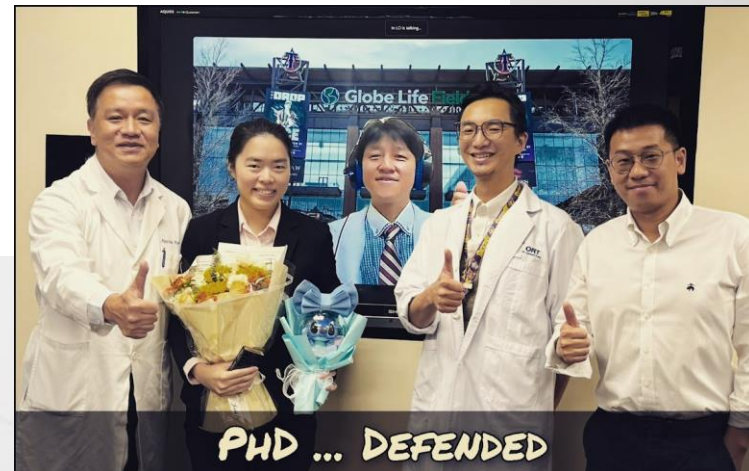
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# Achilles tendinopathy

- Important clinical problem
- Both active and sedentary individuals



# Pulsed Electro-Magnetic Field therapy

- Non-invasive
  - Influx of ions eg **Calcium**, which acts as a **messenger** in cell signaling → gene expression → protein synthesis

**Active** PEMF regimen: 1mT, 50Hz, 10 minutes

**Sham** PEMF regimen: 0mT, 0Hz, 10 minutes

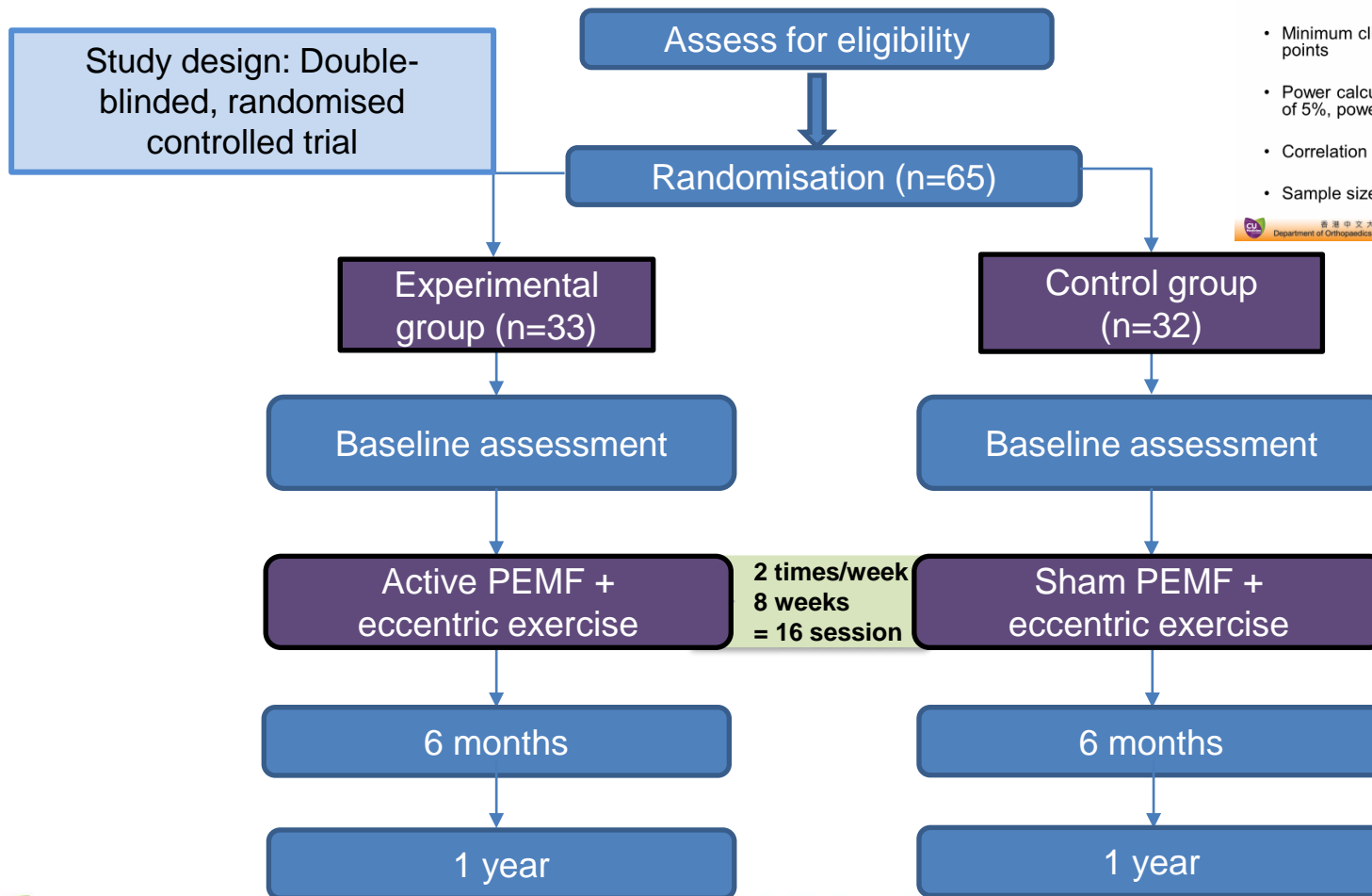
Treatment sessions: 2 times per week, 8 weeks total



## Sample size

- Minimum clinically important difference for VISA-A: 16 points
- Power calculation: G Power program at a type I error of 5%, power of 80%, 20% dropout rate
- Correlation value: 0.03; pooled SD: 20.25
- Sample size: 40 participants (we recruited n=65)

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# Eligibility criteria

## Inclusion

- Age 18 - 70
- VISA-A score <80
- Sx of Tendinopathy
  - Tenderness, thickening
- >6wk Sx duration

## Exclusion

- Surgical history / fracture on the affected lower limb in the past 3 months
- Musculoskeletal or serious conditions
- Severe cognitive impairments or neurological disorders



# Diagnosis of Achilles tendinopathy

## Clinical

- Localised tenderness
- Localised tendon thickening
- Achilles tendon pain during single-leg calf raise

## Ultrasonography

- Achilles tendon thickening >1 mm in relation to the contralateral tendon
- Color Doppler showing increase angiogenesis

(Sunding K et al., 2016)



# Participant demographics

	PEMF group	Sham group	p-value
Participants (n)	33	32	-
Gender (M/F)	20/13	13/19	0.107
Age (years)	52.3 $\pm$ 12.0	53.4 $\pm$ 12.9	0.715
Weight (kg)	67.4 $\pm$ 12.7	67.0 $\pm$ 17.8	0.917
Height (cm)	163.9 $\pm$ 8.4	164.4 $\pm$ 12.0	0.842
Type (insertion/ midportion)	20/13	20/12	0.875
Duration of symptoms (months)	20.9 $\pm$ 3.6	33.0 $\pm$ 34.0	0.089

# Carry-over effects: VISA-A

Within-group sig.

Week 26

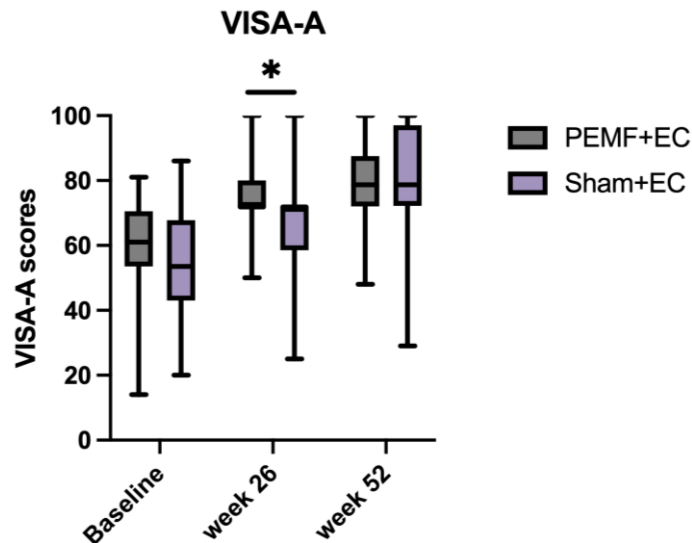
- PEMF: 59.58 to 75.78 ( $p < 0.001$ )
- Sham: 55.41 to 67.93 ( $p = 0.001$ )

Between-group sig.

**week 26**

- PEMF:  $75.77 \pm 11.77$
- Sham:  $67.93 \pm 18.25$
- p-value: **0.043**

No between-group sig. at week 52



Article

Cross-Cultural Adaptation of  
Chinese Victorian Institute of Sports  
Assessment-Achilles (VISA-A)  
Questionnaire for Achilles Tendinopathy

AO  
FAS  
AMERICAN  
ORTHOPAEDIC  
FOOT & ANKLE  
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and Samuel Ka-Kin Ling, ChM<sup>1</sup>

# Carry-over effects: NPRS general

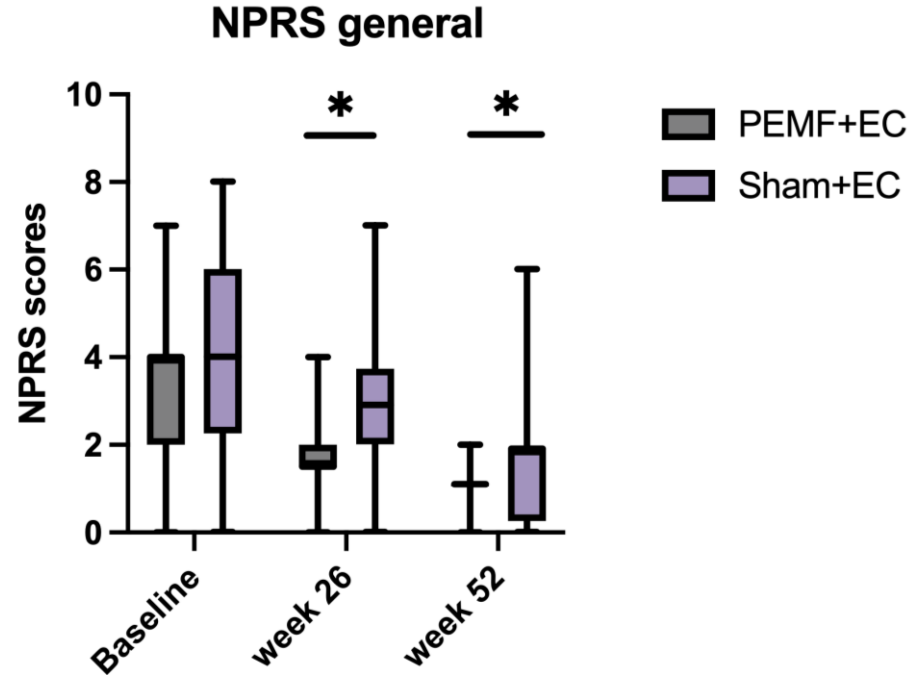
Between-group sig.

## Week 26

- PEMF:  $1.53 \pm 0.87$
- Sham:  $2.88 \pm 1.85$
- p-value:  $<0.001$

## Week 52

- PEMF:  $1.07 \pm 0.58$
- Sham:  $1.93 \pm 1.71$
- p-value:  $0.008$



# PEMF in the Achilles

- PEMF is **safe** and non-invasive
- PEMF has “**sustained effects**” after a course
- PEMF **accelerates** regain of Achilles function



FOOT & ANKLE

### FA.Team

- + Ortho Surgeons: 3 / Residents: 2
- + Post Doc: 1
- + PhDs: 2 / Research Asst: 1



# CUHK Orthopaedics

- Prince of Wales Hospital (**Public: 1800 beds**)
- CUHK Medical Centre (**Private: 500 beds**)
- AFC Medical Centre of Excellence: CUHK x Kitchee Clinic

