

# Evidence of the effect of physiotherapy procedures

## - an example of the flossing method -



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BIP Prague 23.10%. 2023

# FLOSSING – compress therapy



# WHAT is FLOSSING?

- compression
- elastic band
- effect ??????
- EBM ????????



# FLOSSING - today

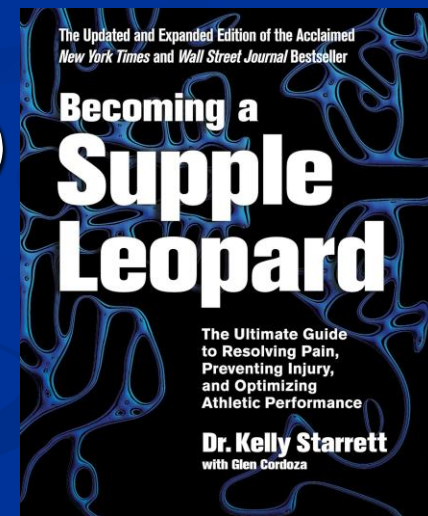
- MEDICAL FLOSSING
- EASY FLOSSING
- Myofascial technique
- COMPRE FLOSS-FLOSSBAND

- .
- .
- .



# FLOOSING - history

- Voodoo- nebo Ninja Flossing
- Relatively new procedure
- Compressions treatment – old Roma
  - lace up bandages for gladiators
- Dr. Kelly Starrett (USA sport therapist)
  - Support of training- effect





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(Obr. Z:  
[https://www.google.cz/search?q=bandaze+v+antice+obrazky&dcr=0&tbm=isch&tbo=u&source=univ&sa=X&ved=0ahUKEwjB2\\_3pqqLZAhWBkywKHeVfAXsQsAQIJg&biw=1920&bih=963#imgdii=OLgito\\_Md5DjUM:&imgcr=JRAus\\_gBa\\_WZVM](https://www.google.cz/search?q=bandaze+v+antice+obrazky&dcr=0&tbm=isch&tbo=u&source=univ&sa=X&ved=0ahUKEwjB2_3pqqLZAhWBkywKHeVfAXsQsAQIJg&biw=1920&bih=963#imgdii=OLgito_Md5DjUM:&imgcr=JRAus_gBa_WZVM))



# APPLICATION

- Elastic band – directly application
- +
- Movement (passive / active)





# MATERIAL

- Different colors (w, l)
  - natural product
- Differences in resistance
- Different schools



# Flossing - main effect

- Pain reduction
- ROM
- Swelling reduction
- Improvement of muscle function

# Examples



# Video - examples

- <https://www.youtube.com/watch?v=dK-1LFDziJ8>
  - UE demo
- <https://www.youtube.com/watch?v=drT'xhTcvLgU>
  - Kelly Starrett (ankle compression demo)
- <https://www.youtube.com/watch?v=VyvI3h8T-VS>
  - QF application

# Effect - evidence

- <https://www.researchgate.net/publication/355181668> The Effect of Tissue Flossing Technique on Sports and Injury Prevention and Rehabilitation A Systematic Review of Recent Research

# The Effect of Tissue Flossing Technique on Sports and Injury Prevention and Rehabilitation: A Systematic Review of Recent Research

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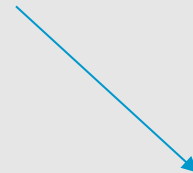
**Abstract** Flossband, as a novel and effective tissue flossing technique, is becoming increasingly popular in the field of athletic training, sports injury prevention, and rehabilitation. The purpose of this literature review is to summarize updated evidence about the effects of flossband application on joint range of motion (ROM), pain, muscle tightness, strength, and physical functional performance as well as identify research gaps for future study. Google Scholar, PubMed, EBSCO, and Web of Science were used to search related articles. The keywords of floss bands, flossbands, floss band, tissue flossing, flossing band, voodoo floss band, voodoo floss bands, track floss, rock floss, life floss band, and Rogue voodoo floss were used to extract target articles. English journal articles, full-text available, and content related to outcome measures were included. Conference abstracts, books, case studies, guideline reviews were omitted. 23 full-text journal articles were included for further qualitative analysis after removing duplicates and deleting articles that violate the

mainly focused on the acute effect of flossband application on peripheral joints or soft tissues in healthy and active participants or well-trained athletes. Therefore, for future studies, more evidence is needed on the benefits of long-term flossband trunk application and concerning patients with various diseases.

**Keywords** Flossband, Pain Management, Range of Motion, Tightness, Strength, Physical Function Performance, Fascial Release

## 1. Introduction

High-energy sports are prone to sports injuries as a result of tissues being overused during intense sports activities. Repeated exposure to the high mechanical stresses associated with sporting activities promotes



# What we know - EBP

- Flossband as a novel and emerging therapeutic tool has been used in sport as well as clinical practice in recent years
- Based on the findings in previous studies, flossband wrapping on different soft tissues or peripheral joints could **be a valid method** to:
  - increase joint ROM
  - manage pain
  - reduce muscle tightness
- Flossband could also have other potential benefits and **enhance muscle strength, exert higher rate of force development in per unit time, as well as improve physical functional performance such as squat, sprint and jump ability.**
- Findings indicate that flossband is a useful treatment option, and it can provide significant contribution in the field of **athletic training, sports injury prevention and rehabilitation in the future.**

# Flossing

- Studies demonstrate the effect, but so far no study has been conducted that would explain - objectify **WHY** the given effect occurs.



# Flossing

- In order to be able to understand the effect that occurs during the application of physiotherapy procedures, we must also clarify the essence of how the methods work.

**principle of effect**

**???????**

# Flossing

- There are several publications that are dedicated to the flossing method.
- These publications describe the application - practical procedures and further describe the essence of the method, i.e. what happens during application.
- As one of the most important principles that should occur when applying compression therapy is the **bath sponge effect**

# Bath sponge effect

- The bath sponge effect is described, but no publication / studies documents
  - why this effect occurs
  - whether this effect has been investigated
  - what research has been done,.....
- This means, that the authors of the publications and the authors of the flossing method **only assume the given effect without any evidence.**

# Bath SPONGE-Effect



- Compression and fluid drain



- Increasing of inflow
- Oxygen increasing

# Our experiment

- At our faculty, we deal with the evaluation of the effect of physiotherapy procedures and try to understand the principles of the methods, document them and thus contribute to EBP.
- When applying flossband, we tried to demonstrate the bath sponge effect.

# Pilot study - aim

## ■ Measurement

- transcutan oxygen
- flossband application UE
- 20 participants

# Equipment



- Précise 8008
  - transkutan monitor tcp02
- Exactly measurement –  
transcutan oxygen

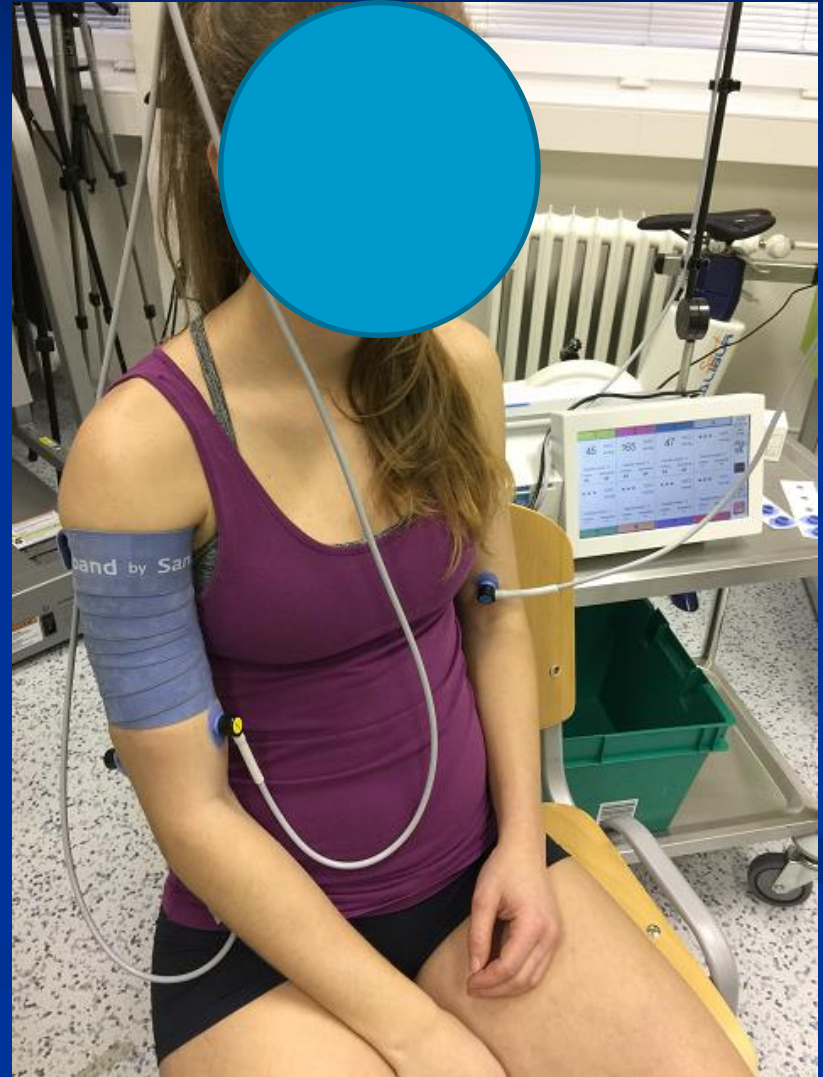
# Procedure

- 1 min – measurement - relax UE
  - flossband
- 2 min measurement with compression
  - Flossband ex
- 10 min measurement with relax UE



- m. biceps brachii + m. triceps brachii dx
- m. biceps brachii sin





# Results

- surprising results
- the bath sponge effect was **absolutely not proven**
- after compression there was a massive reduction in blood flow
- after removing the compression, there was **no rapid** return of blood flow, but on the contrary, a very gradual blood flow and only after 15 minutes did the blood flow return to the original level, in some probands the blood flow did not return to the original level even after 15 minutes


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## Effect of Blood Circulation in the Upper Limb after Flossing Strategy

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### Abstract

A very popular method in the field of prevention, sports, and therapy is flossing, working with an elastic band. A number of effects have been reported with this approach, but there are so far only a few studies to objectivize the declared effects. The aim of our study was to determine the change in the blood supply to the musculus biceps brachii during and after the flossing method applied to the upper limb in the area of the shoulder joint. The study recruited 27 healthy respondents (23.3 ± 2.8 years old). Measurement of the blood flow was performed on a Präcisé 8008 (Ulrichstein, Germany) a device for measuring transcutaneous oxygen (tcpO<sub>2</sub>) before, during the 2-min compression therapy applied in the area of the shoulder joint, and after. We noted that both upper limbs, the limb where the application was performed and the opposite limb reached significant changes in the blood flow in musculus biceps brachii. Due to the significant depression of perfusion after only 2 min of flossing, great caution is required when performing the flossing method. The “sponge effect,” which means that after the occlusion is removed, the perfusion increases rapidly, was not confirmed by our study.

**Keywords:** flossing; blood circulation; musculus biceps brachii; transcutaneous oxygen

### 1. Introduction

In recent years, new approaches have emerged both in the field of physiotherapy and sport, which aim to influence the functional state of the patient and/or the athlete. One of the new trends of these times is flossing. This is a method that involves compression, which is achieved by using an elastic band. A number of effects have been reported with this approach, but there are so far only a few studies to objectivize the declared effects in blood circulation. In our paper, we, therefore, present a study that evaluates changes in blood flow in the muscle during the



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To evaluate the results, statistical data analysis was also used in the statistical program R (R for Windows; GUI front-end), in the extension RStudio (R for Windows; GUI front-end R i386 3.6.1).

### 3. Results

The study yielded interesting results that do not fully correspond to the expected effects of the flossing method. Figure 2 shows the changes in blood flow in the right, i.e., on the side of flossing application, and the left upper limb over time in one proband. There is an apparent significant depression of perfusion in the right upper limb during flossing and the subsequent normalization of the condition. In this case, there was an elevation of blood flow above the input value. This elevation, with the exception of two probands, was observed in all subjects tested.

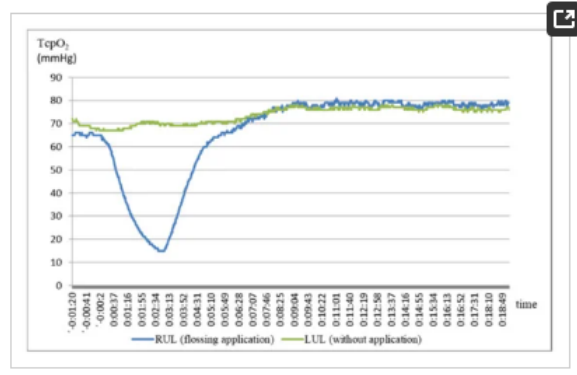


Figure 2. Change in blood flow in one proband (No. 20 in Table 1 and Table 2) in the right upper limb (RUL), where flossing was applied, and in the left upper limb (LUL) without application.

Table 1. Change in blood flow over time (T0–baseline, NN–lowest value, T2– after 2 min).

Time	RUL (flossing application)	LUL (without application)
T0	70	70
NN	15	70
T2	75	75
T5	75	75
T10	75	75
T15	75	75

Table 2. Relative expression of the change in blood flow in the right upper limb where flossing was applied and in the left upper limb where it was not applied (NN–lowest value, T5–value at 5 min, T10–value at 10 min, T15–value at 15 min).

Time	RUL (flossing application)	LUL (without application)
NN	15	70
T5	75	75
T10	75	75
T15	75	75

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- Our study proved that there is **no bath sponge** effect that is described in textbooks
- Our study concerned only the upper limb, for which these conclusions apply.
- This year, we conducted a second study on the lower limb and the results are similar - the bath sponge effect was also not proven.

# NEW PROCEDURES

- YES – if benefit for patient

**BUT**

- lege artis
- critical thinking
- know the principle of applied methods
- EBM



?? ? ? ? ? ?

? ? ? ? ? ? ? ?





# „Fun game“

- To diversify and keep your attention, we will test your clinical reasoning
- Pictures of world tennis players who suffered from some problem.
- These are real situations and problems.
- Your task is to look at a series of some pictures and assess what problem and why the given athlete suffered from.

- In most cases, these are problems that were the result of incorrect technique.
- The given problem of the athlete was analyzed in cooperation between the trainer and the physiotherapist.
- The intervention also concerned the adjustment of the technique, on which both the coach and the physiotherapist collaborated.



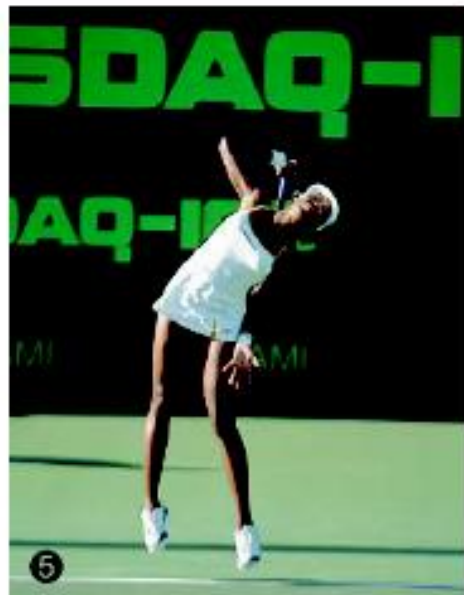
# Shoulder





# Hip





# Upper body + shoulder







# Knee





# Hand



# Conclusion

- EBM is absolutely necessary also in the field of sports
- As with patients, when working with athletes, clinical considerations in the sense of EBM / EBP are necessary
- Also in the field of sports, interdisciplinary cooperation is necessary, when the team must include not only a physiotherapist but also a trainer, a coach and others.

Thank you

