

# Evidence Based Approach to the Use of Tissue Flossing Bands to Improve Perceived and Actual Range of Motion

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The University of Texas at  
**TYLER**

# Thank you



# PICO Question

- **Patients** – Subjects suffering from a decreased range
- **Intervention** – Tissue flossing with tissue flossing bands
- **Control** – Conventional treatment
- **Outcome** – Improved perceived and actual range of motion



# Outline

- History of tissue flossing bands
- Potential modes of action
- Precautions
- The evidence behind flossing bands
- Anecdotal evidence
- Methods
- Conclusions



# History of tissue flossing bands

- Relatively new modality
- Gained initial popularity in the weight lifting community
  - Improved muscle preparation for performance
- Evidence was largely anecdotal until recently



# Potential modes of action

- Gate Control Theory
- Other neurological pathways
- Myofascial Release



# Myofascial Release

- Began to develop as far back as the 1940's
- First named in 1981
- Can be accomplished by manually mobilizing tissues or placing them on a stretch



# Myofascial Release

- Current level of evidence ranges from low to high
  - Leads to difficulties in making conclusive statements
- Shows a lot of promise for clinical application



# Potential modes of action

- Gate Control Theory
- Other neurological pathways
- Myofascial Release
- Blood reperfusion



# Blood Flow Restriction

- Occludes venous blood flow while restricting arterial inflow
  - Application of some form of tourniquet
- Reduces oxygen delivery to muscle cells during exercise



# Blood Flow Restriction

- Creates anaerobic environment
- May promote muscle hypertrophy
  - Initiating cell signaling
  - Hormonal changes
  - Preferential type II muscle fiber activation
- Safe treatment option



# Precautions

- Can be uncomfortable
  - “Pinching” sensation
  - “Rope burn”
- Can leave temporary marks
- Cannot be used on patients with latex allergies
  - Band is 100% latex



# Best available evidence



# **Borda J, Selhorst M, 2017**

- **Case Study**
- **14-year-old female with chronic Achilles tendon pain**
- **Pain intensity decreased from 8/10 to 0/10 after two flossing band sessions**



# **Cage, et al, 2018**

- **21-year-old collegiate men's basketball player**
- **X-ray and MRI revealed advanced Keinbock's Disease**
- **Patient experiencing high levels of pain and dysfunction**



# Cage, et al, 2018



# Cage, et al, 2018

- 6-weeks of tissue flossing treatments in conjunction with therapeutic exercise.
- 88% decrease in pain from week 1 to week 6 as measured with VAS
  - $p < 0.05$
- 45% increase in function as measured using the Wrist/Hand Disability Index
  - $p < 0.05$



# Driller, Overmayer, 2017

- Randomized controlled trial
- Showed significant improvements in:
  - Weightbearing lunge test
  - Ankle dorsiflexion
  - Ankle plantarflexion
  - Single leg vertical jump height
  - Single leg vertical jump velocity



# Driller, et al, 2017

- Follow up from previous study
- Found that previous measures were maintained for at least 45 minutes
  - Points to tissue flossing not having a negative effect on muscle performance



# Kiefer, et al, 2017

- Pilot study
- Examined effects of tissue flossing on actual and perceived range of motion at the glenohumeral joint
- No actual improvement in glenohumeral joint range of motion
- Significant improvement in perceived glenohumeral joint range of motion



# PICO Question

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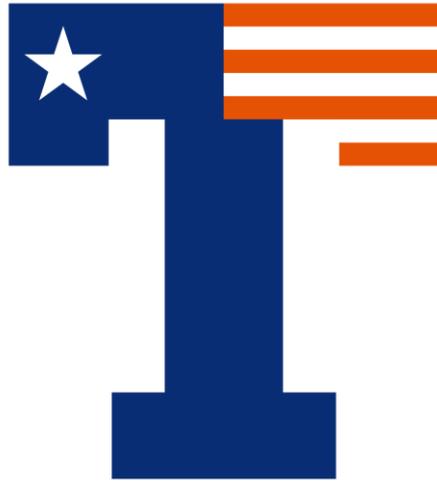


# What do you do when there is limited evidence?

- Make the most of the evidence that is available
- Remember that evidence based practice has three pillars
  - Best available evidence
  - Clinician expertise
  - Patient values
- Find your own evidence



# What we've been working on



# Pain & Dysfunction

- Controlled design study
- 20 collegiate baseball players
- Participated in upper body fatiguing protocol
- Threw 10 fastballs
- Received Flossing Treatment
- Threw 10 more fast balls



# Pain & Dysfunction

- Pre- and post measures taken
- 27% decrease in pain as measured with the VAS
  - $p < 0.05$
- No significant difference in function as measured with Upper Extremity Functional Scale
  - Likely due to the fact that subjects were healthy and already at a high level of function.



# Muscular Tenderness

- Controlled design study
- 13 collegiate baseball players
- 3 tenderness measurements taken using handheld algometer
  - Dominant and non-dominant forearms



# Muscular Tenderness

- Single flossing band treatment performed to the dominant forearm
- Immediate retest of muscle tenderness for both the dominant and non-dominant forearm
- Significant differences muscle tenderness along medial and lateral aspects
  - Medial =  $4.83 \pm 2.44$  vs.  $0.79 \pm 1.59$
  - Lateral =  $3.03 \pm 2.39$  vs.  $0.41 \pm 1.89$
  - $p < 0.001$

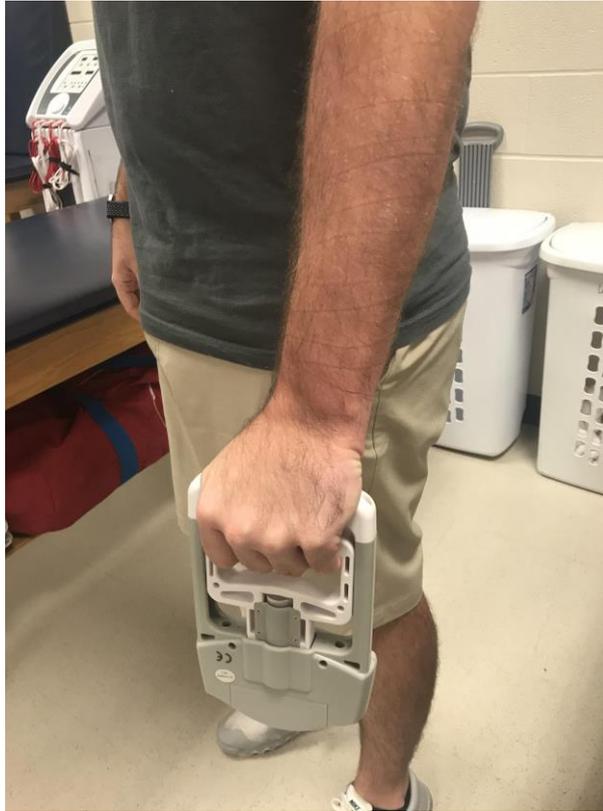


# Grip Strength

- Controlled design study
- 20 collegiate baseball players
- Baseline grip strength tested for dominant and non-dominant hand 3 times



# Grip Strength



# Grip Strength

- Controlled design study
- 20 collegiate baseball players
- Baseline grip strength tested for dominant and non-dominant hand 3 times
- Single tissue flossing band treatment to the dominant forearm followed by retests



# Grip Strength



# Grip Strength

- 4.3% decrease in strength in the dominant hand
  - $p = 0.001$
- No significant difference between dominant and non-dominant hand
  - $p = 0.143$



# Anecdotal Evidence

- Initially introduced at UT Tyler with baseball pitchers
- Effective for decreasing pain and muscle and joint stiffness
- Some pitchers reported decreased accuracy with pitches
  - Used primarily on off days



# Methods

- **Indications**

- Musculoskeletal pain
- Muscular tightness
- Myofascial adhesions
- Decrease joint range of motion related to muscle or joint stiffness



# Methods

- **Contraindications**
  - Latex allergy
  - Open wounds
  - Conditions affecting circulation
  - Conditions affecting sensation



# Methods

- Make sure your patient is **NOT ALLERGIC** to **LATEX**
- Prescreen the tissues
  - Feel for adhesions, tightness, and tension
  - Ask patient about tender areas



# Methods

- Apply distal to proximal
- First session apply ~50% tension
  - Can increase tension as patient tolerance increases
- Take patient through brief bout of exercise
  - Do not exceed 3 minutes



# Methods

- Remove band
- Scan tissues again
- Solicit patient feedback
- Repeat again if necessary



# Conclusions

- Tissue flossing is continuing to increase in popularity
- Further research needs to be conducted
- Tissue flossing is a safe and potentially effective alternative modality to decrease pain and increase perceived and actual range of motion



# Quiz Time

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# Question 1

- Which of the following is NOT a contraindications for tissue flossing bands?
  - Muscular Tightness
  - Acute Muscle Strain
  - Latex Allergy
  - Open Wound



# Question 1

- Which of the following is NOT a contraindications for tissue flossing bands?
  - **Muscular Tightness**
  - Acute Muscle Strain
  - Latex Allergy
  - Open Wound



## Question 2

- True/False: There is evidence to support that tissue flossing bands can positively affect actual ankle dorsiflexion.



## Question 2

- **True**/False: There is evidence to support that tissue flossing bands can positively affect actual ankle dorsiflexion.



# Question 3

- True/False: There is evidence to support that tissue flossing bands can positively affect perceived ankle dorsiflexion.



# Question 3

- True/**False**: There is evidence to support that tissue flossing bands can positively affect perceived ankle dorsiflexion.



# Question 4

- True/False: Tissue flossing bands should be applied in a distal to proximal fashion.



# Question 4

- True/**False**: Tissue flossing bands should be applied in a distal to proximal fashion.



# Question 5

- For an initial treatment, tissue flossing bands should be applied with approximately \_\_\_ percent tension.
  - 25
  - 50
  - 75
  - 100



# Question 5

- For an initial treatment, tissue flossing bands should be applied with approximately \_\_\_ percent tension.
  - 25
  - **50**
  - 75
  - 100



# References

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# Questions

