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# Myofascial Interventions

## Part IV: Therapeutic Taping

Scott Cheatham, PhD, DPT, PT, OCS, ATC, CSCS



- Presenter Disclosure: Financial: Scott Cheatham has received an honorarium for presenting this course. Non-financial: Scott Cheatham has no relevant non-financial relationships to disclose.
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# Speaker Bio

- Dr. Scott Cheatham is an Associate Professor in the Division of Kinesiology at California State University Dominguez Hills in Carson, California. He is the owner of Sports Medicine Alliance (SMA). Dr. Cheatham received his Doctor of Physical Therapy (DPT) and his Doctor of Philosophy (PhD) in Physical Therapy. Dr. Cheatham is a Board Certified Orthopedic Physical Therapist (OCS) and a Certified Athletic Trainer (ATC). He also holds several fitness certifications and is a certified ergonomic specialist.
- Dr. Cheatham is a national presenter for various organizations and has authored over 100 peer-reviewed publications, textbook chapters, and several home study courses on the topics of orthopedics, health & fitness, and sports medicine. He is the co-editor and contributing author of the textbook titled Orthopedic Management of the Hip and Pelvis. Dr. Cheatham's professional responsibilities include being an associate editor for the NSCA Strength and Conditioning Journal, Journal of the Canadian Chiropractic Association, and a manuscript reviewer for several other peer-reviewed journals. Dr. Cheatham is an education and research consultant for various health and fitness organizations.



# Learning Outcomes

As a result of this course, participants will be able to:

- Two current scientific theories behind therapeutic taping.
- Discuss at least two best practice patterns for kinesiology taping and athletic taping.
- Identify at least two common indications, precautions, and contraindications for each intervention.
- Identify at least two important aspects of current evidence behind each intervention.



# Disclaimers

- Different products are shown with permissions and/or proper citations.
- There are no conflicts of interest with this presentation.
- We are still learning about therapeutic taping. This presentation share's what we are currently learning.



# Module I: Scientific Review





# Nomenclature

- Common Terms in the Literature:
  - KT
  - Kinesiology Tape
  - Kinesio Tape
  - K Tape
  - Elastic Therapeutic Tape

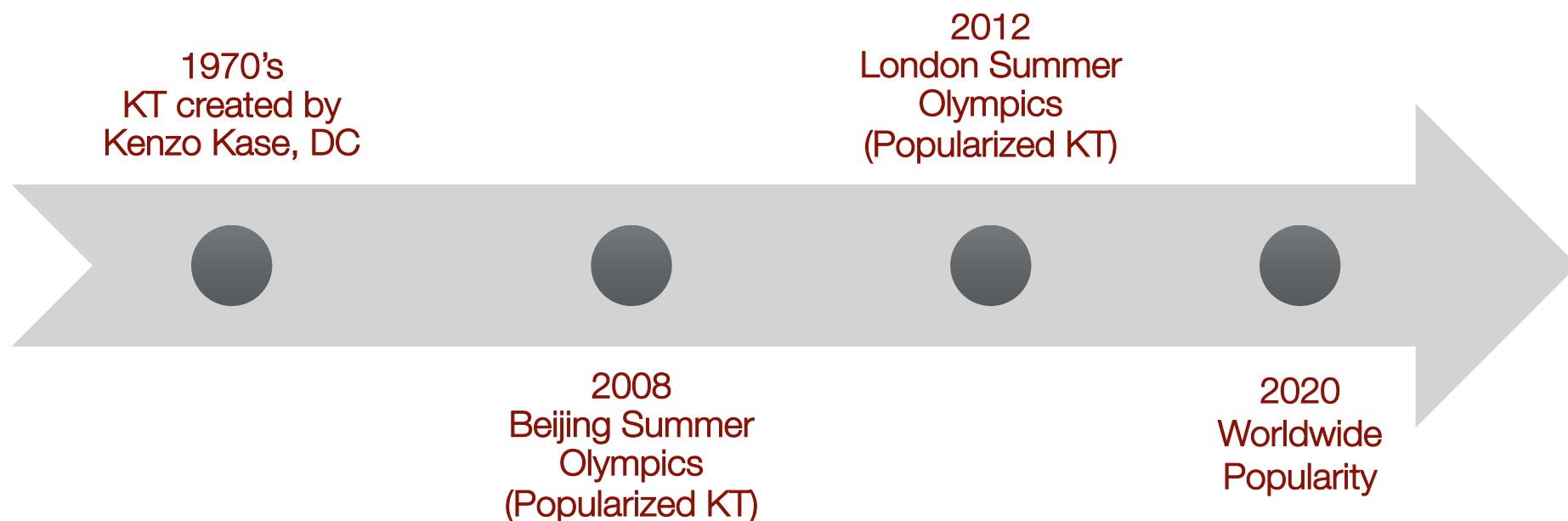


# KT Definition

- Design: thin elastic cotton-based tape.
  - The tape is woven to allow it to stretch up to 140%.
  - Tape adhesive is heat activated.
  - Tape roll is already on a pre-stretch (e.g. 10-15%).
- Indications: KT used for sports, neuro-sensory effects, edema control, post-exercise recovery, etc.



# History of KT

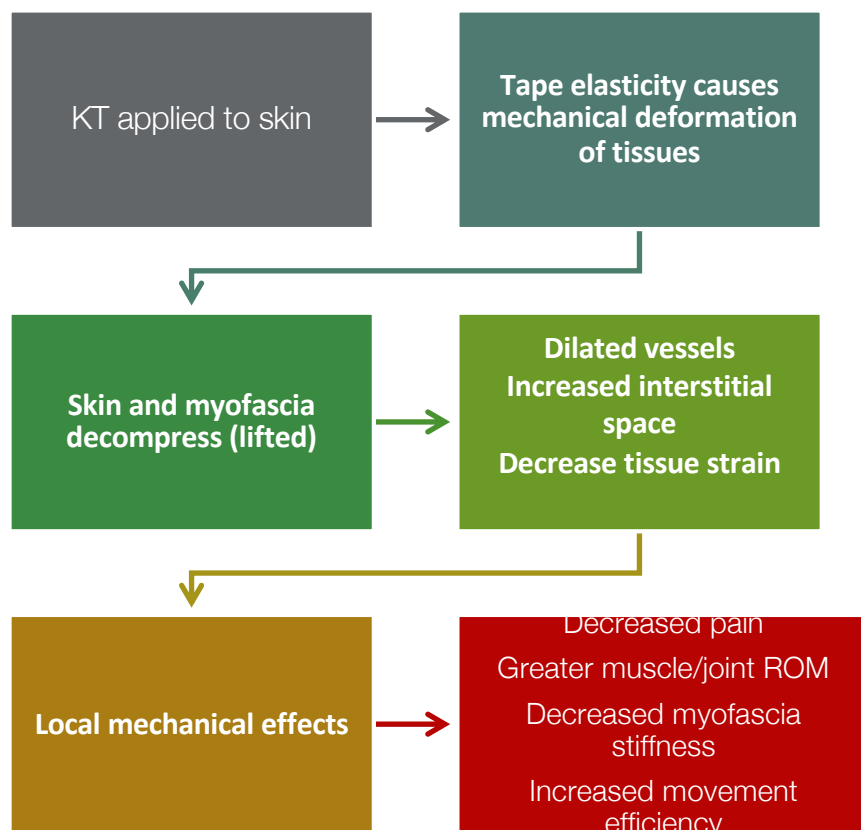


What are the current scientific theories behind Kinesiology Tape?

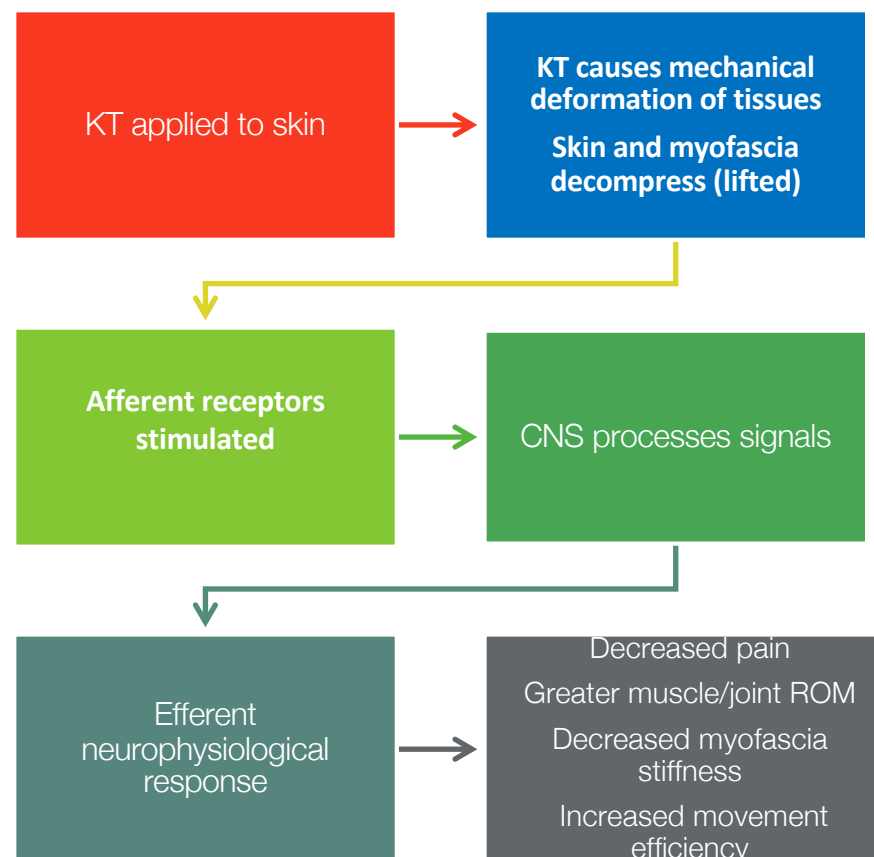


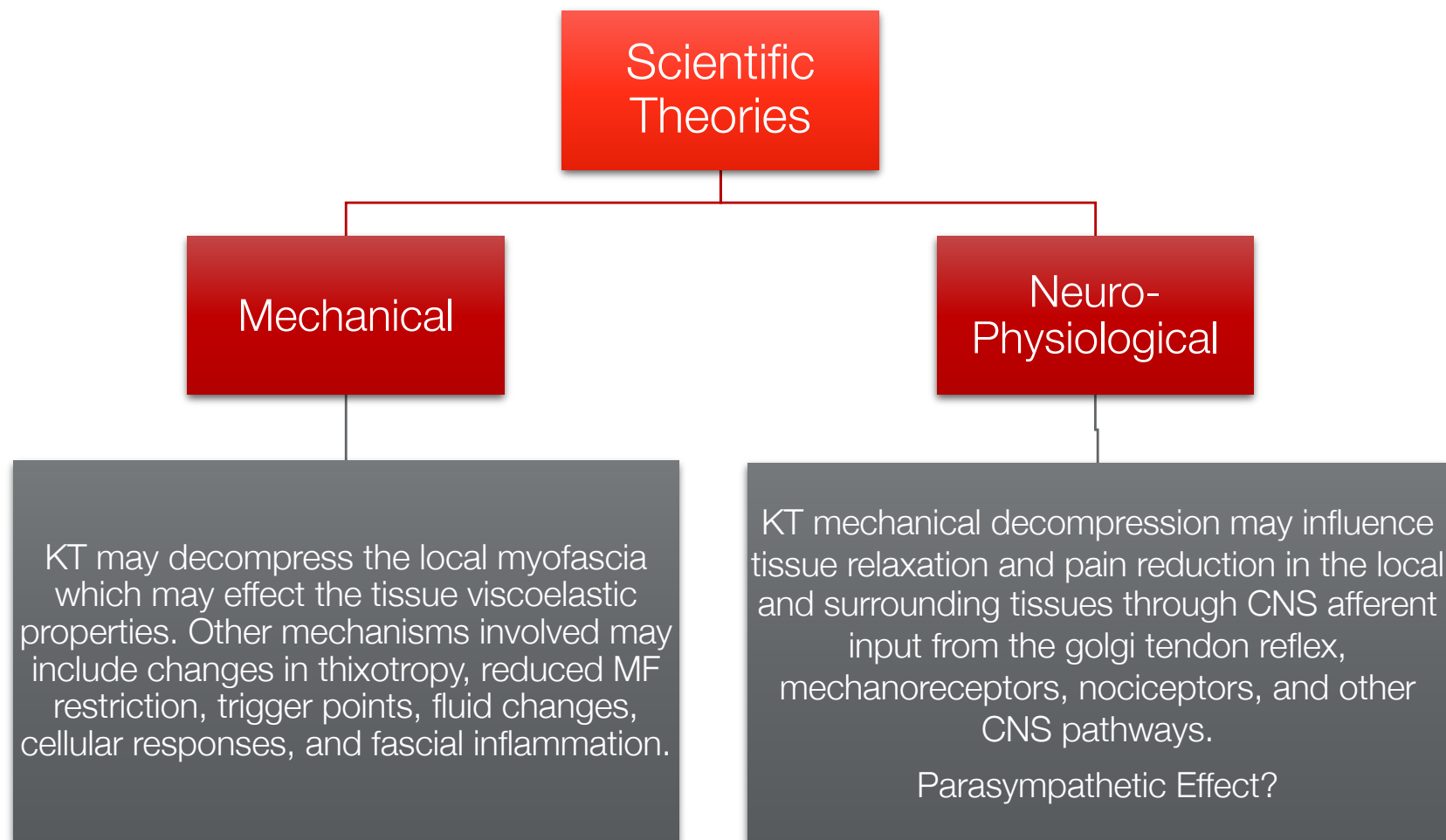
# Summary

## Mechanical Effect



## Neuro-Physiological





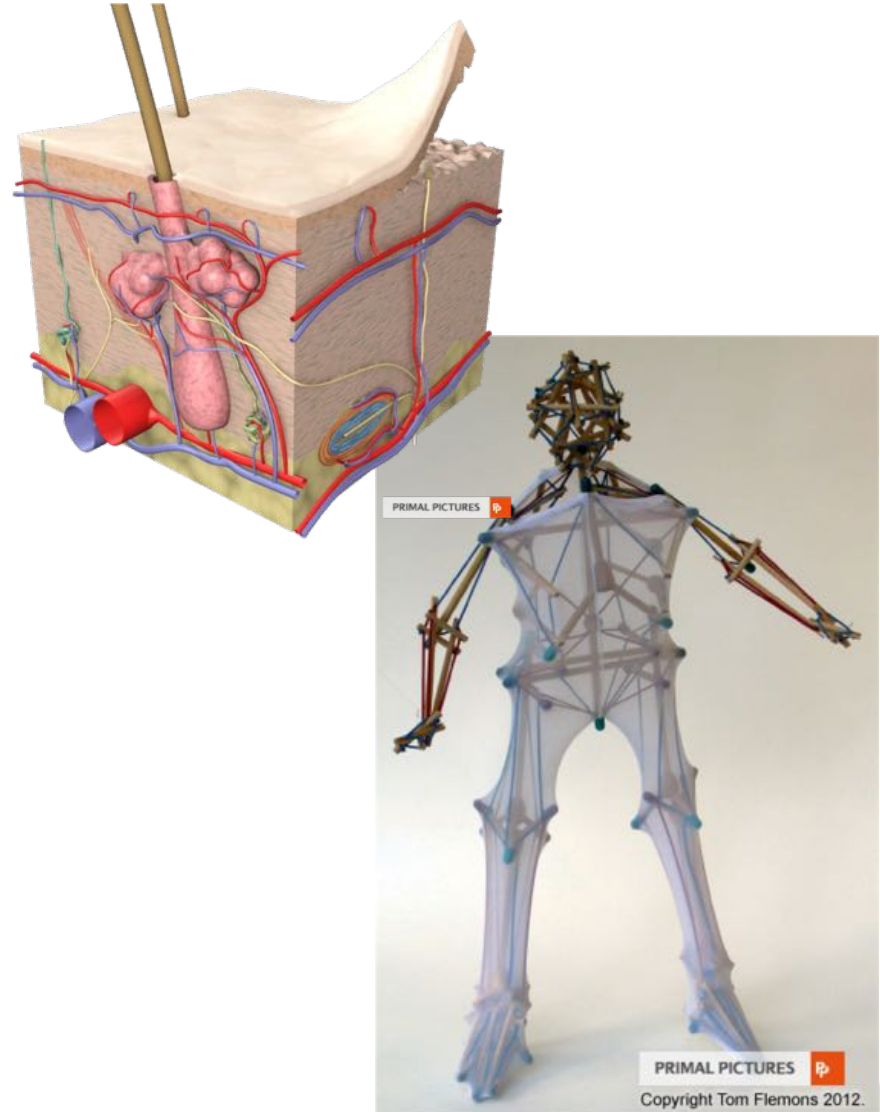
# KT Scientific Theory Evidence

## Studies:

- 2018- Cimino et al. J Biomech (US Study)
- 2015- Pamuk and Yucesoy. J Biomech (MRI Study)

## Consensus:

- Mechanical Effect: KT causes a deformation of the skin and myofascia locally and at distant regions
- Human movement may increase the effects of the deformation



# Bottom Line

- The scientific research suggests two theories:
  - Mechanical
  - Neurophysiological
  
- Based on evidence, KT may:
  - Create local and distal tissue deformation
  - Stimulate afferent receptors and CNS pathways??
  - Etc.





# KT Survey



# Kinesiology Tape: a Descriptive Survey of Healthcare Professionals in The United States

Cheatham SW, Baker RT, Abdennour T (2020-In review)

- Purpose: To survey and document the beliefs and clinical application methods of KT among healthcare professionals in the United States.
- Design: Cross-sectional survey study.
- Methods: 30Qs (AAOPT, AASPT, NATA, FB Groups)
- Results: N=1083 (2.1% completion) (1083/51,000)



# Module II: KT Beliefs Among Professionals

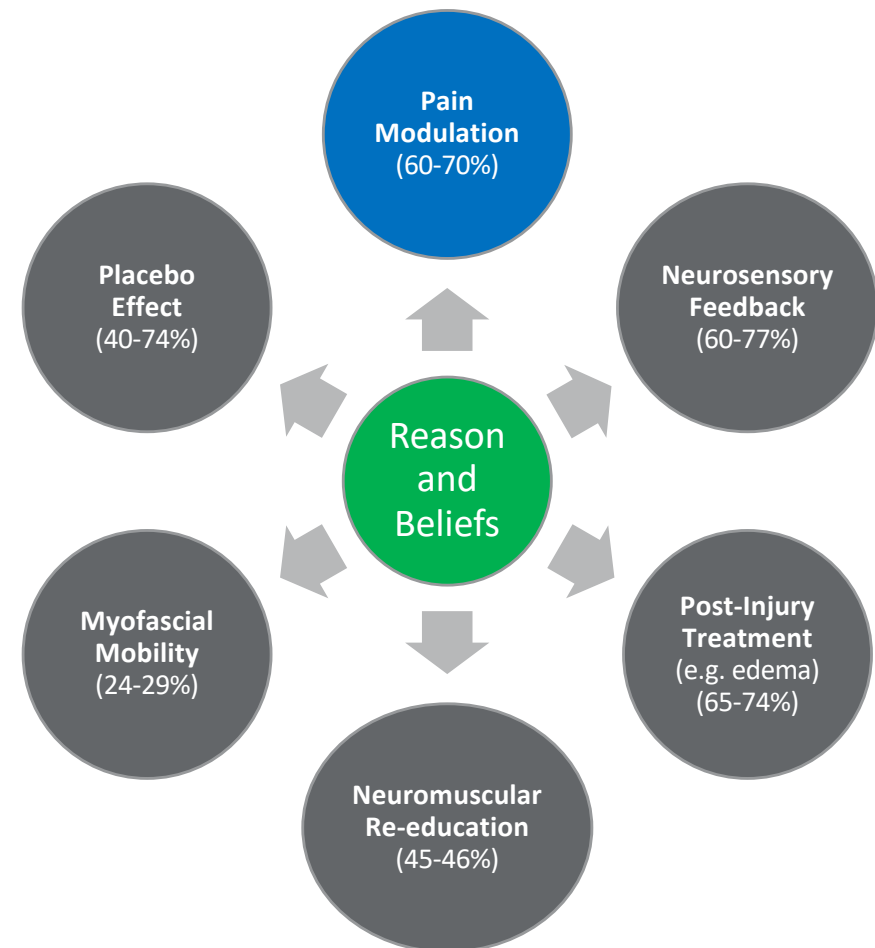


Does KT modulate pain?



# KT Beliefs: Survey

- Survey:
  - Q1: What are common reasons to use KT on clients?
  - Q2-3: What therapeutic effects & physiological mechanisms occur with KT?



# KT Beliefs: Literature Review

- Studies: Pain Modulation
- \*2019- Zhang et al. Phys Sportsmed
- \*2019- Li et al. Clin Rehabil
- \*2019- Ramirez-Velez et al. Physiotherapy
- \*2016- Nelson. J Bodyw Mov Ther
- 2019- Sheng et al. J Rehabil Med
- 2015- Lim and Tay. Br J Sports Med
- (\*positive effects)



# KT Beliefs: Literature Review

- Studies: DOMS
- \*2020- Camacho et al. Int J Sports Med
- \*2019- Hazar Kanik et al. J Sport Rehabil
- \*2019- Kirmizigil et al. J Sport Rehabil
- \*2015- Lee et al. J Phys Ther Sci
- (\*positive effects)



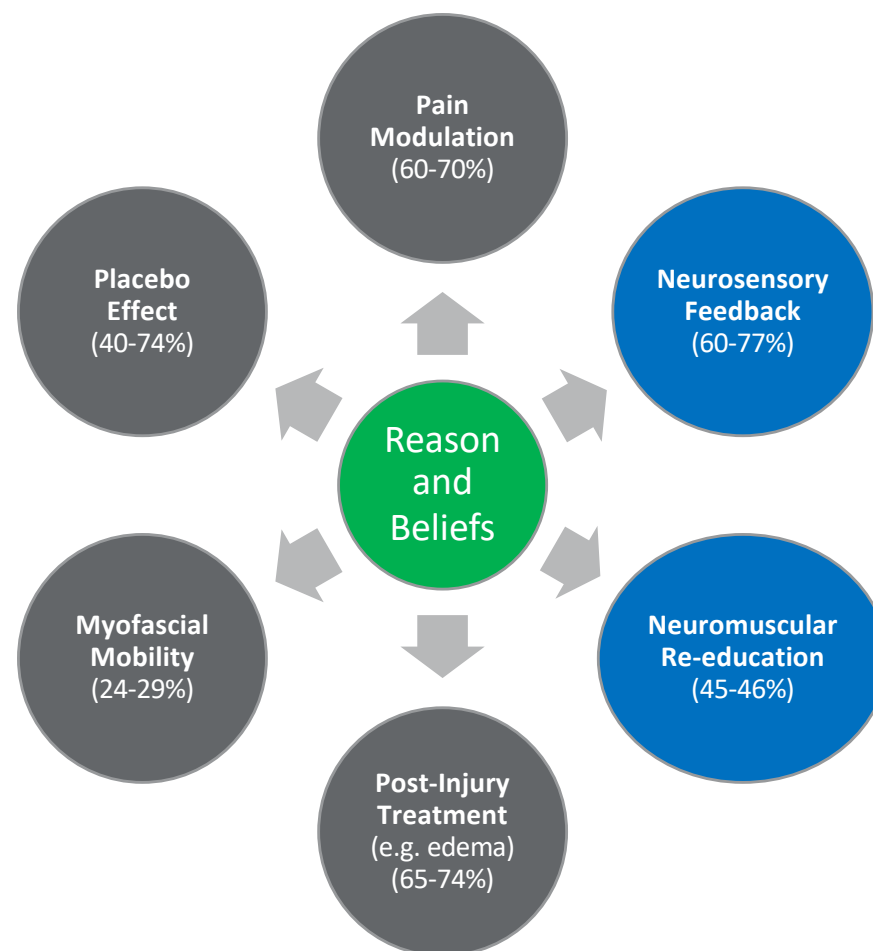
Does KT create a neurosensory effect and enhance muscle re-education?





# KT Beliefs: Survey

- Survey:
  - Q1: What are common reasons to use KT on clients?
  - Q2-3: What therapeutic effects & physiological mechanisms occur with KT?



# KT Beliefs: Literature Review

- Studies: Neuro sensory feedback/Muscle Reeducation
- \*2018- Bischoff et al. Eur J Orthop Surg Traumatol
- \*2018- Hosp et al. Gait Posture
- 2018- Hadamus et al. Ortop Traumatol Rehabil
- 2016- Torres et al. J Bodyw Mov Ther
- (\*positive effects)

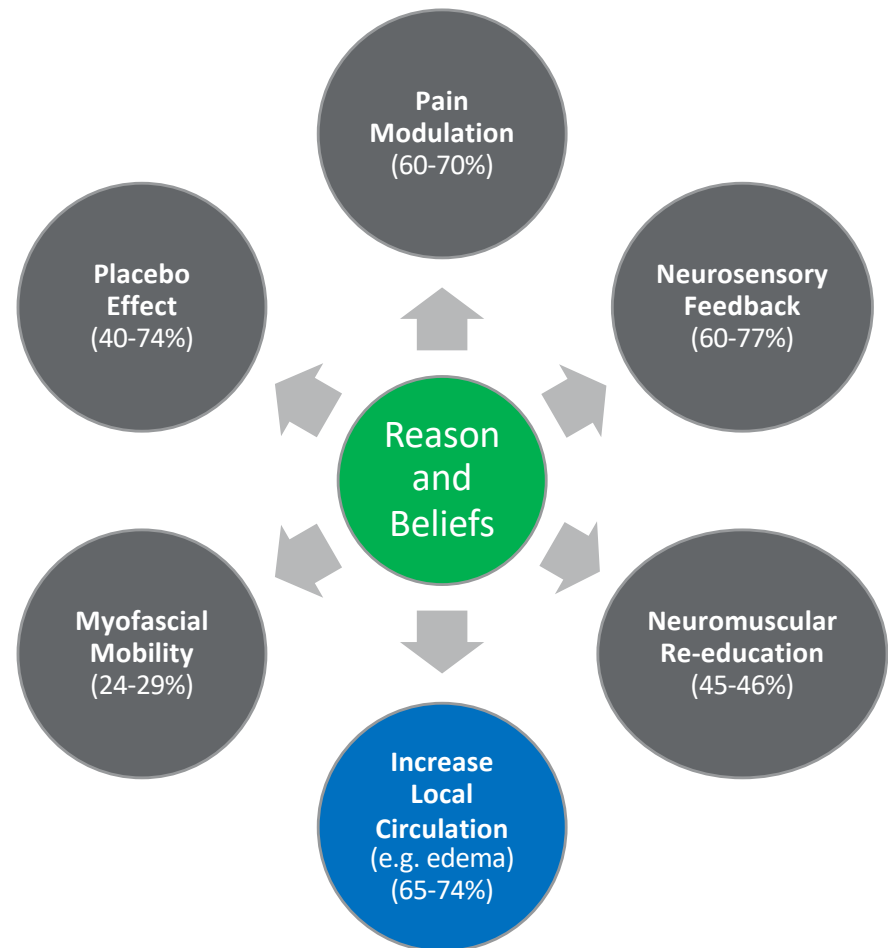


Does KT increase circulation?



# KT Beliefs: Survey

- Survey:
  - Q1: What are common reasons to use KT on clients?
  - Q2-3: What therapeutic effects & physiological mechanisms occur with KT?



# KT Beliefs: Literature Review

- Studies: Local Circulation
- \*2020- Liu et al. Front Physiol
- \*2018- Slomka et al. Res Sports Med
- \*2018- Yang and Lee. Med Sci Monit
- \*2020- Hormann et al. BMC Sports Sci Med Rehabil
- 2020- Banerjee et al. PLOS ONE
- (\*positive effects)

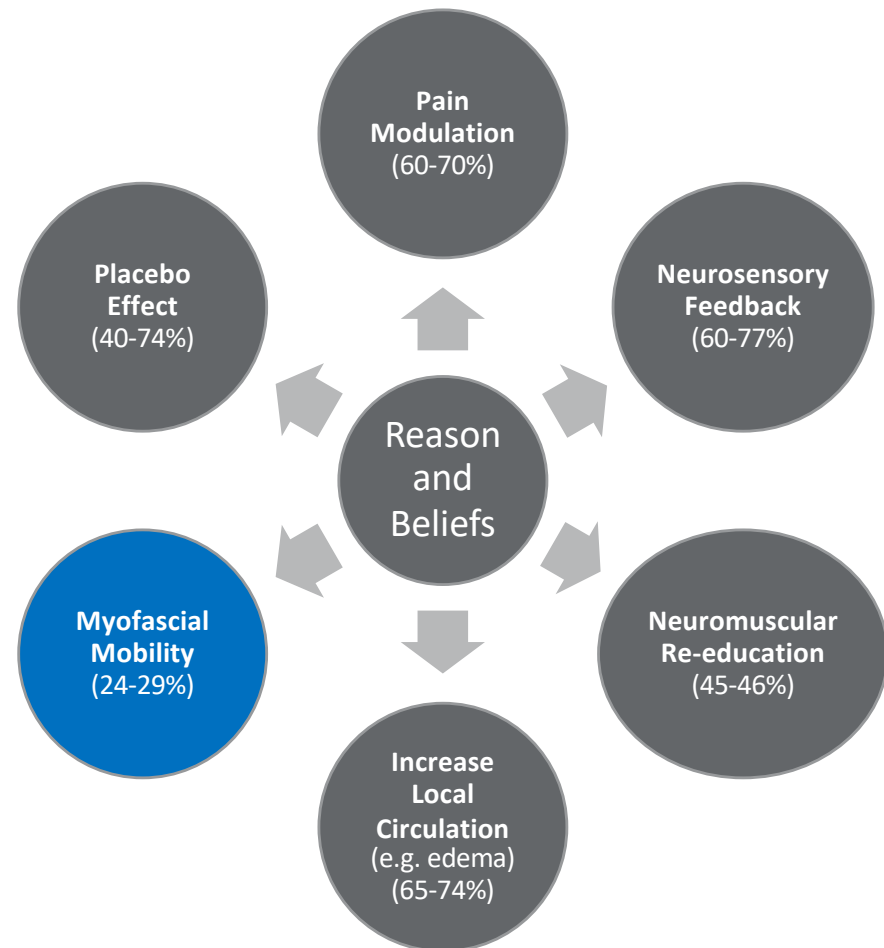


Does KT improve myofascial mobility?



# KT Beliefs: Survey

- Survey:
  - Q1: What are common reasons to use KT on clients?
  - Q2-3: What therapeutic effects & physiological mechanisms occur with KT?



# KT Beliefs: Literature Review

- Studies: Myofascial Mobility
- \*2018- Cimino et al. J Biomech (US Study)
- \*2015- Pamuk and Yucesoy. J Biomech (MRI Study)
- (\*positive effects)
- Consensus:
- Weak Evidence: KT creates tissue deformation locally and distally



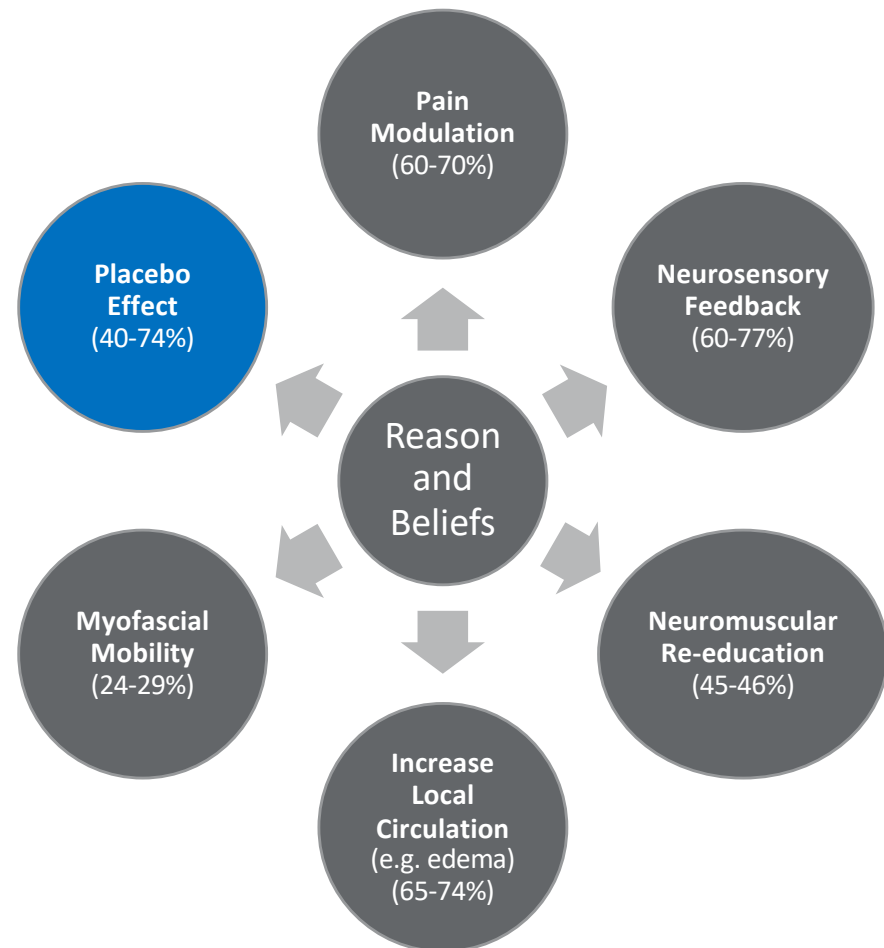


Does KT create a placebo effect?



# KT Beliefs: Survey

- Survey:
  - Q1: What are common reasons to use KT on clients?
  - Q2-3: What therapeutic effects & physiological mechanisms occur with KT?



# KT Beliefs: Literature Review

- Studies: Placebo Effect
- \*2019- Mak et al. Physiother Theory Pract
- \*2018- MacPhail et al. J Bodyw Mov Ther
- \*2017- Au et al. Physiother Theory Pract
- \*2016- Cai et al. J Sci Med Sport
- \*2016- Cheung et al. Man Ther
- \*2016- de Freitas et al. Int J Sports Phys Ther
- (\*positive effects)



# Bottom Line

- Survey research:
  - Most of the survey respondent beliefs match the research
  
- Based on research evidence:
  - KT may produce pain modulation, local circulation, and placebo effects.
  - Weak evidence for neurosensory



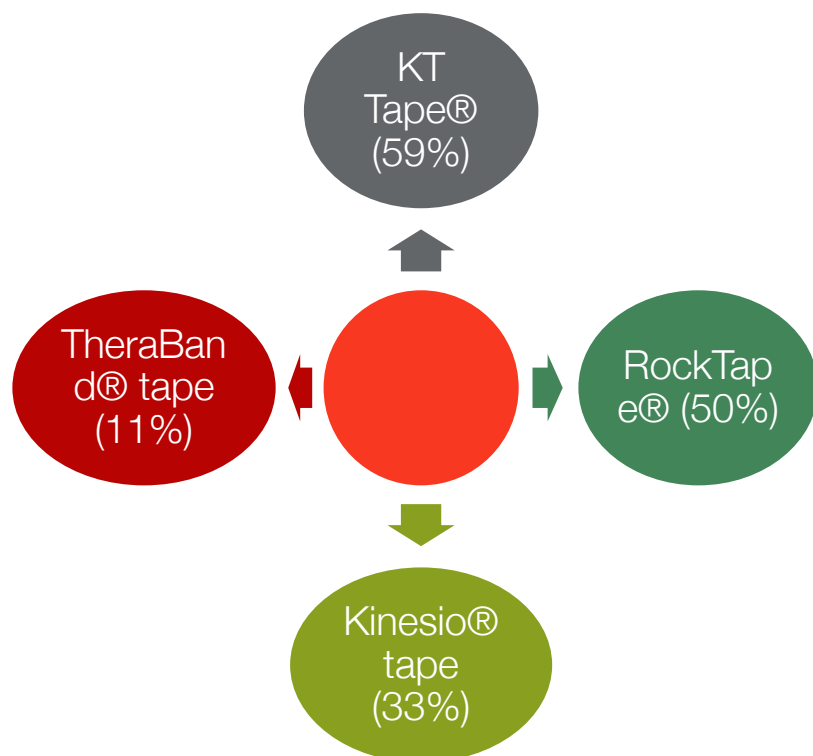
# Module III: KT Clinical Application



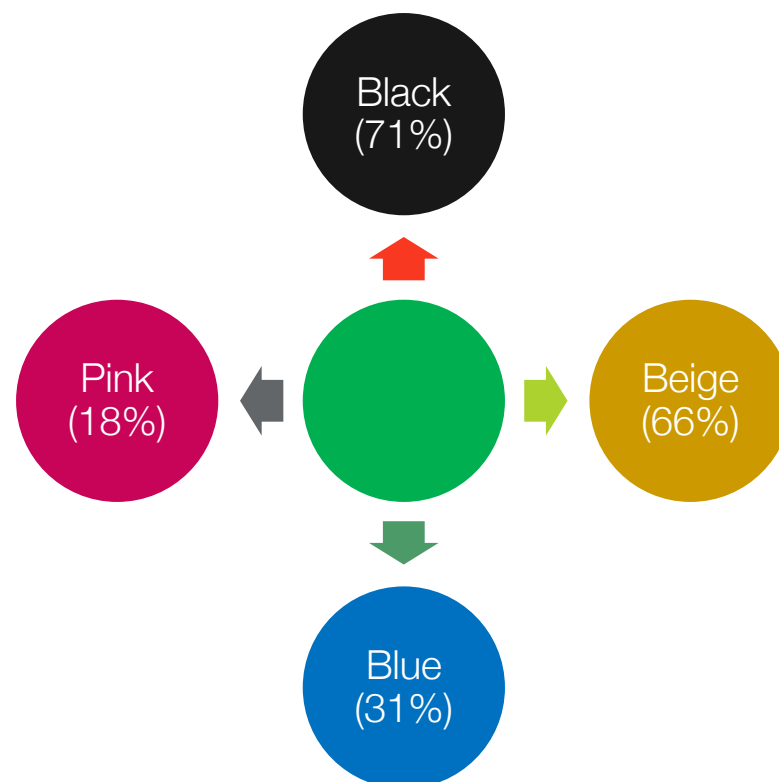
# KT Clinical Application: Survey

- Survey:
  - Q1: Which commercial brand KT do you commonly use in your practice?
  - Q2: Which color/s of KT do you use most often with your clients?

## Tape Brands



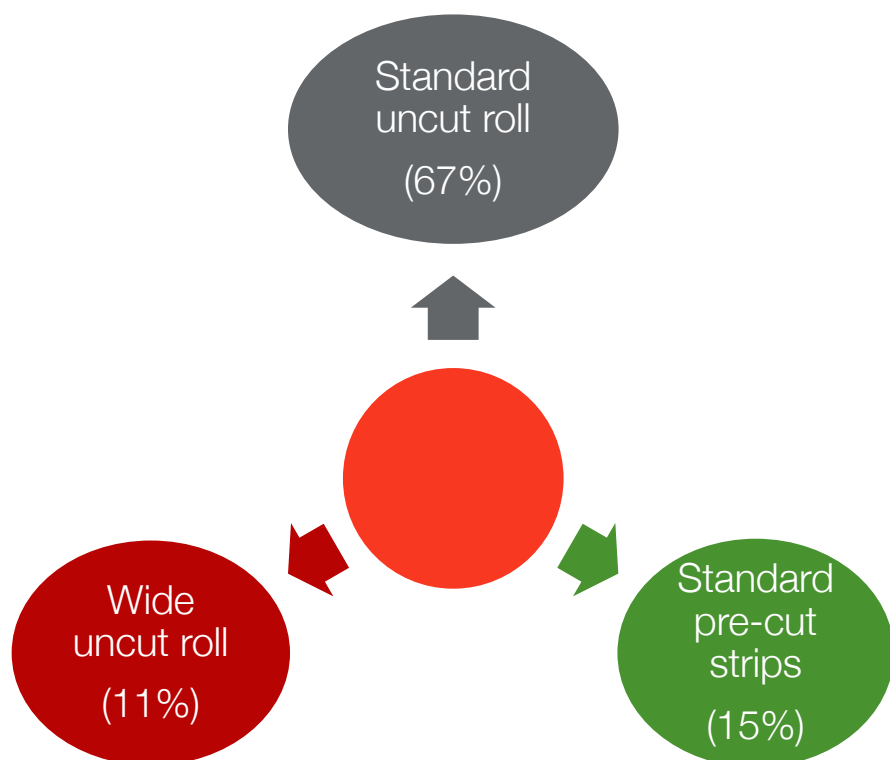
## Tape Colors



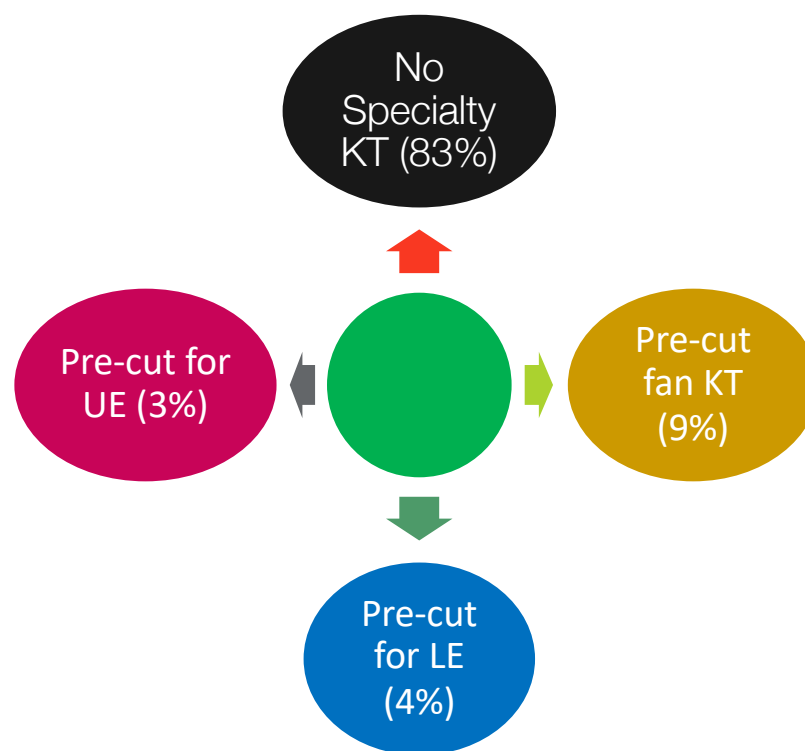
# KT Clinical Application: Survey

- Survey:
  - Q3: Which types of standard KT do you use most often on your clients?
  - Q4: Which types of specialty pre-cut KT do you use most often?

## Standard KT



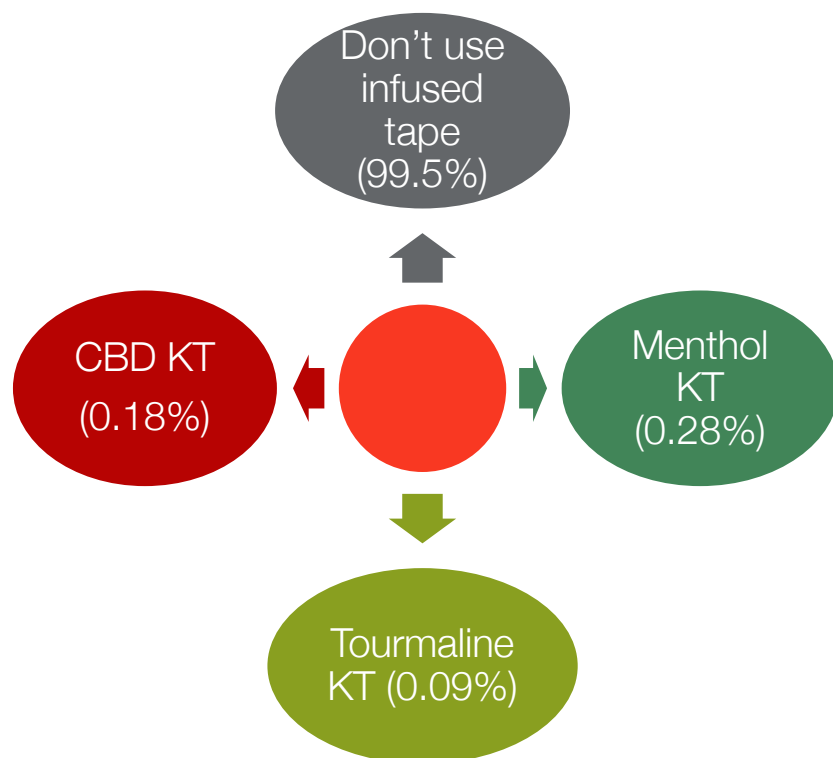
## Specialty Pre-Cut KT



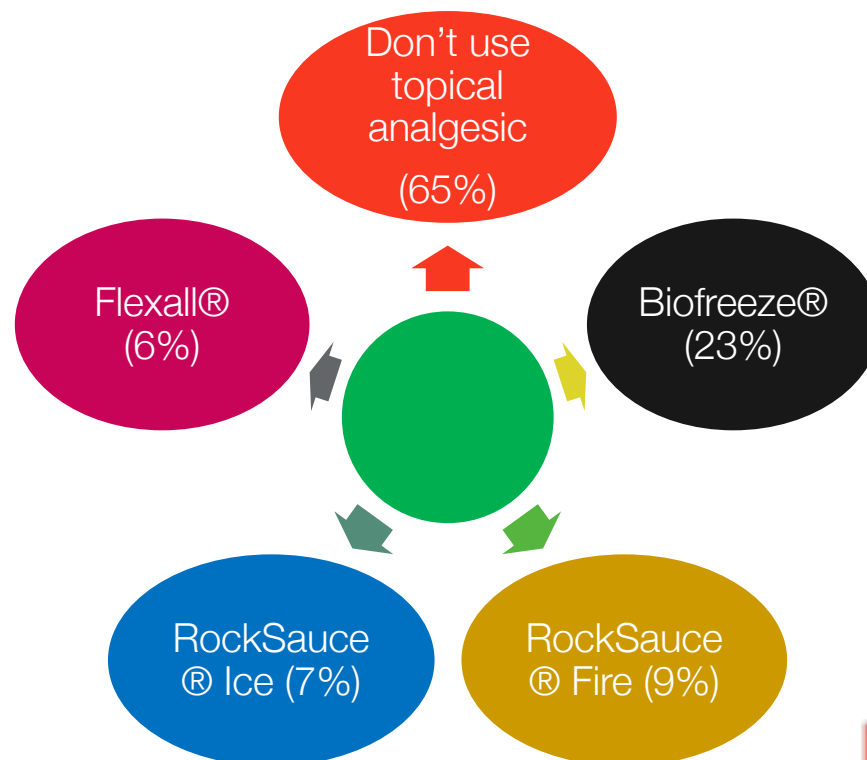
# KT Clinical Application: Survey

- Survey:
  - Q5: Which type/s of commercial infused KT do you use with clients?
  - Q6: Which topical analgesic/s do you use with non-infused KT?

## Infused Tape



## Topical Analgesics





# KT Clinical Application: Literature Review

## Studies: Influence of KT color

- \*2018- Cavaleri et al. BMC Sports Sci Med Rehabil
  - Examined the influence of KT color on athletic performance, quadriceps strength, and neuromuscular function among healthy individuals.
  - Five conditions: no tape, KT beige sham, beige KT with 50% tension, red KT with 50% tension, and blue KT with 50% tension

## Consensus:

- Results: KT, regardless of color or condition, did not alter athletic performance, lower leg strength, or neuromuscular function



# Bottom Line

- Survey research: Most Respondents
  - Used 4 tape brands
  - Used standard KT and no specialty KT
  - Do not use infused tape or a topical.
  - KT colors black and beige most popular.
- Based on research evidence:
  - KT color has no effects



# Module IV: KT Treatment Variables



What is the ideal KT tension length?



# KT Tension Length: Recommendations

- Recommendations:
  - Different elongation lengths for different effects
  - Tape strip: no stretch on ends “anchors”, 25-75% elongation in middle.

25% to 75%

Musculoskeletal conditions  
Sports performance

25% to 50%

Fascia  
Circulatory  
Stimulate muscle activity  
Inhibit muscle activity

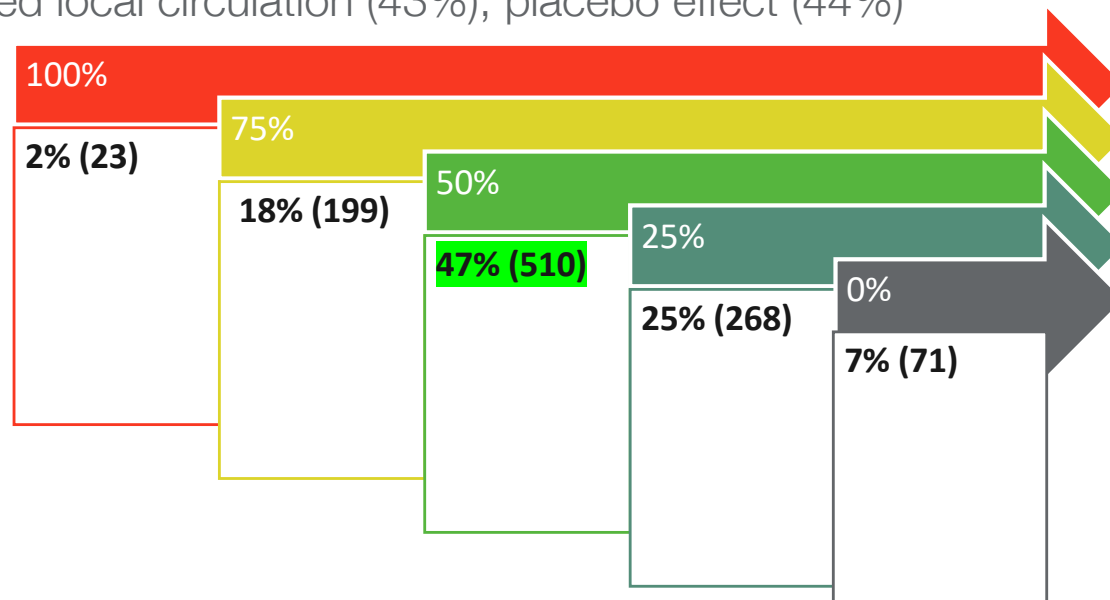
0-15%

General treatment



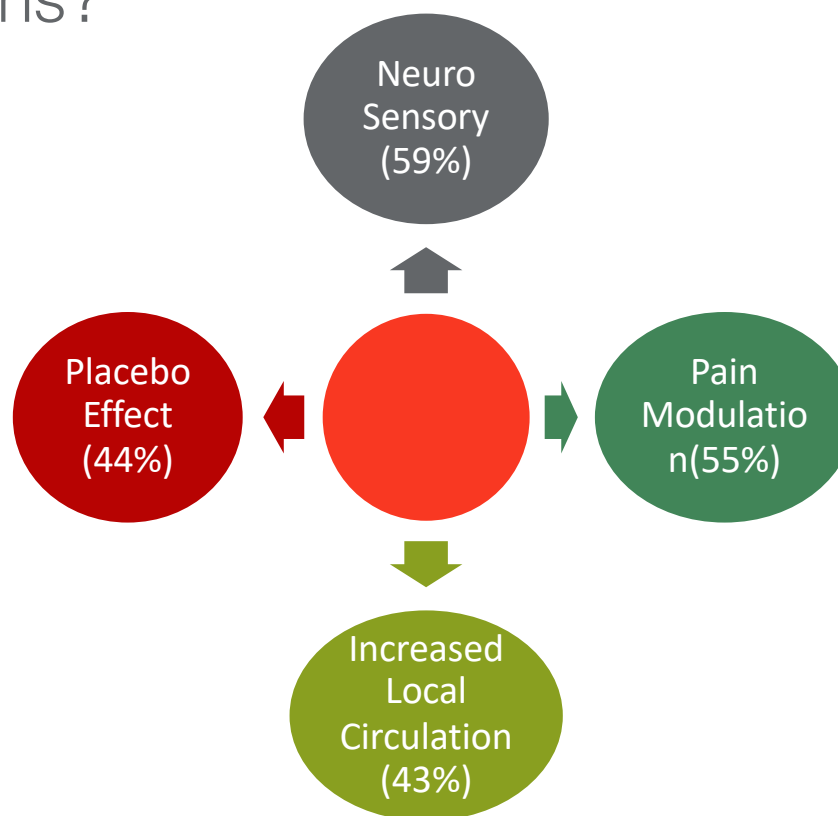
# KT Tension Length: Survey

- Survey:
  - Q1: When applying the KT, what is the most common tension length percentage you use for your clients?
  - Q2: What therapeutic effects do you believe occurs with the KT tension length?
    - Answer: Enhanced proprioception and kinesthetic sense (59%), pain modulation (55%), increased local circulation (43%), placebo effect (44%)



# KT Tension Length: Survey

- Survey:
  - Q2: What therapeutic effects do you believe occur with KT tension lengths?



# KT Tension Length: Literature Review

## Studies:

- 2020- Chen et al. PLOS ONE
- 2019- Grześkowiak et al. J Sport Rehabil
- 2019- Pires et al. Braz J Phys Ther
- 2018- Lemos et al. Braz J Phys Ther
- 2018- Velasco-Roldan et al. Pmr
- 2017-de Jesus et al. Int J Sports Phys Ther
- 2017- Yoosefinejad et al. J Bodyw Mov Ther
- 2017- Sanzo. Int J Prev Treat



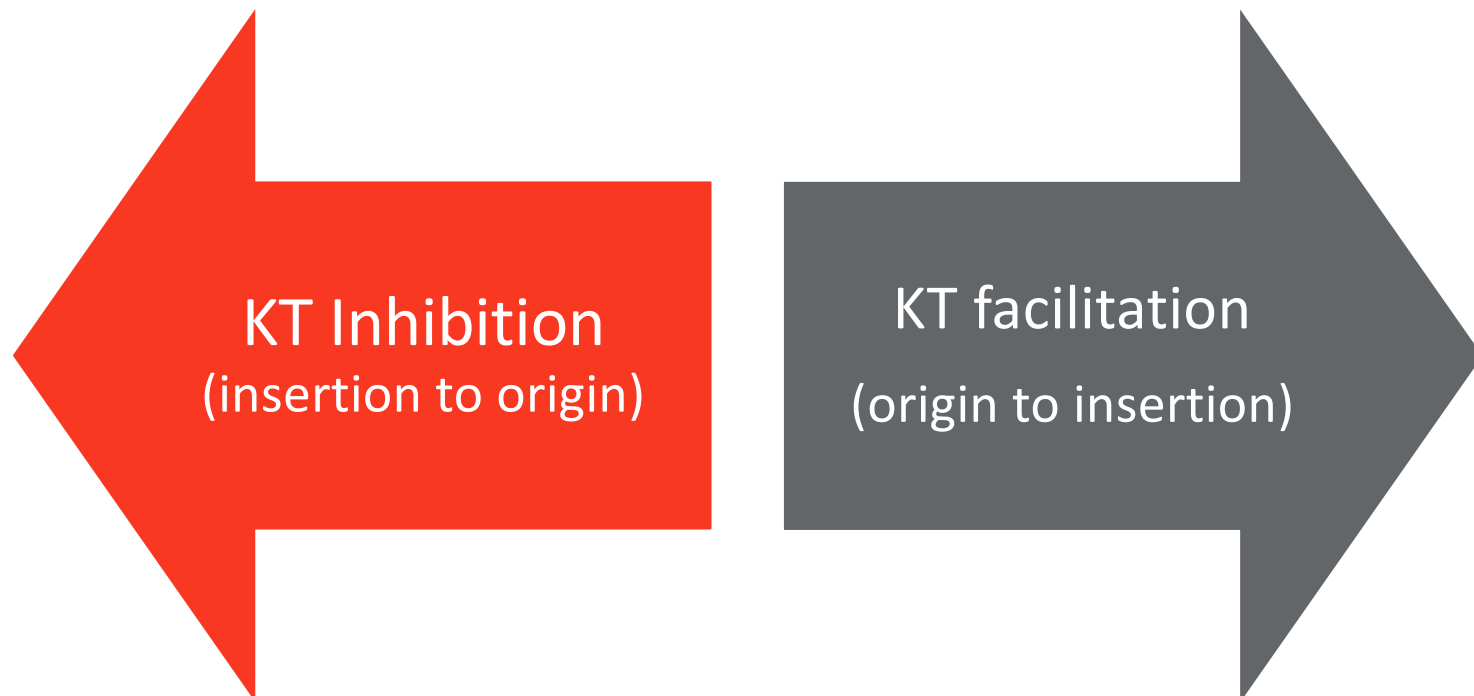


Does KT direction make a difference?



# KT Direction: Recommendations

- Recommendations:
  - KT direction can facilitate or inhibit myofascial activity
  - \*KT survey did not ask this question



# KT Direction: Literature Review

## Studies:

- 2018- Choi and Lee. Medicine
- 2017- Kim et al. Phys Ther Sport
- 2020- Magalhaes et al. J Sport Rehabil
- 2020- Limmer et al. Eur J Sport Sci
- \*2016- Yeung and Yeung. Medicine
- (\* Positive Effects)



# Bottom Line

- Scientific research:
  - KT tension length and direction may not have any effects versus non-tensioned tape
- Based on research evidence:
  - KT may produce some type of placebo or neurophysiological effect just by tactile stimulation
    - Stimulate afferent receptors and CNS pathways??
    - Etc.



# Module V: KT Clinical Measures, Education, & Referral



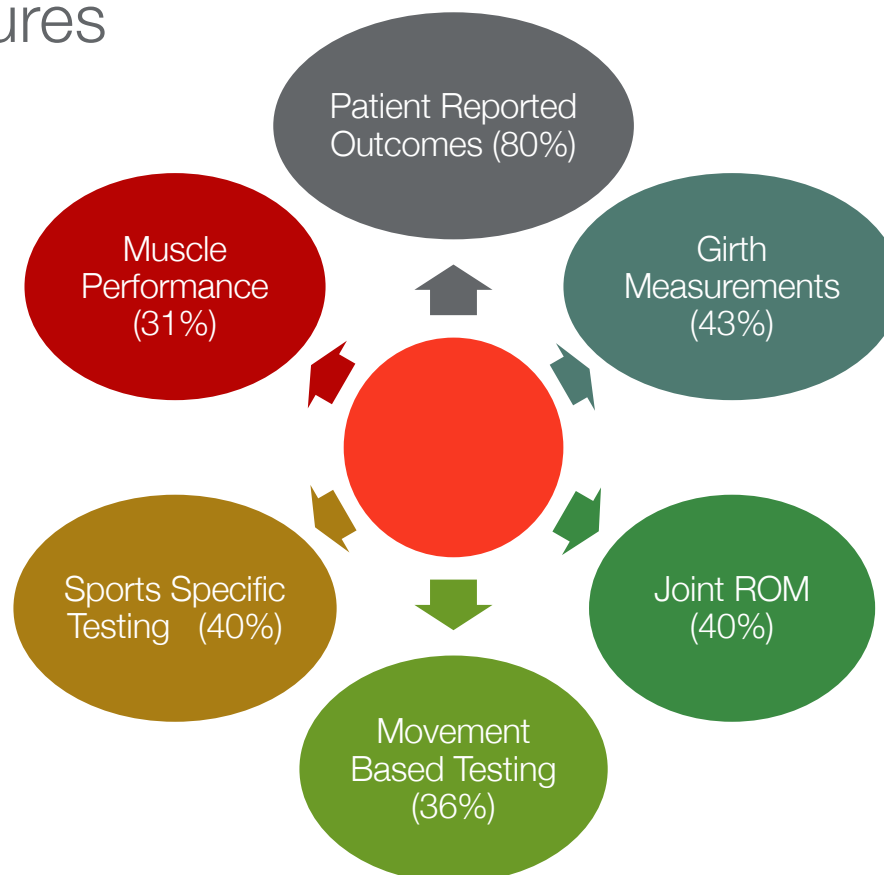
What are common clinical measures used for KT?



# KT Clinical Measures: Survey

- Survey:
  - Q1: What clinical measures do you use to assess the effects of KT?

## Clinical Measures



What are modes of KT  
education and patterns of  
client referral?

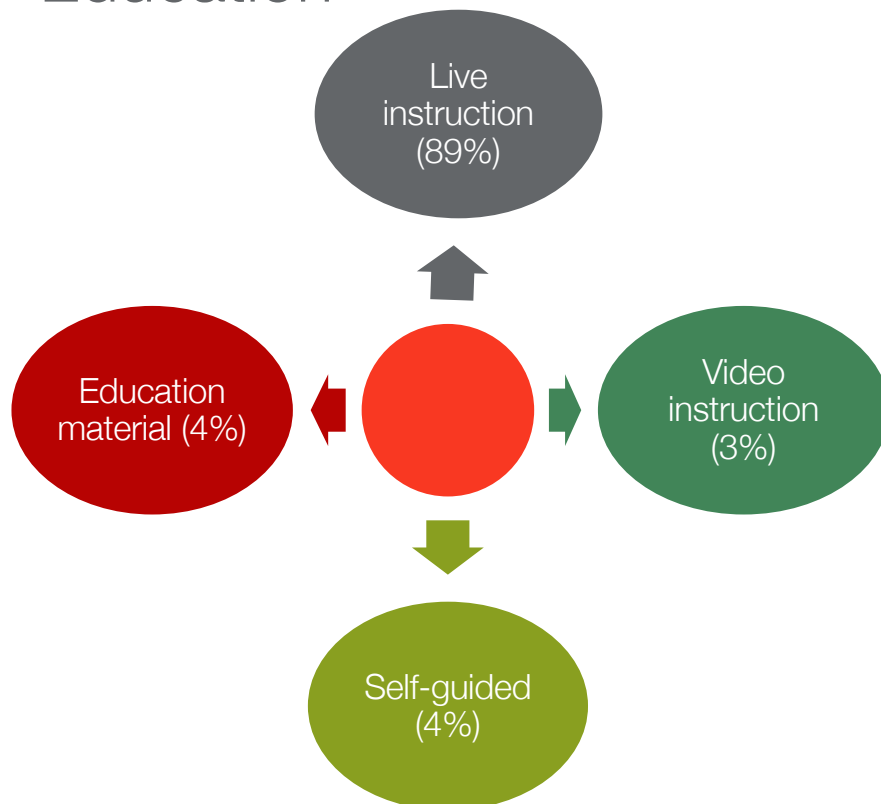




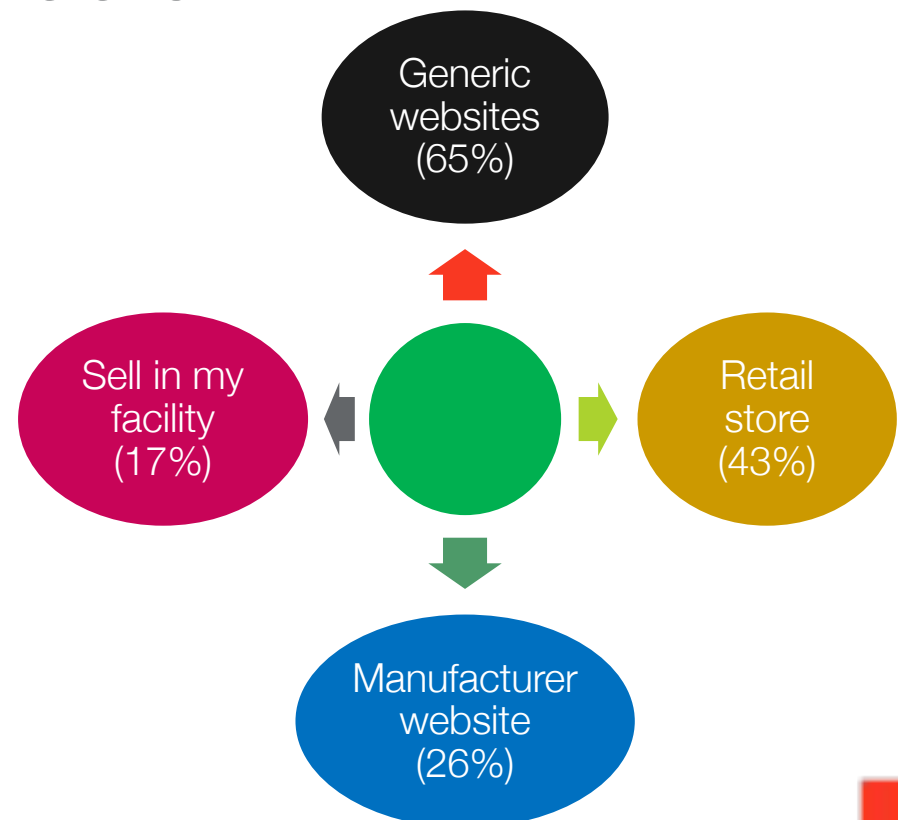
# KT Education & Referral: Survey

- Survey:
  - Q1: What are common types of education you with clients?
  - Q2: Where do you direct your clients to purchase KT?

## Education



## Referral



# Bottom Line

- Scientific research:
  - KT research has used all the outcomes that respondents used in the survey. Patient related outcomes were most common
  - Efficacy of KT teaching modes and client referral patterns have not been studied.



# Module VI: KT Skin Prep, Tape Removal, and Length of Time to Wear Tape



What is the best method/s to  
prep the skin and remove KT?



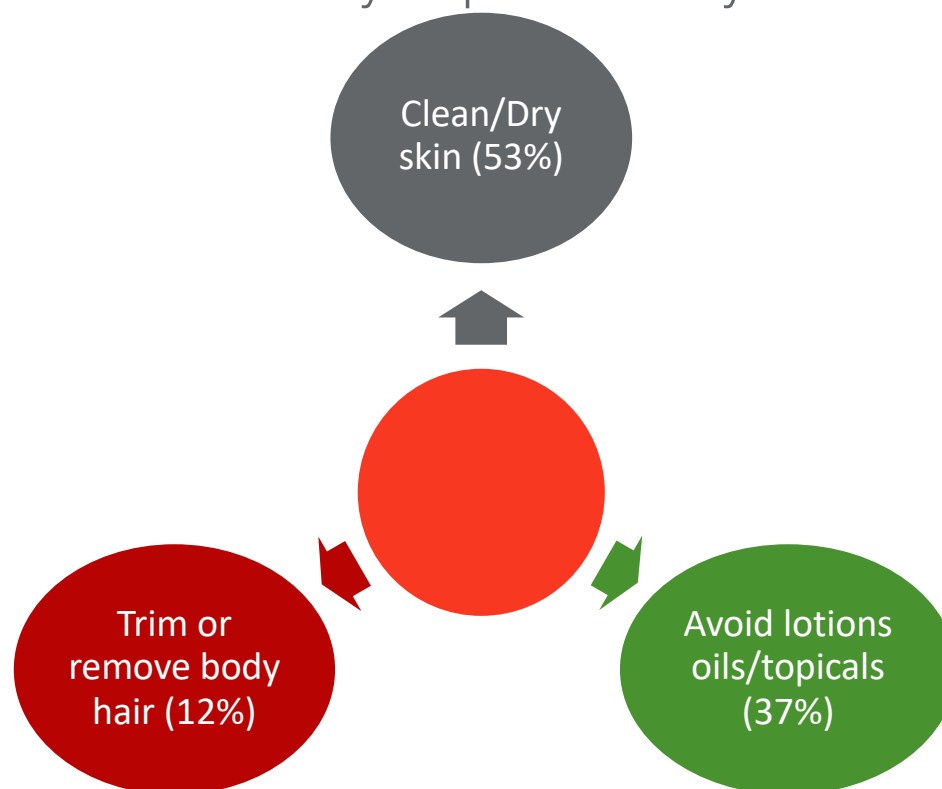
# KT Skin Prep: Recommendations

## Guidelines



# KT Skin Prep: Survey

- Survey:
  - Q1: Do you instruct clients to prepare their skin before applying the KT?
    - Answer: Yes (64%), No (36%)
  - Q2: If yes, what instructions do you provide to your clients?



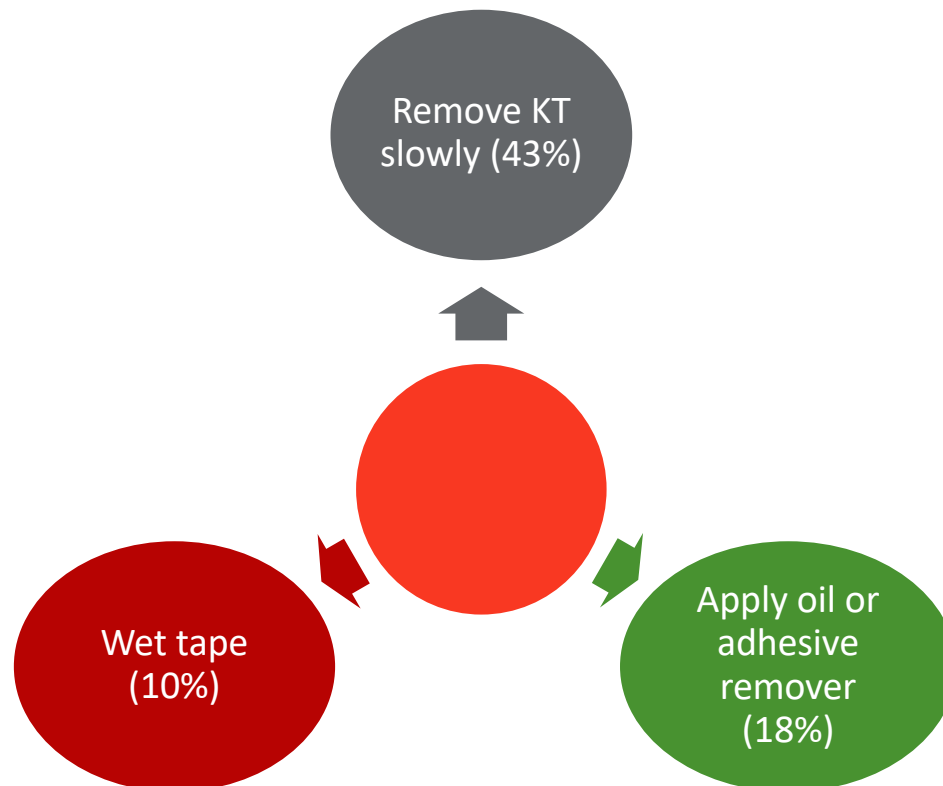
# KT Removal: Recommendations

## Guidelines



# KT Removal: Survey

- Survey:
  - Q1: Do you instruct your clients to safely remove the KT?
    - Answer: Yes (77%), **No (23%)**
  - Q2: If yes, what instructions do you provide to your clients?





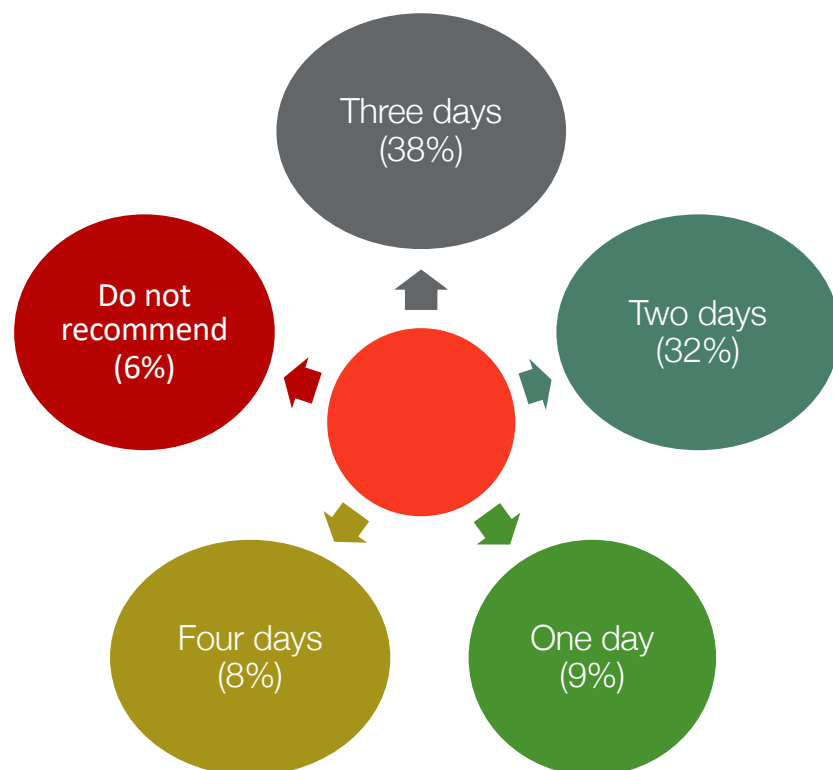
What is the recommended average and maximum time to wear KT?



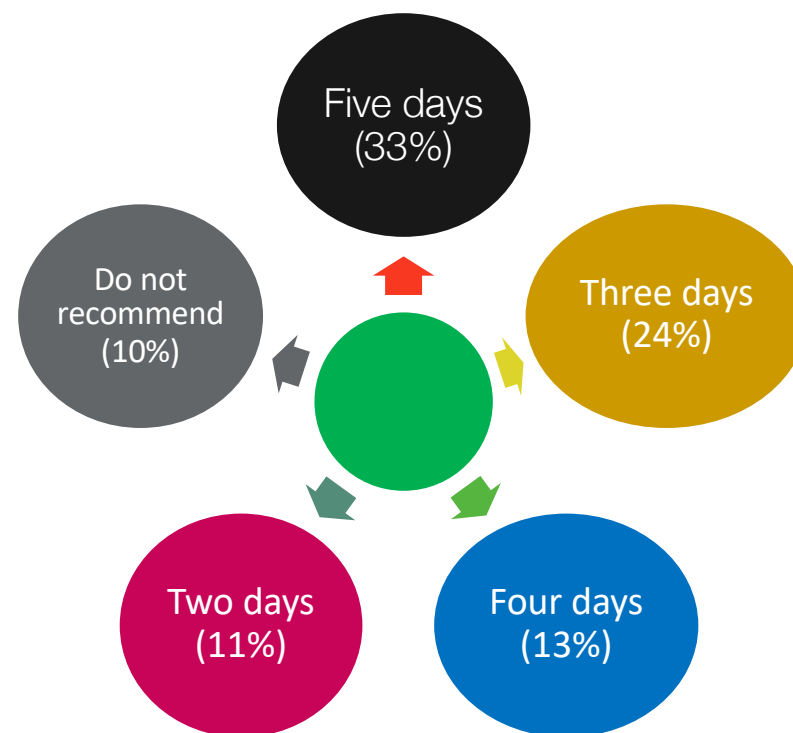
# KT Wear Time: Survey

- Survey:
  - Q1: What is the average time you recommend clients to wear KT?
  - Q2: What is the maximum time you recommend clients to wear the KT?

KT Average Wear Time



KT Maximum Wear Time



# KT Wear Time: Literature Review

## Studies:

- 2020- Noguera-Iturbe et al. Sci Rep
- 2019- Pakkir et al. Int J Physiother
- 2019- Donec and Kubilius. Ther Adv Musculoskel Dis
- 2017- Mohamadi et al. Chiropr Man Therap
- 2016- Wilson et al. Int J Sports Phys Ther
- 2016- Jackson et al. J Athl Train
- Etc.

## Consensus:

- Research: KT wear time of 3 to 7 days
- Moderate Evidence:
  - Balance, myofascial pain, chronic ankle instability, subacromial impingement, rheumatoid arthritis
  - Knee osteoarthritis, knee arthroplasty, lymphedema, hamstring extensibility, and quadriceps strength



# Bottom Line

- Scientific research:
  - KT has no current research regarding skin prep and tape removal.
  - KT research uses a tape wear range of 3 to 7 days.
- Based on research evidence:
  - Professionals will have to rely on best practices for skin prep and removal.
  - Professionals will have to rely on their clinical judgement when prescribing KT wear time to clients.



# Module VII: KT Precautions and Contraindications



What are common KT  
precautions and  
contraindications?



# General Guidelines

## Precautions

- Congestive heart failure
- Patient intolerance
- Bones/nerves/vessels
- Thin/healing skin (scars/wounds)
- Skin allergies
- Meds altering sensation
- Diabetes/neuropathy
- Lymph node removal
- Etc.

## Contraindications

- Skin infection
- Skin rash/open wounds
- Blisters/tissue inflammation
- Cancer/malignancy
- Over eyes/sensitive areas
- Healing surgical/injury site
- Severe pain/neuro-conditions
- Deep vein thrombosis
- Etc.

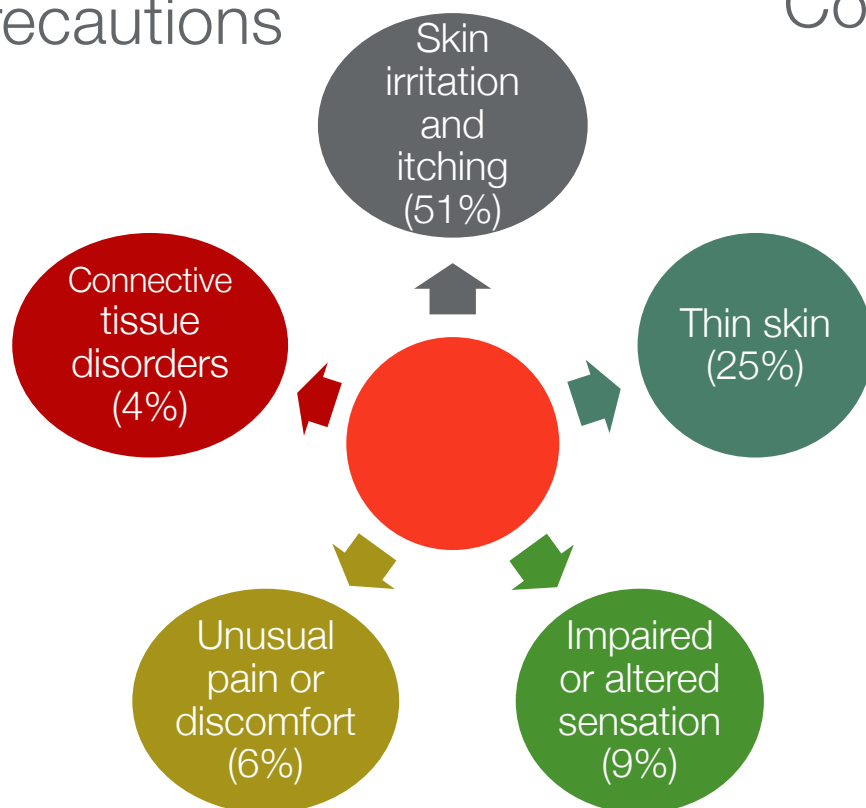
\*See Module 1 for General Precautions and Contraindications



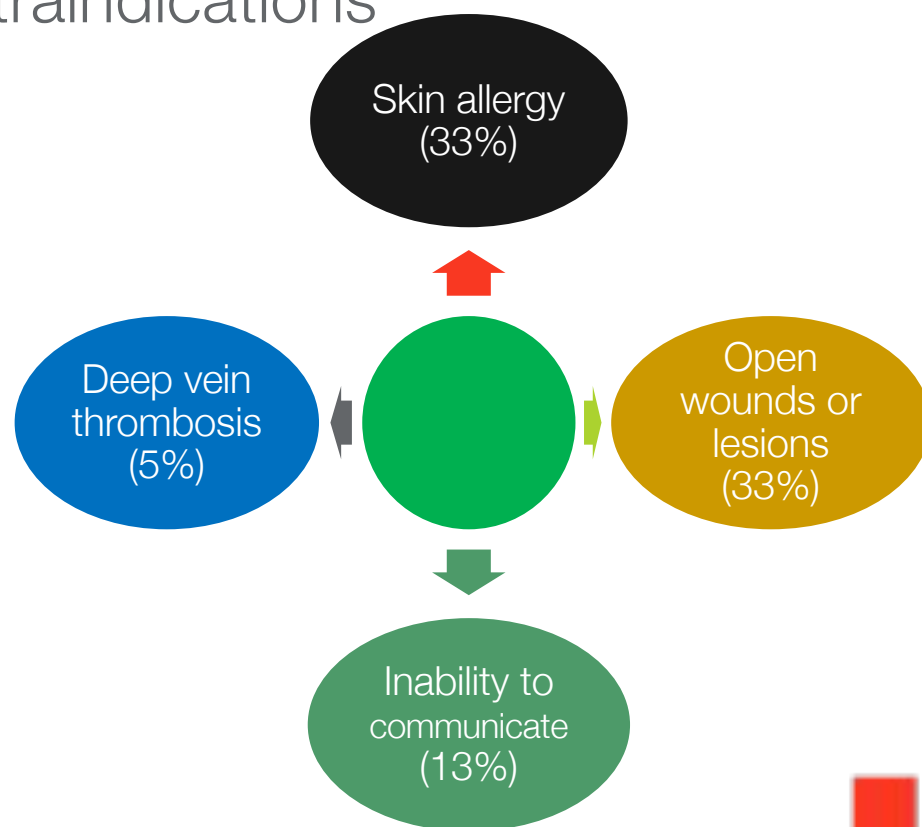
# KT Precautions/Contraindications: Survey

- Survey:
  - Q1: Which precautions do you believe are most important?
  - Q2: Which contraindications do you believe are most important?

## Precautions



## Contraindications





# KT: Side Effects

- Reasons for skin damage
  - Skin not properly prepped
  - Tape removed improperly
  - Prolonged tape wear
  - Skin precaution/contraindication
  - Etc.



# Bottom Line

- Scientific research:
  - KT precautions and contraindications have not been fully investigated.
- Based on research evidence:
  - Professionals will have to rely on their clinical judgement when prescribing KT for clients.

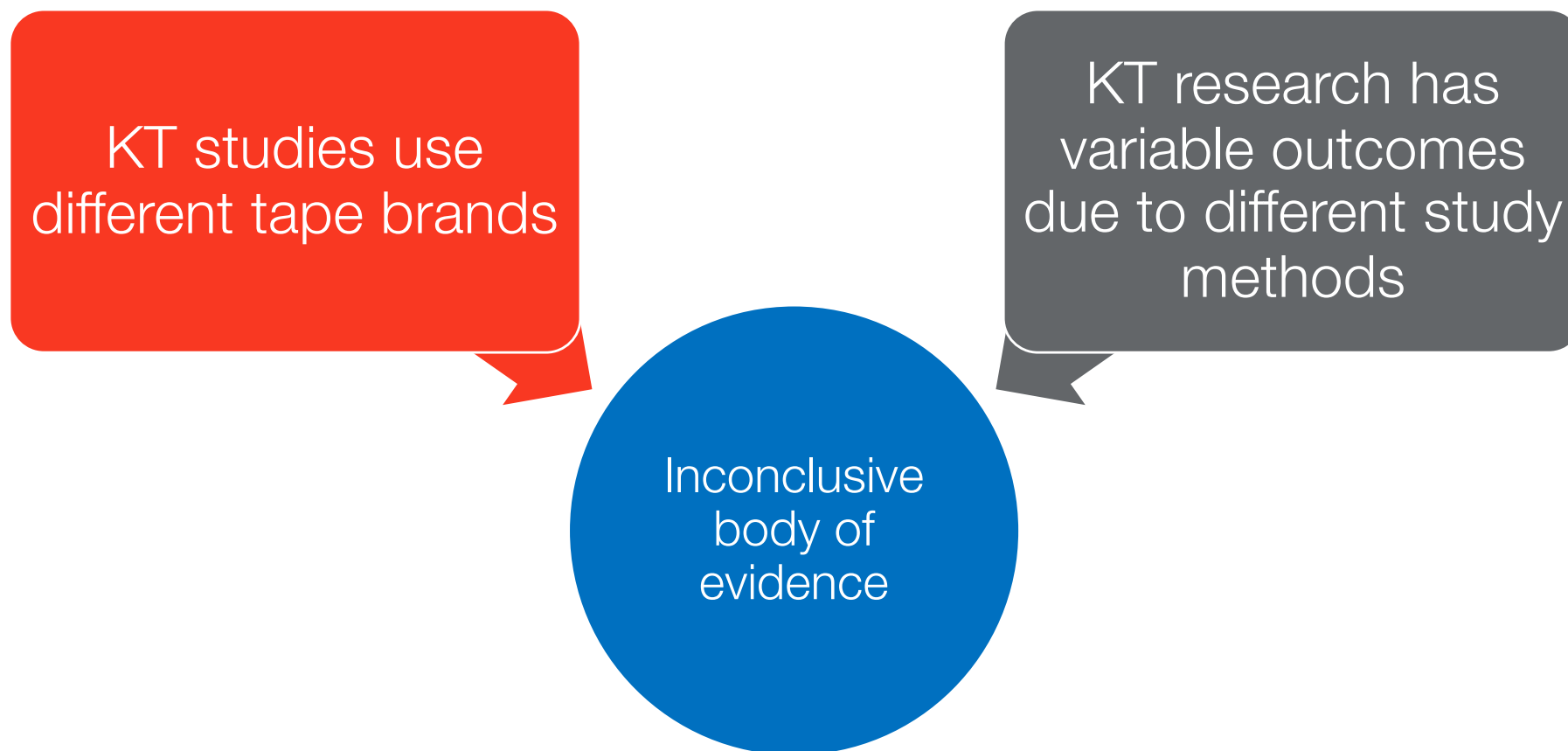


# Module VIII: KT Research Synthesis



What are the main issues in the KT research that has led to the overall evidence being weak?





# KT Research Issues: Literature Review

## Studies:

- 2019- Selva et al. BMC Musculoskelet Disord
- 2017- Matheus et al. Phys Ther Sport
- 2016- Boonkerd and Limroongreungrat. J Phys Ther Sci

## Consensus:

- Moderate Evidence:
  - Three recent studies measured the material and mechanical properties of 23 different KT brands.
  - Researchers found that all brands had different mechanical properties making it difficult for a direct comparison.



# Bottom Line

- Scientific research: 2 main issues
  - Tape Brands: Studies used different types
  - Study Methods: Different among all studies
- Based on research evidence:
  - Professionals will have to rely on their clinical judgement when prescribing KT for clients.



# Module IX: Athletic Tape





# Nomenclature

- Common Terms in the Literature:
  - Athletic Tape
  - Sports Athletic Tape
  - Non-Elastic Tape
  - Rigid Strapping Tape
  - Etc.

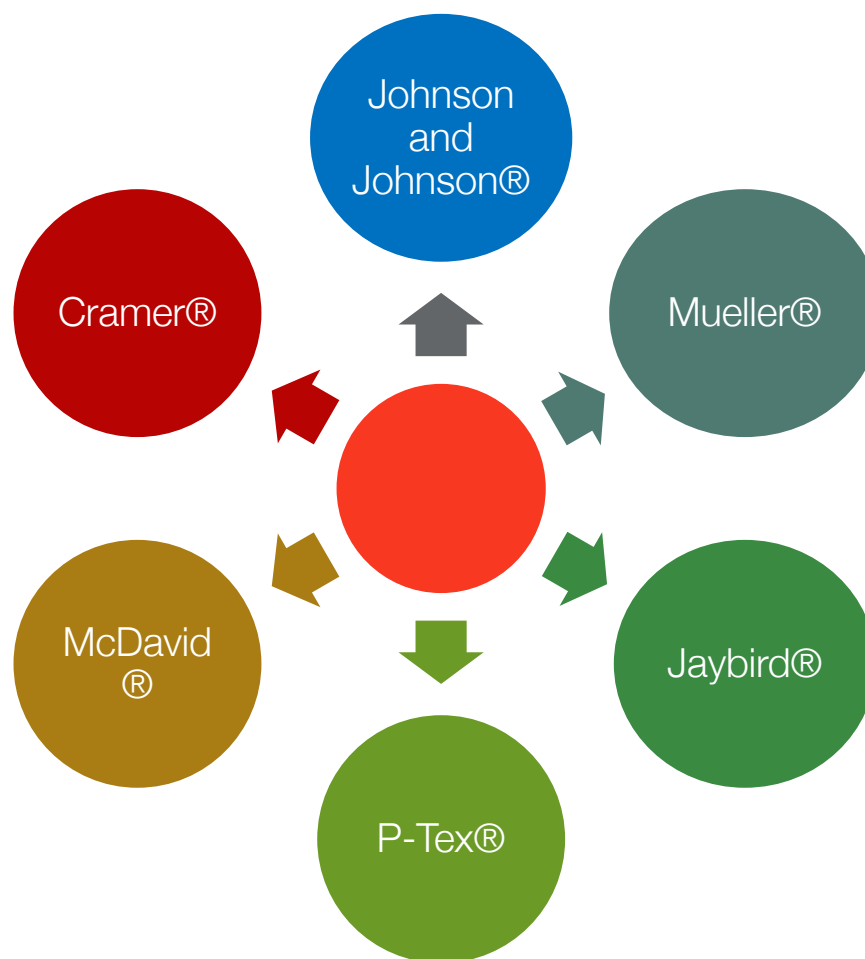


# Athletic Tape Definition

- Design: Non-elastic cotton-based tape
  - The tape is woven to not stretch and provide support.
  - Tape adhesive is heat activated.
  - Tape roll is not on a specific pre-stretch.
- Indications: Athletic tape used for sports, injury-prevention, and post-injury recovery, etc.

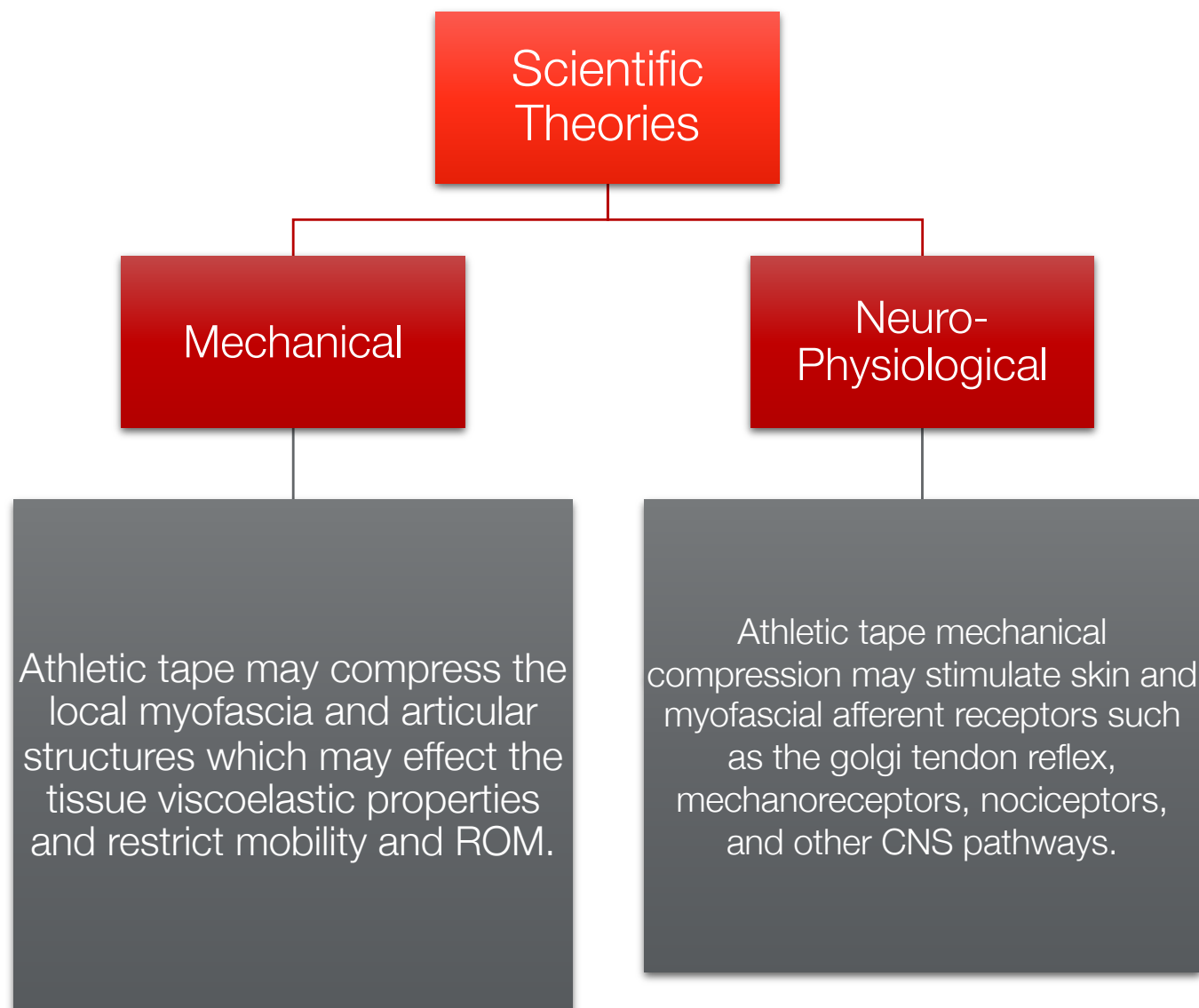


# Common Brands of Athletic Tape

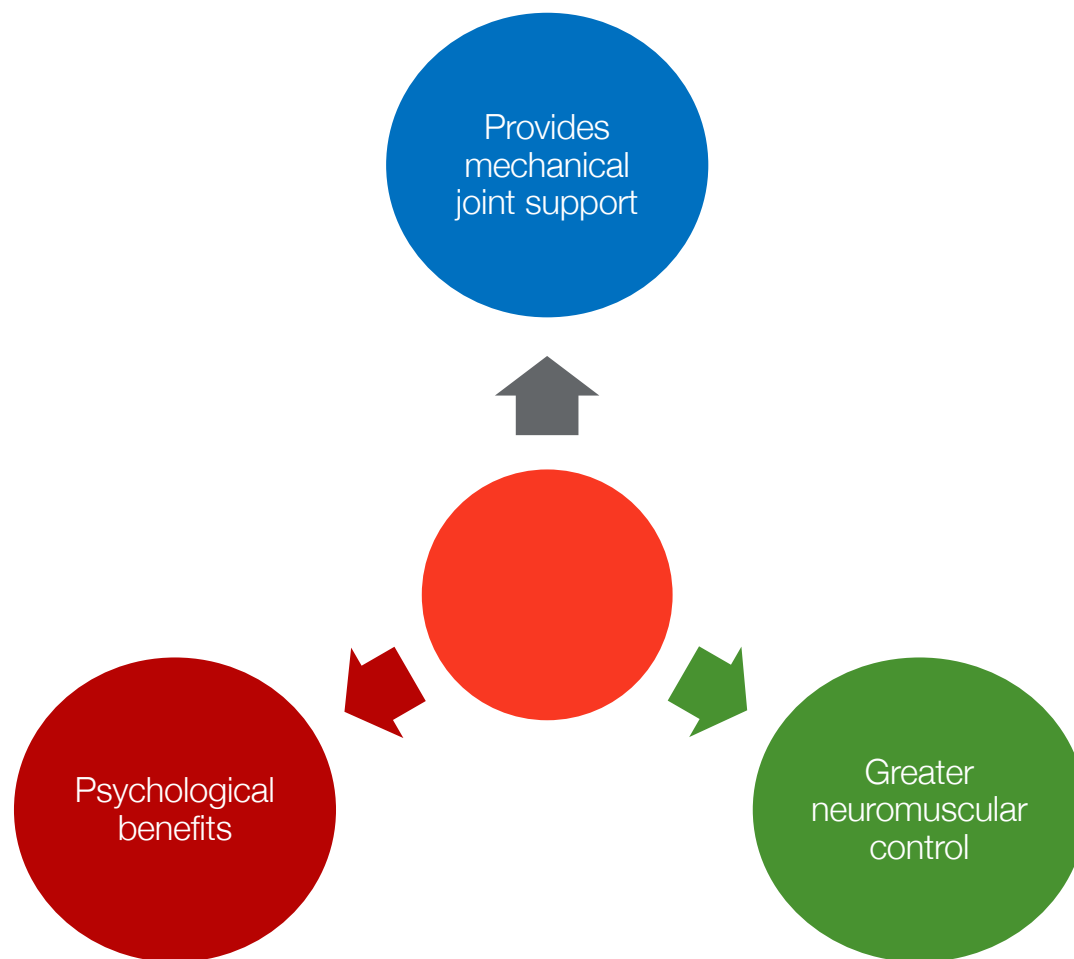


What are the current scientific theories behind athletic tape?





# Therapeutic Effects of Athletic Tape



# How long does athletic tape keep its strength & shape?



# Athletic Tape: Literature Review

## Studies:

- 2020- Tsikopoulos et al. Clin Orthop Relat Res
- 2016- Boonkerd and Limroongreungrat. J Phys Ther Sci
- 2013- Tregouet et al. Ann Phys Rehabil Med
- 2011- Briem et al. J Orthop Sports Phys Ther
- 2000- Cordova et al. J Orthop Sports Phys Ther
- 1999- Alt et al. Foot Ankle Int
- 1997- Manfroy et al. Am J Sports Med

## Consensus:

- Strong Evidence:
  - Athletic tape keeps its strength and shape for 20 to 40 min





Does athletic tape help prevent joint ligament injuries?



# Athletic Tape: Literature Review

## Studies:

- 2019-Kaminski et al. J Athl Train
- 2018-Vuurberg et al. Br J Sports Med
- 2013: Evans et al. Int Musculoskel Med
- 2012: Kerkhoffs et al. Br J Sports Med
- 2012- Raymond et al. J Sci Med Sport
- 2010- Dizon et al. J Sci Med Sport

## Consensus:

- Weak to Moderate Evidence:
  - Research suggest that non-elastic tape may prevent joint ligament injuries.
  - Ankle and foot primary region studied



What are common athletic tape precautions and contraindications?



# General Guidelines

## Precautions

- Congestive heart failure
- Patient intolerance
- Bones/nerves/vessels
- Thin/healing skin (scars/wounds)
- Skin allergies
- Meds altering sensation
- Diabetes/neuropathy
- Lymph node removal
- Etc.

## Contraindications

- Skin infection
- Skin rash/open wounds
- Blisters/tissue inflammation
- Cancer/malignancy
- Over eyes/sensitive areas
- Healing surgical/injury site
- Severe pain/neuro-conditions
- Deep vein thrombosis
- Etc.

\*See Module 1 for General Precautions and Contraindications



# Athletic Tape: Side Effects

- Reasons for skin damage
  - Skin not properly prepped
  - Tape removed improperly
  - Prolonged tape wear
  - Too much adhesive spray
  - Skin precaution/contraindication
- Solutions
  - Use pre-wrap
  - Use a different type of tape
  - Use an external brace



# Bottom Line

- Scientific research:
  - Athletic tape has weak to moderate evidence for preventing joint sprains.
  - Tape lasts between 20-40 minutes
  - Tape restricts motion, soft-tissue mobility, improves neuromuscular control and proprioception



- Thanks!!!
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- PubMed Citations
- <https://pubmed.ncbi.nlm.nih.gov/?term=cheatham%20SW>



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