Kinesiology Tape in Conjunction with Physical Therapy Interventions

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http://www.bayareaneuromuscular.com
What is K-tape?

- Kinesiology taping is an elastic tape applied to skin
- Enhances function of tissues and physiological systems
  - Skin, fascia, circulatory/lymphatic systems, muscle and joint
- Can be worn for extended periods of time
Comparison to Other Taping Methods

- **Kinesio Tex Tape**
  - Elastic: allows normal ROM
  - Different application for effect
  - Worn 3-5 days

- **Athletic Taping**
  - Limit or assist motion
  - Acute injuries or prevention
  - Compressive force
  - Limited wear time

- **McConnell and Mulligan Taping**
  - Bracing to limit pathological movement
  - Combination of rigid tape over mesh tape
  - Limited wear time

[Images and references to external URLs for Kinesio Tex Tape, Athletic Taping, and McConnell and Mulligan Taping]
Uses of Kinesiology Tape

- Prevent re-injury
- Homeostasis
- Combined with other modalities
- Safe
- Heat activated
K-tape Effects

- **Skin and fascia**
  - Forces can relieve pain
    - Compressive forces may stimulate mechanoreceptors
    - Decompressive forces may decrease inflammation and unload mechanoreceptors

![Diagram showing the effects of kinesiology taping on skin, fascia, and inflammation](http://milehighpt.com/wp/wp-content/uploads/2014/08/kinesiologytaping1.jpg)
Effects

- Superficial lymphatic
  - Reduces pain and edema
  - Enhance fluid exchange and interstitial lymphatic fluid
  - Lifts skin = creates channels of low pressure
  - Assists in return to homeostasis
  - Causes convolutions = affects muscle function and other tissues

http://corespineandsportscenter.com/media/kt-skin1.jpg
Effects

- **Muscle**
  - Improve ROM and length/tension ratios for optimal force
  - Speed tissue recovery
  - Relieve pain
  - Reduce fatigue

- **Joint**
  - Balance agonist and antagonist
  - Reduce muscle guarding
  - Support function of ligament and tendon
  - Kinesthetic awareness
Concepts

**Facilitation** of weak muscle
- Apply proximal to distal (origin to insertion)
- Chronic conditions, rehabilitation
- Tension 15-35%

**Inhibition** of overused muscle
- Apply distal to proximal (insertion to origin)
- Acute conditions, muscle spasm
- Tension 15-25%
Corrective techniques

- Mechanical correction: positional hold
  - 50-75% tension, inward/downward pressure, inhibits pathological movement

- Fascia correction: oscillating tissue
  - 10-25% tension for superficial fascia, 25-50% for deep fascia
  - Create, unwind or direct movement of fascia

- Space correction: lifting
  - 10-35% tension in center of tape
  - Decreases pressure on target tissue
  - Example: donut hole for lateral epicondylitis
**Corrective techniques**

- **Ligament/ tendon correction: proprioceptive**
  - Decrease stress on ligament and tendon
  - Ligament: 75-100% tension, stimulate mechanoreceptors, support injured tissue, no stretch on target tissue
  - Tendon: 50-75% tension, stimulate GTO for joint protection, stretch target tissue

- **Functional correction: spring-assist or limit**
  - 50-75+% tension
  - Sensory stimulation to assist or limit motion
  - Tension applied throughout and Pre-load motion to increase stimulation
**Corrective techniques**

- Circulatory/lymphatic correction: channeling
  - 0-20% tension
  - Anchor typically applied proximally, near healthy lymph node
  - Directional pull allows exudate to travel less congested area
  - Fan tails applied over congested area

Application

- Application of tape changes tension elements of tissue
- Tape applies tension dependent on percentage of stretch used

http://www.theratape.com/education-center/how-to-apply-kinesiology-tape/
Application

- Stretching skin will expose more sensors to be stimulated by tape
  - Maintains and promotes normal tissue flexibility
- Never place tension at anchor or ends!
  - Longer anchors = dissipate tension & decrease risk of skin reaction
- Tape recoils towards anchor to either facilitate or inhibit muscle
Application

- I strip: tension focused within therapeutic zone (region of tape) directly over target tissue
- Y strip: tension dispersed between two tails over target tissue
- X cut: tension focused directly over target tissue and dispersed through tails
- Fan cut: tension dispersed over target tissue and through multiple tails

http://www.physio-pedia.com/Kinesiology_Taping
• Need proper patient assessment, not appropriate for all patients

**Contraindications**
- Don’t apply over:
  - Active malignant site
  - Active cellulitis or skin infection
  - Open wounds
  - DVT

**Precautions**
- Diabetes
- Kidney disease
- Congestive heart failure
- CAD or bruises in carotid artery
- Fragile or healing skin
- Pregnancy
**Rules**

- **Always**
  - Assess, tape, re-assess
  - Tape for pain
  - Clean and dry skin prior
  - Round edges
  - No tension to anchor or ends
  - Anchor in neutral position
  - Therapeutic zone applied to stretched tissue

- Move joint through full ROM prior
- After application, rub to activate adhesive
- May need tape adherent
- Apply 30 minutes before rigorous activity or swimming
- Patient education!
Rules

- Never
  - Blow dry tape
  - Attach to nape of hair, through axilla or groin
  - Pull patient into position with tape
  - Leave tape on if itching or increased pain
  - Avoid touching adhesive side prior to application
Documentation and Billing

- **Documentation**
  - Problem list, target tissue, cut and length of tape, application of direction, amount of tension applied, modifications made or needed for next visit

- **Billing**
  - Times codes
  - Strapping codes
  - Charge per strip or client purchase of roll
  - Tape assessment and application fee
Current Literature
Kinesio taping applied to lumbar muscles influences clinical and electromyographic characteristics in chronic low back pain patients

PAOLONI ET AL. 2011
EUROPEAN JOURNAL OF PHYSICAL REHABILITATION MEDICINE
Paoloni et al.

- Level 1b
- Purpose: Determine the effect of kinesiotaping on pain, disability and lumbar muscle function in subjects with CLBP both immediately and one-month post exam
- Two phases
  - I: intra-subject pre-test/post-test procedure
    - Immediate effect
  - II: RCT
    - Short-term effect
- Outpatient facility
39 subjects with CLBP (30-80 y.o.)

Inclusion criteria
- Back pain lasting >12 weeks, failure to achieve flexion-relaxation (FR)

Exclusion criteria
- Radiculopathy, lumbar stenosis, spondylolisthesis, previous spinal surgery, corticosteroid in last 2 weeks, central and/or peripheral nervous system diseases

VAS, Roland-Morris Disability Questionnaire

FR evaluated using sEMG
Paoloni et al.

- **Interventions**
  - KT+ exercise
  - KT alone
  - Exercise alone

- **K-tape:** 20 cm x 5 cm of Kinesiotape KT545

- **Therapeutic exercise:** 30 min, 3x/week for 4 weeks, groups of 5 subjects
  - Relaxation techniques, stretching, active exercises for abdominal, lumbar and thoracic back extensors, psoas, ischiotibial, and pelvic
Paoloni et al.

- **Results for short-term effect**
  - VAS significantly decreased for all 3 groups
  - RMDQ scores reduced in all 3 but significant for exercise alone
  - FR normalized 28% of subjects but exercise displayed higher rate of FR reappearance

- **Limitations**
  - Small sample size
  - Short duration of follow-up
  - Particular CLBP sub-population
Conclusions

- KT immediate and short-term pain relief for CLBP
- Reduces abnormal paraspinal sEMG activity
- **Exercise alone or exercise + KT** = greater reduction in pain-related disability → better muscle function
Kinesio taping compared to physical therapy modalities for the treatment of shoulder impingement syndrome
Level 2b

Purpose: Determine and compare the short-term efficacy of kinesio tape and physical therapy modalities in patients with shoulder impingement

Inclusion criteria
- Pain before $150^\circ$ active elevation, + empty can, + Hawkins-Kennedy test, ADL difficulty, 18-70 yo

Exclusion criteria
- Intra-articular steroid injection, shoulder girdle fracture, GH dislocation/sublux, AC sprain, cervical radiculopathy symptoms, hx shoulder surgery previous 12 week, shoulder pain > 6 mo
Kaya et al.

- 55 subjects
- KT intervention (N=30) + HEP 2x/day
  - Space and lymphatic correction technique
  - Taped 3 muscles (supraspinatus, deltoids, teres minor)
- PT intervention (N=25) for 2 weeks
  - Same HEP
  - PT modalities (US, TENS, exercise, MH)
- Outcome measures at baseline, 1st, and 2nd week
  - DASH, VAS
Kaya et al.

- **Taping method**
  1. **Supraspinatus tape:** 3 cm below GT
     1. Adducted shoulder w/ lateral neck flexion to opposite side
     2. Rest of strip along spinous process of scapula
  2. **Deltoids, Y-shaped:** 3 cm below deltoid tuberosity
  3. **Teres minor I-type:** lower facet of GT
     1. Abducted in horizontal flexion w/ IR
     2. Rest of strip along axillary border of scapula
• Results
  ○ DASH scores significantly lower for KT group at 2\textsuperscript{nd} week
  ○ Rest, night, and movement median pain scores of KT group were significantly lower at 1\textsuperscript{st} week
  ○ No significant difference between two intervention groups
    ▪ Rest pain scores of KT group before treatment seemed considerably lower than PT group

• Limitations
  ○ No control
  ○ Lack of randomization
  ○ Drop out bias
Conclusion

- **KT alternative treatment option for shoulder impingement when need immediate effect**
- **KT requires shorter application duration**
  - Modalities: daily for 2-4 weeks
  - **KT**: 3 times within 2-4 weeks
The effects of additional kinesio taping over exercise in the treatment of patellofemoral pain syndrome

AKBAS ET AL. 2011
ACTA ORTHOPAEDICA ET TRAUMATOLOGICA TURCICA
Level 1b

Purpose: Determine the effects of kinesio taping in treatment of patients with PFPS

Inclusion criteria
- Diagnosis of unilateral PFPS, 17-50 yo, female

Exclusion criteria
- Tendonitis, Osgood-Schlatter syndrome, known articular cartilage, meniscus or ligament damage, history of patellar subluxation or dislocation and previous knee surgery
31 subjects

KT group (n=15)
- Taping at 5 day intervals for 6 weeks

Control group (n=16)

Each group received HEP of muscle strengthening and soft tissue stretching for 6 weeks
- New exercises added as needed once a week

Outcome measures: VAS, tension of ITB/TFL and hamstrings, mediolateral location of patella, Anterior Knee Pain Scale/Kujala Scale
- VMO and quadriceps femoris for facilitation/proprioceptive stimulation
- VL, ITB/TFL and hamstring muscles for tightness relief
Akbas et al.

Results

- Pain significantly decreased in all positions for both groups
- Hamstring tension significantly decreased after treatment
  - Occurred in 1st 3 weeks for KT group, gradually for control group
- ITB/TFL complex length significantly increased in both groups
  - Last 3 weeks for control group
- No change in mediolateral location of patella
- Kujala score significantly increased for both groups
- **Limitations**
  - Subjects measures without warm-up or pre-stretch

- **Conclusion**
  - Both interventions significantly decreased pain and increased flexibility of soft tissues
  - Flexibility changes occurred earlier in KT group
  - Exercises are effective for PFPS
  - **KT in addition to exercise doesn’t improve results but can improve hamstring flexibility faster**
Effects of short-term treatment with kinesiotaping for plantar fasciitis
Level 1b

Purpose: Investigate the therapeutic effects of kinesiotaping on plantar fasciitis

Inclusion criteria
- Diagnosis of plantar fasciitis, symptoms onset within 10 months

Exclusion criteria
- History of foot surgery or significant foot disorder (arthritis, trauma, tumor, etc.)
52 subjects

Experimental group: KT + PT program
- KT: gastrocnemius and plantar fascia continuously for 1 week

Control group: PT program, ultrasound, low-frequency electrotherapy
- 6x in 1 week

Outcome measures: subjective pain assessment, ultrasonographic assessment
Results

- Pain reduced significantly in both groups, improvement significantly more in KT group than control
- Significant improvement in total foot function for KT group
- Reduced fascia thickness significantly higher in KT group at insertion site but no difference 5 cm distal

Limitations

- Small sample size
- Short follow-up time
Conclusion

- Reduction in pain with KT probably due to tape reducing pulling force to plantar fascia
- KT can effectively reduce inflammatory reaction at insertion site of plantar fascia
- **KT continuous for one week can provide pain relief better than physical therapy alone**
Questions?
References


