Goals of Athletic Taping

Prevention

- Maintain bones and muscles in a stable position during an athletic activity (?Laxity concerns?)
- Enhance proprioceptive feedback in a limb or joint
- Prevent injuries in collision sports
- Shift and maintain an anatomic part such as the patella into a more stable position
- Reduce the severity of any potential injuries

Therapeutic

- Restrict the motion of an injured joint
- Compress soft tissues to reduce swelling
- Support an injured anatomical structure
- Protect an injured joint from progressive injury
- Protect an injured part while it is healing
- Link adjacent structures together (eg) fingers / toes

Taping

- Adhesive strapping tape is a temporary intervention to address lower limb biomechanical issues
- Has both biomechanical and neuromuscular effects during static and dynamic tasks

Tape Types

- Rigid tape
  - Standard white athletic tape
  - Rigid strapping tape (Leukotape)
  - Zinc oxide (Hy-tape)
  - Underwrap tape (cover-roll)
  - In use since 1930s

Rigid Tape

- Should not to be used in isolation
  - Include strengthening and proprioceptive exercises
  - Use in conjunction with rehabilitation for injury prevention or injury treatment

I have no conflicts to declare.
**Rigid Tape for the Knee**

- Some evidence to show that rigid tape can maintain good joint alignment in the knee during exercise.
- Patellar taping may alleviate symptoms associated with patellofemoral joint biomechanics.

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**Tape Types**

- Elastic tape
  - Kinesiotape, Rocktape, KT tape, Ares tape

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**Kinesio Tape Effectiveness**

- A 2012 meta analysis performed on 10 high quality papers:
  - No substantial evidence for role of elastic therapeutic tape in pain relief, ankle proprioception, or muscle activity.
  - Regarding muscle activity, the study concluded: "KT had some substantial effects on muscle activity, but it was unclear whether these changes were beneficial or harmful."
  - The tape "may have a small beneficial effect" in improving strength, range of motion in certain injured cohorts, and force sense error.
  - Further studies are needed to confirm these findings, as the majority of differences were trivial or unclear.

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**Kinesio Tape Effectiveness**

- After wearing KT for an extended amount of time, proprioceptive deficits were improved.
- Applying KT on calves seems to reduce muscle pain in normal fasciitis and patellofemoral pain.
- Patellar kinesio taping provided immediate and significant improvement in pain for patients with PFPS, but single-leg hop function was not improved.

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**Anti-pronation tape (figure)** is commonly used to treat plantar fasciitis and patellofemoral pain.

- Proven to be better than no tape or kinesiotape at stimulating the muscles that prevent ankle sprains.
- Ankle “slings” better at subtalar joint control than low Dye or basket-weave.

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**Kinesio Tape Claims**

- Improve range of motion in both injured/healthy joints.
- Facilitate joint motion as a result of the tape’s recoiling qualities.
- Small and immediate increase in strength.
- Lift the skin to allow improved blood and lymph flow through intersitial space.
- Relieve pain by reduction in pressure on nociceptors.

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**Kinesio Tape Effectiveness**

- No difference in hip or knee, kinematics or kinetics, between KT and no tape. Rigid tape influenced hip and knee biomechanics during running in an asymptomatic sample, whereas KT was not biomechanically different from no tape.
- The application of Kinesio tape did not alter the muscle peak torque generation and total work done, but shortened the time to generate peak torque.
- Our study did not reveal decisively relevant changes following application of Kinesio Tape to the ankle.
- Further work since 2010 papers in meta-analysis: Although the VGRF was increased after Kinesio taping, vertical jump height was not statistically improved.
- The application of Kinesio tape did not alter the muscle peak torque generation and total work done, but shortened the time to generate peak torque.
- Our study did not reveal decisively relevant changes following application of Kinesio Tape to the ankle.
- The application of Kinesio tape did not improve knee proprioception in a group of healthy young women.
- Contrary to the proposed mechanisms of Kinesio tape, our data showed decreased muscle activity during drop jump maneuver.
Bracing

Knee Bracing – The Claims
- **Prophylactic**
  - Protect knees during contact sports
  - Protect medial collateral ligaments from valgus stress
  - Support cruciate ligaments during rotational stress
- **Functional**
  - Support knees to prevent further injury
  - Stabilize rotational and anteroposterior forces
- **Rehabilitative**
  - Limit movement during healing

Other braces types:
- **Patellofemoral**
  - Improve patellar tracking
  - Relieve anterior knee pain
- **Joint Unloaders**
  - Relieve arthritic pain in arthritis associated with mal-alignment
  - Stress shares joint load reducing arthritic pain

The Ankle – Sprain Injury
- Most ankle sprains are inversion injuries
- Complete or partial tearing of the lateral ligament complex
  - Anterior talofibular
  - Calcaneofibular
  - Posterior talofibular
- These ligaments are usually injured in a sequential fashion from anterior to posterior, depending on the severity of the inversion

Ankle Sprains
- 79% of sprains occur in athletes with history of previous sprain
  - 49% of “sprainers” re-sprained in the first 6 mos. following original injury
  - 4 fold increase in re-injury risk in first 6-12 mos. post-injury

Ankle Taping
- Ralph W. Dye, DSC
  - “A Strapping” November 1939
  - Low dye and high dye taping
- Sound evidence to support:
  - Changed sagittal and transverse plane motion at the ankle
  - Reduced ankle abduction and plantarflexion
  - Reduced activity of leg muscles
  - Taping produces more change in the foot than in the ankle or knee

Ankle Taping
- Taping changes foot posture, foot mobility, ankle kinematics and leg muscle activity
- Biomechanics look better, but does it work?
  - Taping studies nearly impossible to control due to multiplicity of variables
  - Sys lit reviews inconclusive
  - Meta-analyses inconclusive
  - Most consistent finding is still “needs more study”
Ankle Taping vs. Bracing

- Many studies!
- Studies showing any preventative effect are the most elusive
- Many variables associated with ankle injuries, difficult to control for all
  - Ex: simply wearing high-top instead of low-top shoes prevented some ankle injuries


   Franettovich M, Chapman AR, Blanch P, Vicenzino B. Augmented low-Dye tape alters foot mobility

   Paluska SA, McKeag DB. Knee braces: Current evidence and clinical recommendations for their

   Hubbard TJ, Cordova M. Effect of ankle taping on mechanical laxity in chronic ankle instability. Foot

   Warden SJ, Hinman RS, Watson MA Jr, Avin KG, Bialocerkowski AE, Crossley KM. Patellar taping


   Raymond J, Nicholson LL, Hiller CE, Refshauge KM. The effect of ankle taping or bracing on

Prevention / Rehabilitation: Ankle Sprains

- Neuromuscular/Proprioceptive training
  - Cost effective “balance disc” programs
  - More effective in athletes with previous sprains
  - Less effective in athletes with no or significant sprain history (>5)

- Injury Education
  - Proper technique with jumps/landings
  - Awareness of “injury scenarios”

- Bracing
  - More effective in athletes with previous sprains


   Raymond J, Nicholson LL, Hiller CE, Refshauge KM. The effect of ankle taping or bracing on

References


- Raymond J, Nicholson LL, Hiller CE, Refshauge KM. The effect of ankle taping or bracing on

Thank You

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