



Pocketbook of

TAPING TECHNIQUES

ROSE MACDONALD

**CHURCHILL
LIVINGSTONE**
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Thank you to St John Ambulance for kindly allowing their diagrams to be used again as an 'aide memoire'.

This book is dedicated to the memory of Ian,
my ever-loving soulmate.



Glossary

Abduction	movement away from the midline of the body
Achilles tendon	tendon behind the heel
AC joint	acromioclavicular joint
Adduction	movement towards the midline of the body
Adhesive mass	sticky backing on tape
ADL	activities of daily living
Anterior	front
Anterior cruciate ligament	within the knee joint, limits anterior movement of the tibia on the femur
Assess	evaluate
Biceps	muscle on the front of the upper arm
Calcaneum	heel bone
Check rein	reinforced tape to restrict movement
Cohesive bandage	rubberized, sticks to itself and not to the skin
Condyle	bony end of the thigh bone
Contract	tense
Contralateral	opposite side
Contusion	bruise
Digit	finger/toe
Distal	area away from the centre of body or the furthest attachment
Dorsal	back (e.g. of the hand)
Extension	to straighten
Extensor tendons	on the front of the ankle joint

Femur	thigh bone
Flexion	to bend
Friction	rubbing
Hamstring	muscle at the back of the thigh
Hyperextend	to extend beyond the normal
Hypoallergenic	will not cause reaction on sensitive skin
Inferior	below
Innominate bones	flat bones that form the pelvic girdle
Inversion	turning in (e.g. ankle sprain)
Ipsilateral	same side
Kinesiology	study of motion of the human body
Lateral	side away from the body, outside
Ligaments	taut bands of tissue which bind bones together
Longitudinal arch	from heel to toes on the undersurface of the foot
Malleolus	ankle bone
Medial	side closest to the body, inside
MTSS	medial tibial stress syndrome
Palmar	front (e.g. of the hand)
Patella	knee cap
Pes cavus	foot with high rigid arch
Pes planus	foot with flat longitudinal arch
Peritendonitis	inflammation of the tendon sheath
Plantar fascia	tough bands of tissue on the sole of the foot
Plantar fasciitis	inflammation at the origin of the plantar fascia (near heel)
Plantarflex	toes and foot pointed downwards, towards the floor
Popliteal fossa	space behind the knee
Posterior	behind, rear
Pronate	turn palm down
Pronated feet	flat feet

Prone	lying face down
Proprioception	awareness of body position, perception of movement and change of direction
Proximal	close to the centre of the body or the nearest attachment
Quadriceps	muscles at the front of the thigh
Rehabilitate	to treat and restore to normal health
Rotator cuff	stabilizing muscles for the shoulder
Spica	figure-of-eight bandage technique
Sprain	overstretching or tearing of a ligament
SSTM	specific soft tissue massage
Strain	overstretching or tearing of a muscle
Superior	above
Supinate	turn palm up
Supine	lying on the back, facing upward
Tendinosis	degeneration in the tendon itself
Thenar eminence	muscular area of the thumb on the palm of the hand (intrinsic muscles)
Tibia	shin bone
Tibial tubercle	tibial attachment for the patellar tendon
Transverse arch	from medial to lateral
Valgus	distal bone/part pointing away from the midline of the body, knock knees
Varus	distal bone/part pointing toward the midline of the body, bow legs

Preface

Taping is now recognized as a skill which is essential for all those involved in the treatment and rehabilitation of injuries. It is widely used not only for sports injuries, but also for many other conditions such as muscle imbalance, unstable joints and impaired neural control. During treatment and rehabilitation, taping aids the healing process by supporting and protecting the injured structures from further injury or stress, thus reducing the need for prolonged treatment and time off work.

New techniques are constantly being developed for injury *prevention* which may also be used in general practice and in the hospital environment for the non-sporting population. Once the basic techniques are mastered, then it is up to the practitioners to modify, change and develop new techniques themselves, always adhering to taping principles.

To aid in the development of new techniques, this pocketbook has many new ideas which may be used as indicated or modified to suit the situation. Many of the 'old favourites' are included, as basic techniques are fundamental to the practice of good taping. Chapters on techniques to alter muscle activity and proprioception, with scientific evidence, are also included for those not familiar with this type of taping.

Sports medicine leans towards early mobilization through functional therapy, and total immobilization in plaster casts is becoming less common. Removable cast bracing is used instead, to enable therapy to continue throughout the recovery phase. Taping a limb or body part is like applying a 'flexible cast' which aids in the prevention of further injury and rests the affected part. Flexible tape casts limit the range of motion and may be used in many sports where rigid supports are not allowed.

On some occasions a bandage is more appropriate than tape. Therefore, at the end of this pocketbook, as an aide memoire, there are two short sections on spica (figure-of-eight) bandaging and the construction of arm slings using a triangular bandage.

New contributors from South Africa, Ireland and the UK share their expertise, bringing an abundant array of new evidence-based techniques and updated literature to the pocketbook.

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Introduction

chapter


R. Macdonald

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The application of tape to injured soft tissues and joints provides support and protection for these structures and minimizes pain and swelling in the acute stage. Tape should reinforce the normal supportive structures in their relaxed position and protect the injured tissues from further damage. Many different techniques are used for injury prevention, treatment, rehabilitation, proprioception and sport.

Various techniques are illustrated in this manual, together with different philosophies expressed by the contributors – many of whom are eminent physical therapists in their respective countries.

ROLE OF TAPING

Initially, tape is applied to protect the injured structure during the treatment and rehabilitation programme:

- to hold dressings and pads in place
- to compress recent injury, thus reducing bleeding and swelling
- to protect from further injury by supporting ligaments, tendons and muscles
- to limit unwanted joint movement
- to allow optimal healing without stressing the injured structures
- to protect and support the injured structure in a functional position during the exercise, strengthening and proprioceptive programme.

It must be clearly understood that taping is not a substitute for treatment and rehabilitation, but is an adjunct to the total injury-care programme.

TYPES OF TAPE

Good-quality tape should adhere readily and maintain adhesion despite perspiration and activity.

Stretch adhesive tape (elastic adhesive bandage, EAB)

Conforms to the contours of the body, allowing for normal tissue expansion, and is used for the following:

- to compress and support soft tissue
- to provide anchors around muscle, thus allowing for expansion
- to hold protective pads in place.

Stretch tape will not give mechanical support to ligaments, but may be used in conjunction with rigid tape to give added support. Stretch tape is not normally tearable and must be cut with scissors, but there are now available very light-weight stretch tapes which may be torn by hand. Stretch tape is

available in a variety of widths, from 1.25 to 10 cm, and sometimes even wider. Stretch tape may have:

- one-way stretch, in length *or* width
- two-way stretch, in length *and* width.

Stretch tape tends to roll back on itself at the cut ends, therefore it is wise to allow the last couple of centimetres to recoil before sticking it down.

Non-stretch adhesive tape

Has a non-yielding cloth backing and is used for the following:

- to support inert structures, e.g. ligaments, joint capsule
- to limit joint movement
- to act prophylactically
- to secure the ends of stretch tape
- to reinforce stretch tape
- to enhance proprioception.

Non-stretch tape should be torn by hand to maintain tension during application. It is important to be able to tear the tape from various positions – practice will help to attain a high level of efficiency.

Note: Leukotape P is an extra-strong non-stretch adhesive tape.

Tearing technique

Tear the tape close to the roll, keeping it taut. Hold the tape with the thumb and index fingers close together. Rip the tape quickly in scissors fashion. Practise tearing a strip of tape into very small pieces in both directions, lengthwise and crossways.

Hypoallergenic tapes

Hypafix/Fixomull offer an alternative to conventional zinc oxide adhesive tape, to which some athletes are allergic.

Waterproof tape

Also available in many widths.

Cohesive bandages

Are a useful product and may be used instead of stretch tape. The product sticks to itself and not to the skin, is waterproof and is reusable.

These are most useful when applying spica bandages or as a cover-up for any tape procedure.

TAPING PRINCIPLES

The application of tape is easy, but if it is not carried out correctly it will be of little value and may even be detrimental. Therefore knowledge of the basic principles and practical aspects is essential if the full value of the technique is to be attained.

A thorough assessment is necessary before taping any structure. The following questions should be answered:

- Has the injury been thoroughly assessed?
- How did the injury occur?
- What structures were damaged?
- What tissues need protection and support?
- What movements must be restricted?
- Is the injury acute or chronic?
- Is immobilization necessary at this stage?
- Are you familiar with the anatomy and biomechanics of the parts involved?
- Can you visualize the purpose for which the tape is to be applied?
- Are you familiar with the technique?
- Do you have suitable materials at hand?

Notes

If you are considering taping a player on the field, ensure that the use of tape does not contravene the rules of the sport, thus making the player ineligible to participate. **Know the sport.** Is there time allowed for taping on the field? Or do you have to remove the player from the field of play in order to apply tape? You must also consider the event in which the athlete is participating.

TAPING GUIDELINES

Prepare the area to be taped:

- Wash, dry and shave the skin in a downward direction.
- Remove oils for better adhesion.
- Cover broken lesions before taping; an electric shaver avoids cutting the skin.
- Check if the athlete is allergic to tape or spray.
- Apply lubricated protective padding to friction and pressure areas.

- Apply adhesive spray for skin protection and better tape adhesion.
- Apply underwrap for sensitive skin.

Tips

If the area is frequently taped, move the anchor point on successive tapings to prevent skin irritation.

Tape application

- Have all the required materials at hand.
- Have the athlete and yourself in a comfortable position, e.g. couch at an optimal working height, to avoid fatigue.
- Apply tape to skin which is at room temperature.
- Have the full attention of the athlete.
- Place the joint in a functional position, with minimum stress on the injured structure.
- Ensure that the ligaments are in the shortened position.
- Use the correct type, width and amount of tape for the procedure.
- Apply strips of tape in a sequential order.
- Overlap successive strips by half to prevent slippage and gapping.
- Apply each strip with a particular purpose in mind.
- Apply tape smoothly and firmly.
- Flow with the shape of the limb.
- Explain the function of the tape to the athlete, and how it should feel.
- On completion, check that the tape is functional and comfortable.

The tape should conform with even pressure and must be effective and comfortable. Tape applied directly to the skin gives maximum support.

Tips

For acutely angled areas, rip the tape longitudinally into strips. Small strips are easier to conform by lapping them over each other.

Avoid

- excessive traction on skin – this may lead to skin breakdown
- gaps and wrinkles – these may cause blisters
- continuous circumferential taping – single strips produce a more uniform pressure

- excessive layers of tape – this may impair circulation and neural transmission
- too tight an application over bony areas – this may cause bone ache.

Tape removal

Never rip tape off, especially from the plantar aspect of the foot. Use a tape cutter or bandage scissors for safe, fast removal. Lubricate the tip with petroleum jelly and slide it parallel to the skin in the natural soft-tissue channels.

Remove the tape carefully by peeling it back on itself, and pushing the skin away from the tape. Pull the tape carefully along the axis of the limb.

Check the skin for damage and apply lotion to restore skin moisture. Tape should not be left on for more than 24 h, unless using hypoallergenic tape which may be left on longer. Leaving tape on for too long a period may lead to skin breakdown.

Return to activity

On return to activity the injured area is still at risk. Reinjury can be prevented by taping the weakened area, with the aim of restricting joint and muscle movement to within safe limits. This allows performance with confidence.

Lax and hypermobile joints may also be supported with adhesive tape in order to reduce the risk of injury during sport.

STORAGE

Tape with zinc oxide adhesive mass is susceptible to temperature change and should be stored in a cool place. Tape should be left in its original packing until required. Partially used rolls should be kept in an airtight container (e.g. cooler box or plastic box) and not left on shelves. At temperatures over 20°C the adhesive mass becomes sticky, making the tension stronger and thus more difficult to unwind. Non-stretch tape is also more difficult to tear when warm. Hypoallergenic tapes are not susceptible to temperature change.

TAPING TERMS

Anchors: the first strips of tape applied above and below the injury site, and to which subsequent strips are attached. Anchors minimize traction on the skin (skin drag) and are applied without tension.

Support strips and stirrups restrict unwanted sideways movement.

Gibney/horizontal strips add stability to the joint.

Notes

Use stirrups and Gibney strips alternately, to form a basketweave pattern.

Reinforcing strips restrict movement and add tensile strength to strategic areas when applied over stretch tape.

Check reins restrict range of motion.

Lock strips secure the cut end of stretch tape (which tends to roll back on itself), secure check reins in place, and neatly finish the technique when applied over anchors (fill strips).

Heel locks give additional support to the subtalar and ankle joints.

OTHER TAPING PRODUCTS

Underwrap/prowrap/Mefix/Hypafix/Fixomull: used to protect sensitive skin from zinc oxide adhesive mass.

Gauze squares: foam squares, or heel-and-lace pads, are used to protect areas which are susceptible to stress and friction.

Padding: felt, foam, rubber or other materials for protecting sensitive areas.

Adhesive spray: applied to make skin tacky and thus help underwrap, protective pads or tape adhere more readily.

Friars' Balsam: applied to protect the skin.

Dehesive spray: breaks down the adhesive mass and allows tape to be removed easily.

Tape remover: available as spray, solution or wipes to clean adhesive residue from the skin.

Petroleum jelly: applied to lubricate areas of stress and reduce friction and irritation to the soft tissues.

Talcum powder: used to remove adhesive residue where necessary; it also prevents stretch tape from rolling at the edges.

Cohesive bandage: adheres to itself but not to the skin and can be used for light compression or applied over tape to prevent unravelling in water.

Tubular bandage: may be applied over completed tape job to help set the tape and hold it in place.

Elastic bandage/tensor: used for compression and for traditional spicas.

Cloth wrap: used for ankle wraps, triangular bandages, collar and cuff support.

Tape cutter: allows quick and safe removal of tape.

Bandage scissors: flat-ended scissors for safe removal of tape.

Other useful products

A variety of athletic braces and supports for body parts, neoprene/elastic/other sleeves, rubber tubing, extra long tensor/cohesive bandages for spicas, hot/cold packs, second-skin/blister kit.

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Taping literature update

chapter


M.J. Callaghan

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INTRODUCTION

Taping continues to be an essential part of a physiotherapist's armamentarium in the various stages of rehabilitation after injury and return to competition. Indeed, many athletes consider taping such an essential part of their sporting preparation that it becomes a ritualistic process, occasionally verging on the superstitious! This should not distract us from continuing to investigate the scientific rationale behind its application from the growing wealth of literature. This chapter deals with the literature concerning both ankle taping and patellar taping.

ANKLE TAPING

The literature on ankle taping is considerable, mainly because ankles are easily studied by X-ray, electromyography, goniometry and kinetic and kinematic analysis. The rationale for ankle taping mainly involves treatment after acute injury, mechanical instability and functional instability and injury prevention.

Acute injury

After an acute ligament sprain of the ankle, compressive strapping is often recommended to control oedema (McCluskey et al 1976). Very few studies have been published to evaluate the efficacy of taping to achieve limb or joint compression, with Viljakka (1986) and Rucinski et al (1991) arriving at conflicting conclusions as to the effect of bandaging on acute ankle oedema. Two Cochrane reviews have helped in our understanding of the best approach for treating acute ankle sprains. First, Kerkhoffs et al (2002a) analysed results from 21 trials of acceptable quality. They provided clear overall evidence that it is better, in terms of return to work and sport, pain, swelling, instability, range of motion and recurrence of sprain, for patients to be treated with various ankle braces or supports rather than total immobilization. A second Cochrane review (Kerkhoffs et al 2002b) then tried to give some insight into the best type of brace to use after an acute ankle sprain. However, in nine trials of moderate quality they found that a lace-up brace was superior to a semi-rigid support, tubigrip-type stocking and taping in terms of reduced swelling, but that a semi-rigid brace was superior for quicker return to work and reported ankle instability. This less compelling evidence means that we are unsure of the best type of bracing or support.

Mechanical instability

Preventing extremes of range of movement and reducing the abnormal movement of the ankle are the most obvious roles of ankle taping. In normal subjects, tape has been demonstrated to reduce extremes of

ankle range of movement after 15 minutes of running round a figure-of-eight course (Laughman et al 1980). In patients with proven mechanical ankle instability, a zinc oxide Gibney basketweave technique significantly decreased the amount of non-weight-bearing talar tilt (Larsen 1984, Vaes et al 1985). It was noted that those patients with the greatest instability received the greatest benefit from the tape.

Although taping does seem to improve mechanical instability, it is important to note that the restricting effect is lost after varying periods of exercise. For example, 40% of the effect of taping was lost after 10 minutes of vigorous general circuit exercises (Rarick et al 1962). Approximately 50% was lost after 15 minutes of standard vigorous exercises (Frankeny et al 1993), there was a 20% decrease after 20 minutes of stop/start running (Larsen 1984), 37% loosening in total passive range of motion after 20 minutes of volleyball training (Greene & Hillman 1990), 10–20% restriction loss in all movements except dorsiflexion after 60 minutes of squash (Myburgh et al 1984) and a 14% loss of inversion restriction after 30 minutes of exercise (Alt et al 1999). It has also been found that the greater the subject's weight, height and body mass index, the less effective the tape is in controlling supination and ankle plantarflexion after 30 minutes of exercise (Meana et al 2007).

It is this inability to maintain mechanical stability during exercise that raises fundamental questions about the theories behind ankle taping and bracing.

Functional instability

Freeman et al (1965) seem to be among the first to describe functional instability as 'a term ... to designate the disability to which the patients refer when they say that their foot tends to "give way"'. Although once of secondary importance to mechanical problems, there is now more interest in the concept of functional instability of the ankle and the role of taping and bracing to alleviate it. As a result, for many years authors have investigated the role of taping and bracing on the proprioception enhancement of the chronically injured ankle (Glick et al 1976, Hamill et al 1986, Jerosch et al 1995, Karlsson & Andreasson 1992, Lentell et al 1995, Robbins et al 1995).

Proprioceptive control of the ankle (and thus the effect of taping and bracing) has been measured by a variety of tests, such as peroneal reflex activity (Ashton-Miller et al 1996, Feuerbach et al 1994, Karlsson & Andreasson 1992, Konradsen & Hojsgaard 1993, Konradsen et al 1993, Lohrer et al 1999), joint angle reproduction (Jerosch et al 1995, Lentell et al 1995, Refshauge et al 2000, Spanos et al 2008) and movement threshold (Konradsen et al 2000).

Injury prevention

Epidemiological studies have established the ability of tape and braces to prevent recurrent ankle injury. The most commonly cited study on injury prevention is that of [Garrick & Requa \(1973\)](#), which studied the effect of taping on 2563 basketball players with previous ankle sprains over two successive seasons. They concluded that a zinc oxide stirrup with horseshoe and figure-of-eight technique, in combination with a high-top shoe, had a protective influence (6.5 injuries per 1000 games) for preventing ankle sprains.

Ankle braces may also lead to a reduction in the incidence and severity of acute ankle sprains in competition ([Bahr 2001](#)), such as basketball ([Sitler et al 1994](#)), men's football (soccer) ([Surve et al 1994](#), [Tropp et al 1985](#)) and women's football ([Sharpe et al 1997](#)). Although the studies reviewed provide important information regarding efficacy of tape or a brace, criticisms have been made regarding study design, external validity, confounding variables and sample size ([Sitler et al 1994](#)). These should also be considered before selecting the appropriate technique or device.

A Cochrane review ([Handoll et al 2001](#)) summarized the relative risk of ankle sprains after application of braces and calculated that ankle bracing brought about a 50% reduction in the number of ankle sprains (relative risk (RR) = 0.53). The reduction was greatest for patients with previous ankle sprains.

Prewrap

Two studies have looked at the effects of prewrap on taping that may ease the reservations among clinicians of the effects of prewrap or underwrap on taping. [Manfroy et al \(1997\)](#) assessed 20 healthy subjects performing 40 minutes of exercise and found no statistically significant differences in experimental limitation of inversion moments between ankle taping with and without prewrap. [Ricard et al \(2000\)](#) measured the amount and rate of dynamic ankle inversion using a trapdoor inversion platform apparatus and concluded that applying tape over prewrap was as effective as applying it directly to skin.

Taping technique

The lack of comparative studies between different taping techniques helps to explain why the choice of tape by athletes and physiotherapists is often governed by personal preference, the experience of the person applying the tape and a general feel as to the correct technique.

Of those few studies, [Rarick et al \(1962\)](#) favoured a basketweave with stirrup and heel-lock technique. [Frankeny et al \(1993\)](#) concluded that the Hinton-Boswell method (in which the ankle is taped in a relaxed