

THE COMPLETE GUIDE TO

Christopher M. Norris

CLINICAL MASSAGE



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B L O O M S B U R Y
LONDON • NEW DELHI • NEW YORK • SYDNEY

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Published by Bloomsbury Publishing Plc
50 Bedford Square
London WC1B 3DP
www.bloomsbury.com

This electronic edition published 2013

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ISBN 978 1 4081 5457 1 (paperback)

ISBN 978 1 4081 8145 4 (ePDF)

ISBN 978 1 4081 8144 7 (EPUB)

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A CIP catalogue record for this book is available from the British Library.

Acknowledgements

Cover photograph © Shutterstock

Inside photographs © Laura Scott-Burns with the exception of Figure 3.8, p. 44 © Physique

Illustrations by David Gardner with the exception of Figures 7.2, 7.3 and 7.4 (pp. 112 and 113) © Jeff Edwards

Designed by James Watson

Typesetting and page layout by Susan McIntyre

Commissioned by Charlotte Croft

Edited by Nick Ascroft

Typeset in 10.75 on 14pt Adobe Caslon

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INTRODUCTION

This book describes the practice of clinical massage, that is massage used to treat conditions such as injuries and pain known as ‘clinical conditions’ that are typically treated in a clinic. The methods described assume that the person applying the clinical massage (henceforth referred to as the therapist) has additional *clinical training* as a therapist or exercise professional.

We begin in chapters 1 and 2 by laying down important foundations of knowledge that deal with the process of tissues healing and injury recovery and the effect of massage on both these mechanisms and the body in general.

The book goes on to describe the effects of massage and in chapter 3 we look at traditional, or general, massage techniques, including effleurage, petrissage, tapotement, frictions and vibration/shaking, before going on in chapter 4 to describe specific clinical methods which target individual parts of the body, including fascial release (FR), deep tissue massage (DTM), trigger point (TrP) release, deep transverse friction (DTF), acupressure and muscle energy technique (MET).

We then look at how to plan a treatment session in chapter 5. It is important that the therapist is in possession of a diagnosis or clinical assessment indicating the tissues at fault (whether that be a ligament, muscle, etc.) and the mechanisms or pathology affecting the body (including swelling,

pain, infection, etc.), and these areas are tackled in this chapter. Where the therapist is unsure of the diagnosis, treatment should not be carried out until the patient has contacted their GP (general practitioner) and determined whether there are reasons that clinical massage should not be used (known as a *contraindication*).

Chapters 6 to 9 are a compendium of massage techniques and exercises for you to use throughout your practice. Each chapter covers the most common techniques for every region of the body: the lower limbs, the trunk, the chest and abdomen and the upper limbs. The section includes an anatomy refresher for each region of the body, while over 90 massage techniques are demonstrated through photos and a detailed description of how to prepare and perform the massage. The section also includes tips and important points that will be valuable to your continued practice. Many of the techniques are performed with the client lying on a bench, which in clinical massage is more commonly called a treatment couch. However, for the purposes of this book the term ‘bench’ is used to describe this piece of equipment, as it will be a familiar term to all exercise professionals and, therefore, more inclusive.

The final chapter provides an overview of research into massage, which provides the scientific basis (known as the *evidence base*) for its use and purpose.

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// **MASSAGE IN PERSPECTIVE**



Massage as a technique has its origins in a caring caress – after an injury, we rub the area that is in pain, while parents tell their children to ‘rub it better’ when they hurt themselves. Dogs lick themselves when they have an injury. The therapeutic value of touch has a place in all aspects of healthcare.

Historically, descriptions of massage and ‘medical rubbing’ have been found in most ancient civilisations. In Europe modern massage as a clinical technique can be traced back to the Swedish system of medical gymnastics (exercise applied for the treatment of medical conditions) founded by Ling in Stockholm, which spread across the world with institutes in both London and New York. Towards the end of the nineteenth century and beginning of the twentieth several books were published on massage in New York (Graham 1884), Germany (Hoffa 1897) and London (Goodall-Copestake 1926), which contributed to the wider popularity and understanding of massage’s usage.

The formation in England of the Society of Trained Masseuses in 1895, the precursor of the Chartered Society of Physiotherapy, led to the standardisation of massage techniques and their quality and also the incorporation of massage into

standard medical management. Further to this, the adoption of massage and soft tissue techniques by two hospital consultants, John Mennell (1920) and James Cyriax (1944) brought the benefits of this system to mainstream medical practice.

Massage has always straddled the border between art and science. The intuitive use of massage, using what ‘feels right’, must be balanced with the scientific proof that the techniques achieve what therapists claim they do. The instinctive nature of rubbing and intuitive use of therapeutic massage has led to its wide usage, but the evidence base for its benefits is sparse compared to other forms of treatment. This is partly because traditional massage had become an accepted form of treatment, applied to patients throughout history and often used almost without question. Although some early research was carried out – and is described in the books cited above – it is only with the spread in popularity of sports massage that modern research has started to accumulate in relation to this technique. Good quality evidence does exist, and we will refer to this throughout the book, but in many cases the experience of practitioners forms our guide. This should not belittle massage because its benefits are many.

Before we begin to outline the practice of clinical massage there are several theoretical principles which all practitioners should acquaint themselves with as a foundation for good practice.

TYPES OF MASSAGE

A huge variety of massage types are available, with different ‘shapes and flavours’ of massage used in every culture across the world. These techniques can loosely be categorised into four major types: relaxation, clinical, re-education and energy work (see table 1.1). The categories are descriptive with much overlap existing between types.

RELAXATION MASSAGE

Relaxation massage is used to help relieve stress and promote a general feeling of wellness. It is commonly used in spas and commercial gyms.

Sports massage falls into several categories and in this case relaxation techniques are used to prepare an athlete for competition. For example, in the case of a nervous or ‘hyped’ athlete muscle relaxation can calm them down and help them focus on their performance.

CLINICAL MASSAGE

Clinical massage differs slightly from relaxation massage in that it promotes wellness, but rather it is used to specifically target something which is wrong with the body, for example a stiff arthritic knee joint, or to aid an individual in their recovery from injury, for example a torn ankle ligament. Again, sports massage can be used specifically to aid athletes in their recovering from a particular injury, for example a pulled hamstring muscle. In each case, massage can help by improving blood and lymph flow, warming and moving stiff tissues and reducing pain.

Table 1.1		Massage types			
Type		Relaxation	Clinical	Re-education	Energy
Outcome		• Relaxes client • Promotes wellness	• Treats injury or clinical condition	• Use with movement	• Free blocked energy through acupressure or meridians (see boxes)
Styles and techniques of massage		• Swedish • Aromatherapy • Sports massage	• Fascial release • Trigger point • Transverse friction	• Muscle energy technique • Passive stretching	• Acupressure • Reflexology

Norris, C. M. (2011) *Managing Sports Injuries* 4th edition (Elsevier)

RE-EDUCATION MASSAGE

Re-education massage may be used with movement to correct movement faults (known as *dysfunction*). For example, massaging stiff tissue which is restricting movement. As the movement restriction is eased through massage application, correct movement is possible and exercise therapy can be applied to reinforce movement quality. Within clinical massage this type of re-education is common with techniques such as PNF stretching for example (*see* page 59), where muscles are tensed and then released to reduce their tone (firmness) and allow them to stretch more easily.

ENERGY MASSAGE

Many massage techniques, from the East especially, are forms of *energy* massage. These include acupressure, which works to restore the flow of qi (life energy) through acupuncture channels or meridians (*see* 'Keypoint' box).

Keypoint

In Traditional Chinese Medicine (TCM) qi energy is said to be transported throughout the body through a system of channels or *meridians*. Where the flow is blocked (which is known as qi stagnation) healing is poor and Chinese medicine believes that restoring the flow of qi will improve healing and reduce pain (*see also* chapter 6, page 103).

Definition

Acupressure is a method of stimulating acupuncture points using finger pressure rather than needles (which is known as acupuncture).

INJURY AND HEALING

Massage has most of its effect on the soft tissues of the body, rather than the bones. Soft tissues include the skin, muscles, fat, tendons, ligaments, nerves, internal organs and fascia (a thin fibrous membrane which surrounds other tissues such as muscles and ligaments, linking them together). When using clinical massage we may affect each of these tissues depending on the technique used.

HOW INJURED TISSUE HEALS

Clinical massage is a technique often used following injury, and to be safe and effective as practitioners we need to understand how the body's tissues heal to enable us to work with the body's healing processes, rather than against them.

As healing progresses, your techniques may change, so knowledge of the healing timescale is also important to the therapist. The changes occurring within the healing tissues, and the parallel changes which you cause with massage treatment, must closely match if you are to achieve satisfactory treatment.

Injury

The moment a client sustains an injury their tissues begin to heal. The process is continuous right up until the point where they have full

function of the injured body part and can return to normal activities.

When soft tissue is damaged, some of the local blood capillaries running through it are disrupted, thus disturbing the release of fresh blood into the area. This has two important effects. Firstly, the tissue disruption instigates chemical messages to the brain that begin the healing process. Secondly, because the blood vessels are damaged, fresh blood can no longer flow into the local tissues. Starved of new blood, which should bring with it oxygen and tissue nutrients, the tissue begins to die. Think of this like watering your garden; if you cut the hose pipe, water cannot get to the flowers and they dry up and die. The same is true here, except it is a blood vessel which has been cut and your client's tissue rather than the flowers which may wither. If your client continues to exercise, the *metabolic rate* or 'tick over' of the tissues (see 'Definition' box) remains high and the demand for oxygen is increased. This increased demand speeds up tissue death, which is occurring due to the oxygen shortage. Rest is therefore vital to slow the metabolic rate and reduce the oxygen demand.

Definition

Metabolic rate is the chemical 'tick over' of the body. It is the amount of oxygen and nutrients that your body requires just to keep going. Exercise increases metabolic rate while rest reduces it – much like putting your foot on a car accelerator pedal to use more petrol, and taking it off to use less.

Local cell death occurring in the injured tissues releases enzymes which begin the process of digesting and dissolving dead material. The body acts quickly as a natural 'road sweeper' to clean up the area in preparation for new tissue growth. This activity further stimulates the release of important chemicals including *histamine* and *prostaglandin*, which act as chemical messengers.

As blood escapes from the damaged blood vessels, red blood cells are in turn damaged by being outside their normal environment. The blood chemical *fibrin* then begins to form a meshwork around the injured area, which develops into a clot. The blood clot is an essential precursor to forming a bridge between the ends of the torn tissue, and any movement which disrupts the clot slows the normal healing process. Continuing to work hard or exercise in the immediate post-injury phase is therefore detrimental, as is the application of vigorous massage.

Keypoint

Immediately after injury, tissues are disrupted and their blood flow reduced. Starved of new blood, tissue death will occur. Rest is vital to slow this process down.

Inflammation

Inflammation begins 10 minutes after an injury occurs and may last several days depending on the first aid action which is taken. Inflammation gives four outward signs:

- 1. Heat
- 2. Redness
- 3. Swelling
- 4. Pain

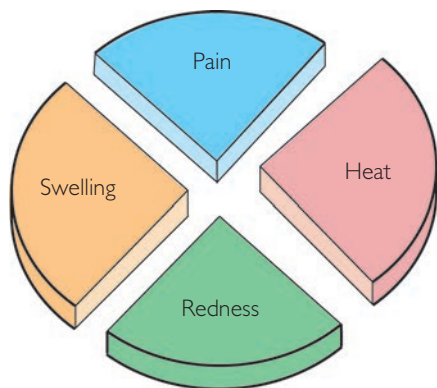


Figure 1.1 Signs of inflammation

Heat and redness

Both occur due to the increase in local blood flow, that is blood which flows close to the injured area. The increase develops as a result of blood vessels opening as a natural reaction to the injury. Just as your skin becomes red as you exercise and get hot, the local skin surrounding an injury reddens. However, this will only be noticeable where the damaged tissues are close to the surface (known as *superficial*). When your client sprains their ankle, the area feels hot and looks red, but if they damage their back, where the damaged tissues lie much deeper, the area may feel hot to you but to an outside observer redness is rarely noticeable unless the condition is very severe. Again the process of heat and reddening is brought about by a number of chemicals including *prostaglandin*. Anti-inflammatory drugs, such as *NSAIDs* (see 'Definition' box), are administered to calm the process of inflammation instigated by this chemical.

Swelling

Broken blood vessels at the injury site cause blood flow to slow. The red blood cells become sticky and adhere to the vessel walls. The cells form part

Definition

An *NSAID* is a non-steroidal anti-inflammatory drug (for example, ibuprofen) which is used to reduce pain and inflammation, especially of joint and muscle conditions.

of the developing blood clot, which dams the area to stop further bleeding into the damaged tissues. *Swelling* (also called *oedema*) then begins as the slow blood movement is unable to keep pace with the fluids being formed by the body. As the damaged tissues release their chemicals, the body tries to dilute the area with watery fluid, which forms the basis of the swelling. The swelling moves into the lymphatic vessels and should be taken away as part of the normal lymph flow process (see 'Definition' box).

Unfortunately, the sheer volume of swelling which often develops after a soft tissue injury means that some will settle and pool around the injured area. Initially the swelling is a watery fluid, but it contains similar clotting chemicals to blood, and over time will become firmer and gel-like.

Definition

The *lymphatic system* is a network of fine tubes which exists in addition to the network of blood vessels. Blood does not come directly into contact with tissues, rather red blood cells remain in the vessels while a clear fluid, called *lymph*, seeps out to touch the tissues directly. It is the lymph fluid which runs within the lymphatic system.

If left, over many weeks the gel-like swelling can harden still further. Clinical massage aims to remove excess swelling and stave off the problem of the tissue becoming stuck together (known as *consolidated oedema*). While massage helps the injury by removing swelling, if used too early or too vigorously it can disrupt the healing process and slow recovery.

Pain

Pain is often the reason why many clients seek clinical massage. Pain following a soft tissue injury normally occurs because the chemicals produced at the time of injury irritate the nerve sensors within the tissues. As swelling occurs, the pressure of the developing fluids presses on these sensors and further pain is produced.

Pain is created by tiny electrical impulses travelling in nerves from the tissue sensors to the brain. This feeling (or *sensory*) mechanism consists of nerves which travel as a *pain pathway*, firstly to the spinal cord. Here, they form a junction (known as a *synapse*) with a small intermediate nerve (or *interneuron*) which itself connects to a longer fibre travelling to the brain where the pain is actually felt. Even within the brain there are several nerve connections (see figure 1.2).

At each junction between the nerves, the nerve impulse can be changed. This fact is important both for pain relief and for the development of longer term (or *chronic*) pain. If another nerve impulse arrives at the nerve junction in the spine, it can cancel out the painful signal. This is what happens when you knock your knee and 'rub it better' – the vigorous rubbing causes an intense sensory stimulus which cancels out the pain at the level of the spinal cord, an effect called *counterirritation* (see 'Definition' box).

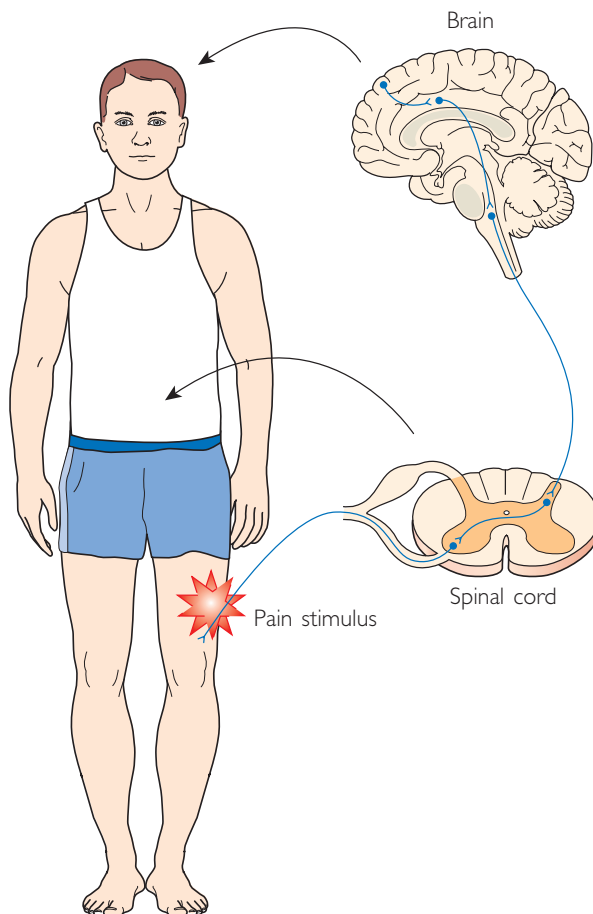


Figure 1.2 The pain pathway

Definition

A *counterirritant effect* is caused when a second intense stimulus cancels out a painful feeling. The effect occurs at the junction (or synapse) between two sensory nerves.

As the nerve impulse travels into the brain, you feel pain, a process that is known as sensory perception. However, the impulse also travels across junctions to other nerves going to different brain areas. Some go to emotional centres and so intense pain, especially if it occurs over a prolonged period, can cause emotional changes such as anxiety, fear and depression.

The nerve junctions can also work to your advantage. You can reduce or block pain by using many treatments, including clinical massage. Impulses produced by the brain as a result of treatment can flood the client's body with pain-relieving chemicals and have positive emotional effects.

THE HEALING TIMESCALE

The process of tissue healing can take some time. Minor aches and pains may resolve in a matter of days, while more major problems can take many months and sometimes even years to heal completely. The key to the healing timescale is the amount of tissue damage your client has, and how the injury is treated. The process of healing described above proceeds through three interrelated phases: *acute*, *subacute* and *chronic*.

Acute phase (48 hours)

During the acute phase your client's tissues have been damaged and are reacting to this through the stage of *inflammation*. There is local bleeding and swelling and the tissues will have only just started to heal. Your aim should be damage limitation – you must not take any action which stresses the damaged tissues and further injures the client. It is a sad fact that in some cases of sports injury, for example, there can be more tissue damage induced by trying to run an injury off than actually

occurred at the time of injury. In addition, we have seen that the swelling formed at the time of injury can spread throughout the local area. Limiting this spread is vital because the sticky swelling will clot, and if it travels this will affect further tissue.

The acute phase of healing typically lasts 48 hours and ceases when the tissues begin to form a healing bridge across the damaged area (*see* page 16). During this phase massage to the damaged tissues is not appropriate.

Subacute phase (14–21 days)

When the healing tissues start to form and no fresh swelling or bleeding occurs, your client has entered the subacute phase of healing, which may last from anything between 14 and 21 days. This is the stage of *regeneration*, when tissue regrowth begins. Initially a soft blood clot forms and a stronger tissue mesh begins to grow around the area. The new healing tissue forms a scar in the same way that the skin heals after a cut. This tissue shrinks and pulls its torn ends together, effectively bridging the tissue gap. The tissue formed at this stage of healing is a meshwork fibres formed from fibrous tissue. Fibrous tissue contains two main types of fibres, one which is strong (fibrin) the other more elastic (elastin). The amount of each of these fibres is governed by the requirements of the tissue. For example both tendons (at the ends of muscles) and ligaments (at the side of joints) are made of fibrous tissue. However, ligaments are more stretchy than tendons and so have a greater proportion of elastin fibres than fibrin.

We have seen that after injury a blood clot forms (*see* figure 1.3a) and shrinks (figure 1.3b). The healing meshwork of fibrous tissue that begins to form has a haphazard, often known

as *disorganised*, appearance, with fibres pointing in various directions (figure 1.3c). The finished tissue must have fibres which align in the strongest (known as *organised*) direction possible (figure 1.3d) and take on the function of the original tissue.

As your client's injury heals it is vital that their tissue remodels to closely resemble the original tissue format. If it is too loose or too tight, its function will be impaired. The make up of fibrous tissue changes depending on the stress placed upon it, and both massage and exercise have a role to play in ensuring the new tissue develops correctly. To change from the haphazard fibre orientation to a more organised mesh, the tissue must be stressed slightly. Too little stress and the fibres will not align correctly, but with too much stress

the fibres will break down again. In the subacute phase progressive massage and exercise are key. Massage when the client cannot perform a suitable movement, and prescribe exercise when they can.

Chronic phase (21 days plus)

The final stage on the healing timescale is the chronic phase which is the stage of *remodelling* lasting from 21 days onwards. Although the term chronic is used here, this phase is an essential stage in which your client's scar tissue adapts to become more like the original tissue it has replaced. Both clinical massage and exercise therapy are useful now providing they place the correct amount of stress on the tissue. Too little will not stimulate remodelling, while too much can injure the tissues. The precise amount is judged by the client's reaction to treatment (*see* page 64). The remodelling phase can last for many years, and one of the mistakes which is often made during treatment is to stop the treatment too soon. Although your client's tissue may be relatively pain free when it has healed by 80 per cent, it has still not fully healed. Tissue at this stage can still break down when subjected to the stress of intense sport and it may give pain when subjected to prolonged postural loading, such as sitting for many hours at a computer.

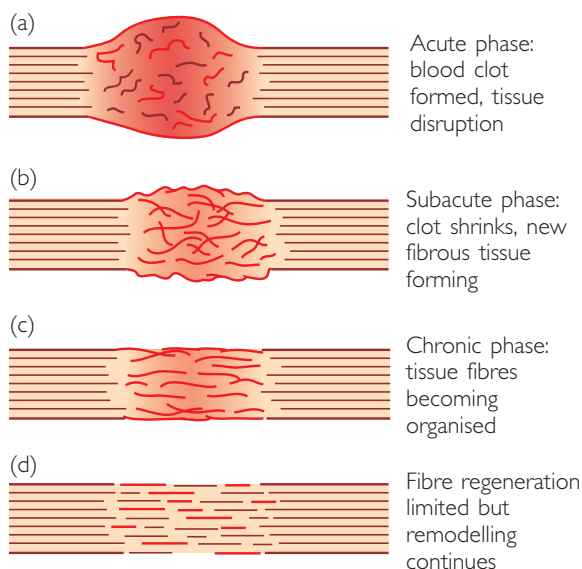


Figure 1.3 A healing blood clot: (a) blood clot forms; (b) shrinks; (c) fibrous tissues form a disorganised meshwork; (d) the healed fibres must point in an organised direction

Keypoint

During healing progressive massage and exercise are vital. Tissues must be stressed to encourage strong fibre development. The stress must match the strength of the newly formed tissue.

THE EFFECTS OF MASSAGE

The effects of massage can be categorised into three areas: *physiological* (living processes), *biomechanical* (the physics of movement) and *psychological* (the mind and behaviour). All occur together, but for convenience we will look at them separately (see figure 1.4).

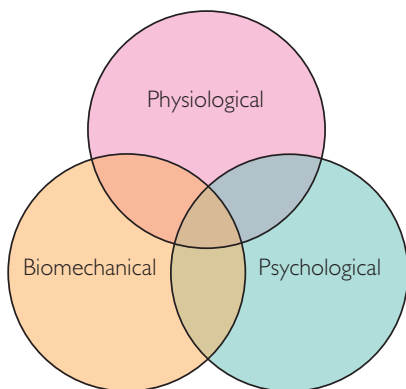


Figure 1.4 The effects of massage

PHYSIOLOGICAL EFFECTS OF MASSAGE

Increasing blood flow

The effect of massage is to both increase blood flow to the skin and, through deeper techniques, to increase flow through the tissues beneath (the subcutaneous tissues). Greater blood flow means the speed of chemical reactions (such as metabolic rate) are increased. It is as though the tissues have been ‘stirred up’ so that everything happens faster.

Physiological effects are caused by the pressure of your hands on the skin compressing the blood and lymph vessels and so pressing fluid along them. As the pressure is released fluid can flow more easily, and the regular compression and

release has a pumping effect on fluid flow. This effect can be aided by lifting (elevating) a limb above the level of the heart, as gravity will help to further increase fluid flow back towards the heart.

Blood flow is increased during clinical massage, both by the pumping effect of pressure described above and through skin stimulation. When the skin is struck sharply or pressed hard, it will go red and show slightly raised areas. This effect, known as the *triple response*, is an important way in which blood flow is increased. The triple response consists of an initial redness when the skin is stroked deeply. After a while this redness spreads causing a *flare* as blood flow increases around the stimulated area, due to blood vessels opening (known as *vasodilation*). Finally, a *weal* is produced where the skin puffs up as a result of the release of the blood chemical histamine. The combination of redness, flare and weal is the triple response.

Keypoint

The triple response is a skin (or *cutaneous*) reaction consisting of redness, flare and weal representing histamine release and consequent vasodilation.

Hormonal changes

Hormonal changes also occur through massage, with research studies showing alterations in the hormones *cortisol*, *serotonin*, *dopamine* and *oxytocin*.

- *Cortisol* is a hormone produced by the adrenal glands sitting on top of the kidneys. It is released at times of stress and causes blood sugar levels to rise.

- *Serotonin* is a nerve chemical (neurotransmitter) which is produced in the gut wall and by nerves themselves. It has effects on mood, appetite and sleep especially.
- *Dopamine* is also a nerve chemical, but it is produced in the brain. It helps with many brain functions.
- *Oxytocin* is a sex hormone, and its concentration is changed by touch, stroking and hugging, especially in children.

Through these hormonal effects, massage can have positive effects on digestive processes, stress, anxiety levels and mood and sleep. In fact a client's wellness level can improve in general.

Nerve impulses

The effect of massage on nerve impulses is also important. When we are anxious we often feel 'butterflies' in our stomach. This is an example of nerve impulses affecting the digestive system when we are under stress. Other ways that we feel stress include tightness around the neck and shoulder muscles. These are often called 'emotional muscles' because they are said to reflect our mood. A tense anxious person often has tight hunched shoulders. Muscles become tense because they are receiving a barrage of nerve impulses. Clinical massage can calm these impulses down and as a result relax tense muscles and ease muscle pain.

At the other extreme, weakened muscle has very few nerve impulses. Here, more vigorous massage can increase the number of impulses travelling into the muscle and help improve the tone of the muscle. It can also be used to help a client learn to tense (*contract*) muscle properly following a prolonged injury. In this

Keypoint

Clinical massage may be used to either increase or reduce muscle tone depending on the technique chosen.

way, clinical massage can both increase or reduce muscle tone, depending on the precise technique selected.

BIOMECHANICAL EFFECTS OF MASSAGE

The biochemical effects of clinical massage come mainly as a result of forces acting on the body tissues and the change in tissue temperature that massage can bring about. Five main forces are involved in clinical massage (*see* figure 1.5) and both the amount of force applied and the direction in which it is employed are important.

Compression force

Compression (pressing) force may be applied rapidly with a tapping or cupping force or slowly with a *petrissage* (pressure) movement. Where a compressive force is applied using a small contact area, such as a fingertip, the effect on tissue is more marked than when the same force is applied using a broader area, such as the palm. High compressive forces rapidly applied over a small area may cause marked skin effects and even bruising if uncontrolled. Slower application over a broader area will cause fluid to flow away from the force. This can be repeated rhythmically to have a pumping effect to facilitate fluid flow through the tissues.

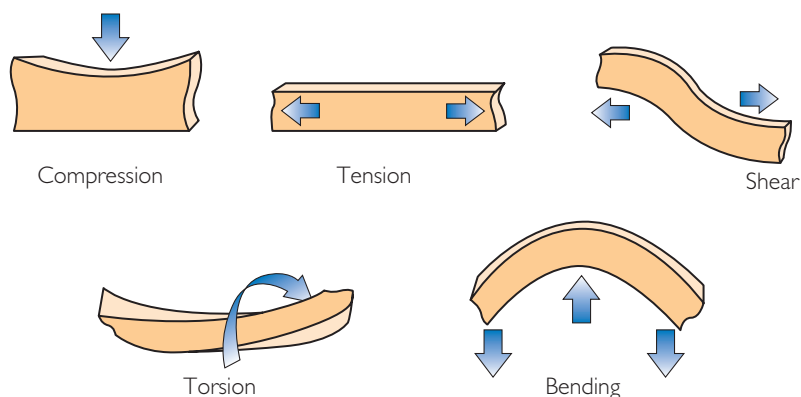


Figure 1.5 The five main forces involved in clinical massage

Tension force

Tension (pulling) forces occur when two ends of a structure are pulled apart. Sustained tension causes tissues to elongate and may be applied using drag and glide techniques on the skin and subcutaneous tissues. These involve pressing the fingers or palm into the tissues slightly to ‘anchor’ them and then pulling gently. Tension applied to muscle, known as *static stretch*, initially causes increased muscle tone and when sustained will cause muscle tension to gradually lower. Static stretch may be used as part of massage in the treatment of tight muscle or trigger points for example.

Shear force

Shear (sliding) force occurs when the force is applied at an angle to the tissue, which creates a combination of both compression and stretch. This type of force may be used to encourage tissue layers to slide over each other. In addition shearing may be used to cause mild inflammation to restart the healing process where healing has stopped prematurely (a condition known as *stasis*) or the injury has not healed correctly. In this

latter case shearing is used as a catalyst to restart healing which then takes place in parallel with gentle exercise therapy to encourage the tissues to continue to slide over each other and to avoid becoming fixed again.

Torsion force

Torsion (twisting) force is used in wringing actions where your hands are gripping the client’s tissues and turning in opposite directions. Torsion stretches the tissue in a rotary manner and may be used to enhance tissue pliability. Treatment using torsion may be applied where a tight band of tissue exists within surrounding normal tissue such as in scarring from a cut (superficial) or a healing muscle tear (deeper). The torsion force moves the stiffer scar tissue which would otherwise remain inactive as the surrounding tissues move instead.

Bending force

Bending force combines compression on one side of a tissue and elongation on the other to create a concave and convex shape respectively. Again, tissue pliability is improved through use of this technique.