

RUHANI COLLEGE

RU RMT 21 · ANATOMY & PHYSIOLOGY 04

LECTURE 02

The Integumentary System and Massage Therapy

The skin is the therapist's working surface and the first tissue every treatment loads — its structure, its sensory architecture, its pathology, and the clinical reasoning that keeps hands-on treatment safe.

Registered Massage Therapy Diploma Program · CMTCA-aligned curriculum

One instructional day · 7 contact hours · Theory

Assumes the tissue, healing and mechanism content of Lecture 01.



How This Session Works

Seven contact hours, delivered in person at the Brampton campus and simultaneously live online via Zoom.

- Block 1 (75 min) — Structure of the skin: epidermis, dermis, hypodermis, accessory structures and blood supply.
- Block 2 (55 min) — The cutaneous sensory receptors and why they are the interface between technique and the nervous system.
- Block 3 (60 min) — Skin physiology: barrier function, thermoregulation, vitamin D synthesis, absorption and wound healing.
- Break (30 min).
- Block 4 (70 min) — Non-infectious and infectious skin conditions, and the infection prevention and control obligations that follow.
- Block 5 (70 min) — Effects of massage on the skin, scar management, lubricant selection, indications and contraindications.
- Block 6 (40 min) — Integumentary assessment workflow, applied scenarios, review questions and summary.
- Assessment note — Contraindication classification and the assessment workflow from this lecture are examinable and recur in every subsequent lecture.



Learning Outcomes (1 of 2)

By the end of this lecture the student will be able to:

- Identify the three layers of the skin, their sublayers, and the accessory structures of the integumentary system.
- Describe the seven major functions of the integumentary system and relate each to clinical practice.
- Identify the cutaneous sensory receptors and state which manual techniques preferentially stimulate each.
- Explain thermoregulation and the skin's contribution to homeostasis.
- Outline the four phases of wound healing and state the treatment implications of each phase.
- Describe the structure and maturation of scar tissue and the indications for scar work.
- Recognise common non-infectious skin conditions and describe appropriate adaptation.



Learning Outcomes (2 of 2)

By the end of this lecture the student will also be able to:

- Recognise common infectious skin conditions and apply the correct infection prevention and control response.
- Apply routine practices and standard precautions to a client presenting with a skin finding.
- Describe the physiological effects of massage on the skin, distinguishing mechanical from reflexive effects.
- Select an appropriate lubricant with reference to skin condition, client sensitivity and treatment goal.
- Determine indications, contraindications and cautions for treatment based on integumentary findings.
- Perform a structured integumentary assessment and document findings in objective, non-diagnostic language.
- State the boundary between recognition and diagnosis, and refer appropriately within the scope of practice of an RMT in Ontario.

Key Terminology for This Lecture

- **Keratinocyte** the dominant epidermal cell, producing the keratin that waterproofs and strengthens the barrier.
- **Melanocyte** pigment-producing cell of the stratum basale providing ultraviolet protection.
- **Langerhans cell** epidermal antigen-presenting cell providing immune surveillance.
- **Acid mantle** the mildly acidic surface film, around pH 5.5, that inhibits microbial colonisation.
- **Desquamation** shedding of surface keratinocytes as part of normal epidermal turnover.
- **Sebum** oily sebaceous secretion that lubricates skin and hair and contributes to the acid mantle.
- **Eccrine gland** sweat gland distributed widely over the body, primarily thermoregulatory.
- **Apocrine gland** sweat gland of the axilla and groin, active from puberty and responsive to stress.
- **Arrector pili** smooth muscle attached to the hair follicle producing piloerection.
- **Erythema** redness of the skin caused by capillary dilation.
- **Reactive hyperaemia** the increase in local blood flow following the release of sustained pressure.
- **Contusion** a bruise: bleeding into tissue from ruptured capillaries without a break in the skin.
- **Cellulitis** spreading bacterial infection of dermis and subcutaneous tissue; a systemic red flag.
- **Routine practices** the standard infection prevention measures applied to every client regardless of known status.



SECTION 1

Structure of the Skin

Layers, accessory structures and the sensory architecture that lies directly beneath the therapist's hands.

- Functions of the integumentary system
- The epidermis and its five strata
- The dermis and the hypodermis
- Blood supply, glands, hair and nails
- Cutaneous sensory receptors

Functions of the Integumentary System

The skin is the largest organ of the body, roughly 1.8 square metres in surface area and about 15 per cent of body weight.

- **Protection** a physical, chemical and microbial barrier; the acid mantle at approximately pH 5.5 resists pathogen colonisation, and melanin absorbs ultraviolet radiation.
- **Thermoregulation** dermal blood flow and eccrine sweating are the principal means by which the body loses or conserves heat.
- **Sensation** cutaneous receptors detect touch, pressure, vibration, stretch, temperature and pain — this is the function massage engages most directly.
- **Excretion** water, sodium chloride, urea and small quantities of other wastes are lost in sweat.
- **Vitamin D synthesis** ultraviolet B radiation converts a cholesterol precursor in the epidermis into cholecalciferol, later activated by liver and kidney.
- **Fluid retention** the keratinised barrier limits transepidermal water loss and prevents dehydration.
- **Blood reservoir** the dermal vascular bed holds a substantial volume of blood that can be redirected to working muscle or to the core.
- **Immune surveillance** Langerhans cells and resident lymphocytes detect and present antigens encountered at the surface.

The Epidermis: Five Strata from Deep to Superficial

Keratinised stratified squamous epithelium, avascular throughout, renewing continuously from its deepest layer. Full turnover takes roughly 25 to 45 days.

- 1. Stratum basale** A single layer of actively dividing keratinocytes resting on the basement membrane; contains melanocytes and Merkel cells.
- 2. Stratum spinosum** Several layers of keratinocytes linked by desmosomes; Langerhans cells provide immune surveillance here.
- 3. Stratum granulosum** Cells begin to die; keratohyalin granules form and lamellar granules release the waterproofing lipids.
- 4. Stratum lucidum** A thin translucent layer present only in thick skin of the palms and soles.
- 5. Stratum corneum** Twenty to thirty layers of dead, flattened, keratin-filled cells forming the surface barrier; cells are continuously shed by desquamation.
- 6. Clinical consequence** Because the epidermis is avascular and nourished by diffusion from the dermis, superficial damage heals from below, and repeated friction or excessive lubricant-free work disrupts the barrier.

The Dermis and the Hypodermis

The dermis gives skin its strength and elasticity; the hypodermis anchors skin to underlying structures and stores fat.

Dermis

- Papillary layer — loose areolar connective tissue with dermal papillae carrying capillary loops and Meissner corpuscles.
- Reticular layer — dense irregular connective tissue with interwoven collagen and elastic fibres providing tensile strength and recoil.
- Contains blood and lymphatic vessels, sensory receptors, hair follicles, sebaceous and sweat glands, and arrector pili muscles.
- Collagen fibre orientation produces cleavage (Langer) lines, which surgeons follow and which influence scar behaviour.
- Dermal tearing beyond the elastic limit produces striae, or stretch marks.
- Ageing reduces collagen and elastin content, thinning the dermis and increasing fragility — a direct pressure consideration.

Hypodermis (subcutaneous layer)

- Not strictly part of the skin, but functionally inseparable from it in manual therapy.
- Areolar and adipose tissue that insulates, cushions and stores energy.
- Anchors skin to underlying deep fascia while permitting the skin to glide over it.
- Contains Pacinian corpuscles, larger vessels and cutaneous nerves.
- The plane in which superficial fascia lies, and the layer engaged by skin-rolling and superficial myofascial work.
- Reduced glide between skin, superficial fascia and deep fascia is a common palpable finding after injury, immobility or surgery.

Accessory Structures and Cutaneous Blood Supply

- **Hair and follicles** provide protection, contribute to sensation through follicle receptors, and assist thermoregulation; arrector pili muscles produce piloerection.
- **Nails** protective keratin plates over the digit tips; nail bed colour and capillary refill give useful information about peripheral circulation.
- **Eccrine sweat glands** widely distributed and primarily thermoregulatory; secrete a dilute watery solution directly onto the skin surface.
- **Apocrine sweat glands** found in axilla and groin, opening into hair follicles, active from puberty and responsive to emotional and stress stimuli.
- **Sebaceous glands** secrete sebum that lubricates hair and skin and contributes to the acid mantle; activity varies widely between clients and regions.
- **Ceruminous and mammary glands** modified sweat glands producing earwax and milk respectively.
- **Cutaneous vascular plexuses** a subpapillary plexus supplying the dermis and a deeper cutaneous plexus at the dermal-hypodermal junction; both are under sympathetic vasomotor control.
- **Arteriovenous anastomoses** direct shunts that divert blood away from the surface in cold conditions and toward it for heat loss.



Cutaneous Sensory Receptors

This is the central slide of the lecture for a massage therapist: different strokes preferentially stimulate different receptors, producing different neurological responses.

Receptor	Location	Stimulus detected	Technique that engages it
Meissner corpuscle	Dermal papillae; dense in fingertips, palms, lips	Light touch and low-frequency vibration; rapidly adapting	Light effleurage, initial contact, sensory warm-up
Merkel disc	Stratum basale	Sustained light touch, texture and edge detection; slowly adapting	Static light contact, slow superficial stroking
Pacinian corpuscle	Deep dermis and hypodermis	Deep pressure and high-frequency vibration; rapidly adapting	Deep compression, vibration, tapotement
Ruffini ending	Dermis and fascia	Sustained pressure and skin stretch; slowly adapting	Myofascial techniques, skin rolling, sustained holds
Free nerve endings (thermoreceptors)	Epidermis and dermis	Warmth and cold	Hydrotherapy adjuncts, warmed or cooled applications
Free nerve endings (nociceptors)	Throughout skin and deeper tissue	Actual or potential tissue damage	Any technique exceeding tolerance — the signal to reduce pressure
C-tactile afferents	Hairy skin	Slow stroking at moderate pressure and skin temperature	Slow, rhythmic effleurage associated with affective and calming responses



The Skin in Numbers

Scale helps students appreciate the integumentary system as a major, metabolically active organ rather than passive packaging.

Figure	Value	Why it matters clinically
Total surface area	About 1.8 square metres	The whole of it is available for sensory input, and the whole of it must be screened at intake
Proportion of body weight	Approximately 15 per cent	The largest organ by mass; systemic disease frequently shows itself here first
Thickness range	0.5 mm to 4 mm	Eyelid skin and plantar skin tolerate entirely different pressures
Epidermal turnover	25 to 45 days	Explains why superficial abrasions resurface quickly and why barrier damage is temporary if not repeated
Core temperature defended	About 37 degrees Celsius	Dermal blood flow and sweating are the primary mechanisms of defence
Surface pH	Approximately 4.5 to 5.5	The acid mantle inhibits pathogens; alkaline products and over-washing disturb it
Sensory receptors	Millions across the body surface	Every stroke is a large sensory input the nervous system must interpret
Blood held in dermal vessels	Up to about 5 per cent of blood volume	Sustained vasodilation during treatment redistributes volume — the basis of post-treatment lightheadedness

Palpation of the Skin: What to Feel For

The therapist's hands gather assessment information continuously. These are the qualities to notice and record.

- **Temperature** local warmth suggests inflammation or increased perfusion; coolness suggests reduced arterial supply.
- **Moisture** localised sweating may indicate sympathetic activity; generalised clamminess with pallor is a systemic concern.
- **Texture** roughness, scaling, thickening or unusual smoothness over a scar or ischaemic area.
- **Turgor** the speed with which pinched skin returns; slow return suggests dehydration or ageing skin.
- **Glide** the ease with which skin moves over superficial and deep fascia; restriction is a treatable finding.
- **Oedema** pitting or non-pitting swelling; note whether unilateral or bilateral, and whether it is new.
- **Colour** erythema, pallor, cyanosis, jaundice or bruising; compare with the contralateral side.
- **Sensation** the client's report of numbness, tingling, burning or hypersensitivity in a defined area.
- **Integrity** any break, crack, blister, ulcer, dressing or transdermal patch.
- **Hair distribution** loss of hair on a limb can indicate chronic arterial insufficiency and warrants referral.

Skin Colour Changes as a Window on Systemic Health

The skin frequently shows systemic disease before the client is aware of it. Recognition is within scope; naming the disease is not.

Finding	Appearance	Possible significance	RMT action
Pallor	Unusual paleness, best seen in conjunctivae, nail beds and palms	Anaemia, shock, acute blood loss, peripheral vasoconstriction	If acute with sweating or faintness, stop and seek help; otherwise refer
Cyanosis	Bluish tinge, central at lips and tongue or peripheral at fingers	Inadequate oxygenation, cardiac or respiratory compromise, cold exposure	Central cyanosis is an emergency; peripheral warrants assessment
Jaundice	Yellowing of skin and sclerae	Liver disease, biliary obstruction, haemolysis	Do not treat until medically assessed; refer
Erythema	Redness, may be localised or widespread	Inflammation, infection, allergic reaction, recent manual work	Distinguish expected post-treatment flushing from spreading infection
Bruising	Purple to yellow discoloration in stages	Trauma; if unexplained or extensive, consider anticoagulants, bleeding disorder or other pathology	Avoid local work; refer unexplained or repeated bruising
Hyperpigmentation or new pigmentation	Darkened patches or new pigmented lesions	Endocrine disease, medication effect, or malignancy	Do not work the site; document and refer



SECTION 2

Skin Physiology and Healing

Barrier function, thermoregulation, absorption and the repair sequence that determines whether local work is contraindicated or indicated.

- Barrier function and the acid mantle
- Thermoregulation and the massage-relevant vascular response
- Absorption through the skin and its implications for lubricants
- The four phases of wound healing
- Scar formation, maturation and abnormal scarring

Barrier Function, Absorption and Lubricant Selection

The barrier is the reason skin protects, and also the reason its breach is a clinical event requiring a decision.

- The barrier has three components: the physical keratinised layer, the chemical acid mantle and sebum film, and the biological resident microbial flora and immune cells.
- Absorption through intact skin is limited and selective: lipid-soluble substances, some vitamins, certain drugs and organic solvents can pass; water and most water-soluble substances largely cannot.
- This is the basis for transdermal medication patches — a client wearing one must not have that site worked, and the therapist must not increase local circulation over it.
- Broken skin dramatically increases absorption and infection risk, changing both technique and infection control obligations.
- Lubricant is a clinical choice: oils and creams differ in glide, absorption rate, residue and allergen profile.
- Nut-derived oils are a genuine allergen risk and must be disclosed and screened for; fragranced products may irritate sensitive or compromised skin.
- Very dry or ageing skin benefits from a richer emollient; very oily or acne-prone skin needs a light, non-comedogenic product used sparingly.
- Any client-reported skin reaction to a product must be recorded in the chart and the product changed for subsequent visits.

Thermoregulation and the Vascular Response to Massage

The skin is the body's primary heat-exchange surface, working with the hypothalamus to hold core temperature near 37 degrees Celsius.

- 1. Detect** Peripheral thermoreceptors in the skin and central receptors in the hypothalamus sense change in temperature.
- 2. Integrate** The hypothalamic thermoregulatory centre compares input against the set point.
- 3. Respond to heat** Cutaneous vasodilation increases surface blood flow and eccrine sweating produces evaporative cooling.
- 4. Respond to cold** Cutaneous vasoconstriction conserves core heat, shivering generates heat, and piloerection traps a still air layer.
- 5. Massage effect** Mechanical friction, reactive hyperaemia and histamine-mediated axon reflexes produce local vasodilation, visible erythema and a measurable rise in skin temperature.
- 6. Clinical use** Warm rooms, heated tables, hydrotherapy adjuncts and effleurage all raise superficial circulation deliberately, and all must be moderated where sensation is impaired.



The Four Phases of Wound Healing

Phase determines whether local work is contraindicated, permitted or indicated. Timing is the single most important clinical variable in scar management.

Phase	Timeframe	Events	Massage implication
Haemostasis	Minutes to hours	Vasoconstriction, platelet plug formation, fibrin clot seals the wound	Absolute local contraindication; no contact with the site
Inflammation	Days 1 to 4, up to 6	Vasodilation and increased permeability; neutrophils then macrophages clear debris; heat, redness, swelling, pain	Local contraindication; proximal drainage and unaffected-region work only
Proliferation	Days 4 to 21	Fibroblasts lay down type III collagen, angiogenesis, granulation tissue, epithelialisation, wound contraction	No work until the wound is fully closed; then very gentle work around, not on, the site
Remodelling	3 weeks to 12 months or more	Type III collagen replaced by type I; fibres realign along lines of stress; scar strength rises and vascularity falls	The window for scar work: cross-fibre frictions, skin rolling, sustained stretch and myofascial technique

The Skin and the Autonomic Nervous System

Every autonomic effect of massage is visible in the skin, which makes the skin the therapist's most accessible indicator of the client's autonomic state.

Autonomic effects visible in skin

- Vasomotor tone — sympathetic activity constricts cutaneous vessels, producing pallor and coolness.
- Sudomotor activity — sympathetic cholinergic fibres drive eccrine sweating; anxiety produces palmar sweating.
- Pilomotor activity — arrector pili contraction produces piloerection, sometimes seen during treatment.
- Apocrine secretion — responds to emotional and stress stimuli rather than to temperature.
- There is no parasympathetic innervation of the skin; relaxation is produced by withdrawal of sympathetic tone.

What the therapist can observe

- Warming and mild flushing of the treated area during a session, indicating reduced vasomotor tone.
- Cooling, pallor or goosebumps mid-treatment, suggesting the client is cold, anxious or in pain.
- Palmar or axillary sweating disproportionate to room temperature, suggesting sympathetic arousal.
- Sudden change in any of these is worth pausing for and asking about.
- Recording these observations gives objective evidence of the client's response to treatment.

Thermal and Hydrotherapy Applications to the Skin

Heat and cold act first on the skin, and their effects are mediated by the cutaneous vasculature and thermoreceptors studied earlier in this lecture.

- Superficial heat produces local vasodilation, increased tissue extensibility, reduced muscle tone and analgesia through thermoreceptor and gate mechanisms.
- Heat is contraindicated over acute inflammation, over an area of impaired sensation, over malignancy, in acute bleeding and where the client cannot report discomfort.
- Cold produces vasoconstriction, reduced metabolic rate, reduced nerve conduction velocity and analgesia, and is the appropriate choice in the acute inflammatory phase.
- Cold is contraindicated in cold hypersensitivity, Raynaud phenomenon, compromised arterial supply and over areas of impaired sensation.
- Contrast applications alternate heat and cold to produce alternating vasodilation and vasoconstriction; end with cold in acute presentations and with heat where the goal is tissue extensibility.
- A barrier layer must always separate a thermal application from the skin, and the skin must be inspected before and after.
- Duration and temperature must be reduced in older adults, in clients with fragile skin, and in anyone taking medication that alters sensation or circulation.
- Document the modality, the site, the duration and the client's skin response, exactly as for any manual technique.

Scar Tissue: Formation, Maturation and Management

Scar is a functional repair, not a restoration. It is weaker, less elastic and differently organised than the tissue it replaces.

- Mature scar reaches roughly 70 to 80 per cent of the tensile strength of the original tissue and never fully recovers normal architecture.
- Scar has no hair follicles, sweat glands or normal sensory receptor complement, so sensation over a scar is commonly altered.
- Adhesion between scar and underlying fascia, muscle or bone restricts glide and can limit range of motion at a distance from the visible scar.
- Hypertrophic scar remains within the original wound boundary, is raised and red, and often improves over time.
- Keloid scar extends beyond the original wound boundary, is more common in darker skin and in certain sites, and may recur after excision — treat conservatively and refer for medical management.
- Contracture is shortening across a joint or region, most serious after burns, and can produce permanent functional loss.
- Indications for scar work: the wound is fully closed, there is no infection, the scar is at least in the remodelling phase, and the client consents specifically to work on the site.
- Technique progresses from superficial skin rolling and gentle stretch, through myofascial techniques, to specific cross-fibre frictions as tolerance builds over several visits.
- Client education matters: sun protection, moisturising and consistent gentle self-massage between visits do more than any single treatment.



SECTION 3

Skin Conditions and Infection Control

What the RMT must recognise, document, work around and refer — and the infection prevention obligations that follow from a contagious finding.

- Non-infectious conditions and their adaptations
- Infectious conditions: fungal, bacterial and viral
- Skin cancer recognition and the ABCDE criteria
- Routine practices and standard precautions
- The recognition-versus-diagnosis boundary

Common Non-Infectious Skin Conditions

RMTs do not diagnose. They recognise presentations, adapt treatment, document objectively and refer where appropriate.

Condition	Key features	Massage consideration
Eczema / dermatitis	Dry, itchy, inflamed patches; may weep or crack; often flexural	Local contraindication over broken or weeping skin; work elsewhere; avoid irritant lubricants; heat may aggravate
Psoriasis	Raised, well-demarcated plaques with silvery scale; not contagious	Not contagious, so not a barrier to treatment; local caution if inflamed or cracked; emollient lubricant may add comfort
Acne vulgaris	Inflamed sebaceous follicles, comedones, papules, pustules	Avoid local pressure over active lesions; non-comedogenic lubricant; scrupulous linen hygiene
Striae and mature scars	Healed dermal tears or repaired wounds	Mature, closed, non-inflamed scars may benefit from specific technique with consent
Contusion (bruise)	Discoloration, tenderness, swelling from capillary bleeding	Local contraindication while fresh and tender; consider anticoagulant use and unexplained bruising as a referral flag
Urticaria (hives)	Transient raised itchy weals, often allergic in origin	Do not treat over active weals; investigate whether the lubricant or laundry product is the trigger
Xerosis and fragile ageing skin	Dry, thin, easily torn skin with reduced elasticity	Reduce shear, use generous emollient, avoid vigorous friction and adhesive contact



Infectious Skin Conditions

Recognising a contagious presentation protects the client, the therapist and every subsequent client that day. When in doubt, do not treat the area.

Class	Examples	Presentation	Response
Fungal	Tinea corporis (ringworm), tinea pedis (athlete's foot), onychomycosis	Annular scaly patches with a raised edge; macerated interdigital skin; thickened discoloured nails	Local contraindication; refer for treatment; rigorous linen and surface hygiene; consider whether the therapist's own footwear or table is a source
Bacterial	Impetigo, folliculitis, furuncles, cellulitis	Honey-crusted lesions; pustules at follicles; spreading warm red area with possible fever and malaise	Impetigo and folliculitis are local contraindications and referrals; cellulitis is a systemic red flag requiring prompt medical assessment and no treatment
Viral	Verruca (warts), herpes simplex, herpes zoster (shingles)	Rough keratotic papules; clustered vesicles on an erythematous base; painful unilateral dermatomal vesicular rash	Local contraindication and cover or avoid; shingles requires avoidance and referral, and is a general contraindication while systemically unwell
Parasitic	Scabies, head lice	Intense itch worse at night; burrows in web spaces and wrists	General contraindication until treated; the client must be referred and the treatment room decontaminated

Burns: Classification and Treatment Implications

Burn depth determines healing, scarring and the point at which manual therapy becomes appropriate.

Classification	Depth and appearance	Healing	Massage implication
Superficial (first degree)	Epidermis only; red, dry, painful, no blistering	Heals in days without scarring	No local work while acute and painful; normal treatment once resolved
Superficial partial thickness (second degree)	Epidermis and upper dermis; blistering, wet, very painful	Heals in two to three weeks, usually without significant scar	Absolute local contraindication until fully closed; then gentle work
Deep partial thickness	Into the reticular dermis; mottled, less painful due to nerve damage	Slow healing with significant scarring and contracture risk	Medical management first; scar and contracture work in the remodelling phase with clearance
Full thickness (third degree)	Through the dermis into subcutaneous tissue; leathery, white or charred, painless	Requires grafting; heals with dense scar	Long-term scar and contracture management only, with physician and burn team guidance



Pressure Injuries and the At-Risk Client

Pressure injuries result from sustained pressure that exceeds capillary perfusion pressure, causing local ischaemia and tissue death. They are common in clients with limited mobility.

- Common sites are over bony prominences: sacrum, ischial tuberosities, greater trochanters, heels, malleoli, occiput and elbows.
- Risk factors include immobility, impaired sensation, poor nutrition, incontinence and moisture, friction and shear, advanced age and reduced perfusion.
- Early signs are non-blanching erythema over a bony prominence, and local warmth, firmness or a boggy feel compared with surrounding tissue.
- Later stages progress through partial thickness skin loss, full thickness loss, and finally exposure of muscle, tendon or bone.
- Any open pressure injury is an absolute local contraindication and a referral; the client requires wound care that is outside the RMT scope.
- The therapist's contribution is prevention: relieving pressure during treatment, avoiding shear when moving the client, and reporting early skin changes to the client and their care team.
- In practice this means checking positioning frequently, using adequate bolstering, limiting time in one position and avoiding dragging the client across linen.
- Non-blanching redness over a bony prominence noticed during treatment should be documented and communicated, not massaged.



The Skin in Diabetes, Ageing and Other Special Populations

Several common client groups have skin that behaves differently and requires modified technique.

- Diabetes mellitus — peripheral neuropathy means the client may not feel excessive pressure or heat; impaired microcirculation slows healing; the feet require inspection and never vigorous work; any lesion on the foot is referred.
- Older adults — thinner dermis, reduced collagen and elastin, reduced sebum, fragile capillaries and slower healing; reduce shear, use generous lubricant, avoid vigorous friction and adhesive contact.
- Clients on corticosteroids — long-term therapy thins the skin, causes easy bruising and delays healing; reduce pressure and avoid frictions.
- Clients on anticoagulants — increased bruising and bleeding risk; lighter pressure, no deep specific frictions, document the medication and the adaptation.
- Pregnancy — striae, increased pigmentation, greater skin sensitivity and increased tendency to itch; select bland lubricants and avoid strong fragrance.
- Athletes — friction blisters, calluses, tinea pedis and skin infections spread in shared facilities; screen the feet and be alert to contagious findings.
- Clients undergoing cancer treatment — radiotherapy fields are fragile, dry and easily damaged, and chemotherapy can cause hand-foot syndrome; work only with clearance and never over an active radiation field.
- Clients with reduced or absent sensation from any cause — spinal cord injury, neuropathy, post-surgical numbness — need reduced pressure, no thermal adjuncts and regular visual inspection during treatment.

Skin Cancer Recognition and the ABCDE Criteria

Massage therapists see more of their clients' skin, more often, than most other health professionals. Recognition is a genuine contribution to client health, and it is not diagnosis.

- Asymmetry — one half of the lesion does not match the other.
- Border — edges are irregular, notched, scalloped or poorly defined.
- Colour — variation within one lesion, including brown, black, red, white or blue.
- Diameter — greater than about 6 millimetres, although melanoma can be smaller.
- Evolving — any change in size, shape, colour, elevation, or new symptoms such as bleeding, itching or crusting.
- Additional flags: a sore that does not heal, a pearly or waxy nodule, a persistent scaly red patch, or a lesion that looks different from all the client's other lesions.
- Correct professional action: do not work over the lesion, document its location, size and appearance objectively, tell the client you have observed a skin finding you are not qualified to assess, and recommend they have it looked at by a physician.
- Incorrect action: naming a suspected diagnosis, reassuring the client that it is probably nothing, or ignoring it because it is not the treatment area.
- Record the observation, the advice given and the client's response — this is both a client-safety and a professional-record obligation.

Routine Practices and Standard Precautions

Routine practices are applied to every client at every visit, regardless of known infection status, because status is often unknown.

- Hand hygiene before and after every client contact, before and after glove use, and after contact with any body fluid or contaminated surface — the single most effective control measure.
- Alcohol-based hand rub is appropriate for visibly clean hands; soap and running water are required when hands are visibly soiled.
- Fresh linens for every client, with used linens handled away from the body and placed directly into a covered receptacle.
- Cleaning and disinfection of the table, face cradle, bolsters and all high-touch surfaces between clients using an appropriate disinfectant with the correct contact time.
- Personal protective equipment where indicated: gloves for contact with broken skin, body fluids or when the therapist's own skin is broken.
- Cover any break in the therapist's own skin with a waterproof dressing, and do not work with an open or weeping lesion on the hands.
- Respiratory etiquette and staying away from work when systemically unwell — an obligation to clients that overrides scheduling pressure.
- Safe handling and storage of lubricants: decant rather than double-dip, keep containers closed, and never return unused product to the container.
- Documentation of any infection-control decision that changed the treatment, including areas avoided and the reason.



Hair and Nail Findings of Clinical Significance

Appendages of the skin carry information about circulation, nutrition and systemic health. The therapist observes and reports; the physician interprets.

- **Loss of hair on the lower leg** may indicate chronic arterial insufficiency; check pulses and refer.
- **Clubbing of the nails** increased curvature and loss of the nail-fold angle; associated with chronic cardiopulmonary disease.
- **Pale or blue nail beds** suggest anaemia or poor peripheral oxygenation.
- **Delayed capillary refill** return of colour taking longer than about two seconds suggests reduced peripheral perfusion.
- **Thickened, crumbling, discoloured nails** commonly fungal; a local contraindication and a referral.
- **Spoon-shaped nails** may accompany iron deficiency.
- **Splinter haemorrhages** small linear marks under the nail; occasionally significant and worth reporting if unexplained.
- **Localised hair loss with scaling** may indicate fungal infection of the scalp; contagious and referred.



SECTION 4

Massage Therapy Application

Translating integumentary anatomy and physiology into safe, effective, defensible treatment.

- Effects of massage on the skin
- Indications and technique considerations
- Contraindications and cautions
- The integumentary assessment workflow
- Applied scenarios and review



Effects of Massage on the Skin

Separating the mechanical from the reflexive is the reasoning skill this course is built on.

Direct mechanical effects

- Increased local blood flow through mechanical pressure and release and reactive hyperaemia.
- Increased local skin temperature from friction and increased perfusion.
- Improved pliability and glide of skin over superficial fascia.
- Mobilisation of adherent mature scar tissue and reduction of restriction.
- Desquamation of surface dead cells, supporting normal barrier turnover.
- Movement of interstitial fluid from the superficial tissues toward lymphatic collectors.

Indirect reflexive effects

- Mechanoreceptor stimulation modulating nociceptive transmission through the gate mechanism.
- Histamine and axon-reflex mediated vasodilation extending beyond the point of contact.
- Reduced sympathetic vasomotor tone with slow, rhythmic, sustained contact.
- Parasympathetic shift with reduced heart rate, respiratory rate and perceived stress.
- C-tactile afferent activation associated with the affective pleasantness of slow stroking.
- Altered body awareness and reduced threat appraisal in the treated region.



Indications and Technique Considerations

Always obtain informed consent before treating any visible skin finding, and document the finding and the client's response.

- **Mature, non-inflamed scar** cross-fibre friction, skin rolling and sustained myofascial stretch, progressed over a course of treatment.
- **Adherent superficial fascia** skin rolling and superficial myofascial work to restore glide between skin, superficial fascia and deep fascia.
- **General relaxation goals** slow, rhythmic effleurage at moderate pressure — the technique profile most associated with parasympathetic shift.
- **Localised circulatory support** effleurage and rhythmic compression directed proximally, after screening for vascular contraindications.
- **Sympathetic dominance** predictable rhythm, sustained contact, minimal technique change, quiet environment and unhurried pacing.
- **Lubricant selection** match to skin type and treatment goal; less product for friction work, more for gliding strokes and for dry or fragile skin.
- **Technique progression** begin superficial and light, allow the skin and nervous system to accommodate, then progress depth as tolerated.
- **Continuous monitoring** watch for erythema that does not settle, weal formation, itching or client-reported burning, and adjust or stop.

Contraindications and Cautions

Classify every finding before deciding. The class determines the action, and the reasoning is what is assessed.

Absolute or refer

Cellulitis or any spreading infection
Active contagious skin disease affecting a wide area
Systemic infection with fever or malaise

Undiagnosed changing or suspicious lesion (do not treat the site; refer)
Acute severe burns or extensive sunburn
Shingles while systemically unwell

Regional or local contraindication

Open wounds, weeping eczema, ulceration
Active acne lesions, boils and folliculitis
Warts, fungal patches, herpetic lesions

Fresh bruising or haematoma
Recent surgical incision or graft site
Transdermal medication patch site

Caution and adapt

Fragile or thin ageing skin
Recent scar still maturing — monitor response
Known sensitivity or allergy to lubricant ingredients
Reduced sensation, for example diabetic neuropathy
Anticoagulant therapy or easy bruising
Very recent radiotherapy field or fragile irradiated skin



What the Evidence Supports for Skin and Scar

Students must be able to distinguish supported claims from marketing claims when speaking to clients.

- Reasonably supported: scar massage during the remodelling phase improves scar pliability, reduces adherence and improves client-reported symptoms such as itch and tightness.
- Reasonably supported: manual work increases local skin temperature and local blood flow for a period after treatment.
- Reasonably supported: slow, moderate-pressure stroking of hairy skin activates C-tactile afferents and is associated with reduced anxiety and pleasant affect.
- Reasonably supported: massage reduces itch and discomfort in some burn-scar populations, alongside standard care.
- Not supported: that massage removes toxins from the skin or from the body generally.
- Not supported: that manual pressure permanently lengthens or breaks down dense fascial tissue.
- Not supported: that massage prevents or reverses striae, or eliminates a mature scar.
- Uncertain: the optimal dose, pressure and frequency for scar management, which remains an active research question.
- Defensible client-facing language describes the expected experience and the plan, not a mechanism that cannot be substantiated.

The Integumentary Assessment Workflow

A consistent four-step process, aligned to SOAP charting and to the safe-practice competencies assessed under CMTO requirements.

- 1. Observe** Inspect exposed skin during intake and as each region is uncovered: colour, integrity, lesions, swelling, temperature, scars, bruising and any dressing or patch.
- 2. Question** Ask about existing diagnoses, itch, pain, recent change, known triggers, medications including topical and transdermal, and any allergy to lubricants.
- 3. Decide** Classify the finding as absolute, regional, local or conditional; decide to treat, adapt, avoid the region, or refer, and obtain consent for whatever you decide.
- 4. Document** Record the objective finding, the classification, the adaptation made, the advice given, the consent obtained and the client's response to treatment.
- 5. Follow up** Reassess the finding at the next visit and record whether it has changed; a lesion that has changed is a referral even if it was previously unremarkable.



Recording Integumentary Findings

The record must be objective, specific and non-diagnostic. Compare the two columns of wording below.

- **Instead of 'rash on the arm'** write 'raised erythematous area approximately 4 by 3 cm on the left anterior forearm, dry, not weeping; client reports it is longstanding and diagnosed'.
- **Instead of 'looks like a melanoma'** write 'pigmented lesion approximately 7 mm on the mid-thoracic region, irregular border, two shades of brown; client unaware of it'.
- **Instead of 'told client to see a doctor'** write 'advised client that I am not qualified to assess the lesion and recommended assessment by their physician; client acknowledged'.
- **Instead of 'avoided the area'** write 'no treatment applied to the left anterior forearm; remainder of planned treatment completed as consented'.
- **Instead of 'skin was fine'** write 'skin intact throughout treated regions, no lesions, bruising or breaks observed'.
- **Instead of 'client got red'** write 'expected post-treatment erythema over the treated thoracic region, settled within ten minutes; no weal formation'.
- **Consent** record that specific consent was obtained before working over any scar, lesion or sensitive area, and that the client was told what the technique involves.
- **Follow-up** record at the next visit whether a previously documented finding has changed, and what action followed.

Scenario Practice

Work in trios. For each scenario, state the classification, your action, the exact wording you would use with the client, and the chart entry you would make.

- Scenario 1 — During a routine treatment you uncover the client's mid-back and observe a 7 millimetre pigmented lesion with an irregular notched border and two distinct shades of brown. The client says she has never noticed it and asks you what it is.
- Scenario 2 — A regular client arrives with a warm, red, tender area on the anterior lower leg that has spread noticeably since yesterday. She feels generally unwell and reports feeling feverish but wants to proceed with her booked treatment for low back pain.
- Scenario 3 — A client presents with well-controlled psoriasis, with plaques over both elbows and the sacral region. He is embarrassed and asks whether you are willing to treat him.
- Scenario 4 — A client on long-term corticosteroid therapy has thin, fragile skin that bruises easily, and requests deep tissue work for chronic shoulder tension.
- Scenario 5 — Mid-treatment you notice a transdermal patch on the client's upper arm that was not disclosed at intake.
- For each scenario, state which effects of massage you would be relying on, and which you would deliberately be limiting.

Review Questions

Answer in your own words without notes, then verify against the lecture material.

- Name the five strata of the epidermis from deep to superficial and state which layer is responsible for cell division.
- Explain why the epidermis is avascular and what that means for the healing of a superficial abrasion.
- Name three functions of the dermis that are directly relevant to massage practice.
- Match each of the following techniques to the receptor it preferentially stimulates: slow light effleurage, deep sustained compression, skin rolling, tapotement.
- Describe the four phases of wound healing with approximate timeframes, and state the appropriate manual intervention for each.
- Distinguish hypertrophic scar from keloid scar and state how the management differs.
- State three criteria from the ABCDE framework and describe the exact action you would take on observing a lesion meeting them.
- Classify each of the following: cellulitis of the lower leg; a single wart on the palm; well-controlled psoriasis; an undiagnosed changing mole; a transdermal patch.
- List five components of routine practices as they apply to a massage therapy treatment room.
- Explain why reduced sensation is a caution rather than a contraindication, and describe the modifications you would make.



Lecture 02 Summary

- The skin has three layers — epidermis, dermis and hypodermis — plus accessory structures, and is the largest organ of the body.
- Its functions span protection, thermoregulation, sensation, excretion, vitamin D synthesis, fluid retention, blood storage and immune surveillance.
- Cutaneous receptors are the direct interface between massage technique and the nervous system, and different techniques engage different receptors.
- Absorption through intact skin is limited but real, which makes lubricant choice a clinical decision and transdermal patch sites a no-work zone.
- Wound healing phase, not the calendar, dictates whether local work is contraindicated or indicated; scar work belongs to the remodelling phase.
- RMTs recognise, document and refer skin conditions; they do not diagnose and do not name a condition to a client.
- Contagious conditions carry infection control obligations that extend beyond the individual client to the linens, the table and the next appointment.
- Safe practice depends on a repeatable workflow: observe, question, decide, document, and reassess at the next visit.
- Next lecture: the cardiovascular system, beginning with the heart and the circulation that supplies every tissue treated today.



References (1 of 2)

Primary and supporting sources for this lecture. Citations in the slide footers refer to these entries.

- Rattray, F., & Ludwig, L. (2000). Clinical Massage Therapy: Understanding, Assessing and Treating Over 70 Conditions. Elora, ON: Talus Incorporated. [Primary text for this course.]
- Werner, R. (2019). A Massage Therapist's Guide to Pathology (7th ed.). Boulder, CO: Books of Discovery.
- Tortora, G. J., & Derrickson, B. (2020). Principles of Anatomy and Physiology (16th ed.). Hoboken, NJ: Wiley.
- Premkumar, K. (2004). The Massage Connection: Anatomy and Physiology (2nd ed.). Baltimore, MD: Lippincott Williams & Wilkins.
- Salvo, S. G. (2019). Massage Therapy: Principles and Practice (6th ed.). St. Louis, MO: Elsevier.
- Fritz, S. (2021). Mosby's Fundamentals of Therapeutic Massage (7th ed.). St. Louis, MO: Elsevier.
- Walton, T. (2011). Medical Conditions and Massage Therapy: A Decision Tree Approach. Baltimore, MD: Lippincott Williams & Wilkins.
- Marieb, E. N., & Hoehn, K. (2019). Human Anatomy & Physiology (11th ed.). Hoboken, NJ: Pearson.



References (2 of 2)

- Schleip, R., Findley, T. W., Chaitow, L., & Huijing, P. (2012). *Fascia: The Tensional Network of the Human Body*. Edinburgh: Churchill Livingstone Elsevier.
- Kisner, C., Colby, L. A., & Borstad, J. (2017). *Therapeutic Exercise: Foundations and Techniques* (7th ed.). Philadelphia, PA: F. A. Davis.
- Lowe, W. (2009). *Orthopedic Massage: Theory and Technique* (2nd ed.). Edinburgh: Mosby Elsevier.
- Field, T. (2014). Massage therapy research review. *Complementary Therapies in Clinical Practice*, 20(4), 224-229.
- Public Health Ontario. *Infection Prevention and Control for Clinical Office Practice*. Toronto, ON: Queen's Printer for Ontario.
- Goodman, C. C., & Fuller, K. S. (2015). *Pathology: Implications for the Physical Therapist* (4th ed.). St. Louis, MO: Elsevier.
- College of Massage Therapists of Ontario. *Standards of Practice, Regulations under the Massage Therapy Act, 1991, and the Regulated Health Professions Act, 1991*. Toronto, ON: CMTO.
- Federation of Massage Therapy Regulatory Authorities of Canada. (2016). *Inter-Jurisdictional Practice Competencies and Performance Indicators for Massage Therapists at Entry-to-Practice*. Ottawa, ON: FOMTRAC.