RUHANI COLLEGE
OF HEALTH BUSINESS AND TECHNOLOGY

RUHANI COLLEGE OF MASSAGE THERAPY

Registered Massage Therapy Diploma Program

RU RMT 25 · Hydrotherapy · 70 Hours · 10 Days

Lecture 1 — Foundations of Hydrotherapy and the Skin

Student Handout

Water as a therapeutic agent, the integument as its interface, and the professional frame that governs both.

How to use this handout

This handout carries the full content of the lecture in continuous form so that you can follow the session without transcribing slides, and revise from it afterwards. Work through it alongside the deck, annotate it freely, and use the review questions at the end to test recall before the written and practical examinations. Section 8 lists the prescribed and recommended reading, together with the regulatory sources cited throughout.

All clinical parameters in this handout are the ones you will be assessed on. All professional requirements are drawn from the CMTO Standards of Practice (2022) and the Ontario legislation listed in the references.

1. Learning outcomes

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

- Define hydrotherapy and describe the three therapeutic properties of water.
- Explain how heat moves between a thermal agent and body tissue.
- Identify the layers, appendages and functions of the skin relevant to thermal treatment.
- Explain how thermoreceptors detect temperature and trigger a physiological response.
- Distinguish local, reflex (consensual), derivative and systemic effects of a treatment.
- Situate hydrotherapy within the RMT scope of practice, the CMTO Standards of Practice and Ontario legislation.
- Recognise the client and skin factors that change the dose you may safely deliver.

2. Overview

Hydrotherapy is the external therapeutic application of water — in any of its three states and across a range of temperatures — to influence the tissues and the nervous system. Everything else in this course is a variation on that single idea. Before you can dose a modality safely you need three things: an understanding of what water does to tissue, an understanding of the organ that receives it, and a clear view of the professional boundaries within which you may work.

This lecture builds all three. It begins with water's three therapeutic properties — thermal, mechanical and chemical — and the physical reasons water is such an efficient thermal agent. It then works through the structure and function of the skin, the cutaneous circulation, and the thermoreceptors that convert a temperature change into a physiological response. Finally it situates hydrotherapy within the Ontario RMT scope of practice and the CMTO Standards of Practice that govern every application you will give.

The single most useful thing to take from this session is the habit of asking three questions of every application before you make it: where does the effect occur, how far does it penetrate, and how much load does it place on the client as a whole. A modality that is trivial applied to one hand can be a genuine cardiovascular event applied to the whole body.

3. Key terms

- **Hydrotherapy —** the external therapeutic application of water in any state and across a range of temperatures, to influence tissue and the nervous system.
- **Thermal property —** the capacity of water to transfer heat to or from the body; the primary driver of physiological response.
- **Mechanical property —** the effects of pressure, buoyancy, friction and movement, independent of temperature.
- **Chemical property —** the added effect of substances dissolved or suspended in the water — salts, oils, herbs.
- **Conduction —** heat transfer by direct contact between two surfaces; the mechanism of most modalities in this course.
- **Convection —** heat carried by a moving fluid, as in a whirlpool or an agitated bath.
- **Specific heat —** the quantity of heat a substance stores per degree of temperature change; water's is high.
- **Thermal conductivity —** how readily a substance conducts heat; water's is far higher than air's, which is why moist heat feels more penetrating.
- **Local effect —** a response occurring in the tissue directly beneath the application.
- **Reflex (consensual) effect —** a nervous-system-mediated response appearing away from the site — segmentally, or in the opposite limb.
- **Derivative effect —** blood drawn toward a heated region and away from a congested one, as when a warm foot bath relieves a headache.
- **Systemic effect —** a whole-body response arising when the treated area is large enough to load the cardiovascular system.
- **Thermoreceptor —** a dermal receptor responding to temperature; cold receptors outnumber warm receptors and lie more superficially.
- **Rubefaction —** reddening of the skin from increased superficial blood flow, produced thermally, mechanically or chemically.

4. Lecture content

What hydrotherapy is

Hydrotherapy is the external therapeutic application of water — in any of its three states and across a range of temperatures — to influence the tissues and the nervous system.

- Water is applied as a solid (ice), a liquid (baths, compresses, packs, sprays) or a vapour (steam).
- Its effects are produced through temperature, through pressure and movement, and through any substance carried in it.
- In massage therapy it is used to prepare tissue, enhance manual treatment, manage pain and inflammation, and support home care.
- Hydrotherapy is rarely used alone — it is integrated with manual technique and clinical reasoning.
- It is inexpensive, widely accessible, and produces powerful physiological effects from a very simple agent.
- Its home-care value is one of the strongest reasons to teach it well: the client can continue the treatment between visits.

The three therapeutic properties of water

Every modality in this course is some combination of these three properties. Naming the property tells you what effect to expect and what to screen for.

Thermal

- Water transfers heat to or from the body very efficiently.
- Temperature is the primary driver of response.
- Heat produces vasodilation; cold produces vasoconstriction.
- Governs almost every indication and contraindication in the course.

Mechanical

- Pressure, buoyancy, friction and movement stimulate skin and circulation.
- Acts independently of temperature.
- Seen in sprays, dry brushing, salt glow and immersion.
- Adds a sensory, tonifying dimension to the treatment.

Chemical

- Substances dissolved or suspended in the water add their own effects.
- Epsom and mineral salts, mustard, oatmeal, essential oils and herbs.
- Introduces an allergy and sensitivity risk on top of the thermal one.
- Covered in detail in Lecture 10.

Why temperature does most of the work

- Tissue responds to the difference between its own temperature and that of the agent, not to the agent's temperature alone.
- Neutral skin temperature is roughly 33–34 °C; the further an application sits from that point, the stronger and faster the response.
- Heat raises local metabolic rate, dilates vessels and increases tissue extensibility.
- Cold lowers metabolic rate, constricts vessels and slows nerve conduction.
- The body defends its core temperature continuously — so a large or prolonged application recruits systemic thermoregulation, not just local change.
- This is why surface area and duration matter as much as the temperature you choose.

Pressure, movement and friction

- Hydrostatic pressure during immersion compresses superficial vessels and supports venous and lymphatic return.
- Buoyancy unloads joints and allows movement that would be painful on land — the principle behind pool-based therapy.
- Friction from a brush, cloth or salt granule stimulates cutaneous receptors and draws blood to the surface (rubefaction).
- Moving water — a spray, jet or agitated bath — adds an intermittent mechanical stimulus that is arousing rather than sedating.
- Mechanical effects are additive: a warm bath with vigorous friction is a stronger stimulus than either alone.
- In this course the mechanical property is most visible in dry brushing, the salt glow and immersion baths.

What the water carries

- Additives change the character of an application without changing its temperature.
- Epsom and mineral salts are used for soothing, relaxing soaks.
- Mustard is a rubefacient: it drives strong surface circulation and is powerfully skin-reactive.
- Oatmeal and baking soda soothe irritated or itching skin.
- Essential oils and herbs add aromatic and relaxing qualities and must be properly diluted.
- Skin absorption is limited but real, so quality, dilution and allergy screening all count.
- Every additive adds a reactivity risk on top of the thermal risk — patch-test anything new.

Forms of water and their applications

The same agent spans nearly every modality in this program; only its state and temperature change.

State	Examples in this course	Typical therapeutic use
Solid (ice)	Ice massage, cold packs, ice bags	Acute injury, analgesia, control of inflammation and swelling
Liquid	Foot baths, hot and cold towels, hydrocollator packs, contrast baths, immersion baths, compresses	Heating and cooling, circulatory drive, relaxation, tissue preparation
Vapour (steam)	Facial steam, steam applications, steam rooms	Decongestion, skin hydration and preparation, relaxation

Five ways heat moves

Naming the mechanism tells you why one modality penetrates further, cools faster or needs more layering than another.

- **Conduction —** direct contact between two surfaces. Hydrocollator packs, cold packs, paraffin and ice massage all work by conduction.
- **Convection —** heat carried by a moving fluid. Whirlpools, agitated baths and moving air transfer heat faster than still water at the same temperature.
- **Radiation —** heat emitted as infrared energy without contact. Infrared lamps and radiant heat sources.
- **Evaporation —** heat lost as liquid becomes vapour. The cooling phase of a wet-sheet wrap and the chill of a wet, unwrung towel.
- **Conversion —** another energy form converted to heat within tissue, as in therapeutic ultrasound. Named for completeness; not a hydrotherapy modality.

The physical properties that make water an ideal agent

High specific heat

- Water stores a large quantity of heat for each degree of temperature change.
- A hydrocollator pack therefore holds usable heat for 15–20 minutes.
- The same property makes a bath slow to cool and easy to maintain.

High thermal conductivity

- Water conducts heat far more readily than air.
- Water at 40 °C feels much hotter than air at 40 °C and is far more dangerous.

- Moist heat is perceived as more penetrating than dry heat at the same temperature.
- This is also why a dripping towel both scalds and then chills.

The skin is the interface for every hydrotherapy treatment.

Heat and cold are never applied to deep tissue directly. They are sensed, buffered and transmitted by the skin first. Every safety rule in this course — layering, barriers, time limits, skin checks — exists because of what the skin can and cannot tolerate. Understanding the integument is the foundation of safe practice.

The three layers of the integument

Layer	Composition	Relevance to thermal treatment
Epidermis	Avascular stratified squamous epithelium; five strata; keratinocytes, melanocytes, Langerhans and Merkel cells	Barrier to infection and water loss; the surface that burns first; thickness varies greatly by site
Dermis	Papillary and reticular layers; collagen and elastin; blood vessels, lymphatics, nerves, glands, follicles	Where thermoreceptors sit and where the vascular response happens; carries the therapeutic effect
Hypodermis (subcutaneous)	Areolar and adipose tissue; larger vessels; anchors skin to fascia	Insulates; adipose slows heat transfer both inward and outward; alters effective dose

The barrier layer

Strata, superficial to deep

- Stratum corneum — dead keratinised cells; the true barrier
- Stratum lucidum — present only in thick skin (palms, soles)
- Stratum granulosum — keratinisation begins
- Stratum spinosum — immune surveillance (Langerhans cells)
- Stratum basale — mitosis, melanocytes, Merkel cells

Why it matters clinically

- Avascular: it takes its nutrition from the dermis below.
- Any break in the stratum corneum is a portal for infection — screen before every application.
- Thick palmar and plantar skin tolerates more heat than the forearm or face.
- Turnover is roughly four weeks, so recent injury or grafting means immature, vulnerable skin.

Where hydrotherapy actually acts

Dermis

- Papillary layer: capillary loops and free nerve endings
- Reticular layer: dense collagen, elastin, larger vessels
- Contains sweat glands, sebaceous glands, hair follicles and arrector pili
- Houses the thermoreceptors, nociceptors and mechanoreceptors that respond to your treatment
- Collagen here becomes more extensible when warmed — the basis of pre-stretch heating

Hypodermis

- Adipose tissue is a poor conductor and an effective insulator.
- A client with more subcutaneous fat over the site heats and cools more slowly.
- The same application therefore delivers a different effective dose to different clients.
- Larger vessels here carry heat away from the site into the general circulation.

What the skin does

Protection and regulation

- Physical, chemical and microbial barrier
- Prevents excessive water loss
- Thermoregulation through blood flow and sweating
- Immune surveillance
- Vitamin D synthesis

Sensation and exchange

- Touch, pressure, vibration, temperature and pain
- Excretion of water, salts and organic wastes in sweat
- Limited absorption of lipid-soluble substances — relevant to additives
- Blood reservoir: the dermal vessels can hold a substantial share of circulating volume

Cutaneous circulation and core temperature

- The hypothalamus is the body's thermostat; the skin is its main effector organ.
- Arteriovenous anastomoses in the dermis shunt blood toward or away from the surface.
- Heat load: vasodilation plus sweating dumps heat — the skin flushes and the client feels warm.
- Cold load: vasoconstriction plus shivering conserves heat — the skin pales and the client feels chilled.
- The dermal vascular bed can hold a large volume of blood, so widespread vasodilation drops blood pressure.
- That is the mechanism behind post-treatment light-headedness after a large heat application.
- It is also why systemic applications demand health-history screening and continuous monitoring.

Thermoreceptors: how temperature is detected

Cold receptors

- More numerous than warm receptors — roughly a ten-to-one ratio in most regions
- Situated more superficially in the dermis
- Fire between about 10 °C and 35 °C
- Signal chiefly through thinly myelinated A-delta fibres — fast
- Explains why cold is felt sharply and immediately

Warm receptors

- Fewer, and located slightly deeper
- Fire between about 30 °C and 45 °C
- Signal through unmyelinated C fibres — slower

- Explains why heat builds gradually and why a burn can be established before it is fully perceived
- Above roughly 45 °C, nociceptors take over and the sensation becomes pain, not warmth

From thermal stimulus to physiological response

1. **Stimulus.** The agent contacts the skin and a temperature gradient is established across the epidermis.
2. **Transduction.** Dermal thermoreceptors depolarise in proportion to the rate and degree of temperature change.
3. **Afferent transmission.** A-delta and C fibres carry the signal to the dorsal horn of the spinal cord.
4. **Segmental reflex.** Local reflex arcs alter vascular tone and muscle tone in the same and related segments — no conscious input required.
5. **Central processing.** Signals ascend to the thalamus, somatosensory cortex and hypothalamus; the client becomes aware and the thermostat responds.
6. **Efferent response.** Autonomic outflow adjusts vessel diameter, sweating and muscle tone locally and systemically.

Local and reflex (consensual) effects

Local effects

- Occur in the tissue directly under the application.
- Vascular change, altered metabolic rate, altered tissue extensibility, altered pain threshold.
- Strongest at the surface and diminish with depth.
- Governed by temperature, duration, area and the insulating tissue in between.

Reflex and consensual effects

- Mediated by the nervous system, appearing away from the application site.
- Segmental: a thermal stimulus affects structures sharing the same spinal segment.
- Consensual: applying heat to one limb produces vasodilation in the contralateral limb.
- Clinically useful when the target area cannot be treated directly — for example an acutely injured limb.

Derivative and systemic effects

Derivative effect

- Blood is drawn toward a heated region and away from a congested one.
- The classic example: a warm foot bath relieving a tension headache or nasal congestion.
- Used deliberately to decongest the head and upper body.
- Covered practically in Lecture 7.

Systemic effects

- Appear when the treated area is large enough to load the whole body.
- Heat: raised heart rate, lowered blood pressure, increased respiration, sweating.
- Cold: shivering, peripheral vasoconstriction, raised blood pressure.
- Systemic applications require health-history screening and continuous supervision — Lecture 10.

Ask three questions of every application: where, how far, and how much?

Where does the effect occur — locally, reflexively, derivatively, systemically? How far does it penetrate — surface, subcutaneous, or deeper? How much load does it place on the client as a whole? A modality that is trivial on one hand can be a genuine cardiovascular event when applied to the whole body.

Client factors that change the effective dose

Tissue factors

- Skin thickness at the site — palms and soles tolerate more than the face or antecubital fossa
- Subcutaneous adipose depth — insulates and slows transfer
- Local circulation — good perfusion carries heat away and protects tissue
- Scar tissue, grafts and recently healed skin — reduced sensation and reduced tolerance

Whole-person factors

- Age: very young and older adults tolerate less and respond more slowly
- Vitality, hydration and general health
- Cardiovascular status and blood pressure control
- Medication affecting sensation, circulation or sweating
- Cognitive status and ability to report discomfort reliably

What to inspect before any thermal application

Skin inspection takes under a minute and prevents most avoidable adverse events in hydrotherapy.

- Integrity — cuts, abrasions, blisters, ulcers, surgical sites, cracked or macerated skin.
- Colour — pallor, cyanosis, unusual redness, bruising or mottling.
- Temperature and moisture — a limb noticeably cooler than its pair suggests circulatory compromise.
- Oedema — pitting or non-pitting swelling, and whether it is acute.
- Rashes, infection and infestation — a local contraindication and an infection-control issue.
- Sensation — tested formally in Lecture 2; never assume it is intact.
- Client report — pain, numbness, tingling, burning or altered sensation at the site.

Clients who need extra care from the outset

Sensory and neurological

- Diabetes mellitus with peripheral neuropathy
- Multiple sclerosis and other demyelinating conditions
- Peripheral nerve injury, radiculopathy, post-surgical numbness
- Cognitive impairment or any barrier to reporting discomfort

Vascular, systemic and structural

- Peripheral vascular disease and Raynaud's phenomenon
- Cardiovascular disease, uncontrolled hypertension, heart failure
- Pregnancy — avoid systemic heating and abdominal heat
- Scar tissue, grafts, recent burns; very young and older adults
- Cold hypersensitivity, cold urticaria, cryoglobulinaemia

Hydrotherapy within the Ontario RMT scope

- Massage therapy is a regulated health profession under the Regulated Health Professions Act, 1991 and the Massage Therapy Act, 1991.
- The scope statement covers assessment and treatment of soft tissue and joints to develop, maintain, rehabilitate or augment physical function, relieve pain and promote health.
- Hydrotherapy sits comfortably inside that scope as an adjunct to manual treatment — it is a supporting modality, not a separate practice.
- RMTs must practise only within their demonstrated competence: training on a modality is what makes its use defensible.
- CMTO rescinded its separate complementary-modalities policy; the governing question is now whether the modality falls within the scope of practice and whether the RMT is competent and can obtain informed consent for it.
- Refer when a presentation falls outside your scope or training — referral is a professional act, not a failure.

CMTO Standards of Practice that govern hydrotherapy

All CMTO Standards below were approved 9 February 2021 and published in the 2022 Standards set. Full text at cmto.com/rmts/standards-and-rules.

Directly engaged

- Safety and Risk Management — safe, sanitary practice setting; equipment cleaned and disinfected; equipment service record
- Consent — six elements discussed before assessment, treatment or any change of plan
- Infection Prevention and Control — routine practices for tubs, basins, linens and reusable equipment
- Record Keeping — what was applied, how, and how the client responded

Also engaged

- Draping and Physical Privacy — exposure limited to the area being treated
- Client-centred Care — the client's goals, comfort and right to stop
- Communication — plain-language explanation before and during
- Code of Ethics — duty of care, integrity and the client's best interest

The Ontario instruments behind the Standards

Instrument	What it governs	Relevance to hydrotherapy
Regulated Health Professions Act, 1991	Regulation of health professions; controlled acts	Establishes the framework within which massage therapy is regulated
Massage Therapy Act, 1991	Scope of practice; protected titles RMT and MT	Defines what an RMT may do — hydrotherapy as an adjunct falls inside it
O. Reg. 544/94, s. 26	Professional misconduct	Practising beyond competence, failing to obtain consent, or unsafe practice
Health Care Consent Act, 1996	Consent and capacity; substitute decision-makers	Underpins the CMTO Consent Standard for every thermal application
PHIPA, 2004	Personal health information	Governs the treatment record you create for every application

Instrument	What it governs	Relevance to hydrotherapy
Occupational Health and Safety Act / WHMIS	Workplace safety; hazardous materials	Electrical heating units, hot water, additives and cleaning agents

The six elements CMTO requires in the consent discussion

Requirement 1 of the Standard of Practice: Consent. Consent is obtained before assessment, before treatment, and again whenever the treatment plan changes.

1. **Nature of the treatment.** What modality, where, at what temperature, for how long, and how it will feel.
2. **Expected benefits.** What you are aiming to achieve and why this modality was chosen.
3. **Risks and side effects.** Redness, transient discomfort, the possibility of a burn or skin reaction.
4. **Alternative courses of action.** A milder application, a different modality, or manual treatment without any thermal component.
5. **Consequences of not proceeding.** What is likely if the thermal component is omitted.
6. **Right to ask questions and to stop.** Confirm the client may have treatment stopped or modified at any time, at their request.

Two CMTO requirements worth memorising now

- If you do not have sufficient information about the risks, benefits and contraindications of a modality or product — including topical products, lubricants and additives — then consent cannot be obtained, and it must not be used.
- That requirement is the professional reason this course exists: you cannot lawfully consent a client to a modality you do not understand.
- Consent must be monitored and, when appropriate, reverified during the treatment — thermal applications change over their course, so re-checking is the norm, not the exception.
- Consent conversations are documented in the client health record within 24 hours of the assessment or treatment.
- Written informed consent is required before assessment or treatment of sensitive areas, and the written record is kept in the client health record.

The six-step sequence used for every application in this course

You will meet this sequence in every remaining lecture. Learn it once here and apply it to all fourteen modalities.

1. **Screen.** History, contraindications, stage of the condition, medications, whole-person factors.
2. **Test.** Skin integrity and protective sensation at the site — the subject of Lecture 2.
3. **Consent.** Explain, offer alternatives, answer questions, obtain and record agreement.
4. **Apply.** Correct temperature, barrier or layering, area and duration for the modality chosen.
5. **Monitor.** Re-check the skin early, watch the whole client, and act on any adverse response.
6. **Document.** Modality, dose, response, home care and the plan for reassessment.

Hydrotherapy equipment and routine practices

Hydrotherapy creates infection-control obligations that dry manual work does not. CMTO requires the practice setting and all equipment to be cleaned and disinfected regularly, with maintenance documented in an equipment service record.

Between every client

- Disinfect tubs, basins, footbaths and any immersion vessel
- Fresh linens, towels and single-use barriers
- Clean toweling for every layered heat application
- Discard used paraffin — never return it to the bath
- Hand hygiene before and after every client contact

Ongoing and documented

- Inspect cords, casings and thermostats on electrical units; remove damaged equipment from service
- Maintain hydrocollator water level and monitor tank temperature
- Keep an equipment service record or log
- Follow PIDAC / Public Health Ontario routine practices for clinical office settings
- Handle cleaning agents and additives in line with WHMIS requirements

What a hydrotherapy entry must contain

- Screening findings, including the skin inspection and the sensation test result.
- The clinical reasoning for choosing — or withholding — the thermal component.
- Modality, temperature or setting, barrier or layering used, site, and duration.
- Timing of skin checks and what was observed at each.
- Client response during and after: subjective report and objective findings.
- Any adverse reaction and the action taken.
- Home-care guidance given, in the words the client was actually given.
- The plan for reassessment at the next visit.

Where hydrotherapy sits in a treatment plan

Before manual treatment

- Warm tissue to increase extensibility before deeper work or stretch
- Reduce guarding and raise the pain threshold before assessment
- Warm a chilled or anxious client so they can settle

During, after and between visits

- During: contrast work between manual techniques on a subacute region
- After: cold to settle a region that has been worked vigorously
- Between visits: home care is where hydrotherapy delivers most of its value
- Always integrated with manual technique and clinical reasoning — never a substitute for either

Common beginner errors and their corrections

The error

- Choosing a modality before staging the condition
- Treating the client's tolerance as the only safety limit
- Assuming intact sensation because the client 'seems fine'

- Applying heat because the client asked for heat
- Recording 'hot pack applied' and nothing more

The correction

- Stage first — acute, subacute or chronic — then choose
- Tolerance is unreliable where sensation is blunted; use objective checks
- Test sensation formally, and re-test when the presentation changes
- Client preference informs the plan; screening determines it
- Record modality, dose, barrier, checks, response and home care

Reason these through before the next lecture

Scenarios

- A client with a 24-hour-old swollen ankle asks for a hot pack because 'heat always helps'.
- A client with long-standing diabetes and reduced foot sensation wants a warm foot bath.
- A client reports a tension headache and consistently cold feet.
- A client's forearm skin is intact but there is a healed graft over the treatment site.

What the reasoning should surface

- Stage governs the choice: acute and inflamed means cold, not heat — and the consent discussion must include the alternative.
- Impaired protective sensation means mild, brief, closely monitored applications or none at all.
- The derivative effect: warming the feet to decongest the head.
- Grafted skin has altered sensation and tolerance; treat as a higher-risk site and reduce the dose.

5. Summary — carry these into the clinic

- Hydrotherapy is water applied externally, in any state, across a range of temperatures.
- Its effects arise from three properties: thermal, mechanical and chemical.
- Water's high specific heat and conductivity make it powerful — and make errors consequential.
- The skin is the interface: it senses, buffers and limits every treatment you give.
- Effects occur locally, reflexively, derivatively and systemically — know which you are aiming for.
- Scope, competence, consent, safety, infection control and documentation are not add-ons; they define competent practice.
- Screen, test, consent, apply, monitor, document — every application, every time.

6. Review questions

Cover the answers below and attempt each question from memory before checking. These map directly to the written examination.

1. Define hydrotherapy in a single sentence, naming the three states of water.
2. Name the three therapeutic properties of water and give one modality that leads with each.
3. Which two mechanisms of heat transfer account for most modalities in this course?
4. Why is moist heat perceived as more penetrating than dry heat at the same temperature?

5. Which thermoreceptor type is more numerous, and what does that mean clinically?
6. Distinguish a local effect, a reflex effect, a derivative effect and a systemic effect.
7. List the six elements CMTO requires in the consent discussion.
8. Name four client factors that reduce the dose you may safely deliver.

7. Answers and discussion

1. Hydrotherapy is the external therapeutic application of water — as a solid (ice), a liquid (baths, compresses, packs) or a vapour (steam) — across a range of temperatures, to influence the tissues and the nervous system.
2. Thermal (a hydrocollator pack leads with temperature), mechanical (dry brushing leads with friction) and chemical (an Epsom-salt bath leads with what is dissolved in the water).
3. Conduction and convection. Conduction accounts for hot and cold packs, paraffin, ice massage and towels; convection accounts for agitated baths and moving water.
4. Water conducts heat far more efficiently than air, so at any given measured temperature a moist agent delivers more heat to the tissue and is perceived as deeper and more penetrating — and is correspondingly more dangerous.
5. Cold receptors are far more numerous and lie more superficially, and they signal through faster A-delta fibres. Clinically this means cold is felt sharply and immediately, whereas heat builds gradually — so a burn can be well established before it is fully perceived.
6. A local effect occurs under the application; a reflex effect appears elsewhere through nervous-system pathways (segmentally or in the opposite limb); a derivative effect redistributes blood toward the heated region and away from a congested one; a systemic effect is a whole-body cardiovascular and thermoregulatory response arising from a large treated area.
7. Nature of the treatment; expected benefits; risks and side effects; alternative courses of action; likely consequences of not having treatment; and the client's right to ask questions and to have treatment stopped or modified at any time at their request.
8. Any four of: skin thickness at the site; subcutaneous adipose depth; local circulation; scar tissue or grafts; age; cardiovascular status; medication affecting sensation, circulation or sweating; cognitive capacity to report discomfort.

8. References and further reading

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