Hydrotherapy: a forgotten Australian therapeutic modality

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Put simply, hydrotherapy, also called hydrothermal therapy or medical hydrology, is the use of water, in any of its forms, for the maintenance of health or the treatment of disease. Balneotherapy is a branch of this therapy that specifically studies baths and their medical uses, with a large focus on the healing aspects of various mineral contents (though this itself used to be a sub-branch called crenoology, which was limited to the science and use of mineral spring waters). Thalassotherapy is another branch which refers to the use of seawater and seascapes for healing.

History

The use of water therapeutically is nearly as old as medicine itself. The Riga Veda describes simple hydrotherapy treatments, noting that “water cures the fever’s glow”, and water used for healing was also described in biblical records. Hippocrates extensively described hydrotherapy in his writings and was effusive in his praise, noting that “for the bath soothes the pain in the side, chest and back; cuts the sputum, promotes expectoration, improves the respiration, and allays lassitude: for it soothes the joints and outer skin, and is diuretic, removes the heaviness of the head, and moistens the nose” (Hippocrates 1955). Hippocrates viewed the application of water for healing as an essential component of his regimen, along with diet, exercise, manipulation and herbs. Uses of ‘gushes of water’ or ‘water cure’ are documented extensively in Roman, Greek and Arabic medicine texts (Boyle and Saine 1988). King Henry’s Herbalist Charter also points to the use of seawater and mineral waters from encroaching mining developments, the first reserve of its type in Australia (Wishart and Moile 1861). In 1867 areas around Daylesford and Hepburn Springs were set aside as the Mineral Springs Reserve to protect the health giving properties of the mineral waters from encroaching mining developments. However no therapeutic discipline has been as influential by hydrotherapy as the naturopathic profession. Although naturopathy grew from and inherited the traditions of various therapeutic schools (such as the Eclectics and Thompsonian herbal medicine traditions), it was the Nature Cure movement and hydrotherapy practice which most influenced early naturopathy (Whorton 2004). In Australia too, hydrotherapy had a strong influence on the nascent naturopathic profession (Martyr 2002). However the tradition of hydrotherapy practice has diminished considerably.

Hydrotherapy in Australian naturopathic practice

One of the first Australian natural medicine texts of any description was a hydrotherapy text (Hydropathy; or the system of effecting cures by means of cold water, a text describing and translating Priessnitz’s work by R.T. Claridge) originally published in London in 1843 but locally published in Launceston in 1846. By 1861 a water cure sanatorium had been established in Melbourne (La Moile 1861). In 1867 areas around Daylesford and Hepburn Springs were set aside as the Mineral Springs Reserve to protect the health giving properties of the mineral waters from encroaching mining developments, the first reserve of its type in Australia (Wishart and Wishart 1990).

Early Australian naturopathic journals such as Nature Cure and Medical Freedom (1924-1927), Nature’s Path to Health (1930-1950) and Australian Naturopath (1936-1961) extensively covered hydrotherapy treatments. Hydrotherapy, like physical medicine and manipulative therapies, was a core part of Australian naturopathic education practice until naturopathic scope was compromised by the introduction of the National Health Training Package which reduced naturopathic training to herbal and nutritional medicine. This was largely to allow colleges to seek accreditation in the vocational education sector which could not accommodate the complexities of broad scope naturopathic practice. This move may have been motivated more by the financial gain to colleges of attracting increased student numbers (due to students at vocationally accredited colleges being eligible for Austudy payments) than it was by the improvement of the quality or level of naturopathic training (Wardle et al. 2011). In the mid-1990s most, but not all, naturopathic training institutions in Australia still taught hydrotherapy and training was retained in some university programs. In all nations except Australia, these modalities (physical medicine and hydrotherapy) have not been lost but remain an essential part of naturopathic practice and are recognised as such by the World Health Organization and other accreditation authorities (Chaitow 2008; Baer and Sporn 2009).

Benefits

The failure of Australian naturopathic practice to retain hydrotherapy in practice and education has been a great loss as hydrotherapy conveys numerous benefits in treatment. Hydrotherapy abides by the underlying...
principles of naturopathic practice far more readily than many other therapeutic modalities as, unlike herbal and nutritional medicines which are considered drugs (albeit natural ones), it is completely drugless. It uses only water as a means to support the body’s own healing processes, largely through the manipulation of circulation. Additionally, hydrotherapy is a therapy which can offer therapeutic benefit for little financial cost to the patient. The therapy itself is often free and most patients already have the requisite equipment in their homes. After initial prescription of a therapeutic regime, hydrotherapy is a practice the patient can continue at home without a practitioner or expensive supplements.

As such, hydrotherapy is ideal in instances where patients may have an affinity for naturopathic treatment but are limited by available resources or access issues. Such an example is in rural practice where patients often seek naturopathic treatment but are unable to comply with complex regimes that require ready access to clinics and dispensaries (Wardle et al. 2010; Wardle et al. 2012). Similarly, hydrotherapy treatments are ideal for patients who simply may not be able to afford naturopathic treatments or supplements; it is often these patients who could benefit most from naturopathic treatment. Hydrotherapy treatments may therefore provide opportunities for new patient groups to experience the benefits of naturopathic treatment, in addition to offering practitioners an extra tool in their therapeutic toolkit.

**Mechanism**

Hydrotherapy and hydrothermal therapy are chiefly used to tone the body. Most therapeutic benefits result simply from improved circulation which in turn has numerous therapeutic benefits. Through this mechanism, hydrotherapy encourages the body’s innate healing mechanisms by encouraging increased nutrition and healing precursors via improved blood supply as well as encouraging elimination of waste. This simple mechanism has a broad clinical application, with hydrotherapy being traditionally used to stimulate digestion, circulation and the immune system, relieve pain, reduce stress, rejuvenate the body (through affecting the skin and muscles), as well as tone the lungs, heart, stomach, and the endocrine system by stimulating reflex areas (Boyle and Saine 1988).

The physiological effects of water are elicited in three main ways. Thermal effects are produced by the application of water at temperatures above or below that of the body. Mechanical effects are produced by the impact of water upon the surface of the body in the form of sprays, douches, frictions, whirlpools and other treatments. Chemical effects are produced when it is taken by mouth, used to irrigate a body cavity or when the solvent properties of water are used to transmit other substances (e.g. magnesium sulphate baths or steam inhalations with herbs).

Hydrotherapy elicits these responses through a variety of techniques. These include: application of water to the body with hands accompanied by light rubbing (ablutions); application of water in the form of a gentle pour (affusions); application of falling water ‘at some force’ so mechanical pressure effects are also elicited (douches); ‘mid-range’ falling water application (showers); diffused shower (sprays); application of cool to cold wet towelling surrounded by an insulating layer (compress or wet packs); application of warm to hot wet towelling surrounded by insulating layer (compress or fomentations); subersion of some part of the body in water (baths); and exposure of all or part of the body to steam (steam vapours).

Cleansing and detoxification are thought to be encouraged via a number of mechanisms. These include: increased kidney clearance via increased water intake; increased removal of blood impurities through the liver and kidneys by encouraging blood circulation; aiding excretion through sweating (which also occurs when underwater); and promotion of detoxification through chemical mediators in the case of balneotherapy (for example via the effects of various bath salts or minerals) (Boyle and Saine 1988).

**Thermic application effects**

Different types of thermic applications have different types of physiological effects. Generally speaking, heat relaxes and sedates while cold stimulates, invigorates and tonifies (see Table 1). However, prolonged cold can be depressive and seductive, while high temperatures can stimulate and also be destructive.

**Table 1: The effects of different types of hydrotherapy application (adapted from Blake 2008)**

<table>
<thead>
<tr>
<th>Application Type</th>
<th>Circulation</th>
<th>Metabolism</th>
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<tr>
<td>Short hot application</td>
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<tr>
<td>Long hot application</td>
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<tr>
<td>Long cold application</td>
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The generally accepted temperatures for water are: hot (over 40°C), warm (37.2-40°C), neutral (33.9-37.2°C), tepid (21.1-33.9°C) and cool or cold (4.4-21.1°C) (Blake 2008). The maximum safe exposure time for applying heat at 45°C is 30 minutes, although it should be noted that temperatures as low as 42°C can cause thermal damage to skin—as well as the nerves and tissue underneath—with long exposure (Blake 2008). Similarly excessive application of cold may also cause thermal damage and should not be used to a level where skin becomes white or numb.
Principles of ‘blood movement’ in hydrotherapy

To promote healing either locally or systemically, hydrotherapy treatments aim to maximise circulation of well-oxygenated, nutrient-rich blood which also has the effect of carrying away metabolic and other waste products. The rate of blood flow and blood volume can be either increased or decreased through specific organs or areas of the body. The major ways in which this is controlled are listed in Table 2. It should also be noted that beyond research conducted during hydrotherapy’s peak popularity in the early 20th century (see Table 2 for research examples), there has been little further physiological research into hydrotherapy effects.

Balneotherapy

There is emerging evidence that the mineral content of various waters does have specific physiological effects which translate into differing effectiveness outcomes (see Tables 3 and 4). For example, in a randomised trial of tap water versus (sulphur containing) mineral water for low back-pain it was found that mineral containing waters were more effective, though improvements were

<table>
<thead>
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<th>Table 2: Principle types of effects in hydrotherapy (adapted from Blake 2008)</th>
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<tr>
<td><strong>Effect type</strong></td>
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<tr>
<td>Revulsive</td>
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<tr>
<td>Derivative</td>
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<tr>
<td>Spinal Cord/Reflex areas</td>
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<td>Collateral circulation</td>
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<td>Arterial trunk reflex</td>
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<th>Table 3: Biological and physiological effects of various water applications (adapted from Karagülle 2006)</th>
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<tr>
<td>Sulphur Water Balneotherapy</td>
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<tr>
<td>Immuno-modulatory</td>
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<td>Anti-inflammatory</td>
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<tr>
<td>Antioxidant</td>
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<tr>
<td>Release of β endorphin</td>
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<tr>
<td>Analgesic</td>
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<td>Muscle relaxant</td>
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<th>Table 4: Effectiveness of various water applications (adapted from Karagülle 2006)</th>
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<tr>
<td>Sulphur Water Balneotherapy</td>
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<tr>
<td>Rheumatoid arthritis</td>
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<tr>
<td>Knee osteoarthritis</td>
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<tr>
<td>Low back pain</td>
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<td>Fibromyalgia</td>
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seen in both groups (Balogh et al. 2005). However, the exact mechanisms underlying these differences remains unknown and studies demonstrate that tap water hydrotherapy still offers improvement in many conditions.

Example treatments
Alternating sinus compresses

Alternating sinus compresses are used as a stand-alone treatment for painful, swollen sinuses, but can also be used in conjunction with the nasal lavage treatment (jala neti or neti pot). Combining the two seems to make each one work a little better. Supplies required for this treatment include two face cloths and a supply of both hot and cold water. For severe and acute problems, it is recommended to perform the treatment in the morning and evening, and only once a day for less severe problems or for maintenance treatment. The entire procedure should take less than 10 minutes once everything has been organised.

Directions:
• Soak one face cloth in hot water. Wring it out so it is damp but not dripping. Place the face cloth over your nose and eyes and the sinuses surrounding these areas and leave in place for three minutes.
• Have the second face cloth soaking in cold water. Wring the cloth out. Remove the hot cloth, and place the cold cloth over the same area of your face for 30 seconds.
• Repeat this alternating sequence two more times for a total of three alternating sequences of three minutes hot and 30 seconds cold.
• The entire procedure will take about 10 minutes after preparation. If you are trying to clear drainage from your sinus passages, perform nasal lavage after you have completed the alternating hot and cold heating compresses.

Wet sock treatment

Wet sock treatments are traditionally used to treat colds, headaches, sore throats, ear infections and almost any other problem involving congestion or infection in the upper body and head (Boyle and Saine 1988). It has also been traditionally used in some cases of insomnia and can be used on a regular basis to encourage general immune stimulation. As one of the more ‘unusual’ treatments, it can draw ridicule from some quarters, particularly for conditions that seem unrelated to feet as insomnia. However, it should be pointed out that, like all hydrotherapy treatments, the principal mechanism lies in its manipulation of circulation, in this case drawing circulation to the distal areas. Emerging evidence offers insights that highlight how this mechanism may be of use in conditions like insomnia, with increases in distal blood flow being demonstrated to assist with both onset and latency of sleep (Kräuchi et al. 1999; Kräuchi et al. 2000; Romeijn et al. 2012).

Directions:
• It is imperative that prior to treatment, the feet are warmed first. This is very important as the treatment will not be as effective and could be harmful. Warming can be accomplished by soaking the feet in warm water for five minutes.
• Next, take a pair of cotton socks and wet the portion covering the feet with cold water. Be sure to wring the socks out so they are damp, but not dripping.
• Place the cold socks on your feet. Cover these with thick wool socks. Go to bed, being sure to wrap up well with a warm blanket. Avoid getting chilled.
• DO NOT remove the socks in the middle of the night. This is a common mistake and will ruin the effectiveness of the treatment. They may still be wet in the middle of the night but trust that they will be dry in the morning. Many patients also report that they sleep much better during the treatment.

Alternating sitz baths

A sitz bath is an immersion bath with the person seated in a tub with water covering the hips, buttoks and lower abdomen. It is used to decrease congestion and increase circulation to the pelvic and lower abdominal organs. It is highly recommended by European naturopaths and is used for treating conditions that negatively affect the organs of the female reproductive system such as pelvic inflammatory disease and endometriosis, but are also traditionally used for constipation, haemorrhoids and lower back problems (Boyle and Saine 1988). Sitz baths are contraindicated in open wounds or active bleeding, vaginal bleeding (including excessive menstrual bleeding), prolapsed organs, acute lung congestion, acute inflammation, painful conditions with spasm or colic, pregnancy and heart problems.

Directions:
• Prepare a tub with hot water at a temperature of 40-43°C. This range is about the same or slightly warmer than a typical hot tub. Do not exceed 49°C. Fill the tub so that it comes to 2.5cms (1 inch) above your navel when you are in a seated position.
• Put a long towel in a separate small ice water bath (a bucket or large bowl will suffice) placed next to the tub.
• Sit in the hot bath for at least 3 minutes.
• After the hot bath, stand up and take the cold towel from the ice water bath. Without wringing it out, wrap it around your pelvis like a diaper. Make sure that the towel is touching your skin all the way around. Do not allow the towel to come up higher than 2.5cms (1 inch) below your navel. Leave on for 30 seconds. Return towel to ice bath.
• Sit down in the hot bath for another 3 minutes.
• Repeat cold towel wrap, as before, for 30 seconds.
• Sit down in hot bath for another 3 minutes.
• Repeat cold towel wrap, as before, for 30 seconds.
• Following the third cold towel wrap, get out of tub and dry off.
Contrast showers

Contrast showers are traditionally used to stimulate vitality and promote detoxification, as well as treat generalized areas of pain and soreness. By alternating between hot and cold water while showering, the patient stimulates their body to heat itself up and cool itself down in order to counteract the external stimulus. This temperature contrast helps strengthen and normalize the nervous, circulatory, endocrine, musculoskeletal and immune systems (Goedche et al. 2007) and is also thought to be excellent for helping the body cope with physiological and psychological stress (Boyle and Saine 1988). One German study of medical students also demonstrated that regular use of a cold shower alone had a progressively beneficial effect on immune system function (Ernst 1990).

Directions:
• After a normal hot shower, gradually turn down the hot water until the shower is pleasantly cool or cold; rinse the whole body under the cooler water for about 1 minute.
• If there are localised areas of pain or soreness focus the shower stream on these areas.
• Next, switch the shower back to hot to rewarms the body for 3-5 minutes. Repeat the cycle 3-5 times and end with cool water.
• It is important that the hot phase is longer than the cold and that the process is finished with cool water.
• After the final cool rinse, the patient should dry off quickly, rubbing briskly with a cold towel to stimulate the rewarming process. As a sign of increased peripheral circulation, the skin may turn transiently pink afterwards.
• It is also important to note that sharper contrasts in temperature between the hot and cold phases increases the therapeutic benefit. As the patient gets used to treatment, they can increase the intensity by varying the speed and degree of the temperature change.

Hydrotherapy for headaches

Headaches are often caused by muscle tension or temporary changes in blood circulation in the brain. The muscle tension that can lead to headaches may be triggered by stress, joint misalignment in the neck or jaw, emotional factors, or poor posture. Chemical reactions (including food allergies), poor blood sugar regulation, hormonal changes, alcohol and fatigue may trigger headaches caused by increased blood flow, as vasoactive compounds expand cerebral blood vessels. Application of hot and cold water to change blood flow and release muscle tension has long been traditionally used to relieve headaches of both muscular and vascular origin. Materials required consist of two small towels, two basins and an ice pack or tray of ice cubes in water.

• Migraine or vascular headache
Fill one basin with ice water and the other with hot water (no more than 46°C). Soak one towel in the basin containing ice water. Wring out the towel from the ice water and place on the back of the neck while soaking the feet in the basin of hot tap water. Leave for 20 minutes. If this does not bring relief then soak one towel in the hot water. Place the hot wrung towel on the back of the neck and soak the feet in the basin of ice water for 20 minutes.

• Tension headache
Fill one basin with ice water and one basin with hot water (no more than 46°C). Soak one towel in each basin. Wring out hot towel and place on the back of the neck for 3 minutes. Remove this towel and replace it with the iced towel for 30 seconds. The hot and cold applications should be repeated three times each.

• Sinus headache
The same process should be used as for tension headache but the wrung towels placed over the sinuses rather than on the back of the neck. This is an example of the hot and cold alternating compress.

Colonic hydrotherapy

It would be remiss to discuss hydrotherapy without discussing colonic hydrotherapy. Although colonic hydrotherapy (also known as colonic irrigation) is amongst the most well known hydrotherapy treatments, its modern use as a detoxifying agent and preventive measure belies its traditional use in naturopathic hydrotherapy. Traditional texts warn that enemas ‘should not be abused’, that they are ‘remedial, not preventive or strengthening’, and that practitioners should ‘reserve their use for well-indicated clinical situations, which are largely limited to constipation, impacted faeces or distension suspected to be caused by faeces’ (Boyle and Saine 1988). Similarly, whilst there does appear to be some evidence for the use of colonic irrigation in the treatment of defecation disorders (Gosselink et al. 2005; Koch et al. 2008), there is limited evidence for other conditions or for preventive use, though some patients do report temporary benefit (Tod et al. 2007).

There may also be significant risks with excessive or unnecessary use of colon hydrotherapy. Injuries caused by treatment have resulted in conditions such as life-threatening perineal gangrene or comparatively benign, but nonetheless debilitating and unpleasant, abscesses (Tan and Cheong 1999; Ratnaraja and Raymond 2005). Physiological examination has even suggested that the process of colonic irrigation may in fact introduce perineal distension suspected to be caused by faeces’ (Boyle and Saine 1988). Similarly, whilst there does appear to be some evidence for the use of colonic irrigation in the treatment of defecation disorders (Gosselink et al. 2005; Koch et al. 2008), there is limited evidence for other conditions or for preventive use, though some patients do report temporary benefit (Tod et al. 2007).

Clinicians are free to use their personal judgement in determining whether colonic irrigation or hydrotherapy may be suitable for a patient, but they must perform this judgement in the knowledge that use for non-acute presentations is neither supported by evidence nor traditional use. Excessive or unnecessary use of...
the therapy also poses significant risks and should only be used when properly indicated. Detoxification and elimination can be encouraged by a number of safer and less invasive hydrotherapy techniques, in addition to other naturopathic treatments.

Other treatments

In addition to the beginning treatments outlined, hydrotherapy texts outline numerous other treatment types. The addition of herbs to hydrotherapy treatments is an obvious example. One of the founding fathers of the hydrotherapy therapeutic movement, Father Sebastian Kneipp, caused great consternation amongst his nature cure colleagues (who eschewed all drugs, natural and synthetic) when he began using ‘herb cure’ (primarily oat straw baths and herbal teas internally, particularly nettles) to complement his ‘water cure’. Kneipp believe that “both cures, the interior and exterior, harmonise and work together in unity” (Kniepp 1896 p122), though he did caution that the gentlest application was always the best. Modern naturopathic hydrotherapy utilises a variety of herbal medicines to complement hydrotherapy application.

Constitutional hydrotherapy, a treatment that uses hot and cold applications with low-volt electrical sine-wave stimulation (Boyle and Saine 1988), was developed by US naturopathic physician Otis Carroll in the first half the 20th century. Although commonly used by many naturopathic physicians, particularly in North America, its therapeutic claims have not been tested.

Discussion

Although commonly used in most naturopathic traditions, hydrotherapy remains a ‘lost art’ in Australian naturopathic practice. This is unfortunate as it is a therapeutically valuable addition to any practitioner’s toolkit. However, the loss of hydrotherapy seems to be an accidental one due largely to aligning naturopathic education to an inappropriate accreditation model. Given the reincorporation of naturopathic education into the higher education sector, a model far more accepting of naturopathic philosophy and practice and broader scope of treatment, hydrotherapy is a therapy that could be easily re-instated into Australian naturopathic practice.

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