INTRODUCTION

Nature has provided many gifts of healing. One of the most outstanding and exciting is peat. The use of organic peat and its constituents is ancient, yet people with pain, injury, and dermatologic, rheumatic, and other conditions are benefiting from modern peat therapy today. This pleasant and safe healing discovery has brought relief and cure for many.\(^1\)\(^{1-18}\)

Balneology is the study of the art and science of bathing. Balneotherapy is the use of natural thermal mineral waters, additive baths, peloids, and other natural substances, as well as various atmospheric or environmental elements singly or in combination for the prevention and treatment of disease. The aim of balneotherapy is to change regulation and reactive functions, leading to improvement of capacity, adaptation, and self-healing.\(^19\)

Peloid refers to the pulp of a substance that is applied to the body. It may be in pack form or bath, either local or whole body. The concentration of peloidal solutions can vary and should be applied to the skin in a specific manner for a specific condition to optimize results. Common peloids are peat pulp, lake or sea muds, and plant substances.

For many conditions, balneotherapy works synergistically with peloid therapy, and the percutaneous absorption of their constituents along with the physiologic and psychological effects provides an excellent therapy for people who can no longer tolerate oral or injectable pharmaceuticals and have chronic degenerative diseases. Life is stressful, and our society is aging. We would be wise to utilize the positive benefits of balneotherapy in the conventional treatment of pain and illness as well as in health maintenance and prevention of disease. The purpose of this chapter is to describe the general concept of balneotherapy with emphasis on the therapeutic application of peat. There certainly is a distinction between the application of peat and the application of other muds, such as lake mud or clay. The characteristics of the specific peat mud constituents being used are vitally important, as well as the manner of their application.*

**BALNEOLOGY**

History

Therapeutic bathing is an ancient art and probably the oldest of medical procedures. Hippocrates wrote on the application of therapeutic bath in 400 BC and how it soothed pain in the side, improved respiration, soothed the joints and skin, was diuretic, and removed heaviness of the head. It was suited for those who benefited, but could be unsuitable if applied in the wrong way. It enjoyed tremendous popularity until about 75 years ago when, along with other natural techniques, it fell out of favor as conventional medicine produced its modern successes. Since then, the large corpus of empirical wisdom has been expanded on and much scientific evidence has contributed to the advancement of balneology as a science. Many institutions are teaching hydrotherapy and balneologic techniques, and many spas have wonderful programs for people to utilize. It is not hard to imagine that the reason this art survived and improved is because it can better people's health.

*References 7, 10, 11, 13, 16, 18-26.

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Balneotherapy’s modern day roots lie predominantly in European spas, which have some of the longest continuously running histories of any medical institution. Millions of patients flock to clinics throughout Europe and the world each year for treatment in hydrology departments under the supervision of physicians and their staffs. Such clinics provide a variety of balneotherapeutic techniques. Spa therapy is a term used for the combination of balneotherapy and other techniques usually delivered at a resort setting. The effects of spa therapy are influenced positively by the pleasure of being in a beautiful setting with the stresses of home and work removed. Medical spas are often in an area where earth’s elements are present. The pristine air, the ambient temperature, the humidity or amount of light, nourishing food, and exercise can effect a change in the spirit, mind, and body.19

**Balneotherapy in Combination with Other Therapies**

Many therapies work well together, such as phototherapy and mud therapy in the treatment of psoriasis. Mud pack therapy, podotherapy, massage, soft and osseous tissue manipulation, iontophoresis, phonophoresis, and exercise work together.27 The combination of buoyancy and heat in the water make sense, for example, in underwater traction bath and massage, which have been shown to reduce the levels of analgesic consumption in patients.18 In my own experiences with patients, hydrotherapy, with and without mud in combination with other treatments, such as naturopathic manipulation, can work like nothing else to help people heal and stay healthy. A multitude of conditions can be treated with balneotherapeutic methods—pain, injury, and dermatologic and rheumatic conditions rank high.2,19,28,29 Under the right conditions and with the right application, balneotherapy stimulates healing and speeds recovery.30

**Physiologic Effects**

Balneotherapeutics induce direct and indirect actions on the body. The direct actions of balneotherapy take into consideration the physical actions of water on the body, such as hydrostatic pressure, buoyancy, viscosity, and frictional resistance, as well as thermal effects and the chemical and pharmacologic effects of the percutaneous absorption of the substance being used.44 Such substances are found in hot spring waters of various types, such as carbon dioxide, hydrogen sulfide, chloride, sulfate, iron, acid, and radon. Mineral waters contain cations such as sodium, potassium, calcium, and magnesium, and anions SO₄²⁻, Cl⁻, and HCO₃⁻. The concentrations of these ions are usually significantly high (1 g/L). In spring water, levels of nitrogen compounds, such as nitrate, nitrogen dioxide, and nitrogen oxide, are very low and the water is free of or low in bacteria.17 Peat muds, plant preparations, and mineral-containing muds are also used. In Europe, peat bath and peloids are traditional. These applications are used in combination with exercise, aquatics, steam bath, sauna therapy, climatotherapy, physical therapy, and pharmacotherapy, among others, with important consideration being given during treatment to the chronobiologic and circadian rhythmic phases of the body.1,14,23,25-28

The indirect actions of balneotherapy arise from the repeated application of therapeutic stimulation, such as climatic exposure to the elements, training effects of exercises, and social and psychological effects arising from changes in environment. These elements act as a complex stimulation in a nonspecific manner of the physiologic function of the organism’s central nervous system, autonomic nervous system, endocrine system, immune system, and so on. The result of these stimulations is a reactive response by the body, leading to activation and improvement of capacity, adaptation, and self-healing potential. In other words, balneotherapy has a normalizing effect on the body’s systems and rhythms.*

**Circadian Rhythms**

Biorhythms are important in the expression of many conditions.30,43 Sunlight, mealtimes, and seasonal changes are external cues that, together with internal cues such as blood pressure and respiration, affect the hypothalamus or master clock. This part of the brain then signals hormones, enzymes, and other substances to facilitate healing, produce cells, or cause pain and symptoms. It has been shown that different times of day affect the amount of muscle torque potential, body temperature, and clock-gene messenger RNA (mRNA) expression.42 A cold or hot foot bath can induce a rise in temperature of oral mucosa up to 1°C, but the extent of the oral temperature increase depends on the body’s reaction to this stimulus, which is influenced by the body’s own internal clock.1

Conditions such as arthritis have pain with varying cycles.43 It is thought that some of these cycles are in synchrony with the moon and the sun. Heart attacks, asthma, and rheumatoid arthritis joint pain are early morning diseases, so medication and treatment can be tailored for different times of day when it is significantly more helpful and less wasteful when not needed. Serum adrenocorticotrophic hormone, prolactin, luteinizing hormones, and immune parameters such as plasma levels of soluble p75 tumor necrosis factor and tumor necrosis factor-α (TNF-α) vary in 24-hour rhythms in the body.30 These may be affected through balneotherapy, as may melatonin production and expression.44 Melatonin affects the organization and expression of biorhythms and is easily susceptible to oxidative stress. Symptom remission in some conditions coincides with a normalization of circadian rhythms promoted by balneotherapeutic treatment.45-48 In a European study, the combination of carbon dioxide bath and mud bath was shown to downregulate the systolic pressure in hypertension while having a balancing effect on biological clocks.49 A study on fibromyalgia patients, in whom altered reactivity of the hypothalamic-pituitary-adrenal axis was observed, supported the theory that mud pack therapy works in synergy with antidepressant treatment to decrease pain and improve depression. Balneotherapy can promote the body’s response systems, such as the stress response system, to achieve homeostasis.46

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*References 2, 4, 7, 10, 11, 15, 31-39.
skin diseases, trauma and its sequelae, and many other ailments and afflictions. The many substances in peat offer a vast possibility of medicinal cure applications.\textsuperscript{51-61}

It is important to consider the region and origin of the peat being used for medicinal purposes. Low moor peat has been shown to contain higher concentrations of nitrous substances, which are thought to contain a higher content of biologically active substances than the high moor peats or peats taken from a shallower depth. It is not just high nitrous content that makes a certain peat more medically useful, but the quality, type, and amount of the biologically active substances it contains that are the determining factors in its medicinal effect. In Germany these types of peats are now a national resource.

**Skin Response**

Skin is a reflex, metabolic, immune, and excretory organ. It affects the autonomic, immune, and circulatory systems and participates in the biosynthesis of not only vitamin D but also acetylcholine, histamine, and serotonin.\textsuperscript{2,4,10,15} Significantly higher concentrations of minerals and medicaments can be attained in the epidermis with baths than with systemic flooding via the vascular system. There is percutaneous uptake of many substances by the skin but not in large amounts for most natural substances. Permeation into the dermis does occur especially for humic acids, and uptake beyond the stratum corneum is exemplified by measurable urinary excretion rates.\textsuperscript{62,63}

The primary effects of bath components take place within the skin. For instance, hydrogen sulfide acts as a trap for oxygen radicals, functioning to reduce inflammation. It is thought that the action comes from the effect of sulfur on the Langerhans cells, which play a role in immune presentation and inflammation modulation. In this way, skin responses can act as transmitter-activating helper functions. Sulfur-containing peat baths demonstrate a pain-reducing and healing effect on rheumatic and degenerative diseases. One reason may be the reduction in Langerhans cell activity in producing cytokines that results from the combination of the components within peat and thermal radiation.\textsuperscript{*}

**Physiologic Effects**

Peat has a structure containing micropores, which accounts for its sponge-like, water-carrying capacity and its ability to maintain either hot or cold temperatures. When applied, peat produces a gradient rise or fall in temperature, which is especially desirable in a therapeutic bath. A peat formulation bath influences neuromuscular, endocrine, and pulmonary functions, as well as kidney hemodynamics, depending on the consistency and volume of the partial or full bath.\textsuperscript{4,10} Peat has well-documented effects, such as tissue dilatation and increases in stroke volume, metabolism, and immunologic stimulation. Peat bath may be preferable to water bath if one considers the gradient rise and fall of temperature, increased buoyancy, and prevention of heat loss during a bath and the possible positive chemical and pharmacologic effects of the constituents of peat.\textsuperscript{50,62-65}

Those who have experienced a therapeutic bath can appreciate the feelings of exhilaration and deep relaxation induced by a bath that contains an additive such as peat. The response is affected by the constituents in the water, the temperature of the bath, and the time of day the stimulus is given.\textsuperscript{65}

*References 2, 7, 15, 19, 22, 50, 64.

The patient’s genetics and physical capacity are also important. A peat bath enhances circulation significantly longer than a water bath.\textsuperscript{51} Microcirculatory vasodilation in the skin has been shown to increase even without hyperthermia. The peripheral and deeper arteries, such as the intrauterine vessels, have shown prolonged increased flow after peat bath. The effects of peat constituents can occur without heat, but heat increases the effect on the body.

The antirheumatic activity of thermal muds has a precise pharmacologic character. Therapy can be prescribed according to the characteristics of the mud for specific conditions.\textsuperscript{60,62} For example, specific muds work better with phototherapy for psoriasis and atopic dermatitis. The length of time that the peat mud has undergone humification and maturation lends unique characteristics. Maturation of peat muds increases their thermoinsulating, hydrating, and, importantly, biochemical characteristics. The sulfoglycolipid content of mature mud differentiates a natural remedy from a specific application with a precise pharmacologic character. These sulfoglycolipids are absorbed through the skin and stimulate an antirheumatic effect.\textsuperscript{66} Several peat substances are able to permeate the skin.\textsuperscript{63} Their absorption and action have been documented by the comparisons of placebo, water bath, and peat bath using Doppler ultrasound measurement. One study that measured circulation in the uterine artery after bath therapy showed that only the peat bath achieved the physiologic effect of prolonged vasodilation and circulation. This effect lasted for several hours after the treatment. It is thought that absorption of peat substances takes place through the hair follicles and apocrine glands via diffusion and partial pinocytosis.\textsuperscript{21,38} The fractions of peat components that penetrate the skin include the humic acid fractions, fulvic, ulmic, and volvic. The excitatory effect of humic acid fractions such as fulvic acid impact the reactivity of \( \alpha_2 \) and \( \alpha_2 \) receptors of smooth muscle cells.\textsuperscript{64}

The functions of peat in medicinal applications are antimicrobial, antiviral, anti-inflammatory, and antineoplastic, to name a few.\textsuperscript{65} Many biochemical effects have been demonstrated in humans and animals. The anti-inflammatory effect of peat mud has been attributed to a sulfoglycolipid associated with a decrease in serum interleukin-1 (IL-1) in patients with arthritis.\textsuperscript{67} The effects of mud applications include elevation of protein synthesis, reduction of arachidonic acid, and inhibition of inflammatory mediators such as leukotrienes (LTB4), prostaglandins (PGE-2), and thromboxane. Biologic activity is ascribed to peat ingredients, such as sulfur compounds, magnesium, manganese, iron, and humic acids.\textsuperscript{1} Mud pack therapy decreases the proinflammation factors IL-1 and TNF-\( \alpha \) and radical-mediated peroxidations, nitric oxide and myeloperoxidase.\textsuperscript{68} It also increases serum levels of insulin-like growth factor 1, which is cartilage protective. Humic substances spread widely in nature, and when found mainly in highly degraded peat, have been shown to have a proliferative effect on certain leukocytes. Water-soluble oxihumate, given orally or dermally, increases the proliferative response in mononuclear leukocytes as well as production and expression of IL-2.\textsuperscript{2,50,69}

**Hyperthermia**

The thermal properties of peat mud applications have been shown to be much greater than those of water bath because of the former’s dynamic viscosity, decreased convective cooling, and a protective effect on the skin with hot applications.\textsuperscript{2} Whole-body, extracorporal, and local infrared applications of hyperthermia...
have uses in cancer therapy. Hyperthermic effects include changes in heat shock proteins (HSPs) and upregulation of heart antioxidant defense proteins such as manganese superoxide dismutase.66 Plasma B-endorphins also rise in response to hot water bathing and may be responsible for the euphoric feeling the bath may bring.44,70 In a study of patients with cancer, hyperthermia was shown to create the same endorphin rise both after sauna bath and in whole-body infrared hyperthermia.

Whole-body hyperthermia (WBH) stimulates an increase in T cells, such as monocytes and absolute numbers of white blood cells.70 Heat increases granulocyte mobility, phagocytic and bactericidal properties, and enzymatic activity.1 There is an increase in homing response to different tissues of lymphocytes, which contributes to antitumor activity. Hyperthermia may increase lymphocyte migration into inflamed tissue or lymphoid tissues such as lymph nodes and Peyer’s patches; this effect may help generate the cellular immune response. TNF-α and IL-6 are regulated by the stimulus of hyperthermia.71-73 HSPs produced by hyperthermia can provide protection against the muscle damage that occurs through a pathologic increase in intracellular calcium or uncoupling of the mitochondrial respiratory chain. Hyperthermia provides protection against typical damage from reperfusion after ischemia or with excessive exercise damage. Calcium homeostasis, energy loss, increased free radical–mediated reactions, and activation of apoptosis pathways are affected. I use a thermal application of the partial or full peat-additive bath for the treatment of back pain, musculoskeletal disorders, skin problems, viral illnesses, and more. The use of heat in the right amount is crucial to treatment efficacy.66,73,74

**CLINICAL APPLICATIONS**

Care must be exercised in the selection of patients for any type of thermal therapy. It is important to allow each patient time to adapt by starting with lower temperature and shorter duration treatments first. Patients with neurodegenerative diseases like multiple sclerosis (MS) and conditions such as diabetes are not good candidates for WBH. In MS, the excitatory effect on nerves from heat leads to chronic headaches can respond to peat bath or to peat packs especially on the neck or over the cervical spine. One must be careful not to heat the medulla with the cervical pack treatment; thus, mud applications are usually applied below the second cervical vertebra.

**Arthritis**

Peat treatments have shown efficacy for both osteoarthritis and rheumatoid arthritis. Matrix metalloproteinases (MMP-1 or stromelysin-1) are significantly reduced in mud bath patients with osteoarthritis.75 One needs to be careful with acute rheumatoid arthritis because treatment may initially stir up symptoms. Generally, in osteoarthritis, these treatments have been shown in both the literature and my experience to be very beneficial. I have observed significant decreases in swelling and pain with one treatment multiple times in osteoarthritis of the knee and other areas. Generally, a series of either combination bath and pack or single bath or packs is given. Treatments are done every day or two.

**Headache**

Chronic headaches can respond to peat bath or to peat packs especially on the neck or over the cervical spine. One must be careful not to overheat the medulla with the cervical pack treatment; thus, mud applications are usually applied below the second cervical vertebra.

**Hamstring Strain**

One of the best applications of bath followed by mud pack is in a hamstring muscle strain. In my experience, athletes even of professional stature have been able to ‘get back into the game’ faster and with more function than they would have with any other type of treatment.

**Ankle Sprain**

Partial peat bath immersion of the foot and leg for ankle sprain is very effective. One can see in older sprains the immediate reduction of ecchymosis after the treatment. Patients can perform home treatments in a plastic wastepaper basket on a daily basis for three to six treatments. This approach is inexpensive and wonderfully effective.

**Hypertension**

Ambulatory blood pressure has been shown to be affected positively by balneotherapy. After a series of treatments, blood pressure at rest and during standardized levels of ergonomic exercise tends to decrease, as does nocturnal blood pressure. The effect is sustained sometimes permanently.49 I do not necessarily recommend this treatment for people with hypertension, because people with hypertension have more cardiovascular problems that must be considered before they undergo thermal therapy. Generally, people with mild hypertension tolerate the bath better than people with mild hypotension.

**Dermatologic Problems**

Psoriasis and atopic dermatitis are the dermatologic conditions more commonly treated with peat bath. I, however, have had very good success in eczema and dermatitis with both peat bath and cream application. There are multiple possibilities with dermal applications.

**Scleroderma**

Peat bath weekly for 6 to 12 treatments is often a good method of treating scleroderma. Treatment should start with a tolerable
temperature and increase slowly over the series of baths so that the patient can adapt.

**Human Papillomavirus**

Antiviral effects of topical peat application have been demonstrated on several viruses, including the human papillomavirus. Remission and prevention of implantation of the virus have been described. This is a measure that prevents cancer. The antiviral and antineoplastic effects are thought to be associated with the ability of peat constituents, such as humate, to bind on lectin-binding junctions, thereby blocking viral entry into cells.\(^{21,52}\)

**Herpes Virus**

Topical treatment of herpes virus skin disease with humic and fulvic fractions of peat has been effective. I have had significant success with zoster outbreaks. Most important, the topical application of specific peat formulation creams that include humic acids has been very helpful to some of my patients.

**Infertility**

A study on infertility due to immature follicle maturation syndrome demonstrated good results with peat therapy in comparison with pharmacotherapy. In the peat therapy group, the rate of pregnancy was very good, along with a practically nonexistent spontaneous abortion rate, whereas in the pharmacotherapy group, the rate of spontaneous abortions was very high.\(^{45}\)

**Ankylosing Spondylitis**

In the treatment of ankylosing spondylitis and spondylitis associated with inflammatory bowel disease, mud therapy showed a decrease in the level of C-reactive protein and an elevation of hemoglobin with a series of treatments. This coincided with a significant reduction in pain and an improvement in function.\(^{46,47,76}\) Peat bath and pack and just the bath are options. If a patient is not a candidate for thermal bath, the packs over the spine can be very useful.

**Hematoma**

Organic peat with its intense vasodilating, anti-inflammatory effects, interactions of ions and mineral properties, enhances reduction of hematomas. Hematomas treated with thermal peat application have been reported to resolve 50% faster, with no hemosiderin residue, than those treated with only heat applications, which often leaves residues.\(^{77}\) One can see bruising decrease with pack application immediately after the treatment and an enhancement in the absorption of the hematoma in significantly less time with bath and pack.

**Immune Stimulation**

Peat bath in combination with hyperthermia demonstrates leukocyte elevation. The immune-stimulating effects of peat bath seen clinically correspond to hematologic changes after baths.\(^{70}\) Some effects on immune function are due to heat and others are due to the constituents in peat. A favorable effect is seen on peripheral blood lymphocytes in atherosclerotic disease after hydrogen/sulfide bath independent of heat.\(^{74}\) Oxihumate has shown antiviral activity plus immunostimulatory effect on mononuclear lymphocytes while also having very low or no toxicity, showing promise for treatment of immunocompromised patients.\(^{50}\) Immune stimulation or regulation may also be due to increases or changes in immunocyte numbers and function and the balancing of chronobiologic rhythms.\(^{7}\) Oral oxihumate, a potassium salt of oxihumic acid, may show some activity in blocking human immunodeficiency virus type 1 infection of MT-2 cells and may be helpful in the topical treatment of herpes virus–induced skin diseases.\(^{50}\)

There are also internal uses for constituents of peat. Interestingly, electrophoresis of peat mud showed benefits in patients with duodenal ulcer, secondary to hormone shifts and normalization of collagen metabolism in the duodenal mucosa.\(^{15}\) The internal use of peat fractions, such as humic acid, also increased the proliferation of some T cells.\(^{50}\)

**CLINICAL PROCEDURES**

The following procedures should be applied with care and forethought as to diagnosis and the skillful administration of the treatment. These procedures are stimulations to the body, and the thermal effects should not be taken lightly. Patients must be thoroughly screened for contraindications to treatment before undergoing full-body immersion hyperthermia. The very young and very old should, in general, have very gentle hot or cold stimulation, if any at all. Generally, up to three thermal baths are given per week if they are hot. Thermal therapy can be depleting for some patients, so consideration to the patient's vitality is primary.

**Hyperthermic Medicinal Peat Bath**

The indications for and contraindications to hyperthermic medicinal peat bath are given in Box 45-1.

**Materials**

- Peat bath material—I use a commercially available peat bath formula containing peat extract, sulfur, wintergreen, and pine oil.
- Tub with water thermometer and safety features like handrails and nonslip floor mats.
- Room with table for perspiration time.
- Gown or loose-fitting bathing suit.
- Two sheets.
- Two wool blankets.
- Two large towels (one for patient to dry off after treatment and one for head wrap).
- Basin with iced water and a hand towel for cooling patient's face.
- Digital thermometer or otothermometer for patient monitoring (no glass mercury thermometers). A microcomputer-based data acquisition device that records electrocardiogram (ECG) and body and ambient temperatures during bathing can be used; this is preferred over individual readings of pulse and oral temperature during the bath because the ECG shows heart function and the clinician is freed from the task of doing the monitoring. This device can be a real-time recorder for the bath.\(^{83}\)
- Exhaust fan or room air filter.
- Footstool for entering and leaving tub.
- The design of the bath area should take into consideration getting patients in and out of the tub and then as directly as possible to a treatment table.

*References 45, 50, 71, 73, 74, 78-82.*
### BOX 45-1 Indications and Contraindications for Hyperthermic Medicinal Peat Bath

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<thead>
<tr>
<th>Indications</th>
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<td>Acute hypertension</td>
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<td>Arthritis pain</td>
<td>Breastfeeding</td>
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<td>Back pain</td>
<td>Cardiac insufficiency</td>
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<td>Benign prostatic hypertrophy</td>
<td>Diabetes</td>
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<td>Bursitis</td>
<td>Multiple sclerosis</td>
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<td>Neurodegenerative disease</td>
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<td>Preexisting high fever</td>
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<td>Fibromyalgia</td>
<td>Pregnancy</td>
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<td>Flu</td>
<td>Pulmonary insufficiency</td>
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<td>Respiratory insufficiency</td>
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<td>Systemic lupus erythematosus</td>
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<td>Gynecologic disorders</td>
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<td>Trauma</td>
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<td>Viral infections</td>
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### Procedure

1. Before a patient begins treatment, cardiovascular risk and any other conditions that do not respond to or are aggravated by thermal therapy should be ruled out. Once the patient has been classified as to risk factors for thermal therapy, the clinician should ask about previous experience with heat in sauna, steam baths, or other types of infrared heating of the tissues. Much depends on the patient’s positive health perspective of the self and of the pain or disease process, and the patient’s expectations of the therapeutic bath or application.

2. Make sure the tub is clean without a ring. Check log book on last treatment and cleaning. If any evidence of an unclean tank is seen, it must be cleaned and disinfected before use: wearing rubber gloves, use a soft scouring sponge to scrub the tank with disinfectant soap, followed by a rinse of hot water. Then spray the surface with 10% bleach solution, and wait 10 minutes before rinsing with very hot water. Alternatively, a nonbleach product that is antimicrobial can be used; there are many choices for practitioners to choose from on the market.

3. Fill the tub to 10 inches from the top with water at a temperature of 104°F to 113°F (40°C to 45°C).

4. The starting temperature and possible duration of treatment are determined by the condition.

5. Straight water bath should not exceed 110°F. With peat additive, the temperature should not exceed 113°F.

6. Add peat to the bath.

7. Close monitoring during treatment, by means of periodic recording of the patient’s pulse, oral temperature, duration of treatment, and tank temperature, is necessary. A quick spike in pulse above initial pulse within the first minute or minutes is a contraindication to treatment. Any adverse reaction, such as tingling of fingers and toes, nausea, headache, lightheadedness, or vertigo, should be evaluated closely, and treatment terminated. Some patients may be able to tolerate only a low temperature and short duration for the first treatment. For a patient having a series of treatments, the first treatment is of shorter duration and lower temperature to see how the patient responds. The ability to tolerate treatments should improve as patients acclimate through their series of treatments.

8. The patient should enter extremely still water slowly. It will not feel as hot if the water is still.

9. Have the patient remain still as he or she becomes fully immersed, to help decrease the sensation of intense heat.

10. To treat the pelvis, utilize a sitz bath rather than a full bath to concentrate the effects of the treatment. A full bath after the sitz bath may be useful.

11. The water will cool as time passes, although the peat material will help maintain the temperature. If the starting temperature was 105°F, hot water may have to be added.

12. Bath duration is 8 to 20 minutes and should not exceed 20 minutes due to the additive pharmacologic effects and the tendency for hyperthermia to produce increased metabolism and mobilization of chemicals within the body.

13. If the patient becomes fatigued or distressed, he should exit the bath to be wrapped in the waiting sheet and wool blankets; do not wait longer to have the patient leave the bath.

14. The patient must have help exiting the tub, from two people who provide lifting support from under the arms on either side. This is a time to be very careful. The clinician should assist the patient by placing an arm under the patient’s arm but having the patient use his or her own ability to walk and get out of the tub. If the clinician tries to lift the patient rather than provide necessary support, the patient’s tendency is to put all his or her weight on the clinician, which is not the goal. After thermal therapy, patients are usually fine to walk, but there is a chance of lightheadedness and, in rare cases, vertigo. Patients may need assistance.

15. Encourage the patient to concentrate on walking on his or her own.

16. Have the patient lie down on a fresh sheet and wrap the patient in both sheets and two or three wool blankets. Cover the head with a towel.

17. Continue to monitor pulse and oral temperature for the duration of the 20-minute perspiration time.

18. Rinse a face cloth in cold water and apply for 10 seconds or longer to the patient’s face every 1 or 2 minutes during both bath and perspiration times. This is extremely important during the bath.

19. Encourage the patient to relax and help the patient to focus on pleasant matters during the bath. The psychological component of the bath is huge. Having patients think and talk about whatever excites and pleases them about their lives or their future during the difficult part of the bath and the treatment will help them tolerate the heat and reframe their disease processes.

20. After the patient has been wrapped from head to foot in sheet and wool blankets (it is not necessary to have blankets under the patient, because the table is a good insulator that prevents the blankets from getting wet), allow the patient to go through the hydrotherapy reaction of rise and fall in temperature, pulse, and diaphoresis three times. Then remove the patient from the sheets and allow him or her to return to...
Peat Therapeutics and Balneotherapy

CHAPTER 45

Indications and Contraindications for Medicinal Peat Peloid

<table>
<thead>
<tr>
<th>Indications</th>
<th>Contraindications</th>
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<tbody>
<tr>
<td>Acne</td>
<td>Allergies</td>
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<tr>
<td>Arthritis pain</td>
<td>Heat-insensitive skin</td>
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<tr>
<td>Back pain</td>
<td>Fragile skin</td>
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<tr>
<td>Bursitis</td>
<td>Open wounds</td>
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<tr>
<td>Carpal tunnel syndrome</td>
<td>Pregnancy</td>
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<tr>
<td>Eczema</td>
<td>Very thin, fragile skin</td>
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<tr>
<td>Fibromyalgia</td>
<td>Very thin, fragile skin</td>
</tr>
<tr>
<td>Fractures</td>
<td>Heat-insensitive skin</td>
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<tr>
<td>Acute gouty toe</td>
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<tr>
<td>Chronic gout</td>
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<td>Headaches</td>
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<td>Hematomas</td>
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<td>Hives</td>
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<td>Lymphangitis</td>
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<td>Molluscum contagiosum</td>
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<td>Muscle tension</td>
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<td>Orthopedic disorders</td>
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<td>Osteoarthritis</td>
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<td>Postoperative rehabilitation</td>
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<td>Premenstrual syndrome</td>
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<td>Prostatitis</td>
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<td>Psoriasis</td>
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<td>Rash</td>
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<td>Rheumatoid arthritis</td>
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<td>Sciatica</td>
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<td>Skin care</td>
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<td>Sprains</td>
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<td>Strains</td>
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<td>Stress relief</td>
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<td>Trauma</td>
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Normal activities. This cyclic reaction is seen with peat bath. With water bath, the patient may or may not sweat after the bath. With peat bath, perspiration is helpful, because there is increased absorption or skin effect if perspiration is allowed to continue after the bath.

21. Have the patient rest and replace electrolytes after treatment. The patient should not do a lot of exercise for 12 to 24 hours after a full bath, especially patients with back problems. The patient should promote good posture in the treated area during this time.

22. During the perspiration time, manual traction can be applied to the spine. This is done by grasping the ankles of the supine patient and pulling for 30 to 45 seconds with enough traction that the patient almost slides on the table. Indications for manual traction are disc problems, scoliosis, and impingement; it is a nice addition to any peat bath for any condition because it feels good to the patient.

23. Advise the patient not to shower with soap for up to 12 hours after the peat bath, because absorption rates continue after the bath if peat additives have been used.

24. Patients should dry thoroughly and remain covered, warm, and out of draft for 3 hours after treatment. This precaution can easily be overlooked and cause aggravation if cold stimulation is allowed to happen. More than one reminder to the patient is necessary, since after thermal bath, people naturally are ready to cool down.

25. Clean the tank and room thoroughly after use. Log out times of bath and tank cleaning.

Medicinal Peat Peloid

The indications for and contraindications to this procedure are given in Box 45-2. Care should be taken when performing this application to avoid burns. It is important for the patient to have a strong feeling of warmth without a hot burning sensation. For a typical application, this heat sensation should last for 20 to 30 minutes and may take a few minutes to start once the mud has been applied. Start timing from the point that the patient first feels warmth. The practitioner should use his or her own touch and sense of heat during the application.

Materials

- Peat poultice material—I use Healing Botanical’s professional use poultice formula containing peat pulp, peat extract, sulfur, wintergreen, and pine oil. Hot water should be added to this dry material 3 minutes before application, and the solution should be mixed so it becomes very slightly supersaturated. The point at which it just becomes shiny and has the consistency of mixed cake batter is perfect. In 1 to 3 minutes, it will be time to apply it to the area being treated. It will still be warm for application because hot water was used.
- Three large towels.
- Small towel.
- Face cloth.
- Small blanket to cover hydrocollator.
- Two small stainless steel basins.
- One small paper cup.
- Hydrocollator (alternatively, hot water bottle can be used).

Procedure

This is a thermal peat pack meant to be applied for 30 minutes. The procedure is as follows:

1. Make a square layer of peat material about 0.25 inches thick, 2 inches bilaterally over the spine and 6 to 8 inches long over the spine. If the spinal area is not being treated, area to be treated is covered. The area of application should be as flat and level as possible.
2. Cover the peat directly with a single-layer warm, wet facecloth. So as to remember the borders of peloid exactly, ridge the facecloth around the margins of the peat.
3. Border the wet facecloth–covered peloid with a rolled bath towel, making a quarter turn at the corners while folding the towel to match the margin of the peat.
4. Apply one layer of towel over the facecloth and peat material. Depending on the size and mass of the hydrocollator and its temperature, this layer may not be necessary.
5. Put a fresh hydrocollator pack directly over the towel. The hydrocollator should be heated at a gentle boil for 1 hour before use. Do not allow any exposed skin to come in contact with the hydrocollator.
6. Cover the hydrocollator pack with a towel or small blanket to insulate it and prevent heat loss.
7. Have a cup of cold water ready to pour on the wet facecloth–covered peloid if it gets too hot. In a good treatment, the peloid pack should get hot enough to require two to three dousings of water or more.
8. As soon as the patient says that the pack is getting too hot, lift up the hydrocollator pack and towel and pour the water directly over the facecloth–covered peloid until cool. Then replace the hydrocollator and coverings.
9. Never leave the patient unattended with the hydrocollator on the mud!
10. Treatment time is approximately 25 to 30 minutes.
11. To remove the peat from the skin after treatment, slide a small basin along the skin under the peat, scraping the peat into the bowl. Wipe the area with a full faceloch wetted with warm water in a gentle twisting motion back and forth to remove peat residue from the skin.
12. Cover the treated area after treatment to maintain warmth for 3 hours. The patient’s clothing is fine but a wool blanket would do a better job.
Partial-Immersion Medicinal Peat Bath

The indications for and contraindications to this procedure are given in Box 45-3.

**Materials**

- Deep-well basin; a tall plastic wastebasket size works well for the leg
- Medical peat bath
- Water thermometer
- Small towel

**Procedure**

1. Fill basin to three-quarters full with 108°F to 114°F water.
2. Add peat to the bath.
3. Have the patient immerse the wrist, ankle, or elbow slowly into the water. Try to immerse the forearm and leg if treating the hand or foot.
4. Keep the body part immersed for 25 minutes.
5. After the treatment, cover the area with a wool sock or clothing, and keep covered for 3 hours after treatment.
6. Often peat material is sent home with the patient to do home treatments.

7. Clean up the basin by washing with antimicrobial soap. Then disinfect with 10% bleach solution, and rinse after 10 minutes.

**Combination Full Bath and Peat Pack**

**Materials**

The same materials as described for the two preceding applications.

**Procedure**

This treatment is used for many conditions. I particularly like it for treatment of vertebral disc injury or degenerative joint conditions. This procedure is also very good for injuries such as hamstring strain. It focuses the balneologic effects in the area to which the peoloid pack is applied. Performing the peat bath first and then applying the peat pack is the ultimate treatment for those who can tolerate the bath. After the patient steps out of the bath, he or she walks to the table and lies face up for the regular traction sequence. After three tractions, it is appropriate to turn the patient face down and apply the peat pack over the spine or area being treated.

**SUMMARY**

As a physician using balneotherapy for 15 years, I have achieved excellent results in a large percentage of patients who undergo peat therapy. This therapy often helps other therapies to work better. Balneotherapy can be primary or adjunctive. The potential effect on the body should not be taken lightly. I have observed excellent results for the following conditions:

- Arthritis
- Tenosynovitis
- Strains and sprains
- Discopathy
- Plantar fascitis
- Low back pain, including sciatica
- Scoliosis
- Fractures
- Gout
- Muscle pain
- Dermatologic conditions such as eczema

The combination of medical sophistication in diagnosis and application of various balneologic methods provides an excellent tool for physicians to treat in a natural way to the great benefit of their patients.


