Balneotherapy

Indexing Metadata/Description

› **Procedure:** Balneotherapy

› **Synonyms:** Spa therapy; mineral baths; bathing in thermomineral waters; therapy with spa water; balneology

› **Area(s) of specialty:** Aquatic Therapy, Orthopedic Rehabilitation

› **Description/use**
  - Balneotherapy is the use of mineral baths to reduce pain and improve the sense of well-being.
  - Theoretical rationale for the therapeutic use of balneotherapy:
    - Balneotherapy might generate mechanical, chemical, and physical effects in a treated extremity with the goal being reduction in pain and an improved sense of well-being
text . (1)
    - Balneotherapy might lead to local hyperthermia, improved circulation, and muscle relaxation. There might be an increase in the activity of the lymphatic system and stimulation of the immune system, which might lead to decreased inflammation (2)
    - Chemical effects of mineral salts and gaseous compounds (e.g., sulfur and carbon dioxide) absorbed through the skin might cause intense vasodilation and hyperemia (3)
    - Immersion in mineral bath water might reduce loading on joints (4)
    - Hydrostatic pressure might assist in reducing peripheral edema (2)

› **Indications**
  - Indicated to decrease pain and improve sense of well-being

› **CPT codes**
  - There are no CPT codes for balneotherapy
  - 97113 aquatic therapy with therapeutic exercise (5)
  - 97022 whirlpool

› **G-Codes**
  - **Mobility G-code set**
    - G8978, Mobility: walking & moving around functional limitation, current status, at therapy episode outset and at reporting intervals
    - G8979, Mobility: walking & moving around functional limitation; projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
    - G8980, Mobility: walking & moving around functional limitation, discharge status, at discharge from therapy or to end reporting

  - **Changing & Maintaining Body Position G-code set**
    - G8981, Changing & maintaining body position functional limitation, current status, at therapy episode outset and at reporting intervals
    - G8982, Changing & maintaining body position functional limitation, projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
    - G8983, Changing & maintaining body position functional limitation, discharge status, at discharge from therapy or to end reporting
• Carrying, Moving & Handling Objects G-code set
  – G8984, Carrying, moving & handling objects functional limitation, current status, at therapy episode outset and at reporting intervals
  – G8985, Carrying, moving & handling objects functional limitation, projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
  – G8986, Carrying, moving & handling objects functional limitation, discharge status, at discharge from therapy or to end reporting

• Self-care G-code set
  – G8987, Self-care functional limitation, current status, at therapy episode outset and at reporting intervals
  – G8988, Self-care functional limitation, projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
  – G8989, Self-care functional limitation, discharge status, at discharge from therapy or to end reporting

• Other PT/OT Primary G-code set
  – G8990, Other physical or occupational primary functional limitation, current status, at therapy episode outset and at reporting intervals
  – G8991, Other physical or occupational primary functional limitation, projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
  – G8992, Other physical or occupational primary functional limitation, discharge status, at discharge from therapy or to end reporting

• Other PT/OT Subsequent G-code set
  – G8993, Other physical or occupational subsequent functional limitation, current status, at therapy episode outset and at reporting intervals
  – G8994, Other physical or occupational subsequent functional limitation, projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
  – G8995, Other physical or occupational subsequent functional limitation, discharge status, at discharge from therapy or to end reporting

<table>
<thead>
<tr>
<th>G-code Modifier</th>
<th>Impairment Limitation Restriction</th>
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<td>CH</td>
<td>0 percent impaired, limited or restricted</td>
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<td>At least 1 percent but less than 20 percent impaired, limited or restricted</td>
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<td>CJ</td>
<td>At least 20 percent but less than 40 percent impaired, limited or restricted</td>
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</tr>
<tr>
<td>CN</td>
<td>100 percent impaired, limited or restricted</td>
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</tbody>
</table>

Source: http://www.cms.gov

• Reimbursement
  • Coverage varies with insurance plans, depending on diagnosis and reason specific treatment is required. There might be limitations, such as number of treatments per condition or per time period
  • The treating clinician is advised to check with the patient’s specific carrier to obtain reimbursement information
  • In some European countries, such as Germany and the Czech Republic, a portion of the costs are reimbursed through the national health insurance system. In these countries, balneotherapy is considered part of the conventional medical system. In the United Kingdom and the United States, balneotherapy is viewed as complementary therapy\(^{6, 7}\)
Indications for procedure
› Balneotherapy is used to treat the following conditions:
   • Pain\textsuperscript{(8,27)}
   • Muscle spasms\textsuperscript{(8)}
   • Peripheral edema\textsuperscript{(2)}
   • Joint stiffness\textsuperscript{(8)}
   • Depression\textsuperscript{(9,27)}
   • Anxiety\textsuperscript{(10)}
   • Mild hypertension\textsuperscript{(20)}
   • Dermatological conditions

Goals of balneotherapy
› Relieve muscle spasms\textsuperscript{(8)}
› Maintain or improve functional mobility\textsuperscript{(8)}
› Reduce edema\textsuperscript{(4)}
› Reduce stiffness\textsuperscript{(8)}
› Reduce pain\textsuperscript{(8)}
› Reduce loading on joints\textsuperscript{(4)}
› Improve circulation\textsuperscript{(8)}
› Heighten sense of well-being\textsuperscript{(8)}

Guidelines for use of procedure
› There are no clear evidence-based guidelines for the selection of methods or protocols for application of balneotherapy. Water content, temperature, application techniques, and duration varies in the literature
   • Water content
     – By definition, mineral content is at least 1 g/L\textsuperscript{(11)}
     – Natural spring water might contain sodium, bicarbonate, sulfate, calcium, magnesium, iron, aluminum, chlorine, and metasilicate\textsuperscript{(6)}
   • Temperature
     – Thermal mineral water from natural springs is approximately 34°C\textsuperscript{(11)}
   • There are several methods and techniques used in the application of balneotherapy
     – Immersion in mineral bath water
     – Immersion in mud bath
     – Wrapping in towels soaked with mud, peat, or other organic material
   • Mudpacks
     – Transfer of heat through the skin and contact with minerals in mud, including zinc and copper, might have beneficial effects\textsuperscript{(12)}
   • Duration
     – Variables such as type of application, immersion level, and temperature influence duration
     – 20- to 30-minute applications are reported
   • The effectiveness of balneotherapy often depends on environmental and other specific factors, such as chemical and thermal character, water temperature, ambient temperature, and combination with other interventions (e.g., walking and stretching exercises)\textsuperscript{(21)}

Contraindications/Precautions to procedure
› Balneotherapy contraindications\textsuperscript{(9)}
   • Severe epilepsy
   • Malignancy
- Unstable hypertension
- Severe cardiac impairments
- Hemorrhagic diseases
- Active bleeding
- Severe anemia
- Pregnancy
- Allergy to minerals
- Major hepatic or renal insufficiency
- Reduced thermal sensation

» **Balneotherapy precautions** (*some are only relevant if entire body is immersed*)
  - Impaired sensation
  - Infection
  - Limited cognition or confusion
  - Anxiety or aqua phobia
  - Recent alcohol consumption
  - Certain medications
  - Multiple sclerosis*
  - Impaired thermal regulation*
  - Older adults

Deaths of older adults associated with balneotherapy have been reported in environments where balneotherapy is practiced in traditional ways without medical counseling or supervision

- An autopsy case series conducted in Turkey reported on 3 persons who suffered sudden cardiac death or drowning precipitated by myocardial infarction (MI) while having thermal baths
- In older adults the probability of cardiovascular system limitations must be considered. Instead of empirical and general use of thermal baths, professional guidance is recommended for this population

» See specific **Contraindications/precautions** under **Assessment/Plan of Care**

**Examination**

» **Contraindications/precautions to examination**
  - Record adverse reaction to water immersion/therapy, if present

» **History**
  - **History of present illness/injury for which balneotherapy is indicated**
    - Mechanism of injury or etiology of illness: Identify reason for referral
      - Examination varies based on reason for referral
    - Course of treatment
      - Medical management: What medical procedures, diagnostic tests, surgeries, complications, and/or hospital stays has the patient had? What treatments have helped? What treatments have not? Medical management varies depending on underlying condition/reason for referral
      - Medications for current illness/injury: Determine what medications the physician has prescribed; are they being taken?
      - Diagnostic tests completed: Diagnostic tests vary depending on nature of condition
      - Home remedies/alternative therapies: Document any use of home remedies (e.g., ice or heating pack) or alternative therapies (e.g., acupuncture) and whether or not they help
      - Previous therapy: Document whether patient has had occupational or physical therapy for this or other conditions and what specific treatments were helpful or not helpful
    - Aggravating/easing factors (and length of time each item is performed before the symptoms come on or are eased): Document any noted aggravating or easing factors
      - Body chart: Use body chart to document location and nature of symptoms
      - Nature of symptoms: Document nature of symptoms (e.g., constant vs. intermittent, sharp, dull, aching, burning, numbness, tingling)
      - Rating of symptoms: Use a visual analog scale (VAS) or 0-10 scale to assess symptoms at their best, at their worst, and at the moment (specifically address if pain is present now and how much)
Pattern of symptoms: Document changes in symptoms throughout the day and night, if any (A.M., mid-day, P.M., night); also document changes in symptoms due to weather or other external variables

Sleep disturbance: Document number of wakings/night, if any

Other symptoms: Document other symptoms patient might be experiencing that could exacerbate the condition and/or symptoms that could be indicative of a need to refer to physician (e.g., dizziness, bowel/bladder/sexual dysfunction, saddle anesthesia)

Respiratory status: Is there any history of respiratory compromise, or supplemental oxygen use, or need for a mechanical ventilation?

Barriers to learning
- Are there any barriers to learning? Yes__ No__
- If Yes, describe ______________________

Medical history
- Past medical history
  - Previous history of same/similar diagnosis: Has the patient had a previous episode of presenting problem?
  - Comorbid diagnoses: Ask the patient about other health concerns, including diabetes, cancer, heart disease, complications of pregnancy, psychiatric disorders, and orthopedic disorders. Ask about conditions that are contraindications/precautions for balneotherapy
  - Medications previously prescribed: Obtain a comprehensive list of medications prescribed and/or being taken (including over-the-counter drugs)
  - Other symptoms: Ask patient about other symptoms he or she is experiencing

Social/occupational history
- Patient’s goals: Document what the patient hopes to accomplish with therapy and in general
- Vocation/avocation and associated repetitive behaviors, if any: Does the patient participate in recreational or competitive sports? Does the patient work or attend school?
- Functional limitations/assistance with ADLs/adaptive equipment: Include limitations with self-care, home management, work, and/or community leisure
- Living environment: Document information about the living environment including stairs, number of floors in home, with whom patient lives (e.g., caregivers, family members). Identify if there are barriers to independence in the home; any modifications necessary?

Relevant tests and measures: (While tests and measures are listed in alphabetical order, sequencing should be appropriate to patient medical condition, functional status, and setting.) Evaluation procedures should be modified according to patient’s age, diagnosis, and any unique circumstances; the information presented below is meant to serve as a guide only. Following completion of a land-based evaluation, the patient’s water safety (e.g., ability to place feet on pool bottom when immersed in water on request) and motor skills need to be assessed in the mineral bath
- Anthropometric characteristics: Circumference for swelling, peripheral edema, and joint swelling
- Arousal, attention, cognition (including memory, problem solving): Complete a cognitive assessment as indicated and appropriate. Is the patient able to communicate that he or she is uncomfortable or in pain?
- Assistive and adaptive devices: Does the patient require the use of any assistive or adaptive devices?
- Balance: Assess the patient’s balance in sitting and standing
- Cardiorespiratory function and endurance: Assess vital signs before, during, and after intervention as indicated and appropriate
- Circulation: Assess peripheral pulses and compare
- Ergonomics/body mechanics: Observe general body mechanics, which might contribute to the patient’s symptoms throughout the assessment
- Functional mobility: Assess transfers and mobility as indicated by underlying condition
- Gait/locomotion: Evaluate the patient’s gait as indicated by reason for referral
- Joint integrity and mobility: Assess integrity of involved joints as indicated by reason for referral
- Motor function (motor control/tone/learning): Complete a muscle tone and/or coordination assessment as indicated
- Muscle strength: Complete a thorough strength assessment as indicated and appropriate. Use dynamometer and pinchometer for hand strength assessment where indicated
- Observation/inspection/palpation (including skin assessment): Visually inspect skin for redness, irritation, or breakdown. Palpate for muscle spasm, trigger points, and joint warmth and swelling. Assess for adverse reaction
- Posture: Assess posture in static and dynamic situations
• **Range of motion:** Complete a full active and passive ROM and flexibility assessment as indicated and appropriate
• **Reflex testing:** Assess reflexes bilaterally and compare
• **Self-care/activities of daily living (objective testing):** Assess ADLs as indicated
• **Sensory testing:** Complete a thorough sensory assessment (e.g., light touch, pin prick, hot/cold)
• **Special tests specific to diagnosis:** Special tests are specific to the diagnosis

**Assessment/Plan of Care**

› **Contraindications/precautions**
  • Clinicians should follow the guidelines of their clinic/hospital and what is ordered by the patient’s physician. The summary below is meant to serve as a guide, not to replace orders from a physician or a clinic’s specific protocols
  • Close supervision during balneotherapy is required, particularly with whole body immersion, as there is a risk of drowning. Appropriate precautions to prevent falls should be taken (e.g., use nonslip mats, avoid walking on wet, slick surfaces, supervise patient in and out of therapy pools)
  • Patients who have a diagnosis for which this intervention is used might be at risk for falls; follow facility protocols for fall prevention and post fall prevention instructions at bedside, if inpatient. Ensure that patient and family/caregivers are aware of the potential for falls and educated about fall prevention strategies. Discharge criteria should include independence with fall prevention strategies
  • Medical clearance is recommended for patients with cardiovascular concerns prior to full body immersion balneotherapy

› **Diagnosis/need for procedure:** There are numerous indications for balneotherapy; please see **Indications for procedure**, above. Diagnoses for which balneotherapy might be indicated include:
  • Osteoarthritis (OA)\(^\text{(13,14,25)}\)
  • Rheumatoid arthritis\(^\text{(12)}\)
  • Ankylosing spondylitis\(^\text{(3)}\)
  • Fibromyalgia\(^\text{(15)}\)
  • Low back pain\(^\text{(15)}\)
  • Depression\(^\text{(9,27)}\)
  • Psoriasis\(^\text{(15)}\)

› **Prognosis:** Prognosis varies depending on the underlying condition

› **Referral to other disciplines:** Refer to other disciplines as indicated and appropriate

› **Treatment summary**
  • The musculoskeletal conditions most commonly addressed in a best-evidence synthesis on the effectiveness of balneotherapy were low back pain, OA, fibromyalgia, and rheumatoid arthritis\(^\text{(18)}\)
    – Balneotherapy might be beneficial, but the evidence was found to be insufficient to make a definitive statement about its effectiveness\(^\text{(18)}\)
    – High-quality trials are needed\(^\text{(18)}\)
  • Authors of a systematic review and meta-analysis in Hungary investigated the benefits of hydro- and balneotherapy\(^\text{(25)}\)
    – All clinical trials were conducted in Hungarian thermal mineral waters
    – The systematic review included 18 clinical trials. Data from 1,199 subjects (patients and controls) were evaluated
    – The meta-analysis included 9 of the 18 clinical trials
    – Patients were treated for various conditions including: knee OA, hand OA, chronic low back pain, cervical and lumbar degenerative disease, chronic pelvic inflammatory disease
    – Study limitations included small sample size of studies, heterogeneous populations, diversity of methodology, and diversity in outcome measures
    – The authors concluded that Hungarian thermal mineral waters significantly reduced pain in patients with OA of the hand and knee, degenerative joint and spinal disease, and chronic low back pain. Additional quality studies are warranted
  • Arthritis
    – Intermittent balneotherapy might be helpful for patients with knee OA\(^\text{(13)}\)
      - Based on a randomized controlled trial (RCT) conducted at an outpatient rheumatology clinic in Beer Sheva, Israel, participants were transported twice weekly by bus from the clinic to a Dead Sea hotel spa, 75 km each way
      - Forty-four participants with knee OA
Participants were randomized to 1 of 2 groups for 6 weeks, treatment 2x/week for 20 minutes

- Sulfur pool heated to 35-36°C
- Jacuzzi filled with tap water heated to 35-36°C
- Outcome measures included multiple quality of health and life measures, physical exam, and VAS for pain

- Results
  - Statistically significant improvement, lasting up to 6 months, in the sulfur pool group compared with the heated tap water group\(^{(13)}\)
  - The authors caution that the number of study participants was too small to draw definitive conclusions

- Balneotherapy might reduce the number of swollen or tender joints in patients with hand OA\(^{(17)}\)

- Based on a randomized controlled, single-blind, follow-up study conducted in Hungary
- Sixty-three patients with hand OA between 50 and 70 years of age participated
- Patients were randomized to 1 of 3 groups. Two groups bathed in thermal mineral water at different temperatures (36°C and 38°C) plus received magnetotherapy. The third group received magnetotherapy only
- Thermal mineral water treatment was 20 minutes a day five times a week for 3 weeks
- Outcome measures included VAS pain scores, handgrip strength, pinch grip strength, number of swollen and tender hand joints, duration of morning stiffness, Health Assessment Questionnaire, and SF-36 health status questionnaire

- Results
  - Statistically significant improvement in several parameters immediately after treatment and during follow-up in the thermal water groups versus the control group
  - Balneotherapy was associated with reduced number of swollen or tender joints, improved pinch strength, and improved scores on the Health Assessment Questionnaire

- Balneotherapy, along with physical therapy, was shown to be more effective in improving functional outcomes and pain management for individuals with severe knee OA than physical therapy alone\(^{(29)}\)

- Researchers from Turkey, studied the effects of balneotherapy and physical therapy of 46 patients (10 males, 36 females) with severe knee OA
- Patients were assigned to either the physical therapy group or the balneotherapy plus physical therapy group
- Outcome measures used for this study included the VAS for pain, Western Ontario and McMaster Universities Arthritis Index (WOMAC), 10-meter walking test
- All patients received hotpack, transcutaneous nerve stimulation (TENS), ultrasonography of the knee for 45 minutes, 5 days per week for three weeks
- Additionally, those in the balneotherapy group also received balneotherapy for 20 minutes, 5 days per week for three weeks
- Results at the end of the study show both groups receiving benefits of their respective treatment for pain and functional mobility; however, patients who were also receiving balneotherapy had significantly superior improvements in all outcome measures compared with physical therapy alone

- Rheumatoid arthritis (RA)

  - Clinical trials with solid methodology in the use of balneotherapy for patients with rheumatoid arthritis are lacking\(^{(12,28)}\)
  - Authors of a meta-analysis compared balneotherapy modalities to controls (i.e., no treatment, placebo, or active interventions)\(^{(12)}\)
    - Seven studies involving 374 patients
    - The types of balneotherapy modalities tested included mud packs, radon-carbon dioxide baths, hot sulfur baths, Dead Sea baths, grey sand baths, and Red Sea baths
    - Primary outcome measure was pain; secondary outcomes included grip strength, swollen/tender joints, patient and physician global assessments of disease severity, and functional status
    - Results showed a 5-93% greater improvement reported in all measurements relative to control group
  - Authors of a 2015 Cochrane review investigated the effects of balneotherapy in patients with RA\(^{(28)}\)
    - Nine studies involving 579 participants met inclusion criteria
    - Most studies showed methodological flaws and an unclear risk of bias in many domains. Data and information regarding trial design were often lacking
    - Results
      - A low level of evidence supports balneotherapy over drug therapy for treatment of pain
      - A moderate level of evidence supports additional radon in carbon dioxide baths for management of RA symptoms
- Most studies report positive outcomes but do not provide sufficient evidence or adequate statistical analysis
- Additional large, high quality, low-bias studies are warranted to provide evidence for the effects of balneotherapy

**Fibromyalgia**

- Balneotherapy in patients with primary fibromyalgia syndrome (FMS) may result in improvement compared with control groups for the symptoms of pain, depression, and respiration\(^{(2)}\)
- Based on an RCT conducted in Turkey
- Fifty-six patients with FMS were divided into 3 groups of similar age, gender, and duration of illness
- All 3 groups received the same physical therapy modalities of TENS, ultrasound (US), and infrared (IR). One group received the modalities only, the second group received the modalities plus balneotherapy, and the third group received the modalities plus hydrotherapy
- Outcome
  - Pain – included tender point count, VAS, and total pressure pain thresholds with a dolorimeter on tender points
  - Depression – Beck Depression Inventory and Hamilton Depression Rating Scale
  - Pulmonary functions were determined with dyspnea scale and a spirometer
- Results
  - All groups showed improvement at the end of the treatment (3 weeks)
  - The modalities plus balneotherapy group had significant improvements in dyspnea scale score and spirometric measurements at 6-month follow-up. Pain and depression evaluation assessments were also improved in this group at 6-month follow-up
  - Authors caution that the small sample size might have influenced the results and that larger patient groups are necessary to substantiate these outcomes

**Rotator cuff pathology**\(^{(26)}\)

- Authors of a randomized prospective clinical trial in France studied the effects of spa therapy for treatment of shoulder pain due to chronic rotator cuff lesions\(^{(26)}\)
- One hundred eighty-five patients were randomized into 2 groups. The intervention group received immediate spa treatment (18 days). The control group 6-months delayed spa therapy
- Primary outcome measure was mean change in DASH score at 6 months
- Significant improvement in DASH scores was found in the spa therapy group compared with the treatment delayed control group

**Hypertension**

- Results of a study conducted in Turkey showed a significant reduction in systolic and diastolic pressures in both normotensive patients and patients with hypertension after balneotherapy treatment\(^{(20)}\)
  - Two thousand and ninety patients treated for OA of the lumbosacral region, knee, hand, or foot participated in the study. One thousand and thirty-six participants had primary hypertension and 1,054 were normotensive

**Metabolic syndrome**\(^{(24)}\)

- Researchers of a French RCT investigated the effectiveness of a 3 week balneotherapy program for the treatment of overweight or obese patients\(^{(24)}\)
  - Two hundred fifty-seven overweight or obese patients were randomly assigned to a balneotherapy or control group (usual care with nutritional booklet)
  - At one-year post intervention, the balneotherapy group showed significantly better results via increased body mass index (BMI) loss compared with the control group

**Chronic heart failure (CHF)**\(^{(23)}\)

- The effects of balneotherapy in patients with CHF were studied in Japan
- Thirty-two patients with New York Heart Association functional status II or III were randomly assigned to balneotherapy or a control group
- Balneotherapy was provided at 40°C, 10 minutes daily for 2 weeks; the control group took a daily shower
- Significant improvements were found in clinical symptoms, cardiothoracic ratio (CTR), ejection fraction (EF), and plasma brain natriuretic peptide (BNP). Additionally, inflammatory responses were significantly decreased after balneotherapy. Post treatment, heart rate demonstrated no change
- The authors concluded repeated hyperthermia by bathing in a hot spring is beneficial for improving cardiac and inflammatory status in patients with CHF
- Pain, mood, sleep and depression\(^{(22)}\)
  - A 12-day balneotherapy program was found to have a positive effect on pain, mood, sleep and depression in healthy older adults\(^{(27)}\)
  - Fifty-two healthy older adults participated on a study in Spain
  - Hypothermic, hard water with bicarbonate, sulfate, sodium and magnesium was used for balneotherapy
  - Pain was measured via VAS, mood was measured with the Profile of Mood Status, sleep was assessed via the Oviedo Sleep Questionnaire, and depression was measured using the Geriatric Depression Scale
  - Balneotherapy produced significant improvements in all outcome measures
  - Authors of a RCT conducted in Lithuania comparing balneotherapy to music therapy or no therapy at all reported improvements in reducing stress and fatigue. The balneotherapy group received 108 g/L salinity geothermal water baths for 5 times per week for 2 weeks\(^{(30)}\)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Goal</th>
<th>Intervention</th>
<th>Expected Progression</th>
<th>Home Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>Reduce pain</td>
<td>Balneotherapy</td>
<td>Continue daily immersion in mineral baths for 20 minutes until pain and edema decrease(^{(13)})</td>
<td>Make recommendations for a home program as indicated and appropriate that supports therapeutic goals</td>
</tr>
<tr>
<td>Edema</td>
<td>Reduce edema</td>
<td></td>
<td>Progress each individual as indicated and appropriate</td>
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<td></td>
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<td></td>
<td>(Peripheral edema is reduced through the hydrostatic effect in the water(^{(2)}))</td>
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<td>(Please see Treatment summary under Assessment/Plan of Care, above)</td>
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<td>Impaired ROM and/or</td>
<td>Impaired ROM and/or flexibility</td>
<td>Balneotherapy</td>
<td>Progress each individual as indicated and appropriate</td>
<td>Make recommendations for a home program as indicated and appropriate that supports therapeutic goals</td>
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<tr>
<td>flexibility</td>
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<td>(Please see Treatment summary under Assessment/Plan of Care, above)</td>
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<tr>
<td>Muscle spasm</td>
<td>Muscle relaxation</td>
<td>Balneotherapy</td>
<td>Progress each individual as indicated and appropriate</td>
<td>Make recommendations for a home program as indicated and appropriate that supports therapeutic goals</td>
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<td></td>
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<td></td>
<td>Warm water enhances blood flow and dissipates algogenic chemicals, which facilitates muscle relaxation(^{(2)})</td>
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<td></td>
<td>(Please see Treatment summary under Assessment/Plan of Care, above)</td>
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</table>
Functional limitations (e.g., decreased tolerance for certain positions, decreased independence in ADLs)

Improve function/ADLs

Balneotherapy
(Please see Treatment summary under Assessment/Plan of Care, above)

Progress each individual as indicated and appropriate

Make recommendations for a home program as indicated and appropriate that supports therapeutic goals

Impaired safety in the balneotherapy environment (e.g., inability to independently get in or out of pool)

Ensure the patient’s safety at all times, prevention of adverse events

Safety strategies
Proper staff present before, during, and after mineral bath intervention
Use staff (as indicated) to assist patient in and out of the mineral bath
Monitor vitals, medical clearance for older adults or patients with cardiac history

Potential for adverse events

Desired Outcomes/Outcome Measures

- Decreased pain
  - VAS
- Decreased edema
  - Anthropometric measurements
- Improved ROM and/or flexibility
  - Goniometric measurement of ROM
- Decreased muscle spasm
  - Modified Ashworth Scale (MAS)
- Improved function/ADLs
  - Standardized tests implemented during evaluation depending on underlying condition, e.g., Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), Beck Depression Inventory, Hamilton Depression Rating Scale, SF-36 health status questionnaire, and Lequesne index
- Patient satisfaction
  - In a study conducted in Turkey, patients receiving inpatient balneotherapy and electrotherapy reported higher treatment satisfaction than patients receiving standard outpatient physical therapy consisting of local hot packs and electrotherapy
  - Nine hundred and three patients with OA of the knee, hip, cervical spine, or lumbar spine, mechanical neck pain, or low back pain were included
  - There were significant reductions in pain in both groups
  - Balneotherapy was superior in terms of pain intensity, reduction in analgesic use, and general satisfaction
- Patient’s safety at all times

Maintenance or Prevention

- Six weeks of treatment with balneotherapy might be sufficient to achieve an improvement that can last up to 6 months
• Factors leading to compliance
  – Availability of mineral bath pools
  – Individual’s perception that the balneotherapy sessions were beneficial
• Factors leading to noncompliance
  – Cost
  – Transportation issues
  – Individual’s perception that the balneotherapy sessions were not beneficial

Patient Education

Note
› Recent review of the literature has found no updated research evidence on this topic since previous publication on January 20, 2017

References

Coding Matrix
References are rated using the following codes, listed in order of strength:

<table>
<thead>
<tr>
<th>M</th>
<th>Published meta-analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR</td>
<td>Published systematic or integrative literature review</td>
</tr>
<tr>
<td>RCT</td>
<td>Published research (randomized controlled trial)</td>
</tr>
<tr>
<td>R</td>
<td>Published research (not randomized controlled trial)</td>
</tr>
<tr>
<td>C</td>
<td>Case histories, case studies</td>
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<tr>
<td>G</td>
<td>Published guidelines</td>
</tr>
<tr>
<td>RV</td>
<td>Published review of the literature</td>
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<tr>
<td>RU</td>
<td>Published research utilization report</td>
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References


