Yoga

Indexing Metadata/Description

› **Procedure:** Yoga

› **Synonyms:** Hatha yoga, Vinyasa yoga, Iyengar yoga, Ashtanga yoga, Bikram yoga, Viniyoga, Kundalini yoga, Kripalu yoga, Anusara yoga, Sivananda yoga, Power yoga, Yogafit, Raga yoga

› **Area(s) of specialty:** Cardiovascular rehabilitation, pulmonary rehabilitation, education, home health, oncology, neurological rehabilitation, orthopedic rehabilitation, pediatric rehabilitation, women’s health, geriatric rehabilitation

› **Description/use:** Yoga is an ancient Indian mind-body practice that has been in existence for 2000 years. It is a combination of meditation, mindfulness, self-exploration, breathing control, and body movement designed to improve flexibility, focus, balance and strength. Rousseau Yoga is also considered a way of life designed to create a union of mind, body, and spirit while cultivating *prana*, or life force

• The Indian sage, Patanjali, is considered the father of classic yoga. He described eight limbs of philosophy required to achieve a moral, meaningful life: *yama* (moral behavior), *niyama* (healthy habit), *asana* (physical postures), *pranayama* (breathing exercises), *pratyahara* (sense withdrawal), *dharana* (concentration), *dhyana* (contemplation), and *samadhi* (higher consciousness). *Raja* yoga has strict adherence to all eight limbs

• Yoga was introduced to the Western World starting in the 1930s and consisted primarily of postures (*asanas*), breathing exercises (*pranayama*) and sometimes meditation

• Since that time, yoga has divided into different schools and brands:

  – **Hatha** – A general term for yoga using primarily postures as opposed to breathing or meditation exercises. Considered basic and good for beginners

  – **Vinyasa** – Consists of fluid movement between postures with coordinated breathing and geared for the physically fit

  – **Iyengar** – Known for its emphasis on props to maintain good body alignment. Good for less flexible patients, is accessible to anyone, and training for teachers is more formal and rigorous than other disciplines

  – **Ashtanga** – Movement is rapid, smooth and vigorous and is designed for athletes

  – **Bikram** – Known for its heated room (over 100°F or 38°C) to increase flexibility, it uses the same sequence of postures each time and is best for the physically fit. Also known as “hot yoga” and more popular in USA than in other countries

  – **Viniyoga** – Uses breathing and chanting exercises with gentle postures and is considered suitable for the less fit

  – **Kundalini** – A flowing style with emphasis on breathing techniques, it has more of a spiritual aspect

  – **Kripalu** – Considered physically challenging, it combines breathing and postures and incorporates techniques similar to psychotherapy that address spiritual and emotional aspects

  – **Anusara** – Similar to Iyengar with emphasis on alignment, uses chanting and breathing exercises and is known for being lighthearted

  – **Sivananda** – Lifestyle yoga with moderate poses, breathing, relaxation, vegetarian diet and cheerful attitude
- **Power** – Considered to be an even more vigorous form of Ashtanga yoga
- **YogaFit** – Athletic form, popular in gyms and exercise clubs, that mixes poses with sit-ups, push-ups and other exercises

- The most common forms of yoga in the USA are *Hatha* and *Iyengar* (1) and *Hatha* yoga is what most Americans mean when they refer to yoga. A 2012 survey reported the 20.4 million Americans (or 8.7% of adults in USA) practice yoga, an increase from 15.8 million in 2008 (2)

- It is important to both choose a style of yoga appropriate to one’s fitness level as well as find an experienced teacher (2, 6)

- There is a differentiation between yoga for general well-being and “yoga therapy”, with the latter being prescribed by a health professional for a particular condition. This *Clinical Review* will focus primarily on yoga therapy for rehabilitation with yoga for general well-being addressed in the “Maintenance and Prevention” section below

- Researchers in Germany conducting a bibliometric analysis of randomized controlled trials (RCTs) of yoga interventions concluded that there has been a marked increase in RCTs in recent years (2011 and 2012), but that available research evidence is still sparse for most conditions (2)

### Indications:

- In rehabilitation
  - Diminished quality of life
  - Difficulty managing disease
  - Stress management
  - As yoga is considered less strenuous than other forms of aerobic exercise, it may be more suitable for older adults who are limited in this capacity
  - As yoga is considered to be easily adaptable, it may be suitable for persons who require modification or accommodation due to physical or cognitive disability

- In general
  - Improve flexibility, focus, balance and strength
  - Improve quality of life
  - Improve physical fitness

### CPT codes: NA

### Reimbursement:

No specific issues or information regarding reimbursement have been identified. Most yoga is practiced for general well-being and is considered a personal expense. Reimbursement may be more viable with a diagnosis and prescription from MD for “yoga therapy”

### Indications for Yoga

- There is good evidence for yoga in the treatment of chronic back pain, depression and anxiety and fair evidence for treating asthma, symptoms of menopause, hypertension and mobility issues in the elderly (6)

- At present, data that supports yoga as an intervention for neurological disorders is sparse. However, preliminary data suggests that yoga may be an effective treatment for carpal tunnel syndrome, stroke, multiple sclerosis (MS) and epilepsy (1)

- Yoga is felt to relieve some symptoms of chronic diseases such as cancer, arthritis and heart disease and can lead to increased relaxation and physical fitness. Although not considered effective treatment for cancer, it may enhance quality of life (2)

- It is felt that the beneficial effects of yoga for pain relief may be derived from control of stress and depression, relaxation, stretching and strengthening of targeted muscles (3)

- More specific information regarding indications for yoga is included in the *Treatment summary* below

### Guidelines for Use of Yoga

- It is important to both choose a style of yoga appropriate to one’s fitness level as well as find an experienced teacher (2, 6)

- Type of yoga is important to preventing injury
  - Serious injury can include fractures, neuralgia and arterial dissection (4)

- Family Practice MDs are advised to refer patients to PT for evaluation before beginning yoga if any concerns (6)

- Broad and decentralized nature of yoga practice makes the idea of credentialing or licensure controversial and not well-accepted. Both of the organizations below promote training and curriculums and have search engines for practitioners (6)

- The Yoga Alliance is the best-known credentialing organization
Some specific forms of yoga have their own certification system—International Association of Yoga Therapists (IAYT)

- When choosing a teacher, ask about length of teaching experience, training completed, experience with working with specific medical condition, if applicable

Yoga can be practiced in a group setting or with individual instruction.

**Contraindications/Precautions to Yoga**

- Yoga is considered low-impact and safe for healthy people when practiced under the guidance of a well-trained instructor.
- People with cancer and chronic conditions such as arthritis and cancer should talk to their doctor before starting yoga.
- Some positions in yoga are hard to achieve and may result in overstretching of joints and ligaments.
- There have been rare reports of damage to nerves and discs in the spine as well as certain types of strokes.
  - A rare form of stroke, arterial dissection, has been reported in the literature and is, in a miniscule number of cases, associated with certain yoga poses (inversions, side angle, triangle and plow) that require sudden neck movements that put extreme pressure on neck. It can also be caused by extreme coughs, sneezes and chiropractic adjustments.
- Headstands have caused rare reports of eye damage due to increased pressure.
- Persons with high blood pressure, glaucoma and sciatica should modify or avoid certain postures that cause an increase in symptoms.
- Pregnant women may want to avoid postures that cause excessive pressure on the uterus.
- People who are sick, dehydrated or pregnant may be harmed by performing bikram yoga (vigorous workout in warm, humid room).
  - Any diagnosis that is sensitive to warm, moist conditions (respiratory disease, cardiovascular disease, obesity, etc.) should be advised against practicing bikram yoga.
  - Researchers of a pilot study looking at use of bikram (or “hot yoga”) by pregnant women found that those that engage in “hot yoga” are more likely to trust someone other than their health care provider regarding the safety of this practice.
- If choose to practice bikram or “hot yoga”, patients should be warned of signs of heat-related illness (dehydration, cramping, light-headedness, confusion, nausea) and discontinue practice. Special care is indicated for replacement of water and minerals during sessions.

**Examination**

- **Contraindications/precautions to examination**
  - A PT may be asked to evaluate a client’s readiness to practice yoga. Keep in mind the guidelines and contraindications/precautions listed above when making the evaluation.
  - For detailed information on the examination of a specific condition for which yoga is being recommended, see the Clinical Review associated with the condition.
- **History**
  - **History of present illness/injury for which the procedure is needed**
    - **Mechanism of injury or etiology of illness:** Document the history of the injury or illness that has led to the discussion/prescription of yoga as a form of treatment.
    - **Course of treatment**
      - **Medical management:** Document the medical management of the condition. Is yoga being suggested as an option or alternative in the management of the condition? Is the client opting for complementary and alternative therapies (CAM), like yoga, as an adjunct or in place of traditional medical management?
      - **Medications for current illness/injury:** Determine what medications clinician has prescribed for the condition; are they being taken? Depending on the condition, patients being referred to yoga may be on a variety of medications (e.g., pain medications, depression or anxiety medications, cardiac medications, chemotherapy).
      - **Diagnostic tests completed:** Tests required will depend on the condition for which the patient is being referred to yoga therapy.
      - **Home remedies/alternative therapies:** Document any use of home remedies (e.g., ice or heating pack) or alternative therapies (e.g., acupuncture, therapeutic touch) and whether they help or not. Document whether the patient has practiced yoga in the past and, if he or she has, document reason for practicing yoga, type of yoga practiced, frequency, duration and response to yoga. Any associated injuries or adverse events?
- **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**: Document factors and length of time each item is performed before the symptoms of the condition come on or are eased

- **Body chart**: Use body chart to document location and nature of symptoms, as applicable

- **Nature of symptoms**: Document nature of symptoms associated with condition for which yoga therapy is being considered (constant vs. intermittent, sharp, dull, aching, burning, numbness, tingling)

- **Rating of symptoms**: Use a visual analog scale or 0-10 scale to assess symptoms at their best, 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 (AM, mid-day, PM, night); also document changes in symptoms due to weather or other external variables

- **Sleep disturbance**: Document number of wakings/night that are associated with the condition, if applicable

- **Other symptoms or diagnoses**:
  - If client is female, document if client is or could be pregnant
  - Ask if patient is sensitive to heat and document if applicable
    - Some diagnoses (e.g., heart disease, lung disease, prior history of heatstroke) may not be advisable for *bikram* or “hot yoga”
  - If client being referred due to anxiety/depression, document any tests performed that are related to diagnosis
  - Document other symptoms patient may be experiencing which could exacerbate the condition and/or symptoms that could be indicative of a need to refer to physician

- **Respiratory status**: If condition has effect on breathing (e.g., asthma, heart failure), be sure to note baseline and any use of supplemental oxygen or inhalers

- **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, if applicable**
  - **Comorbid diagnoses**: Ask patient about other problems including diabetes, cancer, heart disease, complications of pregnancy, psychiatric disorders, orthopedic disorders, etc. Although yoga may not be contraindicated, there are certain conditions (e.g., osteoporosis, rheumatoid arthritis, etc.), where modification or deletion of poses may be required
  - **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/she may be experiencing

- **Social/occupational history**:
  - **Patient's goals**: Document what the patient hopes to accomplish with yoga therapy and in general. Are the patient’s goals specific to a disease or are they more for general health? Document if goals are realistic considering the condition and the treatment
  - **Vocation/avocation and associated repetitive behaviors, if any**: (e.g., does the patient participate in recreational or competitive sports?) Document if the current condition is limiting the patient’s ability to participate at work, school or in hobbies. How much daily physical activity does the patient typically get?
  - **Functional limitations/assistance with ADLs/adaptive equipment**: Document if the patient is currently experiencing functional limitations associated with the condition and/or requiring the use of assistance or adaptive equipment
  - **Living environment**: Document number of stairs, number of floors in home, with whom does patient live, caregivers, etc., if applicable. Identify if there are barriers to independence in the home and if any modifications are 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)
  - **Anthropometric characteristics**: Document patient’s height, weight and body mass index (BMI)
  - **Arousal, attention, cognition** (including memory, problem solving): Assess orientation to name, place, time, and situation; attention; short- and long-term memory; and problem solving as indicated
  - **Assistive and adaptive devices**: Document what assistive and adaptive devices are being used, if applicable
  - **Balance**: Evaluate both dynamic and static balance with single-limb stance (eyes open and eyes closed) and with Functional Reach Test (FRT) or other appropriate measure
Cardiorespiratory function and endurance: Six-minutewalk test (6MWT) can be used to assess endurance. Use Borg Rating of Perceived Exertion (Borg PRE) to document intensity of exertion. Other measures of cardiorespiratory health (chest wall excursion, vital signs, forced expiratory volume) can be assessed if applicable to condition.

Circulation: Check peripheral pulses as indicated.

Cranial/peripheral nerve integrity: Assess if indicated by condition.

Functional mobility (including transfers, etc.): Assess transfers, if indicated, including getting up from floor, as can be required to participate in yoga.

Gait/locomotion: Assess for any deviations due to condition. Document gait speed as needed.

Joint integrity and mobility: Assess joint mobility throughout extremities and spine. Note any areas of hypo- or hypermobility and consider when choosing various postures of yoga.

Muscle strength: Manual muscle testing (MMT) can be used to assess upper and lower extremity strength as indicated. Note any weaknesses that may make certain yoga positions difficult or unsafe.

Observation/inspection/palpation (including skin assessment): Assess if indicated by condition.

– Advise patient about skin infection risk with the use of communal mats. Advise use of own mat.

Perception (e.g., visual field, spatial relations): Assess if indicated by condition.

Posture: Assess patient’s posture and note any postural deviations that may interfere with a person’s ability to participate in yoga or that could benefit from yoga.

Range of motion: Assess range of motion in all joints noting any limitations that may interfere with a person’s ability to participate in yoga or that require attention or could benefit from assumption of postures to increase ROM.

Sensory testing: Assess if indicated. Kinesthetic sense may be important when holding yoga postures.

Special tests specific to diagnosis: Assess as indicated by condition.

Assessment/Plan of Care

Contraindications/precautions

- Patients with a diagnosis for which yoga is suggested or prescribed may be at risk for falls. A less vigorous form of yoga would be appropriate for these patients. Ensure that patient and family/caregivers are aware of the potential for falls and educated about fall prevention strategies.

- Injuries during yoga can occur and a number of common poses are risky for many people. The focus in treatment is to emphasize awareness on limitations and not focus on achieving specific poses.

  – A 2012 survey of 2567 healthy yoga practitioners in Australia reported that 4.6% of the participants had suffered an injury that required medical treatment or caused prolonged pain or resulted in time off from work.

  - The same survey reported that the following positions were associated with the most injury: headstands, shoulder stands, lotus and half lotus, forward bends, backward bends and handstands.

  - The cited reasons for injury were commonly, “pushing it too far”, not warming up, along with being “ego driven”.

  – Additional risks are present for those with pathological conditions. Consider the pathology and what positions would be inadvisable.

  - Risks of excessive neck extension and neck loading.

  - Weight bearing through wrists – especially if have carpal tunnel.

  - Risks in people with osteoporosis for any position that puts excessive stress on spine or hips.

Diagnosis/need for procedure: Yoga may be suggested or prescribed for a variety of reasons. Yoga therapy for a specific condition should be prescribed by a PT whereas yoga, in general, can be utilized as a preventative technique. See Treatment summary below for diagnoses that have been researched and applications to healthy population in Maintenance and Prevention section below.

Referral to other disciplines: As needed, depending on condition.

Other considerations:

- Among health professionals, the ratings of the appropriateness of yoga for treatment were not aligned with evidence base, with most health professionals undervaluing yoga therapy.

- Although still new, Tele-Yoga (multi-point video conferencing that connect participants to live classes) has been found to be acceptable and appropriate intervention for patients with heart failure and COPD, who are often limited by high symptom burden and social isolation.
Treatment summary:

- **Low Back Pain (LBP)**
  - Researchers conducting a 2013 systemic review (SR) and meta-analysis of yoga for LBP found strong evidence for short-term effectiveness and moderate evidence for long-term effectiveness of yoga from chronic LBP\(^{(11)}\)
  - Ten RCTs with a total of 967 patients with chronic LBP
  - No serious adverse effects associated with yoga
  - An exploratory RCT of yoga with lumbar disc extrusions and bulges found yoga to be safe and beneficial for this population\(^{(12)}\)
    - Sixty-one adults (ages 20-45), with nonspecific LBP or sciatica, and disc extrusions or bulges. Disc extrusions and bulges were deemed likely by either symptoms (history, past or present sciatica, positive straight leg test, palpation, exacerbated by sitting) or former MRI and confirmed with MRI
    - Yoga group received 3-month yoga course of group classes and home practice that was designed to ensure safety for disc extrusions
    - Significant improvement in Roland Morris Disability Questionnaire (RMDQ) in yoga group at 3 months; however, no change in Aberdeen Low Back Pain Scale or straight leg raise test
  - Researchers in Sweden conducted an RCT with cost-effective analysis comparing yoga therapy, exercise therapy and self-care advice for nonspecific LBP and found six weeks of yoga therapy to be a cost-effective early intervention for non-specific LBP\(^{(13)}\)

- **Depression**
  - Researchers conducting a 2013 SR and meta-analysis of yoga for depression found that yoga could be considered an ancillary treatment option for patients with depressive disorders and individuals with elevated levels of depression\(^{(14)}\)
    - Twelve RCTs with 619 patients included in study
    - No conclusions could be made on long-term effects or safety and only three RCTs had low risk of bias
  - A 2015 SR and meta-analysis of yoga for prenatal depression found that prenatal integrated yoga intervention (utilizing postures, deep breathing, deep relaxation and meditation) may be effective in partly reducing depressive symptoms\(^{(15)}\)
    - Six RCTs with 375 pregnant women
    - Physical-exercise-based yoga (without deep breathing, relaxation and meditation) was not effective

- **Pregnancy**
  - Researchers conducting a 2012 SR of yoga for pregnant women concluded that yoga may improve stress levels, quality of life (QOL), aspects of interpersonal relating, autonomic nervous system functioning and labor parameters such as comfort, pain and duration\(^{(16)}\)
    - Based on 3 RCTs and 3 controlled trials
    - Authors concluded that more RCTs are needed and documented many limitations due to studies included
  - Researchers from the USA reviewed 15 quantitative studies conducted between 2008 and 2013 on yoga interventions in pregnancy and found 10 studies that demonstrated positive changes in maternal psychological or birth outcome measures\(^{(17)}\)
    - Nine of the 15 studies were RCTs
    - Outcome measures for maternal psychological health were anxiety, stress levels, depression, quality of life and interpersonal relationship. Birth outcomes were duration of labor, birth weight and Apgar score
    - Authors concluded that yoga is promising modality for pregnancy
  - Researchers in Thailand conducted an RCT and found that mindfulness eating and yoga exercise had a beneficial effect on blood sugar levels of women with gestational diabetes mellitus (GDM)\(^{(18)}\)
    - One hundred seventy pregnant women with GDM class A1 (fasting glucose < 105 mg/dL and 2-hour postprandial blood glucose less than 120 mg/dL) who were not on insulin therapy
    - The intervention group attended two 50-min training sessions and were then encouraged to continue program at home five times a week for 8 weeks. The control group received standard diabetes care
    - Mindfulness eating involved setting a goal for blood glucose control, carbohydrate choice and portion choices, being aware while eating and eating slowly. Yoga exercise was 15-20 minutes per day and was a combination of deep breathing and postures
    - All outcome measures (fasting plasma glucose, 2-hour postprandial blood glucose and glycosylated hemoglobin [HbA1c]) were significantly reduced in intervention group
• Breast Cancer
  – Researchers of a 2015 SR and meta-analysis of yoga for breast cancer patients concluded that evidence supports yoga as effective in enhancing health and managing some treatment-related side effects of breast cancer(19)
    - Sixteen RCTs with a total of 930 women
    - Significantly differences were found in overall health-related quality of life, depression, anxiety and gastrointestinal symptoms.
    - Further analysis found that yoga only had significant effect on anxiety if practiced for more than 3 months
  – Researchers of an RCT in Taiwan found that an 8-week yoga exercise program was effective in decreasing fatigue in women with breast cancer undergoing chemotherapy(20)
    - 60 women with nonmetastatic breast cancer were randomly assigned to either a yoga exercise group (60 minutes, twice a week) or standard care
    - Yoga exercise program consisted of warm-up, Anusara yoga, gentle stretching and relaxation exercise
    - Outcome measures were Profile of Mood States to measure depression and anxiety and Brief Fatigue Inventory to measure fatigue
    - The intervention did not significantly improve levels of depression or anxiety
  – Researchers in Canada developed a yoga program for women with lymphedema after breast cancer and did a qualitative study of the 13 women who attended. Upon analysis of interviews, they identified the following themes:(21)
    - Greater understanding of arm morbidity
    - Becoming more aware of posture
    - Countering fatigue
    - Furthered their understanding of loss associated with disability
    - Enhanced experiences of embodiment
  › Researchers in India found that a yoga program over a 24-week period during which women with breast cancer underwent surgery followed by chemotherapy or radiotherapy was effective in reducing self-reported symptoms of depression(20)
  › The RCT consisted of 69 participants, 33 in the yoga group and 36 in the control group undergoing supportive therapy
  › Beck’s Depression Inventory (BDI) and symptom checklist were assessed at baseline, after surgery, before, during and after radiotherapy and six cycles of chemotherapy

• Menopause
  – Researchers of a 2012 SR and meta-analysis found moderate evidence to support the short-term effectiveness of yoga in the treatment of psychological symptoms (depression, anxiety, sleep disorders) in menopausal women(22)
    - 5 RCTs with 582 women
    - No support was found for somatic, vasomotor, or urogenital symptoms

• Cardiovascular disease/Hypertension
  – Researchers of a 2014 SR and meta-analysis stated that there is promising evidence that yoga can improve many of the markers associated with cardiac and metabolic health(23)
    - 37 RCTs included in SR, 32 RCTs in meta-analysis
    - BMI, body weight, systolic BP and diastolic BP, low-density lipoprotein cholesterol, high-density lipoprotein, total cholesterol, triglycerides, and heart rate were all positively affected. No evidence was found for improvement in blood glucose or HbA1c
    - No significant differences were seen between yoga and exercise
  – Researchers of a 2014 SR and meta-analysis investigating the effects of yoga on hypertension (HTN) confirmed emerging but low-quality evidence that yoga can be utilized as an adjunct intervention in the management of hypertension(24)
    - Seven RCTs with a total 452 patients
  › Researchers of a RCT in India 2014, found that 12 weeks of yoga therapy reduced myocardial oxygen consumption and decreased blood pressure(47)
  › Seventy patients, age 35-55 years

• Asthma
  – Researchers of a 2014 SR and meta-analysis determined that yoga cannot be considered a routine intervention for asthmatic patients but can be considered an ancillary intervention or alternative to breathing exercises(25)
    - Fourteen RCTs with a total of 824 patients
- Although yoga found to positively affect respiratory values, there was no robust effect when compared to sham yoga and breathing exercises. No effect was robust against potential bias

**COPD**
- Researchers of a 2014 SR and meta-analysis determined that the current limited evidence suggests that yoga breathing improves lung function and exercise capacity and could be used as an adjunct to a pulmonary rehabilitation program for COPD(42)
- Five RCTs with a total of 233 patients
- Authors cautioned that this was only preliminary evidence and called for more studies
- A 2012 Cochrane review of breathing exercises for COPD comparing pursed lip breathing, diaphragmatic breathing, pranayama yoga breathing and computerized feedback breathing concluded that outcomes were similar across all breathing exercises examined and that, when added to whole body exercise training, breathing exercises did not appear to have any additional benefit for patients with COPD(43)
- Sixteen RCTs with a total of 1233 patients

**MS**
- Researchers of a 2014 SR and meta-analysis determined that no recommendation could be made regarding utilizing yoga as an intervention for MS(26)
- Seven RCTs with a total of 670 patients
- Although yoga found to be effective for fatigue and mood, these effects were not robust against bias
- No short-term or longer term effects of yoga when compared to exercise were found
- Yoga was not associated with any serious adverse effects
- Researchers in Turkey found that a 12-week biweekly supervised yoga program improved fatigue, balance and spatiotemporal gait parameters in patients with MS(27)
- Small study involving 8 patients with MS
- Sessions were 60 minutes in length with positions being modified and patients being supported by a chair, the floor or against a wall, as needed. All sessions ended with relaxation exercises
- Outcome measures were Fatigue Severity Scale (FSS) for fatigue and Berg Balance Scale (BBS) for balance as well as three-dimensional quantitative gait evaluation using motion analysis
- Gait parameters significantly improved with yoga were step length and walking velocity

**Neurological Disorders**
- Researchers in a 2013 SR and meta-analysis looking at yoga as an intervention in schizophrenia could make no recommendation for yoga as a routine intervention for schizophrenia(28)
- Five RCTs with a total of 337 patients
- Authors did find moderate evidence regarding short-term effects of yoga on quality of life but these results were not distinguishable from bias
- A single-blinded RCT conducted in Japan found no positive changes in resilience or stress markers when patients with schizophrenia-spectrum disorders were treated with Hatha yoga therapy(29)
- Twenty-five patients in experimental group received 1 hour/week of Hatha yoga in addition to regular treatment. Control group received regular treatment
- Authors attributed lack of response due to duration and intensity of yoga and focus on chronic illness
- Researchers investigated the effect of a yoga intervention on alcohol and drug abuse behaviors in women with post-traumatic stress disorder (PTSD) and suggested that specialized yoga therapy may diminish symptoms of PTSD(30)
- Pilot RCT with 26 women, age 18-65, with at least subthreshold PTSD as measured by PTSD Symptom Scale-Interview
- The alcohol use disorder identification test (AUDIT) and Drug Use Disorders Identification Test (DUDIT) were utilized to identify alcohol and drug abuse behaviors, respectively
- Yoga intervention was 12 Hatha yoga sessions of 75 minutes each with pose modifications to accommodate fitness level and incorporating guidelines for trauma-sensitive yoga
- Changes to AUDIT and DUDIT did not reach statistical significance between groups but yoga group reported reduction in symptoms and improved symptom management

**Use with older adults**
- Considering the possible benefit to older adults, especially in the area of fall prevention, there is a lack of RCTs in this area of research(6)
Researchers in Australia utilized a pilot RCT and concluded that a 12-week Iyengar yoga program was feasible and benefitted balance and mobility in older, community-dwelling adults.\(^{(31)}\)

- Fifty-two older, community-dwelling adults (mean age=68) randomized to intervention or control group
- Intervention group attended twice weekly Iyengar yoga sessions focused on standing postures and received fall prevention education booklet. Control group received fall prevention education booklet
- Outcome measures were standing balance, timed sit-to-stand, timed 4-meter walk, one-legged stand with eyes closed and Short Falls Efficacy Scale-International. Feasibility was assessed by attendance and recording adverse events
- All outcome measures were significantly improved in intervention group except for Short Falls Efficacy Scale-International

Researchers in the USA used a quasi-experimental pretest/post-test design and concluded that a 12-week, 60 minute, biweekly modified Kripalu yoga class benefitted postural control and mobility in community-dwelling older adults.\(^{(32)}\)

- Thirteen older adults (mean age=72) attended at least 19 of the 24 sessions
- Pre and post outcome measures were postural control (using Mini-BESTest [MBT]), mobility (Timed Up and Go [TUG]test), and gait speed (normal and fast). All outcome improved significantly after intervention
- Authors suggest that activities like yoga that require standing, sitting and lying on the floor may be effective in improving mobility, postural control and gait speed in community-dwelling older adults

Researchers of an RCT in the USA concluded that yoga has potential to improve psychological health (anger, anxiety, well-being, general self-efficacy, self-efficacy in daily living and overall self-control) in older adults.\(^{(44)}\)

- 98 older adults (mean age=74) randomly assigned to chair yoga, chair exercise or control group. Program characteristics were modified to accommodate all participants
- Classes met once per week for 45 minutes over 6-week period. Chair yoga was Hatha yoga (breathing, postures, mindfulness); chair exercise paralleled yoga physical movements in attempt to separate meditation and mindfulness from physical activity; control group assigned to waiting list and were able to choose either chair yoga or chair exercise after experiment over
- Assessment tools were State Anger Expression Inventory, State Anxiety Inventory, Geriatric Depression Scale, Lawton’s PGC Morale Scale, the General Self-Efficacy Scale, Chronic Disease Self-efficacy Scale and Self-Control Schedule
- Chair yoga group had significantly better results for all outcome measures when compared to chair exercise and control group. Authors suggest that yoga is not an alternate form of physical exercise but a preferred form for older adults as it provides both gentle and effective physical exercise as well as teaches emotional and cognitive control

### Pediatric

Feasibility studies for both inpatient children receiving intensive chemotherapy and pediatric cancer outpatients have demonstrated that yoga is a feasible treatment for fatigue (inpatient) and health-related quality of life (outpatient).\(^{(33-34)}\)

- Further studies are required to determine yoga’s effectiveness
- Results from a quasi-experimental pretest/posttest design study conducted in the USA suggest that yoga can promote self-regulation among preschool children.\(^{(35)}\)

- 29 children (16 intervention, 13 control) in year-long study of two full-day universal kindergarten classrooms. One teacher provided yoga intervention while other teacher did not
- Intervention was modified version of the standardized Yoga Kids curriculum incorporated into classroom activities. Intervention group received about 40 hours of treatment over 25 weeks
- Pre and post outcome measurements were evaluations that assessed multiple indices of children’s self-regulation (e.g., attention, delay of gratification and inhibitory control) and used input from parents report and direct observation
- Authors noted that children with most risk of self-regulation dysfunction benefitted most from yoga intervention

Researchers of an RCT in Haiti concluded that children living in orphanages with trauma-related symptoms, emotional and behavioral difficulties, showed improvements in mental and physical health after an 8-week yoga program.\(^{(48)}\)

- Seventy-six children, age 7-17 years

### Overweight individuals

Researchers in Thailand examined yoga for improving balance in persons with BMI>25 with poor posture and found yoga to be beneficial to both static and dynamic balance.\(^{(40)}\)

- Sixteen persons with a BMI over 25 and poor standing posture (defined as one-legged standing with eyes open for less than 30 seconds) were randomly assigned to either yoga group or control group
- Yoga training was Hatha yoga (8 postures and breathing) specifically chosen to improve standing balance, 45 minutes per day, three times per week for 4 weeks. Control group maintained usual activity
- Measures were one leg standing (eyes open and eyes closed) and FRT
- Static balance reached statistical significance for yoga group after 2nd week while dynamic balance took until 4th week to reach significant difference

› Chronic disease
› In a SR and meta-analysis, researchers examined yoga programs for individuals with heart disease, COPD, and stroke compared with usual care. Researchers observed the effect of yoga resulted in significant improvements in exercise capacity and a mean improvement in health-related quality of life (HRQL)\(^{(49)}\)

› Ten RCTs including 431 individuals, mean age 56+/−8 years
› Symptoms of anxiety were reduced after yoga in individuals with stroke, but not with individuals with COPD
› The effect of yoga on individuals with depression varied with no significant effects when compared to usual care

<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>Low back pain, symptoms of depression and anxiety, fatigue, decreased strength and flexibility, decreased balance and mobility in older adults, cardiovascular issues, decreased quality of life, women’s issues during pregnancy, breast cancer and menopause</td>
<td>Decreased pain, decreased symptoms of depression, anxiety and fatigue, increased strength, flexibility, balance and mobility, improved cardiovascular health, increased quality of life and other issues associated with women’s health. Yoga is seen as primarily a complementary treatment to other therapies.</td>
<td>Therapeutic Strategies: Yoga therapy prescribed for specific condition. In general, it is important to both choose a style of yoga appropriate to fitness level as well as find an experienced teacher(^{(2,6)})</td>
<td>Ability to practice yoga should increase with practice. In breast cancer, anxiety was reduced only if yoga was practiced for &gt; 3 months(^{(19)})</td>
<td>In general, yoga should be practiced with the assistance of an experienced instructor(^{(2,6)}). A home-based Tele-Yoga program with feedback from a live instructor through video-conferencing was acceptable for COPD and HF patients(^{(10)})</td>
</tr>
</tbody>
</table>

**Desired Outcomes/Outcome Measures**

› Desired outcomes and outcome measures will depend on the condition for which yoga is being suggested or prescribed. See Treatment summary above for outcome measures used with various conditions

**Maintenance or Prevention**

› Research on healthy subjects
  • Researchers conducting a SR of the effect of yoga on balance in healthy populations concluded that yoga may have a beneficial effect on balance\(^{(36)}\)
    – Fifteen studies were included (5 RCTs, 4 quasi-experimental, 2 cross-sectional, and 4 single-group designs) with a total of 688 persons, age 10-93
    – Variable study conditions and poor reporting obscured results and balance was underutilized as a measure
  • Researchers utilized a pilot RCT to evaluate the effectiveness of a home exercise yoga DVD on cardiorespiratory measures and concluded that the DVD program showed potential to improve functional capacity in healthy subjects as measured by 6MWT and gait speed\(^{(27)}\)
  • Researchers in Korea found that yogic exercises reduce life stress and blood glucose levels in an RCT involving nursing students\(^{(38)}\)
    – Twenty-seven healthy female undergraduate nursing students assigned to either yoga exercise group or control
    – Yogic exercises were for one hour, once a week for 12 weeks and were a cyclic form of yoga consisting of postures, breathing exercises, relaxation and meditation.
    – Pre and post-measures were Life Stress Scale for College Students and postprandial blood glucose levels
• Alternate nostril yoga breathing is associated with decreases in blood pressures and changes in heart rate variability in men\(^\text{(20)}\)

**Patient Education**

› For help in finding a yoga instructor or therapist in area, both IAYT and Yoga Alliance offer online search tools:
  • [http://iayt.site-ym.com/search/custom.asp?id=1156](http://iayt.site-ym.com/search/custom.asp?id=1156)
  • [https://www.yogaalliance.org/yogaregistry](https://www.yogaalliance.org/yogaregistry)

### Coding Matrix

<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>
</tr>
<tr>
<td>G</td>
<td>Published guidelines</td>
</tr>
<tr>
<td>RV</td>
<td>Published review of the literature</td>
</tr>
<tr>
<td>RU</td>
<td>Published research utilization report</td>
</tr>
<tr>
<td>QI</td>
<td>Published quality improvement report</td>
</tr>
<tr>
<td>L</td>
<td>Legislation</td>
</tr>
<tr>
<td>PGR</td>
<td>Published government report</td>
</tr>
<tr>
<td>PFR</td>
<td>Published funded report</td>
</tr>
<tr>
<td>PP</td>
<td>Policies, procedures, protocols</td>
</tr>
<tr>
<td>X</td>
<td>Practice exemplars, stories, opinions</td>
</tr>
<tr>
<td>GI</td>
<td>General or background information/texts/reports</td>
</tr>
<tr>
<td>U</td>
<td>Unpublished research, reviews, poster presentations or other such materials</td>
</tr>
<tr>
<td>CP</td>
<td>Conference proceedings, abstracts, presentation</td>
</tr>
</tbody>
</table>

### References

6. Verrastro G. Yoga as therapy: when is it helpful? J Fam Pract. 2014;63(9). (GI)


