Yoga

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, Home Health, Oncology, Neurological Rehabilitation, Orthopedic Rehabilitation, Pediatric Rehabilitation, Women’s Health, Geriatric Rehabilitation

Description/use: Yoga is an Indian mind-body practice that has been in existence for 2,000 years. It is a combination of meditation, mindfulness, self-exploration, breathing control, and body movement designed to improve flexibility, focus, balance, and strength.\(^{(1)}\) 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 habits), 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\(^{(2)}\)

- Yoga was introduced to the Western world starting in the 1930s and initially consisted primarily of postures (asanas), breathing exercises (pranayama), and sometimes meditation\(^{(3)}\)

- Since that time, yoga has divided into different schools and brands\(^{(4,46)}\)
  - 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; 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; training for teachers is more formal and rigorous than other disciplines
  - Ashtanga – Movement is rapid, smooth and vigorous; designed for athletes
  - Bikram – Known for taking place in a 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,” Bikram yoga is more popular in the United States 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; emphasizes 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 United States are Hatha and Iyengar. Hatha yoga is what most Americans mean when they refer to yoga. A 2012 survey reported that 20.4 million Americans (or 8.7% of adults in the United States) practice yoga, an increase from 15.8 million in 2008.

It is important to both choose a style of yoga appropriate to one’s fitness level as well as to find an experienced teacher.

There is a difference 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.

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 a physician 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 older adults.
- At present, data that support yoga as an intervention for neurological disorders are sparse. However, preliminary data suggest that yoga may be an effective treatment for carpal tunnel syndrome, stroke, multiple sclerosis (MS), and epilepsy.
- 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.
- It is felt that the beneficial effects of yoga for pain relief may be derived from control of stress and depression, relaxation, and stretching and strengthening of targeted muscles.
- 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 to find an experienced teacher.
  - Type of yoga is important to preventing injury
    - Yoga can lead to serious injury can include fractures, neuralgia, and arterial dissection.
    - Family practice physicians are advised to refer patients to PT for evaluation before beginning yoga if any concerns.
The broad and decentralized nature of yoga practice makes the idea of credentialing or licensure for teachers controversial and not well-accepted. Both of the organizations below promote training and curriculums and offer online resources for practitioners:

- The Yoga Alliance is the best-known credentialing organization
- International Association of Yoga Therapists (IAYT)

When choosing a teacher, ask about length of teaching experience, training completed, and experience with working with specific medical conditions, 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 persons when practiced under the guidance of a well-trained instructor.
- Persons with cancer and chronic conditions such as arthritis 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.
  - Arterial dissection is a rare form of stroke, has been reported in the literature and is, in a minuscule number of cases, associated with certain yoga poses (inversions, side angle, triangle, and plow) that require sudden neck movements that put extreme pressure on the 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.
- Persons who are sick, dehydrated, or pregnant may be harmed by performing Bikram yoga (vigorous workout in warm, humid room).
  - Persons with any diagnosis that is sensitive to warm, moist conditions (respiratory disease, cardiovascular disease, obesity, etc.) should be advised against practicing Bikram yoga.
  - Researchers who conducted a pilot study of the use of Bikram yoga by pregnant women found that those who engage in “hot yoga” are more likely to trust someone other than their healthcare provider regarding the safety of this practice.
- If choosing to practice hot yoga, patients should be warned of signs of heat-related illness (dehydration, cramping, light-headedness, confusion, nausea) and discontinue practice if they occur. 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), such as 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 diagnosises (e.g., heart disease, lung disease, prior history of heatstroke) may not be advisable for Bikram or “hot yoga” (2)
  - If client is being referred because of anxiety/depression, document any tests performed that are related to diagnosis
  - Document other symptoms patient may be experiencing that 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) for which modification or avoidance 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 patient lives, 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, that require attention, or that could benefit from assumption of postures to increase ROM
• **Sensory testing:** Assess if indicated. Kinesthetic sense may be important when holding yoga postures

### 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 persons. The focus in treatment is to emphasize awareness of limitations and not focus on achieving specific poses
    - In a 2012 survey of 2,567 healthy yoga practitioners in Australia 4.6% of the participants reported that they had suffered an injury that required medical treatment or caused prolonged pain or resulted in time off from work(45)
      - 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, and 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 the patient has carpal tunnel syndrome
      - Risks in persons 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 preventive technique. See Treatment summary below for diagnoses that have been researched and Maintenance and Prevention section for applications to healthy populations

› **Referral to other disciplines:** As needed, depending on condition

› **Other considerations:**
  • Among health professionals studied, the ratings of the appropriateness of yoga for treatment were not aligned with the evidence base, with most health professionals undervaluing yoga therapy(9)
• Although still new, Tele-Yoga (multi-point video conferencing that connects participants to live classes) has been found to be an acceptable and appropriate intervention for patients with heart failure and COPD, who are often limited by high symptom burden and social isolation\(^\text{(10)}\)

**Treatment summary:**

**Low back pain (LBP)**

- Researchers conducting a 2013 systemic review (SR) and meta-analysis of yoga for chronic LBP found strong evidence for short-term effectiveness and moderate evidence for long-term effectiveness of yoga\(^\text{(11)}\)
  - Ten RCTs with a total of 967 patients with chronic LBP
  - No serious adverse effects associated with yoga
- Authors of a 2017 SR found moderate to low evidence for the effectiveness of Yoga for chronic non-specific LBP\(^\text{(54)}\)
  - Twelve trials involving a total of 1080 participants with chronic non-specific LBP were included
  - The authors found that those who participated in Yoga compared to non-exercise had improved overall back function at 3 months (low certainty), 6 months (moderate certainty), and at 12 months (low certainty)
- Authors of a 2016 SR found that Yoga for the treatment of chronic low back pain can reduce pain and improve function and is well tolerated by most participants practicing Yoga\(^\text{(55)}\)
- Authors of a 2016 SR found Yoga to be beneficial for long-term pain management in midlife adults with non-specific chronic LBP\(^\text{(56)}\)

- An exploratory RCT of yoga with lumbar disc extrusions and bulges found yoga to be safe and beneficial for this population\(^\text{(12)}\)
  - 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
  - There was significant improvement in Roland Morris Disability Questionnaire (RMDQ) in yoga group at 3 months; however, there were no changes in the Aberdeen Low Back Pain Scale or straight leg raise test
- Researchers in Sweden who conducted an RCT with cost-effective analysis comparing yoga therapy, exercise therapy, and self-care advice for nonspecific LBP found 6 weeks of yoga therapy to be a cost-effective early intervention for non-specific LBP\(^\text{(13)}\)

**Chronic neck pain**\(^\text{(53)}\)

- Fifty-six participants with chronic neck pain were recruited for this study and were divided into the Pilates group (n = 20), yoga group (n = 19), and control group (n = 17)
- The Pilates group and yoga group participated in 1 hour sessions for 12 weeks. Classes focused on education, positioning, and movement strategies. After 6 sessions, the Pilates group progressed to thoracic flexibility exercises, light upper-extremity weights, upright seated endurance exercises, and increased balance activities using foam rollers
- During the 12 week study participants in the yoga group focused on breathing exercises, postural awareness to address proper alignment, strength and flexibility exercises, and ended with relaxation techniques. Yoga progression was based on increasing the duration of postural holds
- There were significant improvements on the Neck Disability Index for the Pilates group and yoga group, with no changes in the control group. Pain rating scales were also reduced for both intervention groups. There were no significant improvements in ROM

**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\(^\text{(14)}\)
  - Twelve RCTs with 619 patients were included in the study
  - No conclusions could be made on long-term effects or safety and only three RCTs had low risk of bias
- Authors of 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\(^\text{(15)}\)
  - Six RCTs with 375 pregnant women
  - Physical-exercise-based yoga (without deep breathing, relaxation, and meditation) was not effective
Authors of an RCT study in the United States concluded that a 12-week yoga intervention plus coherent breathing exercises can improve depressive symptoms in patients with major depressive disorders (MDD)\(^{(52)}\).

- Thirty subjects with MDD were randomized to either the high-dose group or low-dose group. Both groups participated in a 12-week program; the high-dose group had 3 sessions per week and the low-dose group had 2 sessions per week.
- Both groups received 90 minutes of yoga plus a home exercise program.
- The objective measure used in this study was the Beck Depression Inventory-II.

**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.
- U.S. researchers who reviewed 15 quantitative studies conducted between 2008 and 2013 on yoga interventions in pregnancy 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 relationships. Birth outcomes were duration of labor, birth weight, and Apgar score.
- Authors concluded that yoga is a promising modality for pregnancy.

- Researchers in Thailand who conducted an RCT found that mindful 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-minutetraining sessions and were then encouraged to continue the program at home 5 times a week for 8 weeks. The control group received standard diabetes care.
- Mindful 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 of a combination of deep breathing exercises and postures.
- All outcome measures (fasting plasma glucose, 2-hour postprandial blood glucose, and glycosylated hemoglobin [HbA1c]) were significantly reduced in the intervention group.

**Breast cancer**

- Researchers of a 2015 SR and meta-analysis of yoga for breast cancer patients concluded that evidence supports yoga as being effective in enhancing health and managing some treatment-related side effects in women with breast cancer\(^{(19)}\).
- Sixteen RCTs with a total of 930 women.
- Significant differences were found in overall health-related quality of life, depression, anxiety, and gastrointestinal symptoms.
- Further analysis found that yoga only had a significant effect on anxiety if practiced for more than 3 months.
- Researchers who conducted an RCT in Taiwan found that an 8-week yoga exercise program was effective in decreasing fatigue in women with breast cancer undergoing chemotherapy\(^{(20)}\).
- Sixty women with nonmetastatic breast cancer were randomly assigned to either a yoga exercise group (60 minutes, twice a week) or standard care group.
- Yoga exercise program consisted of warm-up, Anusara yoga, gentle stretching, and relaxation exercises.
- 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 outcomes:\(^{(21)}\)
  - 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 (50).

- The RCT consisted of 69 participants, 33 in the yoga group and 36 in the control group undergoing supportive therapy.
- The Beck Depression Inventory (BDI) and symptom checklist were assessed at baseline, after surgery, and before, during, and after radiotherapy and six cycles of chemotherapy.

**Menopause**

- Researchers who performed 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).
  - Five RCTs with 582 women
  - No support was found for somatic, vasomotor, or urogenital symptoms

**Cardiovascular disease/hypertension**

- In a 2014 SR and meta-analysis researchers found promising evidence that yoga can improve many of the markers associated with cardiac and metabolic health (23).
  - Thirty seven 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 who conducted 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.

**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 was 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 who performed 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 (26).
  - 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 (27).
  - Sixteen RCTs with a total of 1,233 patients.

**MS**

- Researchers who conducted 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 was found to be effective for improving 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 a three-dimensional quantitative gait evaluation using motion analysis
- Gait parameters such as step length and gait velocity were significantly improved with yoga

Neurological disorders

In a 2013 SR and meta-analysis looking at yoga as an intervention in schizophrenia researchers could make no recommendation for yoga as a routine intervention for patients with 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 a lack of response due to the limited duration and intensity of yoga practice
- 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, ages 18–65, with at least subthreshold PTSD as measured by PTSD Symptom Scale–Interview
  - The Alcohol Use Disorders 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
- Authors of an RCT in the United States suggest that a specialized yoga program can significantly improve physical functioning in older adults with Parkinson’s disease (31).

- Forty-one older adults (age 72.2 ± 6.5) with Parkinson’s disease were randomized to either the power training group (PWT) (n = 14), yoga group (n = 15), or control group (n = 12)
- Those in the PWT group utilized 11 pneumatic exercise machines: biceps curls, triceps push down, chest press, seated rows, latissimus pull downs, shoulder press, leg press, leg curl, hip abduction, hip adduction, and seated calf raises. Sessions were performed in three circuits with 10–12 repetitions, twice a week for 12 weeks. Patients exercised at 50% to 75% of optimal loads for PWT and intensity increased when individuals reached plateaus
- Individuals in the yoga group focused on improving movement speed, muscle strength, power, and balance. Intervention was given in a 1-hour group class, twice a week for 12 weeks. Difficulty levels were easy, moderate, or hard. All individuals started at easy and all progressed toward the hard difficulty level
- Individuals in the control group received only a 1-hour health education class once a month for 12 weeks that focused on lifestyle modifications, medication, therapy, nutrition, exercise, and long-term care
- Results at the end of 12 weeks showed that those in the PWT group and yoga group had significant improvements in the Unified Parkinson’s Disease Rating Scale motor score (UPDRS\textsubscript{MS}) and Berg Balance Scale when compared to the control group. No improvements were found in the Mini BESTest, single leg stance, postural sway test, or Timed Up and Go

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 who utilized a pilot RCT 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) were randomized to either the intervention group or control group
- The intervention group attended twice weekly Iyengar yoga sessions focused on standing postures and received a fall-prevention education booklet. The control group received only the 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 the intervention group except for Short Falls Efficacy Scale–International.

Researchers in the United States who used a quasi-experimental pretest/post-test design concluded that a 12-week, 60 minute, biweekly modified Kripalu yoga class benefitted postural control and mobility in community-dwelling older adults.

- Thirteen older adults (mean age = 72) attended at least 19 of the 24 sessions.
- Pre- and post-outcome measures were postural control (using MiniBESTest [MBT]), mobility (Timed Up and Go [TUG] test), and gait speed (normal and fast). All outcomes improved significantly after the intervention.
- Authors suggest that activities such as 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 United States concluded that yoga has the potential to improve psychological health (anger, anxiety, well-being, general self-efficacy, self-efficacy in daily living, and overall self-control) in older adults.

- Ninety-eight 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 a 6-week period. Chair yoga was Hatha yoga (breathing, postures, mindfulness); chair exercise paralleled yoga physical movements in an attempt to separate meditation and mindfulness from physical activity; control group was assigned to waiting list and was able to choose either chair yoga or chair exercise after experiment was over.
- Assessment tools were State-Trait 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 exercises only and control group. Authors suggest that yoga is not an alternative 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).
- Further studies are required to determine yoga’s effectiveness.
- Results from a quasi-experimental pretest/posttest design study conducted in the United States suggest that yoga can promote self-regulation among preschool children.
- Twenty-nine children (16 intervention, 13 control) were included in year-long study of two full-day universal kindergarten classrooms. One teacher provided the yoga intervention while the other teacher did not.
- Intervention was a 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 parent reports 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 and emotional and behavioral difficulties showed improvements in mental and physical health after an 8-week yoga program.
- Study included 76 children (ages 7–17 years).

Overweight individuals
- Researchers in Thailand who examined yoga for improving balance in persons with BMI > 25 with poor posture found it to be beneficial to both static and dynamic balance.
- 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, 3 times per week for 4 weeks. Control group maintained usual activity.

- Outcome measures were one leg standing (eyes open and eyes closed) and FRT.
- There were significant improvements in static balance in the yoga group after the 2nd week, while significant improvements in dynamic balance were found after the 4th week.

**Chronic disease**

- In an SR and meta-analysis researchers examined yoga programs for individuals with heart disease, COPD, and stroke compared with usual care. Researchers observed that 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 in 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>
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</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><strong>Therapeutic Strategies:</strong> 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 an 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, ages 10–93.
  - Variable study conditions and poor reporting obscured results and balance was underutilized as a measure.
  - Researchers who utilized a pilot RCT to evaluate the effectiveness of a home exercise yoga DVD on cardiorespiratory measures concluded that the DVD program showed potential to improve functional capacity in healthy subjects as measured by 6MWT and gait speed\(^{(37)}\).
  - Researchers in Korea found in an RCT involving nursing students that yogic exercises reduce life stress and blood glucose levels\(^{(38)}\).
  - Twenty-seven healthy female undergraduate nursing students assigned to either yoga exercise group or control...
For help in finding a yoga instructor or therapist in one’s 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)

## References


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


