

Indexing Metadata/Description

- › **Procedure:** Therapeutic Exercise: Strength Training –Kettlebells
- › **Synonyms:** Strengthening exercise: kettlebells
- › **Area(s) of specialty:** Sports Rehabilitation, Orthopedic Rehabilitation
- › **Description/use:** Kettlebell exercises make use of a kettlebell, a device shaped like a cannonball with a U-shaped handle that provides the user the ability to work with curvilinear movements, centrifugal forces, and momentum⁽¹⁾
- › **CPT codes:** Therapeutic exercise 97110
- › **Reimbursement:** No specific issues or information regarding reimbursement have been identified

Indications for Procedure

- › Indicated for patients undergoing sports rehabilitation therapy⁽²⁾
- › Indicated for patients who wish to perform an alternative method for improving strength, dynamic flexibility, and power⁽²⁾ while performing functional exercises that mimic daily activities⁽³⁾
- › Kettlebell training may also be used as an early rehabilitation exercise to enhance muscle endurance
- › Kettlebell exercises can be used for cardiovascular training, strength training, and power training

Guidelines for Use of Procedure

- › The therapist should be familiar with the various kettlebell exercises prior to having the patient perform kettlebell drills
- › Various techniques and exercises can be performed using the kettlebell, and proper technique and education should be provided prior to having the patient use the kettlebell

Contraindications/Precautions to procedure

- › **Contraindications** ⁽⁴⁾
 - Unstable angina
 - Uncontrolled hypertension
 - Uncontrolled dysrhythmias
 - Recent history of heart failure
 - Severe stenotic or regurgitantvalvular disease
 - Hypertrophic cardiomyopathy
 - Acute inflammation
 - Severe pain

Examination

- › **Contraindications/precautions to examination**
 - See **Contraindications/Precautions to procedure** above
- › **History**
 - **History of present illness/injury for which the procedure is indicated**

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- **Mechanism of injury or etiology of illness:** What is the current reason for referral? Has the patient had any recent musculoskeletal injuries?
- **Course of treatment**
 - **Medical management:** Patient should be cleared medically prior to participating in kettlebell exercises. Medical management will vary based on reason for referral
 - **Medications for current illness/injury:** Determine what medications clinician has prescribed; are they being taken? Are they effective?
 - **Home remedies/complementary therapies:** Document any use of home remedies (e.g., ice or heating pack) or complementary therapies (e.g., acupuncture) and whether or not they help
 - **Previous therapy:** Document whether the 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): Determine any aggravating or easing factors for this condition
- **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
- **Other symptoms:** Document other symptoms the patient may be experiencing that could exacerbate the condition and/or symptoms that could be indicative of a need to refer to a physician (e.g., dizziness, bowel/bladder/sexual dysfunction, saddle anesthesia)
- **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 any recent injuries or dysfunction?
 - **Comorbid diagnoses:** Ask the patient about other problems, including diabetes, cancer, heart disease, complications of pregnancy, psychiatric disorders, orthopedic disorders, etc.
 - **Medications previously prescribed:** Obtain a comprehensive list of medications prescribed and/or being taken (including over-the-counter drugs)
 - **Other symptoms:** Ask the patient about other symptoms he or she may be 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:** (e.g., does the patient participate in recreational activities?) Does the patient plan on returning to work? What specific movements does work require? Does the patient participate in any competitive sports?
 - **Functional limitations/assistance with ADLs/adaptive equipment** (include limitations with self-care, home management, work, community leisure): Does the patient require assistance with ADLs at home? Does the patient have any limitations in functional mobility? Does the patient use any adaptive equipment?
 - **Living environment:** 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)**
 - **Anthropometric characteristics:** Measure height and weight measurements using a stadiometer or a calibrated digital scale. Calculate body mass index (BMI)⁽⁵⁾
 - **Assistive and adaptive devices:** Provide patient with proper education and measurements when using any type of adaptive equipment
 - **Balance:** Assess balance statically and dynamically; use the Tinetti Balance Scale or the Berg Balance Scale for objective measurement

- **Cardiorespiratory function and endurance:** Use of a heart rate monitor and completing a graded exercise test such as the Borg Rating of Perceived Exertion (RPE) or Bruce protocol, which can assess cardiorespiratory function and measure VO_{2max} .⁽⁵⁾ Monitor patient's vital signs as necessary
- **Ergonomics/body mechanics:** Assess patient's body mechanics when performing exercises using kettlebells. To prevent injuries, proper form and technique are important when exercising with kettlebells
- **Functional mobility:** Assess patient's functional mobility using the Functional Independence Measure (FIM) or Timed Up and Go (TUG) test
- **Gait/locomotion:** Assess patient's gait for deviations. Note the gait quality and determine any abnormalities in gait. The Dynamic Gait Index (DGI) can be used for standardized testing of safety with ambulation
- **Joint integrity and mobility:** Assess bilateral upper and lower extremity joint function and mobility. Ensure proper stability in the joints to ensure safe training when performing exercises using the kettlebell
- **Muscle strength:** Perform a manual muscle test (MMT) and assess scores for the upper and lower extremities
- **Observation** (including skin assessment): Observe the patient performing kettlebell drills. In order to prevent injury, ensure that patient's exercises are being performed properly
- **Posture:** Assess the patient's posture and note any deviations in alignment
- **Range of motion:** Use a goniometer to measure upper and lower extremity ROM. Sufficient ROM and flexibility are important when performing kettlebell exercises to ensure proper exercise performance and to minimize risk of injury
- **Self-care/activities of daily living** (objective testing): Assess ADLs using the Barthel index

Assessment/Plan of Care

› **Contraindications/precautions**

- **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**
- Due to the explosive nature and dynamics of performing kettlebell exercises, extra precaution should be taken in order to minimize risk of injuries

› **Diagnosis/need for procedure:** There are numerous indications for the use of kettlebell training, and the diagnoses behind these indications are many. Please see *Indications for device/equipment*, above, for more details

› **Prognosis:** Prognosis varies depending on the patient's diagnosis

› **Referral to other disciplines:** Primary care physician, athletic trainer

› **Other considerations:** Consider having patients perform plyometric exercises, depending on their goals

› **Treatment summary**

- According to online sources, women should start at 8 kg (18lb) and men should start at 16 kg (35lb).⁽¹³⁾Weights of the kettlebells start as low as 4kg (~9lb) and increase in increments of 4kg;however, certain kettlebells allow the user to modify the weight by a minimum of 2kg (~4lb)⁽¹⁴⁾
- An individual should increase their kettlebell weight if they can perform the following:⁽¹⁵⁾
 - A smooth set of 5-10 single arm presses
 - A set of 3 bottoms-up presses
 - Multiple consecutive windmills and Turkish get ups with ease and poise
- Short-term weight lifting and kettlebell exercises are both effective interventions for increasing strength and power. However, gains in strength with short-term weight lifting is greater than with kettlebell exercises⁽⁶⁾
 - Based on a United States randomized controlled trial of 30 subjects who participated in either kettlebell exercises or weight lifting group
 - Each group trained 2x a week for 6 weeks with at least a 72-hour rest break
 - Kettlebell group trained using 16 kg kettlebell
 - Exercises performed included swings (3x6), accelerated swings (4x4), and goblet squats (4x6)
 - Sets were increased for the last 2 weeks to 4x6 swings, 6x4 accelerated swings, and 4x6 back squats
 - Weight training group performed high pulls (3x6), power clean (6x4), and back squat (4x6)
 - Outcome measures for this study included vertical jump height and the 1-repetition max
- Using kettlebells can reduce pain in the neck/shoulders and low back and improve muscle strength⁽⁷⁾
 - Based on a randomized controlled trial conducted in Denmark involving 40 adults with musculoskeletal pain who were randomized to the intervention group or control group
 - Exercises were performed 3x a day for 8 weeks for 20minutes

- For the first 4 weeks, resting breaks were set at 1 minute after each exercise. For the last 4 weeks, resting breaks were set at 30 seconds after each exercise
 - Women started with the 8 kg kettlebell and men started with the 12 kg kettlebell
 - Exercise intervals were performed 10 times for 30 seconds. Exercises during each interval included the unweighted swings, deadlifts, 2-handed swing, and the 1-handed swing
 - Outcome measures for this study included VAS, muscle force dynamometer scores, and Astrand VO2max
 - Researchers found performing 2-handed kettlebell swings and the kettlebell snatch exercises could be used as an addition to an athlete's strength and conditioning program for their ballistic component^(10,11)
- › Performing 3 sets of 8 repetitions of the kettlebell swing yielded an increase in both explosive and maximum strength, and the same number of kettlebell snatches resulted in a similar mechanical output
- › Researchers from the United States found that kettlebell training can be useful for improving muscular strength and cardiorespiratory fitness when compared with treadmill training⁽⁹⁾
- Exercises such as the kettlebell swing and sumo deadlifts using a 16 kg kettlebell for 30 minutes elicited a greater rated perceived exertion (RPE) response than using a treadmill alone
 - Individuals who have difficulty participating in activities such as brisk walking, jogging, running, or jump roping can get the desired amount of aerobic conditioning, but also muscular strength, when using kettlebells
- › Performing the kettlebell snatch exercise using the 15:15 method (15 seconds of snatches; 15 second rest) significantly improved cardiovascular endurance and aerobic capacity in female intercollegiate soccer players⁽¹²⁾
- Based on a 4-week study from San Jose University involving 17 collegiate female athletes
 - Participants were divided into the kettlebell (KB) group (n = 9) and the circuit weight training (CWT) group (n = 8)
 - Participants in the CWT group were asked to perform a 2-minute unloaded warm-up on a cycle ergometer. They were asked to increase the resistance until they could no longer continue. They also performed various free-weight and dynamic body exercises for 20 minutes
 - Participants in the KB group performed the kettlebell snatch exercise for 5 minutes using a 12kg bell. After each minute, participants were asked to switch arms
 - Results at the end of 4 weeks show that those in the KB group had significant gains in aerobic capacity as compared to the CWT group

See *Description, Indications of device/equipment, and Guidelines for use of device/equipment*, above

Problem	Goal	Intervention	Expected Progression	Home Program
Pain in shoulders, neck, and low back	Decrease musculoskeletal pain	<u>Therapeutic exercises</u> Exercises such as kettlebell swings, suitcase carry, and overhead press	Increase intensity and repetitions of exercises as necessary	Provide exercises at home that decrease patient's pain symptoms
Decreased muscular strength and endurance	Improve muscle strength and endurance	<u>Therapeutic exercises</u> Can utilize exercises with the kettlebell such as the one-leg deadlift, kettlebell swings, squat and press, and Turkish getup ⁽⁸⁾	Increase intensity and repetitions of exercises as necessary	Provide exercises at home to improve muscular strength and endurance

Desired Outcomes/Outcome Measures

- › Desired outcomes/Outcome measures
- Increased strength and endurance
 - MMT, dynamometer, 1-repetition max, 6MWT, Bruce protocol, Borg RPE

- Increased power
 - Vertical jump height
- Decreased pain with musculoskeletal disorders
 - VAS

Maintenance or Prevention

- › Therapist can provide a home exercise program to allow patients to continue to train on their own once therapy sessions are complete
- › Patients can purchase their own kettlebell and perform exercises independently under the supervision of a therapist or kettlebell trainer

Patient Education

- › In order to reduce risk of injury, patients should be educated on proper form and technique for kettlebell exercises
 - Patients who wish to further pursue their skill sets with kettlebells can join organizations that teach kettlebell drills. These organizations include the World Kettlebell Club, International Kettlebell and Fitness Federation (<http://ikff.net/>), CrossFit (<https://www.crossfit.com/>), and Kettlebell Concepts (<http://kettlebellconcepts.com/>)⁽¹⁾

Coding Matrix

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

M Published meta-analysis	RV Published review of the literature	PP Policies, procedures, protocols
SR Published systematic or integrative literature review	RU Published research utilization report	X Practice exemplars, stories, opinions
RCT Published research (randomized controlled trial)	QI Published quality improvement report	GI General or background information/texts/reports
R Published research (not randomized controlled trial)	L Legislation	U Unpublished research, reviews, poster presentations or other such materials
C Case histories, case studies	PGR Published government report	CP Conference proceedings, abstracts, presentation
G Published guidelines	PFR Published funded report	

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