

4.03.38 STRENGTHEN: ABDOMINAL, PLANK AND VARIATIONS (CONTINUED)

Hands: Patient lies face down with legs extended and hands palm down directly under shoulders. Feet should be hip-width apart and elbows should be shoulder-width apart. Patient engages core muscles to maintain a neutral spine while tucking toes and lifting body. Patient should be in a straight line from head to heels. Hold and breathe for up to 1 minute (E1). Modification for wrist issues is to bear weight through fist or use push-up blocks (E2 and E3).

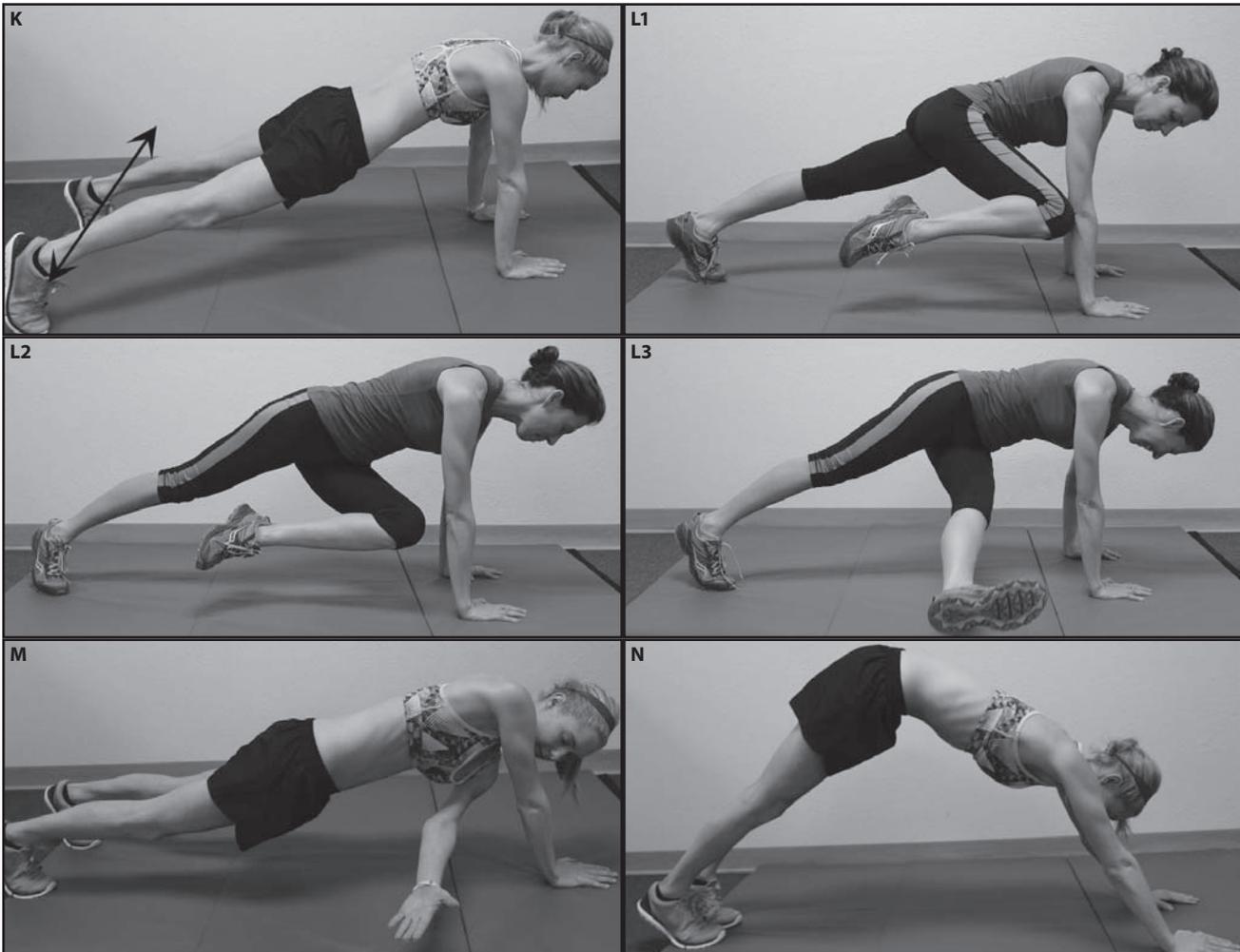
Forearms to hands: Follow instructions for *Hands*, then lower to the right forearm followed by the left forearm so patient is in position described in *Forearm*. Follow with pressing up to right hand and then left returning to start position (F).

Alternating leg lift: Follow instructions in *Hands*, then lift one leg and return. Repeat on other side. Do not allow lower back to extend or body to roll side-to-side (G).

Rocking: Follow instructions in *Forearm* or *Hands*. This can be done in either position. Patient shifts weight forward onto arms, holds, and returns to start (H1). Patient then shifts weight backward onto feet, holds, and returns to start (H2).

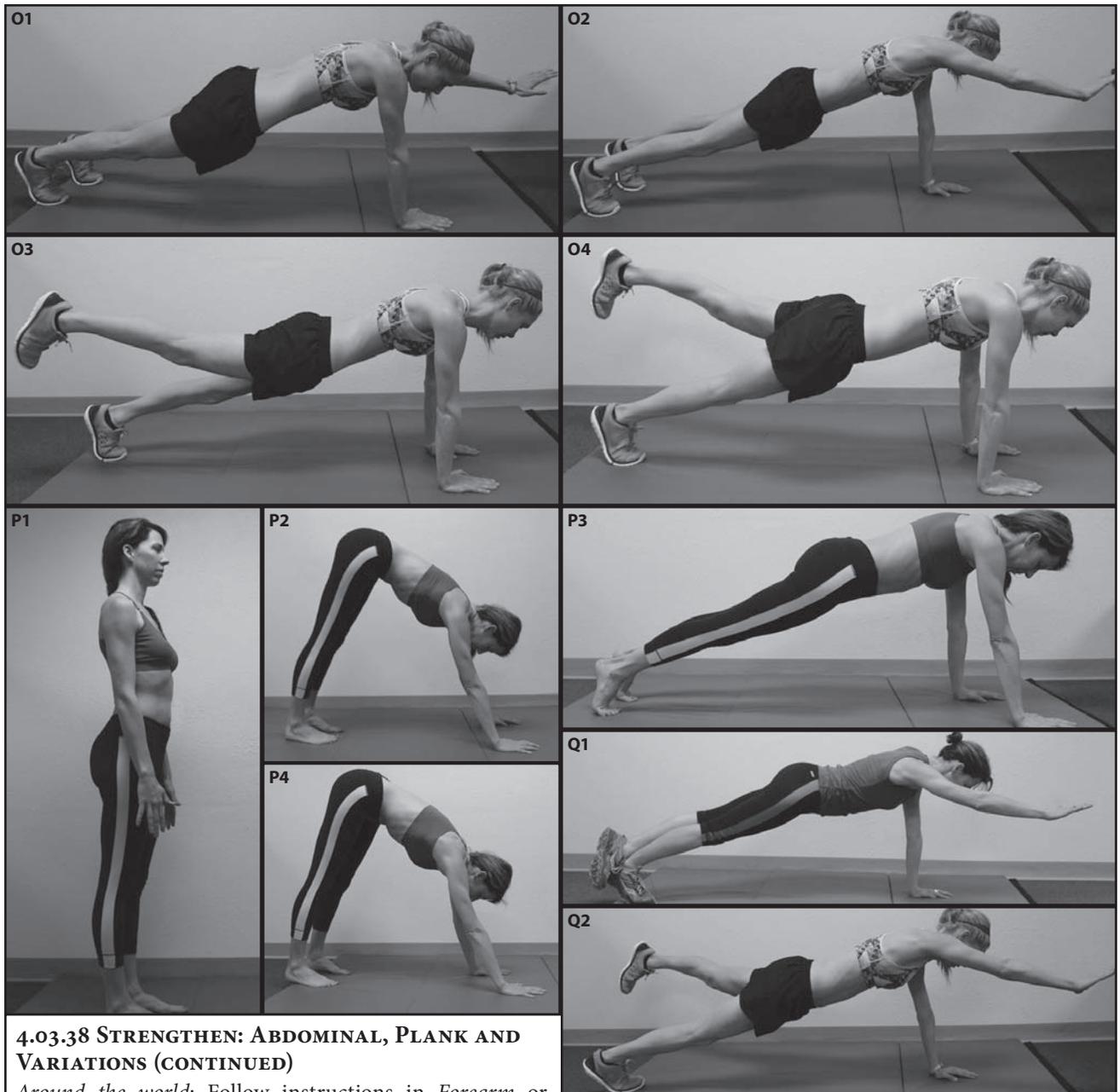
Cheek dips: Follow instructions in *Forearm* or *Hands*. This can be done in either position. Patient dips right hip toward floor while maintaining straight spine; do not allow dipping, side-lower back to sag. Return to start and repeat to other side. This is more of a rotational movement as shoulder horizontally adducts and rotation occurs in hips and pelvis (I).

Tap outs: Follow instructions in *Forearm* or *Hands*. This can be done in either position. Lift one leg slightly off floor and abduct hip to tap the floor. Do not allow dipping, side lower back to sag. Return to start and repeat to other side (J). (continued)



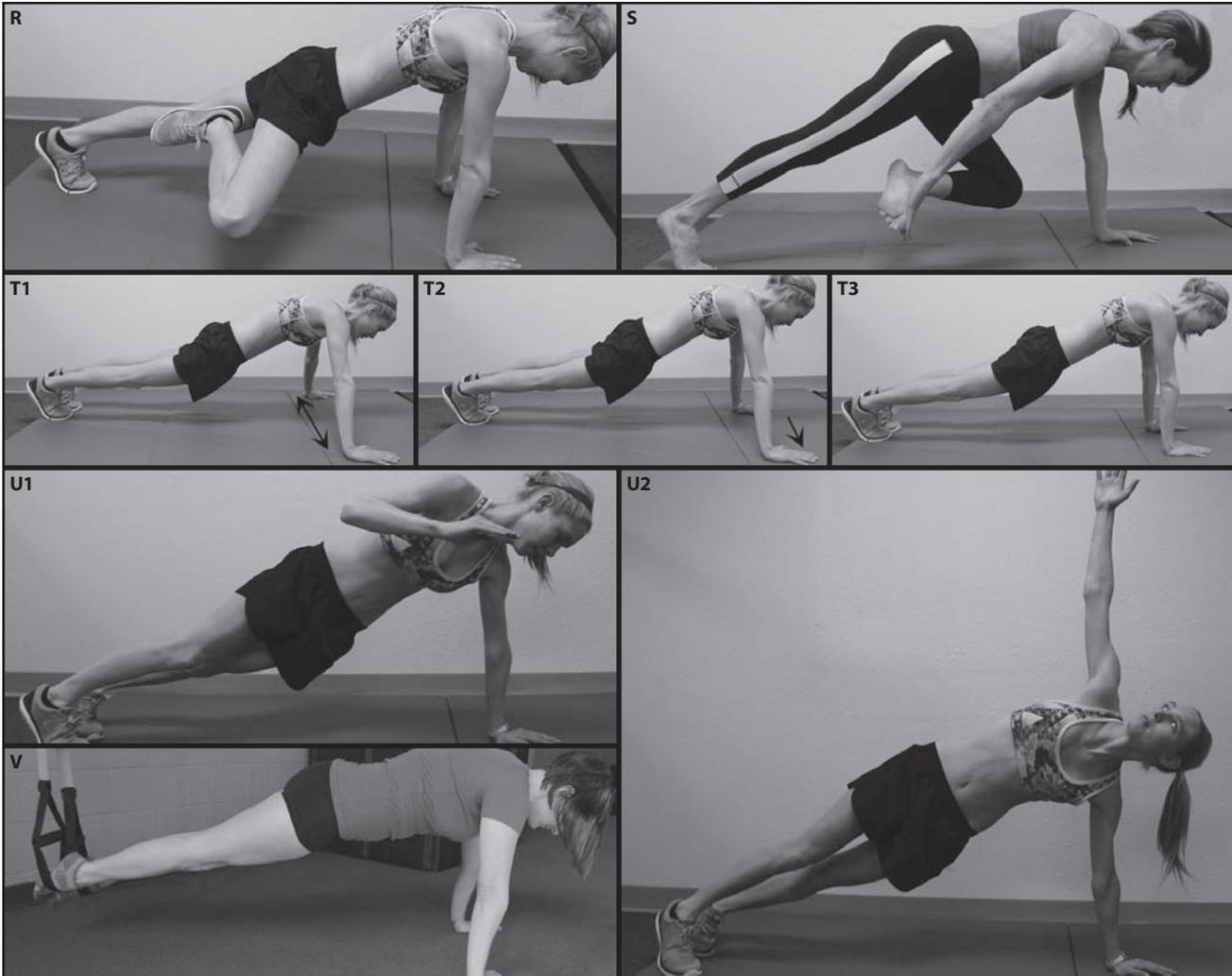
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Jacks: Follow instructions in *Forearm* or *Hands*. This can be done in either position. Patient jumps feet off floor, landing in hip abduction bilaterally like the lower part of a jumping jack and returns to start (K). *Spiderman: Knee to same elbow:* Follow instructions in *Forearm* or *Hands*. This can be done in either position. Patient lifts one leg slightly off floor and abducts hip and flexes knee, bringing knee toward ipsilateral elbow. Do not allow dipping, side-lower back to sag. Return to start and repeat to other side (L1). *Knee to opposite elbow:* Patient lifts one leg slightly off floor and adducts hip and flexes knee, bringing knee toward contralateral elbow. Do not allow dipping, side-lower back to sag. Return to start and repeat to other side (L2). *Knee to opposite elbow extend knee:* Patient lifts one leg slightly off floor and adducts hip and flexes knee, bringing knee toward contralateral elbow and then extends the knee. Do not allow dipping, side-lower back to sag. Return to start and repeat to other side (L3). *Thread the needle:* Follow instructions in *Forearm* or *Hands*. This can be done in either position. Patient brings one hand off surface and threads it just inferior to axilla (arm pit) on opposite side. This is more of a rotational movement as shoulder horizontally adducts and rotation occurs in hips and pelvis. Do not allow dipping, side-lower back to sag. Return to start and repeat to other side (M). *Pikes:* Follow instructions in *Forearm* or *Hands*. This can be done in either position. Patient brings hips up toward ceiling by flexing at the hips, spine and knees remain straight. Return to start (N). (continued)



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Around the world: Follow instructions in *Forearm* or *Hands*. This can be done in either position. Patient picks up right hand and reaches forward, replaces on floor, and then follows with left. Patient then lifts left leg and abducts hip and then returns to start, followed by the same movement with the right leg. Cycle continues around going the same direction. Return to start (O1 through O4). *Walkouts:* Patient in standing, bends forward at the hips to reach for the floor. Once hands are on floor, patient walks hands out to full plank on hands and returns to start by piking hips as described in *Pikes* and walks hands back toward feet then extends hips and stands. Neutral spine must be maintained throughout movement. This is a very advanced plank (P1 through P4). *2-point plank: Supported:* Follow instructions in *Forearm* or *Hands*, place right foot on top of left ankle and left arm behind the back. Repeat to opposite sides (Q1). *Unsupported:* Follow instructions in *Forearm* or *Hands*, extend right hip and lift foot while flexing opposite shoulder and lifting hand off surface and reaching forward. Repeat to opposite sides (Q2). (continued)



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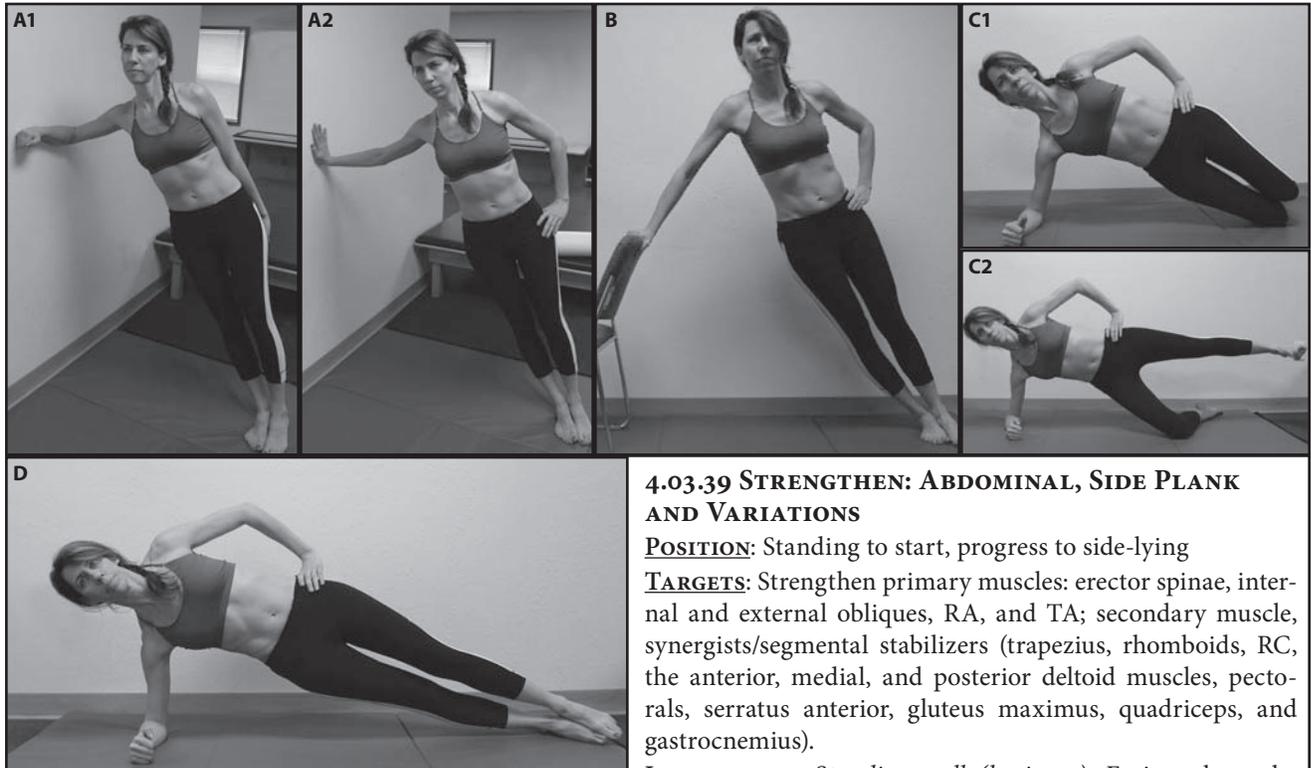
Tree plank: Follow instructions in *Forearm* or *Hands*, place right foot on inside of left knee. Repeat to opposite sides (R). **Hand to toe:** Follow instructions in *Forearm* or *Hands*, bring right foot off surface and bend knee while externally rotating and abducting hip, opposite hand comes off surface to reach down to touch the opposite foot. Repeat to opposite sides (S). **Out-ins:** Follow instructions in *Forearm* or *Hands*, bring right hand off surface and set out further to the side. Perform same movement on left side. Bring right hand back to start followed by left hand (T1 through T3). **Open rotation:** Follow instructions in *Forearm* or *Hands*, bring one hand off surface and rotate the hand up toward the ceiling while body turns to side plank position and weight shift off ipsilateral foot to lateral aspect of contralateral foot. Return to start. Make sure the humeral head is anchored into glenoid fossa; poor control of the shoulder could result in injury with this movement. Repeat to opposite side (U1 and U2). **Suspension straps:** Position patient's feet in straps so that tops of feet are in contact with strap. Patient then comes up to elbows or hands (advanced) while engaging the core and pelvic floor to maintain a neutral spine. Hold (V).

SUBSTITUTIONS: Neck should remain neutral and tucked slightly, gaze between hands, breathing normally during entire plank. With weightbearing through the hand, cupping/lifting of the palm is important and encourage weight distribution through all fingers. This will engage wrist flexors and decrease wrist stress. The modification for wrist issues is to bear weight through fist hands or use push-up blocks (E2 and E3). Shoulders are active and engaged, scapula depressed and retracted slightly. Patient maintains neutral spine. Head should stay aligned with sternum and chin tucked.

PARAMETERS: A-E, Q, R, V: Hold each position for 10 to 60 seconds, 3 to 5 repetitions; F-P, S-U: 10 repetitions, 1 to 3 sets; all exercises: 1 time per day or every other day.

Where's the Evidence?

Atkins (2014) assessed the neuromuscular activation of global core stabilizers when using suspension training techniques, compared to more traditional forms of isometric exercise. Eighteen male youth swimmers performed static bracing of the core using a modified plank position, with and without a Swiss ball, and held for 30 seconds. A mechanically similar plank was then held using suspension straps. Analysis of surface EMG activity revealed that suspension produced higher peak amplitude in the RA than using a prone or Swiss Ball plank. No difference was found between external oblique or erector spinae, concluding that suspension training noticeably improves engagement of anterior core musculature when compared to both lateral and posterior muscles.



4.03.39 STRENGTHEN: ABDOMINAL, SIDE PLANK AND VARIATIONS

POSITION: Standing to start, progress to side-lying

TARGETS: Strengthen primary muscles: erector spinae, internal and external obliques, RA, and TA; secondary muscle, synergists/segmental stabilizers (trapezius, rhomboids, RC, the anterior, medial, and posterior deltoid muscles, pectorals, serratus anterior, gluteus maximus, quadriceps, and gastrocnemius).

INSTRUCTION: *Standing wall (beginner):* Facing along the wall with feet together and 8 inches from wall, patient places elbows on a wall approximately 4 inches below shoulder height and walks feet away from the wall. Patient engages core muscles to maintain a neutral spine while pressing forearm into the wall (A1). Feet become stacked as the distance increases. Progress to hand on wall. Hold and breathe for up to 1 minute (A2). *Standing chair (beginner):* Place chair against and facing wall. Patient facing alongside wall behind the chair then places one hand on chair back and walks feet away from the chair. Patient engages core muscles to maintain a neutral spine while pressing hands into the back of the chair. Feet become stacked as the distance increases. Hold and breathe for up to 1 minute (B). *On elbow and knee (beginner):* Start in side-lying and bend bottom knee. Prop up on bottom elbow and place top hand on the hip. Engage core and lift torso to straighten the spine (C1). The top knee can be bent or straight (C2). Adding top shoulder horizontal abduction with extended elbow will increase intensity as patient reaches fingertips toward ceiling (C3). Hold and breathe for up to 1 minute. *On elbow and feet:* Start in side-lying with feet stacked. Prop up on bottom elbow and place top hand on the hip. Engage core and lift torso to straighten the spine (D). Adding top shoulder horizontal abduction with extended elbow will increase intensity as patient reaches fingertips toward ceiling. Hold and breathe for up to 1 minute. (continued)