

Movement	Modification and Scaling Options	Notes
Running	<ul style="list-style-type: none"> • Ski erg for meters equivalent to rowing meters (see notes) • Row the written distance with one leg, and use a skateboard to support the injured leg • Air bike 0.5 miles to replace a 400-meter run 	<p>Initially, athletes may need to perform the ski erg seated. As they are able to comfortably stand on one leg, even if still relying on crutches, they can move to a standing effort on the ski erg.</p> <p>With the air bike, athletes will not be able to vigorously push down on the pedal. Initially, they will anchor the unusable leg on the pegs of the air bike. Once the leg can tolerate range of motion and pressure, the athlete can let that leg travel through the pedal stroke.</p> <p>For running distances over 800 meters, consider scaling back the total distance on the ski erg or rower by 100-meter increments per 1,000 meters of distance (for example, a workout with 3,000 meters of running would equate to roughly 2,700 meters on the ski erg or rower).</p>
Double-unders	<ul style="list-style-type: none"> • Air bike arms only: 15 seconds = 15 double-unders • Ski erg 10-15 calories per 100 double-unders • Shoulder taps in a plank position 	<p>Because athletes will not be able to push down hard and aggressively on a bike, use the arms only on the air bike to mimic the metabolic stimulus of a double-under. See above in the notes section on running for guidance on sitting versus standing with the ski erg.</p> <p>For the shoulder taps in a plank position, athletes will be able to work the rigid body position needed in a double-under while also taxing the shoulders. Athletes can substitute 1 shoulder tap for 1 double-under (a workout with 100 double-unders = 100 shoulder taps in plank position).</p>
Rowing	<ul style="list-style-type: none"> • Use a skateboard for the healing leg (distance can be modified to mimic the same time domain as the prescribed row component) 	<p>The goal is to enable the athlete to get a metabolic response from the rower. Most athletes are able to do this with one leg. The coach may need to play with the damper setting for the athlete to ensure this can happen.</p> <p>Coaches should be aware that when scaling and modifying around the recovering leg, it is possible to overuse the healthy leg. It's important to keep in mind that when an individual is on crutches, the healthy leg is used all the time. Remember that in some instances, completely substituting the movement and body part used is an option.</p>
Kettlebell swings	<ul style="list-style-type: none"> • Single-leg deadlifts, holding onto a post • Seated high pulls • Seated double dumbbell swings 	<p>The dynamic aspect of a kettlebell swing is to be avoided in consideration of stability and safety. For the kettlebell swing, rely on the root pulling movement pattern of a deadlift.</p>

Squats	<ul style="list-style-type: none"> • Hip extensions off the front of a GHD • Single-leg squats to a box, assisted 	Hip extensions may be an option if the athlete is able to extend their leg fully. Also refer to the deadlift variations below for additional options for squat substitutions.
Deadlifts	<ul style="list-style-type: none"> • Single-leg deadlifts • Seated good mornings • Superman arches and holds • Straight-leg glute bridge lifts 	The deadlift can also be used to replace a squatting motion during the initial recovery phase.
Olympic lifts	<ul style="list-style-type: none"> • Seated dumbbell cleans • Seated dumbbell snatches • Seated presses 	Similar to a kettlebell swing, careful consideration should be taken with any movement that creates a dynamic effort for the healing athlete. In the initial phases of recovery, it is often best to avoid these dynamic efforts. Use the suggested scaling options listed to the left or consider using the root movement pattern. For example, a snatch could become a single-leg deadlift, and a push jerk could become a press. Additionally, a barbell can be used in place of the dumbbells.
Pull-ups	<ul style="list-style-type: none"> • Bar rows using a low bar • Strict pull-ups • Seated pull-ups • Bent-over rows, possibly with a single arm 	While it is possible for some athletes to do a pull-up while wearing a knee brace, careful consideration should be given to the risk/reward for the athlete navigating to the pull-up bar or performing a movement with momentum. Additionally, the jump down from the bar requires the athlete to land and balance on one leg. For strict pull-ups, scale the reps to between one-third and one-half of the total reps prescribed for kipping pull-ups.
GHD sit-ups	<ul style="list-style-type: none"> • Ab mat sit-ups with straight legs • V-ups or tuck-ups 	<p>Potentially set up the ab mat on a box so the athlete does not have to navigate to the floor each round of the workout.</p> <p>V-ups will require more strength and control of the injured leg than a tuck-up. Consider which option will allow the athlete to monitor and control the leg back to the ground for each rep.</p>
Toes-to-bars	<ul style="list-style-type: none"> • Ab mat sit-ups • Strict toes-to-bars • KB pull-overs 	While it is possible for some athletes to do a kipping toes-to-bar with the added weight of the knee brace, there is a risk of the athlete inadvertently driving the toes into the bar and setting back the recovery process of the injured leg. Utilize a strict toes-to-bar or KB pull-over to get at the movement pattern of a toes-to-bar.

<p>Box jumps</p>	<ul style="list-style-type: none"> • Air bike 12-15 calories • Row • Seated KB or DB deadlifts 	<p>Box jumps are one of the last movements to come back into the athlete's movement repertoire. When substituting a box jump, consider utilizing movements that will bias the metabolic conditioning element of the box jump (row) as much as biasing the posterior chain aspect of the movement (seated KB deadlift).</p>
<p>Handstand push-ups</p>	<ul style="list-style-type: none"> • Seated shoulder presses, using a barbell, dumbbells, or kettlebells • Stink bug push-ups 	<p>For most athletes, kicking up to a wall should be avoided given the precision required to avoid knocking or jamming the healing leg into the wall during the kick-up.</p>
<p>Burpees</p>	<ul style="list-style-type: none"> • Walk-out burpees with strict push-ups (half the reps of what is programmed to account for the time each rep will take) • Push-ups 	<p>Many athletes can safely navigate to the ground with a walk-out (inchworm to push-up position). This movement does take additional time, so consider decreasing the burpee reps for the athlete.</p>
<p>Muscle-ups</p>	<ul style="list-style-type: none"> • Seated strict muscle-ups • Seated muscle-ups with bands 	<p>For the athlete who is able to do a muscle-up, avoid the height of the rings by having them perform seated strict muscle-ups in workouts (decrease reps by one-third to one-half of what is programmed). For athletes who do not yet have a muscle-up, use a seated banded muscle-up.</p>

This scaling guide is designed to serve as a resource for coaches who are working with an athlete roughly 0-16 weeks post knee surgery. Specifically, the scaling options are framed for an athlete who is not able to bear weight on the healing leg. This sheet and the scaling and modification options included assume the athlete is on crutches. Specific safety considerations are taken to acknowledge there is an increased risk of falling that could be detrimental to the healing process. Additionally, for some scaling options, the athlete may require assistance in getting their equipment set up. Coaches should direct the other participants in the athlete's class to assist with equipment set-up and return. Finally, while some movements may be OK in the moment, an additional metric to consider is pain or swelling that develops the next day.

Jenni Orr (CF-L3) is a veteran Flowmaster for CrossFit Seminar Staff. She was a competitive and professional dancer since the age of 3 and suffered longtime wear and tear on her knees. In May of 2021, Orr decided to repair both knees with back-to-back surgeries (May 2021, Sept. 2021). The surgeries repaired the ACL and medial meniscus root. For both surgeries, Orr was on crutches for 6.5 weeks and avoided weight-bearing activities during that time. She trained 3-4 times per week during her recovery, often in a group class setting, and she employed many of the scaling and modification options listed above.