

### Theoretical Rational for Exercise Program

<b>Muscle Group</b>	<b>Exercise</b>	<b>Performance</b>	<b>Exercise Progression</b>
Transversus Abdominus	Abdominal bracing <sup>1</sup>	Patient is in supine with hips and knees flexed. Patient is instructed to draw in the lateral abdominal wall without holding the breath.	Goal – 10 contractions for 20 seconds each – then add bracing in standing and with bridging
	Abdominal bracing in standing	Patient is standing with lumbar spine against a wall. Bracing performed as above, patient is instructed to flex the hip and knees approximately 45° while maintaining bracing.	Goal – 20 wall slides
	Abdominal bracing with bridging	Bracing performed as above, patient instructed to lift the hips without extending the lumbar spine.	Goal – able to hold position for 10 seconds – begin with 10 repetitions
Erector Spinae/ Multifidus	Quadruped single leg lifts <sup>2,3</sup>	Patient is in quadruped, abdominal bracing is performed as above. The patient is instructed to extend one hip without extending the spine.	Goal – 20 lifts with each hip without pain – then add opposite arm and leg lifts
	Quadruped opposite arm and leg lifts	Exercise performed as above, except the opposite shoulder is flexed simultaneous with hip extension.	Goal – 20 lifts on each side without pain
Oblique Abdominals	Horizontal side support <sup>4,5</sup>	Patient is side-lying with hips extended and knee flexed 90°, propping on the elbow to create lumbar side-bending. Patient is instructed to lift the pelvis until the lumbar side-bending is eliminated.	Goal – 10 lifts on each side, with a hold time of 10 seconds, without pain – then progress to advanced side support exercise.
	Advanced horizontal side support	Exercise is performed as above except the knees are extended.	Goal – 10 lifts on each side, with a hold time of 10 seconds, without pain

## References

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5. Frank JW, Brooker AS, DeMaio SE, Kerr MS, Maetzel A, Shannon HS et al. Disability resulting from occupational low back pain. Part II: What do we know about secondary prevention? A review of the scientific evidence on prevention after disability begins. *Spine*. 1996; 21(24):2918-2929.