Lumbar Discectomy Post-Operative Rehabilitation Guidelines

- No driving while on narcotics
- No brace
- No scar mobilization for 3 months
- Education booklet prior to surgery (include smoking cessation)
- Progress as appropriate...all patients progress at different rates

Phase 1 (POD 1 - 3 weeks post-op)

Focus:

- Mobilization, correctly performing ADLs
    - Putting shoes on, correctly picking items off ground, etc
- Ambulation, endurance, posture
- Correct usage of assistive device
- Walking (goal of 30 minutes twice per day)

Phase 2 (3-6 weeks post-op)

- Begin regimented OP PT (2-3/week) for recommended 6-8 weeks (12-24 visits)
    - ODI + FABQ at initial eval
        - FABQ also at 6th visit
    - Education on precautions, anatomy/biomechanics, surgery, prognosis

Goals:

- Reduce pain (0-2/10 at rest)
- Maintain erect posture throughout 80% of the day
    - Encourage position changes, limiting sitting
    - Appropriate body mechanics
- Reestablish neuromuscular control of lumbar stabilizers
- Volitional contraction of TA, lumbar multifidi for 5 x 5 sec
- Improve LE strength/mobility
- Demonstrate appropriate functional movement within precautions
- Continue progressive walking program
- Independent with HEP
- Progress exercises once patient demonstrates proper form/technique and control of neutral spine with each repetition

Focus:

- Ambulation/endurance
    - Progress toward discontinuing assistive devices
    - Initiate aerobic conditioning
        - treadmill/track walking, recumbent bike
- Strengthening (legs, core, back)
    - Use light weights/pully system/resistance bands (note weight restriction for 3 mos)

- maintain neutral spine – 2 x 10,15,20 (progress c resistance bands):
    - wall squats
    - supine abdominal crunch (not a sit-up)
    - hook-lying bent knee fall outs
    - side-lying hip abduction/clamshells
    - prone hip extension
- Flexibility, mobility
    - Soft tissue mobilization for hypertonic paraspinal muscles
    - Bilateral LE stretching 3 x 30-45 seconds
        - gastroc/soleus, hamstrings, hip flexor
    - Encourage movement
        - Avoid sitting for prolonged periods of time (30-45 mins)
- Balance, POSTURE, gait training
    - Neuromuscular activation of lumbar stabilizers (multifidi, TA)
        - Abdominal isometrics, drawing in maneuver for TA, VC for volitional multifidus contraction
        - Diaphragmatic breathing
    - Maintain neutral spine (pelvic tilt, lumbar lordosis)
        - Pelvic Tilts (all directions)
    - Stabilization/functional activities
        - Lumbar stabilization 2x10 → 15 → 20
            - Hook-lying pelvic neutral (hip at 45°): marches → SL heel slide → leg lift c knee ext.
            - Dead bug: alt UE → alt. LE → alt. opposite UE/LE
            - Bridges
            - Bird Dog: alt. UE → alt. LE → alt. opposite UE/LE
            - Pelvic tilts
        - Functional movements
            - Bend with knees to reach towards floor
            - Shift weight, avoid twisting
            - Lift slow and close to body
            - Bring feet/leg up to self when donning/doffing socks, shoes
            - Scoot to front of chair before standing
- + / - pool therapy
- Control pain, inflammation
    - Ice modalities for pain/inflammation
- Facilitate healing of incision (watch for redness, drainage, swelling, etc)

<u>Suggested components for daily HEP:</u>

o Pain management - PRN

- Stretches as appropriate
- LE strengthening with neutral spine
- Postural awareness/pelvic tilts
- Abdominal hollowing/abdominal isometrics (in isolation and with extremity movement)
- **Progressive walking program** – walk as tolerated, wear pedometer, track # of steps
    - 1 mi in 20 mins at 6 weeks

Avoid:

- Lifting, push/pulling (yardwork, chores) >20 lbs up to 3 months post-op
- Stationary bike, rower
- Deep flexion/extension at hips
- Lumbar hyperextension
- Combination movements (bending, lifting, twisting at waist...BLTs)

Other Considerations/Precautions:

- Consult doctor for return to driving, returning to work
    - Return to work may be shorter for sedentary jobs
- Sitting
    - No longer than 30-45 mins
    - Back support, with feet flat, knees level with hips
- Avoid lotion/cream, submerging incision underwater until fully healed

Phase 3 (6 weeks - 3 months post-op)

Goals:

- Return to baseline standing/walking duration and distance
- Discharge visual biofeedback after 3-4 weeks
- Maintenance of trunk co-contraction throughout therapeutic activities
- Volitional contraction of TA and lumbar multifidi for 7 x 7 sec
- Maintenance of neutral spine during therapy interventions
- Improve trunk and LE strength
- Achieve functional ROM
- Demonstrate proper ergonomics and work simulation
- Continue progressive walking program
- 0-2/10 pain with activity
- Independent with HEP

Focus:

- Progress strength, endurance
    - Aerobic conditioning
        - Walking, treadmill

- Muscle strength of lumbar stabilizers (multifidi, TA)
    - Abdominal isometrics/hollowing
    - Dynamic, completing with trunk-co contraction (2-3x x 10 → 15 → 20)
        - Hook-lying pelvic neutral (hip at 90°): marches → SL heel slide → leg lift c knee ext.
        - sitting or standing pelvic neutral: alt. UE → marching → marching c alt. UE
        - SL bridges or DL c marches
        - prone and side-lying planks (on knees: 5-10 sec)
            - Can begin 2 months post-op
        - standing isometric core resistance c Thera band
        - standing pelvic neutral: shoulder ext, hor. abd., row, D1/D2 c Thera band (bil → uni)
    - LE strengthening with neutral spine (progress with resistance band, 2-3x 10 → 15 → 20)
        - Stability ball wall squats
        - Standing hip abduction, extension
        - Side stepping
        - Lunges (SP, FP)
        - SL deadlift
- Control pain/inflammation
- Trunk and LE mobility/flexibility
    - Dynamic BLE stretching (gastroc/soleus, hamstrings, hip flexor)
    - Lumbar spine ROM (flex/extension)
        - Quadruped rocking, cat/camel, prayer stretch
- Balance
    - DL → DL, EO → EC, no UE movement, stable → unstable surface
- Begin light ergonomics and simulated work activities
- Pain modulation
    - Grade I-II joint mobilizations above/below surgical site
    - ice/modalities

<u>Suggested components for daily HEP:</u>

- Stretches and ROM
- Trunk and LE strengthening/stabilization
- **Progressive walking program**
    - 2 mi in 30 mins at 9 weeks
    - 3 mi in 45 mins at 12 weeks

Avoid:

- Lifting >20 lbs up to 3 months post-op

Phase 4 (3+ months post-op)

- Can do scar mobilization at 3 months (Cross friction massage)
- ODI + FABQ at discharge
- Released to do most anything
    - Gradual progression with lifting
        - Extreme caution when lifting from ground...use good body mechanics, kneel down
        - Always avoid lifting with combo movements that require deep fwd hip flexion/bending/twisting...increases risk of re-herniation.
    - Gradual progression with strengthening

Goals:

- Volitional contraction of TA and lumbar multifidi for 10 x 10 sec
- 0/10 pain with all or most activities
- Able to tolerate work simulation activities without increase in symptoms
- Verbally understands the return-to-work progression
- Complete progressive walking program
- Independent with HEP
- Achieve *Oswestry Disability Index* MCID

Focus:

- Muscle endurance of lumbar stabilizers (multifidi and TA)
- Trunk and LE strengthening - 2-4x 10 → 15 → 20
    - Stabilization exercises
        - bridges on Dynadisc or BOSU
        - upward/downward chops (cable column)
        - prone and side-lying planks (off knees: 5-10 sec)
        - walkouts/rollouts on stability ball
        - cable column resistance walking (close to body → away from body or OH)
        - prone superman's
    - LE strengthening with neutral spine 2-4x 10 → 15 → 20 c progressive resistance or on unstable surface
        - squats (DL → SL)
        - SL deadlift on Dynadisc or BOSU
        - lateral band walks
        - lunges (add TP)
        - stability ball H/S curl
- Full duty work simulation
- High level balance activities
    - Rebounder toss, medicine ball rotations on stability ball, etc
- Aerobic conditioning
    - walking/treadmill

Suggested components for daily HEP:

o Maintenance therapy including lumbar stabilization exercises, trunk and LE strength/mobility, proper lifting, and functional movement, etc.

o **Continue progressive walking program**

Recommendations for return to work based on job type:

Work Type:	**Return to Work:**
Sedentary (<10lbs) or Light (frequently 10lbs, occasionally 20lbs)	After 6-8 weeks, with limited sitting duration for 30 min at a time for 6 weeks
Moderate (frequently 20lbs, occasionally 50lbs)	At 6-12 weeks, patient may return to light duty if available – no lifting >10lbs At 12-14 weeks, return to full duty – no lifting >25lbs
Heavy (frequently 50lbs, occasionally 100lbs)	At 6-12 weeks, patient may return to light duty if available – no lifting >10lbs At 12-20 weeks, moderate duty – no lifting >25lbs At 20-22 weeks, return full duty

Creation date: March 2008
Latest revision date: April 2022

Authors

Jordan Hudson DPT

Sean Meers DPT

Reviewers

Andrew Grossbach MD, Neurological Surgery, The Ohio State University Wexner Medical Center

Jonathan Karnes MD, Orthopaedic Surgery, The Ohio State University Wexner Medical Center

Safdar Khan MD, Orthopaedic Surgery, The Ohio State University Wexner Medical Center

Varun Singh MBBS, Orthopaedic Surgery, The Ohio State University Wexner Medical Center

Stephanus Viljoen MD, Neurological Surgery, The Ohio State University Wexner Medical Center

Elizabeth Yu MD, Orthopaedic Surgery, The Ohio State University Wexner Medical Center

Jennifer Belu APRN-CNP PT, The Ohio State University Wexner Medical Center

Donald Miller Jr PA-C, The Ohio State University Wexner Medical Center

Julia Rose Ed. D., PA-C, The Ohio State University Wexner Medical Center

References

Arokoski JP, Valta T, Airaksinen O, Kankaanpaa M. Back and abdominal muscle function during stabilization exercises. *Arch Phys Med Rehabil*. 2001;82(8):1089-1098.

Bono CM, Leonard DA, Cha TD, et al. The effect of short (2-weeks) versus long (6-weeks) post-operative restrictions following lumbar discectomy: a prospective randomized control trial. *European Spine Journal.* 2016;26 (3):905-912.

Danielsen JM, Johnsen R, Kibsgaard SK, Hellevik E. Early aggressive exercise for postoperative rehabilitation after discectomy. *SPINE*. 2000;25:1015-20.

Davidson KL, Hubley-Kozey CL. Trunk muscle responses to demands of an exercise progression to improve dynamic spinal stability. *Arch Phys Med Rehabil*. 2005;86(2):216-223.

Distefano LJ, Blackburn JT, Marshall SW, Padua DA. Gluteal Muscle Activation During Common Therapeutic Exercises. *Journal of Orthopaedic & Sports Physical Therapy*. 2009;39(7):532-540.

Donaldson BL, Shipton EA, Inglis GI, Rivett D, Frampton C. Comparison of usual surgical advice versus a nonaggravating six-month gym-based exercise rehabilitation program post-lumbar discectomy: results at one-year follow-up. *Spine J*. 2006;6:357-63.

Ekstrom RA, Donatelli RA, Carp KC. Electromyographic Analysis of Core Trunk, Hip, and Thigh Muscles During 9 Rehabilitation Exercises. *Journal of Orthopaedic & Sports Physical Therapy*. 2007;37(12):754-762.

Erdogmus CB, Resch KL, Sabitzer R, Muller H, Nuhr M, Schoggl A, *et al.* Physiotherapy-based rehabilitation following disc herniations operation. Results of a randomized clinical trial. *SPINE*. 2007;32:2041-9.

Filiz M, Cakmak A, Ozcan E. The effectiveness of exercise programmes after lumbar disc surgery: a randomized controlled study. *Clin Rehab*. 2005;19:4-11.

Hebert JJ, Fritz JM, Thackeray A, Koppenhaver SL, Tehhen D. Early multimodal rehabilitation following lumbar disc surgery: a randomised clinical trial comparing the effects of two exercise programmes on clinical outcome and lumbar multifidus muscle function. *British Journal of Sports Medicine*. 2013;0:1-8.

Hebert JJ, Marcus RL, Koppenhaver SL, Fritz JM. Postoperative Rehabilitation Following Lumbar Discectomy With Quantification of Trunk Muscle Morphology and Function: A Case Report and Review of the Literature. *Journal of Orthopaedic & Sports Physical Therapy*. 2010;40(7):402-412.

Kalfas, I. (2001). Principles of bone healing. Neurosurgical Focus, 10(4), 1-4.

Kulig et al. An intensive, progressive exercise program reduces disability and improves functional performance in patients after single-level lumbar microdiskectomy. *Phys Ther*. 2009:89:1145-1157.

McGregor AH, Dore CJ, Morris TP, Jamrozik K. Function after spinal treatment, exercise and rehabilitation (FASTER): improving the functional outcome of spinal surgery. *BMC Musculoskeletal Disorders*. 2010:11.

McGregor AH, Burton AK, Sell P, Waddell G. The development of an evidence-based patient booklet for patients undergoing lumbar discectomy and un-instrumented decompression. *Eur Spine J*. 2007:16;339-346.

McPherson SL, Watson T. Training of Transversus Abdominis Activation in the Supine Position with Ultrasound Biofeedback Translated to Increased Transversus Abdominis Activation During Upright Loaded Functional Tasks. *PM&R*. 2014. doi:10.1016/j.pmrj.2013.11.014.

Moon HJ, Choi KH, Kim DH, et al. Effect of lumbar stabilization and dynamic lumbar strengthening exercises in patients with chronic low back pain. *Annals of Rehabilitation Medicine.* 2013;37(1):110-117.

Ostelo R, de vet HC, Waddell G, Kerckhoffs, MR, Leffers P, van Tulder M. Rehabilitation following first time lumbar disc surgery: a systematic review within the framework of the Cochrane collaboration. *SPINE*. 2003:28;209-218.
Dolan P, Greenfield K, Nelson RJ, Nelson IW. Can exercise therapy improve the outcome of microdisectomy? *SPINE*. 2000;25:1523-32.

Ostelo RWJ, Pena Costa LO, Maher CG, de Vet HCW, van Tulder MW. Rehabilitation After Lumbar Disc Surgery. An Update Cochrane Review. *SPINE*. 2009;(34)17:1839-1848.

Poppert EM, Kulig K. Rehabilitation following lumbar diskectomy. *Physical Therapy.* 2013;93(5): 591-596.

Rushton A, Wright C, Goodwin P, Calvert M, Freemantle N. Physiotherapy Rehabilitation Post First Lumbar Discectomy. *SPINE*. 2011;36(14):E961-E972.

Selkowitz DM, Kulig K, Poppert EM, Flanagan SP, Matthews ND, Beneck GJ, Popovich JM, Lona JR, Yamada KA, Burke WS, Ervin C, Powers CM. The immediate and long-term effects of exercise and patient education on physical, functional, and quality-of-life outcome measures after single-level lumbar microdiscectomy: a randomized controlled trial protocol. *BMC Musculoskeletal Disorders*. 2006;7(70):doi:10.1186/1471-2474-7-70.

Tudor-Locke C, Bassett DR. How many steps/day are enough? Preliminary pedometer indices for public health. *Sports Med*. 2004;34(1):1-8.

Tudor-Locke C, Hatano Y, Pangrazi RP, Kang M. Revisiting "how many steps are enough?". *Med Sci Sports Exerc*. 2008;40(7 Suppl):S537-543.