Regence

Medical Policy Manual Surgery, Policy No. 145

Automated Percutaneous and Percutaneous Endoscopic Discectomy

Effective: January 1, 2026

Next Review: July 2026
Last Review: December 2025

IMPORTANT REMINDER

Medical Policies are developed to provide guidance for members and providers regarding coverage in accordance with contract terms. Benefit determinations are based in all cases on the applicable contract language. To the extent there may be any conflict between the Medical Policy and contract language, the contract language takes precedence.

PLEASE NOTE: Contracts exclude from coverage, among other things, services or procedures that are considered investigational or cosmetic. Providers may bill members for services or procedures that are considered investigational or cosmetic. Providers are encouraged to inform members before rendering such services that the members are likely to be financially responsible for the cost of these services.

DESCRIPTION

Automated percutaneous and percutaneous endoscopic discectomy are techniques used to remove spinal disc material for treatment of herniated discs.

MEDICAL POLICY CRITERIA

Note: This policy does *not* address intradiscal electrothermal annuloplasty (IDET), percutaneous intradiscal radiofrequency thermocoagulation (PIRFT), or laser discectomy and radiofrequency disc decompression which are considered in separate medical policies (see Cross References below).

Automated percutaneous and percutaneous endoscopic discectomy are considered **investigational** as techniques for intervertebral disc decompression in patients with back pain and/or radiculopathy related to disc herniation in the lumbar, thoracic, or cervical spine.

NOTE: A summary of the supporting rationale for the policy criteria is at the end of the policy.

CROSS REFERENCES

1. Percutaneous Intradiscal Electrothermal Annuloplasty, Radiofrequency Annuloplasty, and Biacuplasty, Surgery, Policy No. 118
2. Decompression of Intervertebral Discs Using Laser Energy (Laser Discectomy) or Radiofrequency Energy (Nucleoplasty), Surgery, Policy No. 131
3. Image-Guided Minimally Invasive Spinal Decompression (IG-MSD) for Spinal Stenosis, Surgery, Policy No. 176

BACKGROUND

Back pain or radiculopathy related to herniated discs is an extremely common condition and a frequent cause of chronic disability. Surgical decompression is often considered when the pain is unimproved with conservative therapy and is clearly neuropathic in origin, resulting from irritation of the nerve roots.

This policy addresses automated percutaneous and percutaneous endoscopic removal of disc material as minimally invasive alternatives to open surgical excision for disc decompression. Automated percutaneous discectomy involves placement of a probe within the intervertebral disc and aspiration of disc material using a suction cutting device. Endoscopic discectomy involves the percutaneous placement of a working channel under image guidance, followed by visualization of the working space and instruments through an endoscope, and aspiration of disc material. Endoscopic discectomy may also be referred to as arthroscopic discectomy.

REGULATORY STATUS

The Stryker DeKompressor® Percutaneous Discectomy Probe (Stryker), Herniatome Percutaneous Discectomy Device (Gallini Medical Devices), and the Nucleotome® (Clarus Medical) are examples of percutaneous discectomy devices that received clearance from the U.S. Food and Drug Administration (FDA) through the 510(k) process. Both have the same labeled intended use, i.e., “for use in aspiration of disc material during percutaneous discectomies in the lumbar, thoracic and cervical regions of the spine.”

A variety of endoscopes and associated surgical instruments have received marketing clearance through the FDA’s 510(k) process.

EVIDENCE SUMMARY

The primary beneficial outcomes of interest for treatment of spinal pain are relief of pain and improved function. Both outcomes are subjective and can be influenced by nonspecific effects, placebo response, and the variable natural history of the disease. Therefore, large, blinded, randomized controlled trials (RCTs) with long-term follow-up are necessary to establish the safety and efficacy of automated percutaneous and percutaneous endoscopic discectomy compared with open surgical discectomy, the current standard of care for surgical removal of damaged intervertebral disc material. These comparisons are necessary to determine whether any beneficial treatment effects of percutaneous and endoscopic discectomy outweigh any risks and provide a significant advantage over conventional open discectomy techniques.

AUTOMATED PERCUTANEOUS DISCECTOMY (APD)

Systematic Reviews

Several systematic reviews (SRs) have been published since 2007.[1-7] Four comparative trials have been published on APD, two comparing APD to chymopapain chemonucleolysis[8, 9] and two comparing APD to microdiscectomy[10, 11]. These trials suggested that APD produced inferior results to either of the established procedures, though the patient selection criteria may have been inappropriate in the Revel (1993) trial[8]. The authors of the systematic reviews reached similar conclusions, that while there is considerable evidence of efficacy for conventional surgical discectomy, there is insufficient evidence on percutaneous discectomy techniques including APD to draw firm conclusions. “Trials of automated percutaneous discectomy and laser discectomy suggest that clinical outcomes following treatment are at best fair and certainly worse than after microdiscectomy, although the importance of patient selection is acknowledged.[1]” A 2015 network meta-analysis found that percutaneous discectomy was one of the least effective treatment strategies for sciatica of 21 assessed.[12]

The four RCTs reviewed in the SRs had several methodological limitations including small size, high loss to follow-up, inadequate randomization procedure, between-group heterogeneity, and other significant design flaws. For example, the LAPDOG study was initially designed to recruit 330 patients, but only was able to recruit 36 patients for reasons that were not readily apparent to the authors.[11] Of the evaluable 27 patients, 41% of the percutaneous discectomy patients and 40% of the conventional discectomy patients were assessed as having successful outcomes at six months. The authors concluded that this trial was unable to enroll sufficient numbers of patients to reach a definitive conclusion. The authors stated, “It is difficult to understand the remarkable persistence of percutaneous discectomy in the face of a virtually complete lack of scientific support for its effectiveness in treated lumbar disc herniation.”

In a 2013 review for their practice guideline[13], the American Society of Interventional Pain Physicians noted that “the available literature on Dekompressor illustrates the common shortcomings of observational studies of interventions. Even though Dekomporssor may be considered a new interventional modality, the early studies were published approximately eight years ago. Consequently, one would expect that the technique’s continued use would be supported by more recent, high quality evaluations. Even though all the studies are of moderate quality, they lack scientific rigor because of their observational, albeit prospective, design. Further, these studies do not include sufficiently large numbers of patients.”

Randomized Controlled Trials

No RCTs were identified after the search dates of the systematic review.

ENDOSCOPIC DISCECTOMY

Systematic Reviews

Li (2022) published a systematic review comparing endoscopic discectomy to non-endoscopic discectomy for the treatment of symptomatic lumbar disc herniation.[14] A total of 25 studies were added, with 20 studies comparing endoscopic discectomy to non-endoscopic discectomy and five studies comparing percutaneous endoscopic transforaminal discectomy (PETD) to percutaneous endoscopic interlaminar discectomy (PEID). Operation time was longer and intraoperative blood loss volume was lower for microendoscopic discectomy (MED) compared to open discectomy. Complication rates were lower for percutaneous endoscopic lumbar discectomy (PELD) compared to fenestration discectomy and also for full-endoscopic discectomy compared to microscopic discectomy. The authors reported that there are some

potential advantages to endoscopic discectomy procedures, however more high quality randomized trials with large sample sizes are needed.

Zhang (2022) published a systematic review comparing percutaneous transforaminal endoscopic discectomy (PTED) to open lumbar discectomy in patients with lumbar disc herniations.[15] Nine studies were included in the review with a total of 1679 patients. There were no significant difference in excellent rates (OR = 1.47, 95% CI: 0.94-2.28, P= 0.09), reoperation rates (OR = 0.96, 95% CI: 0.50-1.84, P = 0.90), length of operation (SMD = -17.97, 95% CI: -54.83-18.89, P = 0.34], and the amount of intraoperative blood loss (SMD = -128.05, 95% CI: -258.67-2.57, P = 0.05), respectively. There were significant differences in complication rates (OR = 0.22, 95% CI: 0.14-0.33, P < 0.001), length of incision (SMD = -2.76, 95%CI: -2.88--2.65, P < 0.001), and length of hospital stay (SMD = -5.19, 95%CI: -5.36--5.01, P < 0.001), respectively. The authors concluded that PTED shows better outcomes for complication rate, incision size, and length of hospital stay compared to standard discectomy, however there was heterogeneity in inclusion criteria, baseline characteristics, and follow-up time in the included studies. Additionally, comparisons for each outcome were not equal and some comparison of outcomes had relatively small numbers of trials.

Zhang (2022) published a systematic review of nine, nonrandomized trials evaluating the safety and efficacy of percutaneous endoscopic cervical discectomy (PECD) in patients with cervical disc herniation.[16] The pooled results demonstration that VAS scores at one week follow-up and at last follow-up (varying times) were significantly lower than baseline VAS scores. The authors also reported pooled results showing decreased operative time and hospital stays for PECD compared to anterior cervical discectomy and fusion (ACDF). There is a need for high quality randomized trials with long-term follow-up and comparison to standard of care procedures, such as ACDF, to establish the clinical utility of PECD in patients with cervical disc herniation.

Zhao (2022) published a systematic review comparing PELD to MED and traditional open surgery for the treatment of lumbar disc herniation.[17] A total of 6467 cases across 33 studies were included in the review which assessed several outcomes such as blood loss, recovery time, VAS for pain, ODI, and revision or recurrence rates. PELD showed superior results compared to MED in some outcomes (e.g., blood loss, postoperative bed time, hospital stay duration), but show inferior results in other outcomes like revision and recurrence rates. Other outcomes were similar across groups including operation times, postoperative VAS for leg pain, and operation success. Additional studies are needed to demonstrate superior efficacy and outcomes for PELD compared to existing standards of care.

Bai (2022) published a systematic review with meta-analysis of 14 studies (N=2,528) comparing PELD to other surgical approaches to lumbar disc herniation (LDH).[18] Outcomes evaluated were success rate, recurrence rate, complication rate, operation time, hospital stay, blood loss, visual analog scale (VAS) score for back pain and leg pain, 12-item Short Form Health Survey (SF12) physical component score and mental component score, Japanese Orthopaedic Association Score, and Oswestry Disability Index. PELD had favorable clinical outcomes for PELD compared to other surgical approaches, including shorter operation time (weight mean difference, WMD=-18.14 minutes, 95% CI -25.24, -11.05; p<0.001) and hospital stay (WMD = -2.59 days, 95% CI -3.87, -1.31; p<0.001), less blood loss (WMD = -30.14 ml, 95% CI -43.16, -17.13; p<0.001), and improved SF12- mental component score (WMD = 2.28, 95% CI 0.50, 4.06; p=0.01) and physical component score (WMD = 1.04, 95% CI 0.37, 1.71; p=0.02). No significant difference between the PELD group and other surgical group was found

in success rate, complication rate, or other clinical outcomes assessed. PELD was associated with a significantly higher rate of recurrent disc herniation (relative risk [RR] = 1.65, 95% CI 1.08, 2.52; p=0.02).

Chen (2020) published a SR with meta-analysis comparing complication rates of surgical treatments of symptomatic lumbar disc herniation which included discectomy/microdiscectomy (OD/MD), MED, PELD, percutaneous laser disc decompression (PLDD), and tubular discectomy.[19] The review included 17 RCTs and 20 cohort studies. Overall complication rates of 16.8% and 16.1%, 21.2%, 5.8%, 8.4%, and 25.8% were found for RCTs evaluating OD/MD, MED, PELD, PLDD, and tubular discectomies, respectively. Moderate-quality evidence was found suggesting that, compared to OD/MD, PELD had a lower risk of overall complications (RR = 0.52, 95% CI 0.29-0.91) and high-quality evidence suggesting a lower risk of Type I complications (RR = 0.37, 95% CI 0.16-0.81). Compared with the data from cohort studies, there was low-quality evidence reported suggesting a higher risk of reherniations (RR = 1.67,95% CI 1.05-2.64) and reoperations (RR = 1.75, 95% CI 1.20-2.55) for PELD compared to OD/MD.

A SR with meta-analysis published by Xu (2020) evaluated mid- and long-term outcomes in single-level lumbar disc herniation treated with PELD or MED.[20] One prospective RCT and eight retrospective nonrandomized comparative studies were included (PELD N=468, MED N=516). Although no difference between groups within 24 months were found, at 24 months postoperative, significantly better outcomes were found in the PELD group compared to MED for low back pain visual analog scale score and Oswestry Disability Index (ODI) score (OR=-0.856, 95% CI -1.488 to -0.224, p=0.008; OR=-0.425, 95% CI -0.724 to -0.127, p=0.005). No significant differences were found in complication, recurrence, or reoperation rates at any timepoint reported.

Yu (2019) compared PTED to MED in a SR of eight comparative studies with a total of 805 patients.[21] Hospital stay, time in bed, incision length were shorter with PTED, but there were not differences between the interventions in surgical time or intraoperative blood loss. Visual Analogue Scale (VAS) back and leg pain scores were similar between groups at most time points, with the exception of lower leg pain VAS score at one week in the PTED group.

A meta-analysis by Alvi (2018) included 14 RCTs or quasi-randomized trials (total n=1,707), and compared OD/MD to minimally invasive procedures including percutaneous discectomy, percutaneous endoscopic discectomy (PED), and tubular discectomy (TD) for lumbar disc herniation.[22] All of the studies were determined to have a serious risk of bias and were judged to be of low or very low quality. No differences were seen between groups for VAS score. ODI score was lower for TD than for other procedures at one year (mean difference 1.17, 95% confidence interval [CI] 0.10 to 2.24, p=0.03), and at last follow-up, ODI scores were worse with OD/MD compared to TD and PED (mean difference 2.61, 95% CI 0.88 to 4.65, p=0.03). Open procedures were also associated with longer hospital stays and greater blood loss. TD was associated with a greater rate of complications and recurrent herniations than the other procedures, while MD/OD had significantly lower rates of recurrent herniations and revision surgery than TD or PED.

A meta-analysis by Ding (2018) compared PTED to fenestration discectomy (FD) in patients with lumbar disc herniation.[23] There were 17 studies included in the analysis, and all were retrospective studies. There were 733 patients who had PTED and 657 who had FD. There was no difference between groups for VAS score, but the PTED group had shorter operation,

bed rest, and hospitalization times (all p<0.00001), less bleeding (p<0.00001), and a lower postoperative ODI score (p=0.02). Long-term outcomes were not assessed in this study.

Phan (2017) published a SR comparing full endoscopic discectomy (FED) and MED with open discectomy for the treatment of lumbar disc herniation.[24] A database search through February 2016 identified 23 studies for inclusion. FED was favorable compared with open discectomy in surgery duration, hospital length of stay (LOS), and blood loss. MED was favorable compared with open discectomy in LOS and blood loss. Both endoscopic procedures were comparable to open discectomy as measured on a VAS for leg pain and ODI score. In terms of patient satisfaction, FED was more favorable than open discectomy and MED was comparable to open discectomy. The authors concluded that FED and MED are safe alternatives to other procedures, but more RCTs are needed to investigate and validate these as options for discectomies.

Li (2016) published a SR comparing FED with traditional discectomy surgery.[25] The search was conducted in January 2015 and resulted in the inclusion of four RCTs and two non-RCTs. FED for herniation (both cervical and lumbar) was favorable compared with traditional discectomy in operative duration, blood loss, length of stay, and return to work days. Clinical outcomes were comparable between FED and traditional discectomy. The authors concluded FED is effective, but larger RCTs with long-term follow-up are needed.

A 2016 meta-analysis identified nine RCTs (total n=1,092 patients) that compared endoscopic to open discectomy for lumbar disc herniation.[26] Endoscopic discectomy resulted in clinical outcomes similar to open discectomy, but had significantly greater patient satisfaction, lower intraoperative blood loss, and shorter hospital lengths of stay.

He (2016) reported results from another meta-analysis of five RCTs (n=501 patients) comparing outcomes from MED and open discectomy for patients with lumbar herniation.[27] Pooled analysis found no difference in VAS, ODI, or complication between the two groups. MED was associated with less blood loss, shorter length of hospital stay, and longer operation time.

A Cochrane review (2014) of literature through 2013 evaluated 11 studies of minimally invasive discectomy compared with microdiscectomy/open discectomy. Seven of the studies reviewed[10, 28-33] were rated as having a high risk of bias and the remaining four studies[34-37] were rated as having a low risk of bias. Included in the review were eight RCTs or quasi-RCTs that evaluated percutaneous endoscopic lumbar discectomy.[38] Also included were three studies on transmuscular tubular microdiscectomy and automated percutaneous lumbar discectomy. The review concluded that minimally invasive discectomy may be inferior in terms of relief of leg pain, low back pain, and rehospitalization; however, differences in pain relief appeared to be small and may not be clinically important. In addition, potential advantages of minimally invasive discectomy are a lower risk of surgical site infection and shorter hospital stay. Because of these potential advantages, the authors concluded that more research was needed to define the indications for minimally invasive discectomy.

Smith (2013) published a SR of MED for lumbar disc herniation.[39] A search was conducted for controlled trials published after the 2007. The Gibson and Waddel (2007) Cochrane review through September 2012 identified four RCTs. None of the studies found a significant difference in ODI scores compared with open discectomy or microdiscectomy. In the largest study, which included 240 patients, Teli (2010) reported an increase in the number of severe complications in the microendoscopic discectomy group.[36] In another large study with 112

patients Garg (2011) found a shorter hospital stay with no significant changes in ODI or complication rates but recommended that microendoscopic discectomy should not be attempted without appropriate training.[28] The two other trials included in the review were small, with 22[29] and 40[30] patients.

Randomized Controlled Trials

The following is a summary of randomized or quasi-randomized trials that were not included in the above systematic reviews.

Cervical disc decompression

Ruetten (2009) compared anterior endoscopic discectomy with anterior cervical discectomy and fusion (ACDF) in 120 patients with mediolateral cervical disc herniations.[40] The duration of pain ranged from 4 to 128 days. The mean operating time was 32 minutes for the endoscopic discectomy compared to 62 minutes for ACDF. In the endoscopic discectomy group, bone resection was required to reach the epidural space or the foramen in 55% of cases. At 24 months, 103 patients (86%) were available for follow-up examinations. The revision rate was 6.1% for ACDF and 7.4% for endoscopic discectomy; these were not significantly different. Excluding four patients who were revised by ACDF, 85 patients (85.9%) had no arm pain; there were no significant differences in clinical outcomes between the two groups. Advantages and disadvantages of the anterior endoscopic approach were discussed, including a difficult learning curve.

Lumbar disc decompression

Gadradj (2022) published the results of a RCT in 613 patients who underwent percutaneous transforaminal endoscopic discectomy (PTED, n=179) or conventional open microdiscectomy (n=309) for the treatment of lumbar disc herniation.[41] The primary outcome was self-reported leg pain measured by a 0-100 visual analogue scale and secondary outcomes included complications, reoperations, self-reported functional status as measured with the Oswestry Disability Index, visual analogue scale (VAS) for back pain, health related quality of life, and self-perceived recovery. At 12 months post-procedure, VAS scores for leg pain were lower in the PTED group (median 7.0, IQR 1.0-30.0) compared to the open microdiscectomy group (16.0, 2.0-53.5) (between group difference 7.1, 95% CI 2.8 to 11.3). Within one year, nine (5%) in the PTED group compared with 14 (6%) in the open microdiscectomy group had repeated surgery. This study was limited by lack of blinding.

Ran (2021) published the results of a RCT in 68 patients with highly migrated lumbar disc herniation who were randomized to computerized tomography (CT) navigation percutaneous spinal endoscopy (n=35) or open discectomy (n=33).[42] Although at one week post-procedure, VAS sores for back pain were significantly lower in the endoscopic group (1.30 ± 1.07 versus 2.44 ± 0.72, p< 0.01), at 12 months post-procedure, VAS scores were not statistically different between groups (0.58 ± 0.90 versus 0.75 ± 0.84, p=0.58). Limitations to the study design include unclear allocation concealment, apparent lack of blinding, and no power calculations reported.

Wang (2019) compared PTED to MED in a trial of 90 patients with lumbar disc herniation at a single center in China.[43] Patients in the PTED group had significantly better surgical and immediate postoperative outcomes (length of surgical incision, bleeding, postoperative bedridden time and hospital stay), while the MED group had shorter surgical time. Both groups

improved from baseline on low back pain VAS scores at three days, three months, and six months. Both groups also improved on ODI scores and there were no differences between groups postoperatively or up to six months after surgery.

Gibson (2017) published a RCT comparing transforaminal endoscopic discectomy (TED) with microdiscectomy.[44] Patients with single-level lumbar prolapse and radiculopathy were randomized to TED under conscious sedation (n=70) or to microdiscectomy under general anesthesia (n=70). Both procedures resulted in comparable improvements in outcomes (ODI scores, VAS back pain, VAS leg pain, SF-36 scores) at three months, one year, and two years compared with baseline. The trial noted limitations including being non-blinded.

Hussein (2014) reported the outcomes of 200 patients randomized to either microendoscopic lumbar discectomy (n=95) or to a control group in which patients underwent open lumbar discectomy (n=90).[45] The patients and investigators were not blinded to the treatment assignments. By eight years follow-up, data was available for 185 patients; 15 patients were lost to follow-up, 10 due to subsequent same-level fusion, three due to death unrelated to surgery, and two who did not response to telephone calls. Relief of leg pain was statistically significant for both groups, with no significant between-group difference. Back pain was significantly improved in the endoscopic group throughout the entire follow-up period. However, in the control group the significant improvement in back pain following surgery deteriorated over time; by eight years follow-up, back pain scores in this group had worsened significantly from preoperative scores. There were no serious complications in either group.

Nonrandomized Studies

Yu (2021) published the results of a retrospective multicenter study that followed patients for two years after receipt of transforaminal percutaneous endoscopic discectomy (n=632) and microendoscopic discectomy (n=421) for lumbar disc herniation.[46] Mean blood loss ($p<0.001$) and mean duration of hospital stay ($p=0.018$) were significantly less with transforaminal percutaneous endoscopic lumbar discectomy compared to microendoscopic discectomy. Rates of complications, recurrence, and revisions were similar in both groups. Visual analogue pain scores did not differ between groups after the first postoperative day. At 1 month postoperatively there was a significant difference in ODI scores between groups ($p=0.016$) in favor of transforaminal percutaneous endoscopic discectomy, but there was no difference at other time points.

Song (2021) published a retrospective single-center study that compared percutaneous endoscopic lumbar discectomy (n=306) and microendoscopic discectomy (n=116) in patients undergoing same day ambulatory surgery for lumbar disc herniation.[47] Mean blood loss and mean duration of hospital stay were significantly less with percutaneous endoscopic lumbar discectomy (both $p<0.001$ compared to microendoscopic discectomy). After three years of follow-up, visual analogue pain scores for the back were also significantly lower in the percutaneous endoscopic lumbar discectomy group compared to the microendoscopic discectomy group ($p=.001$) but there was no difference between groups in pain scores for the legs ($p=0.224$). Overall recurrence rates ($p=0.201$) and ODI scores ($p=0.220$) were also similar between groups.

PRACTICE GUIDELINE SUMMARY

AMERICAN SOCIETY OF INTERVENTIONAL PAIN PHYSICIANS (ASIPP)[13]

In 2013, a task force of the ASIPP published updated guidelines for interventional techniques in the management of chronic spinal pain. The evidence for APD and for percutaneous lumbar discectomy was rated as limited for short- and long-term relief based on all observational studies. An evidence rating of “limited” is defined as evidence insufficient to assess effects on health outcomes because of limited number or inadequate power of studies, large and unexplained inconsistency between higher-quality trials, important flaws in trial design or execution, gaps in the chain of evidence, or lack of information on important health outcomes. The ASIPP concluded that this technique may be performed when indicated, but did not provide patient selection criteria. Nor was the recommendation graded; the authors indicated only that this recommendation was based on “individual experience and the large amount of literature.” Therefore, this recommendation is not considered evidence-based.

NORTH AMERICAN SPINE SOCIETY (NASS)[48]

The 2014 practice guidelines from the NASS on the diagnosis and treatment of lumbar disc herniation with radiculopathy recommended that endoscopic percutaneous discectomy or automated percutaneous discectomy could be considered for the treatment of these patients. Both recommendations were grade C recommendations (poor quality evidence). However, a separate recommendation stated that evidence is insufficient to recommend for or against use of automated percutaneous discectomy compared with open discectomy.

THE AMERICAN SOCIETY OF PAIN AND NEUROSCIENCE (ASPN)[49]

ASPN (2022) published clinical guidance for interventional treatments for low back pain. The guideline states that discectomy procedures (such as percutaneous and endoscopic disc procedures) have favorable safety and efficacy profiles for the treatment of lumbar disc herniation with persistent radicular symptoms; however, it is stated that further research is needed to evaluate complications rates in order for these procedures to supplant classic open microdiscectomy.

SUMMARY

There is not enough research to show that automated percutaneous or percutaneous endoscopic discectomy improves health outcomes for people with back pain and/or radiculopathy related to disc herniation in the lumbar, thoracic, or cervical spine. Therefore, automated percutaneous or percutaneous endoscopic discectomy is considered investigational for people with back pain and/or radiculopathy related to disc herniation in the lumbar, thoracic, or cervical spine.

REFERENCES

1. Gibson JN, Waddell G. Surgical interventions for lumbar disc prolapse. *Cochrane Database Syst Rev.* 2007(2):CD001350. PMID: 17443505
2. Freeman BJ, Mehdian R. Intradiscal electrothermal therapy, percutaneous discectomy, and nucleoplasty: what is the current evidence? *Curr Pain Headache Rep.* 2008;12(1):14-21. PMID: 18417018

3. Hirsch JA, Singh V, Falco FJ, et al. Automated percutaneous lumbar discectomy for the contained herniated lumbar disc: a systematic assessment of evidence. *Pain Physician.* 2009;12(3):601-20. PMID: 19461826
4. Singh V, Benyamin RM, Datta S, et al. Systematic review of percutaneous lumbar mechanical disc decompression utilizing Dekompressor. *Pain Physician.* 2009;12(3):589-99. PMID: 19461825
5. Vorobeychik Y, Gordin V, Fuzaylov D, et al. Percutaneous mechanical disc decompression using Dekompressor device: an appraisal of the current literature. *Pain Med.* 2012;13(5):640-6. PMID: 22494347
6. Manchikanti L, Singh V, Calodney AK, et al. Percutaneous lumbar mechanical disc decompression utilizing Dekompressor(R): an update of current evidence. *Pain Physician.* 2013;16(2 Suppl):SE1-24. PMID: 23615884
7. Manchikanti L, Singh V, Falco FJ, et al. An updated review of automated percutaneous mechanical lumbar discectomy for the contained herniated lumbar disc. *Pain Physician.* 2013;16(2 Suppl):SE151-84. PMID: 23615890
8. Revel M, Payan C, Vallee C, et al. Automated percutaneous lumbar discectomy versus chemonucleolysis in the treatment of sciatica. A randomized multicenter trial. *Spine (Phila Pa 1976).* 1993;18(1):1-7. PMID: 8434309
9. Krugluger J, Knahr K. Chemonucleolysis and automated percutaneous discectomy--a prospective randomized comparison. *Int Orthop.* 2000;24(3):167-9. PMID: 10990391
10. Chatterjee S, Foy PM, Findlay GF. Report of a controlled clinical trial comparing automated percutaneous lumbar discectomy and microdiscectomy in the treatment of contained lumbar disc herniation. *Spine (Phila Pa 1976).* 1995;20(6):734-8. PMID: 7604351
11. Haines SJ, Jordan N, Boen JR, et al. Discectomy strategies for lumbar disc herniation: results of the LAPDOG trial. *J Clin Neurosci.* 2002;9(4):411-7. PMID: 12217670
12. Lewis RA, Williams NH, Sutton AJ, et al. Comparative clinical effectiveness of management strategies for sciatica: systematic review and network meta-analyses. *The spine journal : official journal of the North American Spine Society.* 2015;15(6):1461-77. PMID: 24412033
13. Manchikanti L, Abdi S, Atluri S, et al. An update of comprehensive evidence-based guidelines for interventional techniques in chronic spinal pain. Part II: guidance and recommendations. *Pain Physician.* 2013;16(2 Suppl):S49-283. PMID: 23615883
14. Li WS, Yan Q, Cong L. Comparison of Endoscopic Discectomy Versus Non-Endoscopic Discectomy for Symptomatic Lumbar Disc Herniation: A Systematic Review and Meta-Analysis. *Global Spine J.* 2022;12(5):1012-26. PMID: 34402320
15. Zhang J, Gao Y, Zhao B, et al. Comparison of percutaneous transforaminal endoscopic discectomy and open lumbar discectomy for lumbar disc herniations: A systematic review and meta-analysis. *Front Surg.* 2022;9:984868. PMID: 36439526
16. Zhang J, Zhou Q, Yan Y, et al. Efficacy and safety of percutaneous endoscopic cervical discectomy for cervical disc herniation: a systematic review and meta-analysis. *J Orthop Surg Res.* 2022;17(1):519. PMID: 36456964
17. Zhao XM, Chen AF, Lou XX, et al. Comparison of Three Common Intervertebral Disc Discectomies in the Treatment of Lumbar Disc Herniation: A Systematic Review and Meta-Analysis Based on Multiple Data. *J Clin Med.* 2022;11(22). PMID: 36431083
18. Bai X, Lian Y, Wang J, et al. Percutaneous endoscopic lumbar discectomy compared with other surgeries for lumbar disc herniation: A meta-analysis. *Medicine (Baltimore).* 2021;100(9):e24747. PMID: 33655938

19. Chen X, Chamoli U, Vargas Castillo J, et al. Complication rates of different discectomy techniques for symptomatic lumbar disc herniation: a systematic review and meta-analysis. *European spine journal : official publication of the European Spine Society, the European Spinal Deformity Society, and the European Section of the Cervical Spine Research Society.* 2020;29:1752-70. PMID: 32274586
20. Xu J, Li Y, Wang B, et al. Minimum 2-Year Efficacy of Percutaneous Endoscopic Lumbar Discectomy versus Microendoscopic Discectomy: A Meta-Analysis. *World neurosurgery.* 2020;138:19-26. PMID: 32109644
21. Yu P, Qiang H, Zhou J, et al. Percutaneous Transforaminal Endoscopic Discectomy versus Micro-Endoscopic Discectomy for Lumbar Disc Herniation. *Medical science monitor : international medical journal of experimental and clinical research.* 2019;25:2320-28. PMID: 30927349
22. Alvi MA, Kerezoudis P, Wahood W, et al. Operative Approaches for Lumbar Disc Herniation: A Systematic Review and Multiple Treatment Meta-Analysis of Conventional and Minimally Invasive Surgeries. *World neurosurgery.* 2018;114:391-407 e2. PMID: 29548960
23. Ding W, Yin J, Yan T, et al. Meta-analysis of percutaneous transforaminal endoscopic discectomy vs. fenestration discectomy in the treatment of lumbar disc herniation. *Der Orthopade.* 2018;47(7):574-84. PMID: 29404628
24. Phan K, Xu J, Schultz K, et al. Full-endoscopic versus micro-endoscopic and open discectomy: A systematic review and meta-analysis of outcomes and complications. *Clinical neurology and neurosurgery.* 2017;154:1-12. PMID: 28086154
25. Li XC, Zhong CF, Deng GB, et al. Full-Endoscopic Procedures Versus Traditional Discectomy Surgery for Discectomy: A Systematic Review and Meta-analysis of Current Global Clinical Trials. *Pain Physician.* 2016;19(3):103-18. PMID: 27008284
26. Cong L, Zhu Y, Tu G. A meta-analysis of endoscopic discectomy versus open discectomy for symptomatic lumbar disk herniation. *European spine journal : official publication of the European Spine Society, the European Spinal Deformity Society, and the European Section of the Cervical Spine Research Society.* 2016;25(1):134-43. PMID: 25632840
27. He J, Xiao S, Wu Z, et al. Microendoscopic discectomy versus open discectomy for lumbar disc herniation: a meta-analysis. *European spine journal : official publication of the European Spine Society, the European Spinal Deformity Society, and the European Section of the Cervical Spine Research Society.* 2016;25(5):1373-81. PMID: 27001138
28. Garg B, Nagraja UB, Jayaswal A. Microendoscopic versus open discectomy for lumbar disc herniation: a prospective randomised study. *J Orthop Surg (Hong Kong).* 2011;19(1):30-4. PMID: 21519072
29. Huang TJ, Hsu RW, Li YY, et al. Less systemic cytokine response in patients following microendoscopic versus open lumbar discectomy. *J Orthop Res.* 2005;23:406-11. PMID: 15734255
30. Righesso O, Falavigna A, Avanzi O. Comparison of open discectomy with microendoscopic discectomy in lumbar disc herniations: results of a randomized controlled trial. *Neurosurgery.* 2007;61:545-9; discussion 49. PMID: 17881967
31. Ruetten S, Komp M, Merk H, et al. Full-endoscopic cervical posterior foraminotomy for the operation of lateral disc herniations using 5.9-mm endoscopes: a prospective, randomized, controlled study. *Spine (Phila Pa 1976).* 2008;33:940-8. PMID: 18427313
32. Mayer HM, Brock M. Percutaneous endoscopic discectomy: surgical technique and preliminary results compared to microsurgical discectomy. *J Neurosurg.* 1993;78(2):216-25. PMID: 8267686

33. Ryang YM, Oertel MF, Mayfrank L, et al. Standard open microdiscectomy versus minimal access trocar microdiscectomy: results of a prospective randomized study. *Neurosurgery.* 2008;62:174-81; discussion 81-2. PMID: 18300905
34. Arts M, Brand R, van der Kallen B, et al. Does minimally invasive lumbar disc surgery result in less muscle injury than conventional surgery? A randomized controlled trial. *European spine journal : official publication of the European Spine Society, the European Spinal Deformity Society, and the European Section of the Cervical Spine Research Society.* 2011;20(1):51-7. PMID: 20556439
35. Hermantin FU, Peters T, Quartararo L, et al. A prospective, randomized study comparing the results of open discectomy with those of video-assisted arthroscopic microdiscectomy. *J Bone Joint Surg Am.* 1999;81(7):958-65. PMID: 10428127
36. Teli M, Lovi A, Brayda-Bruno M, et al. Higher risk of dural tears and recurrent herniation with lumbar micro-endoscopic discectomy. *European spine journal : official publication of the European Spine Society, the European Spinal Deformity Society, and the European Section of the Cervical Spine Research Society.* 2010;19(3):443-50. PMID: 20127495
37. Shin DA, Kim KN, Shin HC, et al. The efficacy of microendoscopic discectomy in reducing iatrogenic muscle injury. *Journal of neurosurgery Spine.* 2008;8(1):39-43. PMID: 18173345
38. Rasouli MR R-MV, Shokraneh F, et al. . Minimally invasive discectomy versus microdiscectomy/open discectomy for symptomatic lumbar disc herniation. *Cochrane Database Syst Rev 2014 CD010328.* 2014. PMID: 25184502
39. Smith N, Masters J, Jensen C, et al. Systematic review of microendoscopic discectomy for lumbar disc herniation. *European spine journal : official publication of the European Spine Society, the European Spinal Deformity Society, and the European Section of the Cervical Spine Research Society.* 2013;22(11):2458-65. PMID: 23793558
40. Ruetten S, Komp M, Merk H, et al. Full-endoscopic anterior decompression versus conventional anterior decompression and fusion in cervical disc herniations. *Int Orthop.* 2009;33(6):1677-82. PMID: 19015851
41. Gadjradj PS, Rubinstein SM, Peul WC, et al. Full endoscopic versus open discectomy for sciatica: randomised controlled non-inferiority trial. *BMJ.* 2022;376:e065846. PMID: 35190388
42. Ran B, Wei J, Yang J, et al. Quantitative Evaluation of the Trauma of CT Navigation PELD and OD in the Treatment of HLDH: A Randomized, Controlled Study. *Pain Physician.* 2021;24(4):E433-E41. PMID: 34213868
43. Wang F, Guo D, Sun T, et al. A comparative study on short-term therapeutic effects of percutaneous transforaminal endoscopic discectomy and microendoscopic discectomy on lumbar disc herniation. *Pakistan journal of medical sciences.* 2019;35(2):426-31. PMID: 31086527
44. Gibson JNA, Subramanian AS, Scott CEH. A randomised controlled trial of transforaminal endoscopic discectomy vs microdiscectomy. *European spine journal : official publication of the European Spine Society, the European Spinal Deformity Society, and the European Section of the Cervical Spine Research Society.* 2017;26(3):847-56. PMID: 27885470
45. Hussein M, Abdeldayem A, Mattar MM. Surgical technique and effectiveness of microendoscopic discectomy for large uncontained lumbar disc herniations: a prospective, randomized, controlled study with 8 years of follow-up. *European spine journal : official publication of the European Spine Society, the European Spinal*

Deformity Society, and the European Section of the Cervical Spine Research Society. 2014. PMID: 24736930
46. Yu P, Zan P, Zhang X, et al. Comparison of Percutaneous Transforaminal Endoscopic Discectomy and Microendoscopic Discectomy for the Surgical Management of Symptomatic Lumbar Disc Herniation: A Multicenter Retrospective Cohort Study with a Minimum of 2 Years' Follow-Up. *Pain Physician.* 2021;24(1):E117-e25. PMID: 33400445
47. Song Z, Ran M, Luo J, et al. Follow-up results of microendoscopic discectomy compared to day surgery using percutaneous endoscopic lumbar discectomy for the treatment of lumbar disc herniation. *BMC Musculoskelet Disord.* 2021;22(1):160. PMID: 33563264
48. North American Spine Society. Clinical guidelines for the diagnosis and treatment of lumbar disc herniation with radiculopathy. 2012. [cited 9/11/2025]. 'Available from:' https://www.spine.org/Documents/ResearchClinicalCare/Guidelines/LumbarDiscHerniation.pdf.
49. Sayed D, Grider J, Strand N, et al. The American Society of Pain and Neuroscience (ASPN) Evidence-Based Clinical Guideline of Interventional Treatments for Low Back Pain. *J Pain Res.* 2022;15:3729-832. PMID: 36510616

CODES

NOTE: CPT code 62287 specifically describes a percutaneous aspiration or decompression procedure of the lumbar spine. This code does not distinguish between an aspiration procedure (addressed in this policy) and a laser decompression procedure (addressed in separate medical policies). Also, note that this code is specifically limited to the lumbar region. Although the majority of percutaneous discectomies are performed on lumbar vertebrae, the FDA labeling of the Stryker DeKompressor Percutaneous Discectomy Probe includes the thoracic and cervical vertebrae.

Codes	Number	Description
CPT	62287	Decompression, percutaneous, of nucleus pulposus of intervertebral disk, any method utilizing needle based technique to remove disc material under fluoroscopic imaging or other form of indirect visualization, with discography and/or epidural injection(s) at the treated level(s), when performed, single or multiple levels, lumbar
	62380	Endoscopic decompression of spinal cord, nerve root(s), including laminotomy, partial facetectomy, foraminotomy, discectomy and/or excision of herniated intervertebral disc, 1 interspace, lumbar
	64999	Unlisted procedure; nervous system
HCPCS	C2614	Probe, percutaneous lumbar discectomy

Date of Origin: *October 2005*