Designed to prevent reherniation

Published Clinical Evidence Overview



Levels of Evidence for Published Papers of the Barricaid device for annulus fibrosus closure

V V V

Study	Ref.					
LEVEL I EVIDENCE						
Meta-analysis of randomized trials	1,83,85,86					
554-patient randomized trial	2-3, 5-12, 14-17, 24, 7					
60-patient randomized trial	13					
LEVEL II EVIDENCE	1					
Network meta-analysis	20					
Meta-analysis of controlled studies	21					
Krutko Cohort Study	18					
Superiority Claims: Systematic Review	19					
LEVEL III EVIDENCE						
ISASS Policy Guideline	22					
Systematic review of Barricaid results	23					
Cohort A controlled study	26,28					
Cohort B controlled study	25					
Combined Cohort A & B controlled study	27					
Murphy Annular Closure Review	4					
LEVEL IV EVIDENCE	1					
Cohort A case series	38					
Combined cohort A & B case series	36,37					
Ardeshiri case series	30,31					
Kursumovic case series	32,35					
Martens case series	33					
Sanginov case series	34					
Kienzler RCT + case series	29					
US Cohort case series	82					
Kurzbuch case series	81					
LEVEL V EVIDENCE						
Gautschi case report	48					
Hahn case report	49					
Krutko case report	47					
Lange case report	42					
McClure case report	84					
Barth letter to editor	43					
Bouma letter to editor	50					
Grasso letter to editor						
Izci letter to editor	51					

These articles contain off-label use information. Please use medical discretion when reviewing these articles.

Barricaid is approved for the following indications for use:

Reducing the incidence of reherniation and reoperation in skeletally mature patients with radiculopathy (with or without back pain) attributed to a posterior or posterolateral herniation, and confirmed by history, physical examination and imaging studies which demonstrate neural compression using MRI to treat a large annular defect (between 4-6 mm tall and between 6-10 mm wide) following a primary discectomy procedure (excision of herniated intervertebral disc) at a single level between L4 and S1.

Financial disclosure:

One or more authors have received financial compensation from Intrinsic Therapeutics. Full financial disclosures can be found in the respective manuscripts.

Leve	Notes			
la				
/ Ib				
lb				
llb	Systematic review of Level IIIb evidence; upgraded since a SR is rated higher than the underlying evidence.			
llb	Systematic review of Level IIIb evidence; upgraded since a SR is rated higher than the underlying evidence.			
llb				
llb				
IIIb				
IIIb	Systematic review of Level IV evidence; upgraded since a SR is rated higher than the underlying evidence.			
IIIb				
IV				
V				
V				
V				
V				
V				
V				

Klassen letter to editor	46	V	
Lange letter to editor	45	V	
Shiban letter to editor	44	V	
Burkhardt case report	39	V	
Castro editorial	40	V	
Kienzler letter to editor	79	V	
Kurzbuch letter to editor	80	V	

UNGRADED EVIDENCE

Ammerman WC reoperation study	52			
Ament health economics study (a)	53			
Ament health economics study (b)	56			
Bostelmann health economics study	54			
Klassen health economics study	58			
Parker health economics study	61			
Thaci health economics study	57			
554-patient randomized trial protocol paper	59			
US case series protocol paper	55			
Bostelmann preclinical paper	60			
Wilke preclinical paper	62			
Annular Closure Device Design Considerations	78			
DEFINING THE CLINICAL NEED				
Discectomy outcomes are not perfect	63-75			

Grading scale: Oxford Centre for Evidence-Based Medicine Levels of Evidence

References

- 1. Miller LE, Allen RT, Duhon B, Radcliff KE Expert review with meta-analysis of randomized and nonrandomized controlled studies of Barricaid annular closure in patients at high risk for lumbar disc reherniation Expert Review of Medical Devices (2020); doi.org/10.1080/17434440.2020.1745061
- 2. Kienzler, J.C., Heidecke, V., Assaker, R. et al. Intraoperative findings, complications, and short-term results after lumbar microdiscectomy with or without implantation of annular closure device. Acta Neurochir (Wien). 2021 Feb;163(2):545-559.
- 3. Kienzler JC, Fandino J, Van de Kelft E et al. Risk factors for early reherniation after lumbar discectomy with or without annular closure: results of a multicenter randomized controlled study. Acta Neurochir 2021 Jan;163(1):259-268.
- Murphy TP, Panarello NM, Baird MD, Helgeson MD, Wagner SC Should Annular Closure Devices Be Utilized to Reduce the Risk of Recurrent Lumbar Disk Herniation? Clin Spine Surg. 2020 Oct 23. doi: 10.1097/BSD.000000000001104. Epub ahead of print. PMID: 33105160.

- 5. Kuršumović A, Bouma GJ, Miller LE, Assaker R, Van de Kelft E, Hes R, Kienzler J randomized trial of a bone-anchored annular closure device Journal of Pain Research 2020:13 1-7
- 6. Brink van den W, Flüh C, Miller LE, Klassen PD, Bostelmann R Lumbar disc reherniation prevention with a bone-anchored annular closure device. Medicine: November 2019 - Volume 98 - Issue 44 - p e17760
- 7. Bouma GJ, van den Brink W, Miller LE, Wolfs JFC, Arts MP score-matched analysis Orthopedic Research and Reviews, Volume 2019:11 Pages 177–182; doi.org/10.2147/ORR.S216980
- Klassen PD, Lesage G, Miller LE, Hes R, Wolfs JFC, Eustacchio S, Vajkoczy P 8. **Closure Device: Surgical Strategies and Clinical Outcomes** World Neurosurgery 2019 Oct;130:e926-e932.
- Kienzler JC, Klassen PD, Miller LE, et al. 9. at high risk for reherniation. Acta Neurochir (Wien). 2019;161:1389-1396
- 10. Nanda D, Arts MP, Miller LE, Köhler HP, Perrin JM, Flüh C, Vajkoczy P Annular Closure device lowers reoperation risk 4 years after lumbar discectomy Medical Devices: Evidence and Research 2019:12 327–335
- 11. Bouma GJ. Ardeshiri A. Miller LE. et al. Clinical performance of a bone-anchored annular closure device in older adults. Clin Interv Aging. 2019;14:1085-1094.
- 12. Bouma GJ, Barth M, Miller LE, Eustacchio S, Flüh C, Bostelmann R, Jadik S **Closure in Lumbar Disc Surgery** Pain Res Treat. 2019 Feb 3;2019:3498603. doi: 10.1155/2019/3498603. eCollection 2019.
- 13. Cho PG, Shin DA, Park SH, Ji GY Up of a Randomized Controlled Trial J Korean Neurosurg Soc 62 (6) : 691-699, 2019; doi.org/10.3340/jkns.2019.0071
- Thomé C, Klassen PD, Bouma GJ, et al. 14. Spine J. 2018 Dec;18(12):2278-2287. doi: 10.1016/j.spinee.2018.05.003. Epub 2018 May 3.
- 15. Kuršumović A, Kienzler JC, Bouma GJ, et al. without bone-anchored annular closure Spine (Phila Pa 1976). 2018;43:1386-1394.
- Barth M, Weiß C, Bouma GJ, Bostelmann R, Kuršumović A, Fandino J, Thomé C Acta Neurochir (2018). https://doi.org/10.1007/s00701-017-3463-y
- Klassen PD, Bernstein DT, Köhler HP, Arts MP, Weiner B, Miller LE, Thomé C 17. within 90 days of discharge Journal of Pain Research (2017) 10; 2047–2055

Clinical implications of vertebral endplate disruptions after lumbar discectomy: 3-year results from a

Does patient blinding influence clinical outcomes after annular closure device implantation? A propensity

Reoperation After Primary Lumbar Discectomy with or without Implantation of a Bone-Anchored Annular

Three-year results from a randomized trial of lumbar discectomy with annulus fibrosus occlusion in patients

Challenges in the Analysis of Longitudinal Pain Data: Practical Lessons from a Randomized Trial of Annular

Efficacy of a Novel Annular Closure Device after Lumbar Discectomy in Korean Patients : A 24-Month Follow-

Annular closure in lumbar microdiscectomy for prevention of reherniation: a randomized clinical trial.

Morphology and clinical relevance of vertebral endplate changes following limited lumbar discectomy with or

Endplate changes after lumbar discectomy with and without implantation of an annular closure device

Bone-anchored annular closure following lumbar discectomy reduces risk of complications and reoperations

- 18. Krutko A, Sanginov A, Baykov E Predictors of Treatment Success Following Limited Discectomy With Annular Closure for Lumbar Disc Herniation International Journal of Spine Surgery, Vol. 14, No. 1, 2020, pp. 38–45; doi.org/10.14444/7005
- 19. Golish R, Groff MW, Araghi A, Inzana JA Superiority Claims for Spinal Devices: A Systematic Review of Randomized Controlled Trials Global Spine Journal 2019 Jun 7, https://doi.org/10.1177/2192568219841046
- 20. Arts MP, Kuršumović A, Miller LE, Wolfs JFC, Perrin JM, Van de Kelft E, Heidecke V Comparison of treatments for lumbar disc herniation: Systematic review with network meta-analysis Medicine (Baltimore). 2019;98:e14410.
- 21. Choy WJ, Phan K, Diwan AD, et al. Annular closure device for disc herniation: meta-analysis of clinical outcome and complications. BMC Musculoskelet Disord. 2018:19:290.
- 22. Lorio M, Kim C, Araghi A, Inzana J, Yue J International Society for the Advancement of Spine Surgery Policy 2019—Surgical Treatment of Lumbar Disc Herniation with Radiculopathy International Journal of Spine Surgery, Vol. 14, No. 1, 2020, pp. 1–17
- 23. Ammerman J, Watters WC, Inzana JA, Carragee G, Groff MW Closing the Treatment Gap for Lumbar Disc Herniation Patients with Large Annular Defects: A Systematic **Review of Techniques and Outcomes in this High-risk Population** Cureus. 2019 May 7;11(5):e4613. doi: 10.7759/cureus.4613.
- 24. Martens F, Lesage G, Muir JM, Stieber JR Implantation of a bone-anchored annular closure device in conjunction with tubular minimally invasive discectomy for lumbar disc herniation: a retrospective study BMC Musculoskelet Disord. 2018 Jul 27:19(1):269. doi: 10.1186/s12891-018-2178-4.
- 25. Barth M, Fontana J, Thomé C, Bouma GJ, Schmieder K Occurrence of discal and non-discal changes after sequestrectomy alone versus sequestrectomy and implantation of an anulus closure device Journal of Clinical Neuroscience(2016) 34; 288-293
- 26. Parker SL, Grahovac G, Vukas D, Vilendecic M, Ledic D, McGirt MJ, Carragee EJ Effect of a novel annular closure device (Barricaid) on same level recurrent disc herniation and disc height loss after primary lumbar discectomy: two-year results of a multi-center prospective cohort study Clin Spine Surg (2016) Dec;29(10):454-460
- 27. Trummer M, Eustacchio S, Barth M, Klassen PD, Stein S Protecting Facet Joints Post-Lumbar Discectomy: Barricaid Annular Closure Device Reduces Risk of Facet Degeneration Clin Neurol Neurosurg (2013) Aug;115(8):1440-5
- Vukas D. Ledić D. Grahovac G. Kolić Z. Rotim K. Vilendečić M 28. Clinical Outcomes In Patients After Lumbar Disc Surgery With Anular Reinforcement Device; Two-Year Follow Up Acta Clin Croat (2013) 52:87-91
- 29. Kienzler JC, Rey S, Wetzel O, Atassi H, Bäbler S, Burn F, Fandino J. Incidence and clinical impact of vertebral endplate changes after limited lumbar microdiscectomy and implantation of a bone-anchored annular closure device. BMC Surg. 2021 Jan 6;21(1):19

- 30. Ardeshiri A. Miller LE. Thomé C of reherniation Eur Spine J. 2019;28:2572-2578.
- 31. Ardeshiri A, Miller LE, Synowitz M, Jadik S Discectomy Orthop Surg. 2019 Jun;11(3):431-437. doi: 10.1111/os.12495
- 32. Kuršumović A, Rath S screening criteria from a randomized controlled trial Med Devices (Auckl). 2018 Jun 7;11:193-200.
- 33. Martens F, Vajkoczy P, Jadik S, Hegewald A, Stieber J, Hes R **Controlled Trial**
- 34. Sanginov AJ, Krutko AV, Baykov ES, et al. Outcomes of surgical treatment of lumbar disk herniation using an annular closure device. Coluna/Columna. 2018;17:188-194.
- 35. Kuršumović A, Rath S Population Cureus. 2017;9:e1824.
- 36. Ledic D, Vukas D, Grahovac G, Barth M, Bouma GJ, Vilendecic M **Diskectomy: Two-Year Data** J Neurol Surg A (2015) 76:211-218.
- 37. Bouma GJ, Barth M, Ledic D, Vilendecic M An Anular Closure Device Eur Spine J (2013) 22:1030-1036
- 38. Lequin M, Barth M, Thomé C, Bouma GJ **Results from a Prospeective, Multi-Center Study** Korean J Spine (2012) 9(4):340-347
- Burkhardt BW, Oertel JM. 39 Annular closure device breakage due to recurrent lumbar disc herniation: a case report. Acta Neurochirurgica (2020), https://doi.org/10.1007/s00701-020-04651-9
- 40. Castro V. Cunha e Sa M. Annular closure devices - here to stay or here to go? Editorial (by invitation). Acta Neurochirurgica (2020), https://doi.org/10.1007/s00701-020-04613-1
- 41. Grasso G. closure device. World Neurosurg. 2019;131:217-219.

Two-year real-world results of lumbar discectomy with bone-anchored annular closure in patients at high risk

Surgical Experience and Complications in 50 Patients Treated with an Anular Closure Device Following Lumbar

Effectiveness of an annular closure device in a "real-world" population: stratification of registry data using

Patients at the Highest Risk for Reherniation Following Lumbar Discectomy in a Multicenter Randomized

JB JS Open Access. 2018 Apr 16;3(2):e0037. doi: 10.2106/JBJS.OA.17.00037. eCollection 2018 Jun 28.

Performance Of An Annular Closure Device In A 'Real-World', Heterogeneous, At-Risk, Lumbar Discectomy

Effect of Anular Closure on Disk Height Maintenance and Reoperated Recurrent Herniation Following Lumbar

The High-Risk Discectomy Patient: Prevention Of Reherniation In Patients With Large Anular Defects Using

Primary Limited Lumbar Discectomy with an Annulus Closure Device: One-Year Clinical and Radiographic

Reoperations after first lumbar disk herniation surgery with or without implantation of mechanical annular

- 42. Lange N, Meyer B, Shiban E. Symptomatic annulus-repair-device loosening due to a low-grade infection. Acta Neurochir (Wien). 2018;160:199-203. 43. Barth M, Weiss C, Bouma GJ, et al. Reply to the letter to the editor of E. Shiban and B. Meyer regarding "Endplate changes after lumbar discectomy with and without implantation of an annular closure device" by Barth M et al., (Acta Neurochir (Wien) 2018 Apr;160 (4):855-862). Acta Neurochir (Wien). 2018;160:1611–1612. 44. Shiban E, Meyer B. Letter to the editor of Acta Neurochirurgica: Endplate changes after lumbar discectomy with and without implantation of an annular closure device. Acta Neurochir (Wien). 2018;160:1609. 45. Lange N, Meyer B, Shiban E. Low-grade infection due to annular closure device. Acta Neurochir (Wien). 2018;160:1867. 46. Klassen PD, Bernstein DT, Kohler HP, et al. Erratum: Bone-anchored annular closure following lumbar discectomy reduces risk of complications and reoperations within 90 days of discharge [Corrigendum]. J Pain Res. 2017;10:2739. 47. Krutko AV, Baykov ES, Sadovoy MA Reoperation after microdiscectomy of lumbar herniation: Case report. Int J Surg Case Rep. 2016;24:119-123. Gautschi OP, Corniola MV, Schaller K. 48. Risk of recurrence and postoperative intervertebral disc degeneration after lumbar intervertebral disc operation - is an anulus closure prosthesis the solution? Praxis (Bern 1994). 2014;103:775-779. Hahn BS, Ji GY, Moon B, Shin DA, Ha Y, Kim KN, Yoon DH 49. Use of Annular Closure Device (Barricaid®) for Preventing Lumbar Disc Reherniation: One-Year Results of Three Cases Korean J Neurotrauma (2014) 10(2):119-122 Bouma GJ. 50. Answer to the letter to the editor of Dr. Yusuf Izci entitled "anular closure device: is it necessary after discectomy?" concerning "the high-risk discectomy patient: prevention of reherniation in patients with large anular defects using an anular closure device" by G. J. Bouma, M. Barth, D. Ledic, M. Vilendecic (2013) Eur Spine J; 22(5):1030-1036. Eur Spine J. 2014;23:485. 51. Izci Y. Anular closure device: is it necessary after discectomy? Eur Spine J. 2014;23:483-484 52. Ammerman, JM, Wind, JJ, Goldsmith, ME, Inzana, JA, Lumbar Discectomy and Reoperation Among Workers' Compensation Cases in Florida and New York Journal of Occupational and Environmental Medicine: September 2020 - Volume 62 - Issue 9 - p e478-e484
- 53. Ament J, Thaci B, Yang Z, Kulubya E, Hsu W, Bouma GJ, Kim KD Cost-effectiveness of a bone-anchored annular closure device versus conventional lumbar discectomy in treating lumbar disc herniations Spine (Phila Pa 1976). 2019 Jan 1:44(1):5-16. doi: 10.1097/BRS.000000000002746.

- 54. Bostelmann R, Petridis A, Meder A, et al. example of lumbar disc surgery. Orthopade. 2019;49:32-38.
- 55. Strenge KB, DiPaola CP, Miller LE, Hill CP, Whitmore RG Multicenter study of lumbar discectomy with Barricaid annular closure device for prevention of lumbar disc reherniation in US patients: A historically controlled post-market study protocol Medicine (Baltimore). 2019 Aug;98(35):e16953. doi: 10.1097/MD.00000000016953
- 56. Ament JD, Thaci B, Yang Z, Kuršumović A, Bostelmann R, Lanman T, Johnson JP, Fröhlich S, Kim KD closure device in high-risk patients The Spine Journal 19 (2019) 1170-1179
- 57. Thaci B. McGirt MJ. Ammerman JM. Thomé C. Kim KD. Ament JD through annular closure Clinicoecon Outcomes Res. 2019 Feb 28;11:191-197. doi: 10.2147/CEOR.S193603. eCollection 2019.
- 58. Klassen PD. Hsu WK. Martens F. Inzana JA. van den Brink WA. Groff MW. Thomé C Clinicoecon Outcomes Res. 2018 Jun 26;10:349-357.
- 59. Klassen PD, Hes R, Bouma GJ, et al. primary lumbar disc herniation Int J Clin Trials (2016) Aug;3(3):120-131
- 60. Bostelmann R, Steiger H-J, Cornelius JF **Diskectomy and Annular Repair** J Neurol Surg A (2015) DOI: 10.1055/s-0035-1570344
- Parker SL, Grahovac G, Vukas D, Ledic D, Vilendecic M, McGirt MJ 61. Cohort Study J Neurol Surg A Cent Eur Neurosurg (2013) Sep;74(5):285-9
- 62. Wilke HJ, Widmann L, Heuer F, Graf N, Rath S With An Anular Closure Device Spine (2013) 38(10) E587-E593

Who benefits from medical technical innovations? A medical and medical economic analysis using the

Postoperative direct health care costs of lumbar discectomy are reduced with the use of a novel annular

Reduction of direct costs in high-risk lumbar discectomy patients during the 90-day post-operative period

Post-lumbar discectomy reoperations that are associated with poor clinical and socioeconomic outcomes can be reduced through use of a novel annular closure device: results from a 2-year randomized controlled trial

A multicenter, prospective, randomized study protocol to demonstrate the superiority of a bone-anchored prosthesis for anular closure used in conjunction with limited discectomy to limited discectomy alone for

Effect of Annular Defects on Intradiscal Pressures in the Lumbar Spine: An in Vitro Biomechanical Study of

Cost Savings Associated with Prevention of Recurrent Lumbar Disc Herniation: A Multi-Center Prospective

Can Prevention of A Re-Herniation Be Investigated?: Establishment Of A Herniation Model And Experiments

63. Kuršumović A, Muir JM, Ammerman J, et al. 75. Keskimäki I, et al. The Disability Cascade: A Preventable Consequence of the Loss of Disc Height following Lumbar Microdiscectomy Variations. 11(7): e5169. doi:10.7759/cureus.5169 Spine (2000) Jun 15;25(12):1500-8. 64. Miller LE, et al. 76. Association of Annular Defect Width After Lumbar Discectomy With Risk of Symptom Recurrence and Miller LE. Musacchio M. Reoperation SPINE (2018) Volume 43, Number 5, pp E308–E315 **Results From a Postmarket Study.** Cureus. 2021 Dec 8;13(12):e20274. doi: 10.7759/cureus.20274. eCollection 2021 Dec. 65. Kim KT, et al. PMID: 35018268 Free PMC article. Preoperative Risk Factors for Recurrent Lumbar Disk Herniation in L5–S1 J Spinal Disord (2015) Tech Volume 28, Number 10, December 77. 66. Weiner BK, et al. Annular Closure RCT Study Group. Endplate Changes Following Discectomy: Natural History And Associations Between Imaging And Clinical Data Analysis With 5 Years of Follow-up. Eur Spine J (2015) Nov;24(11):2449-57. doi: 10.1007/s00586-014-3734-8. Epub 2014 Dec 28. PMID: 34882183 Free PMC article. 67. Kim CH. et al. Reoperation Rate After Surgery For Lumbar Herniated Intervertebral Disc Disease: Nation-Wide Cohort Guardado AA, Baker A, Weightman A, Hoyland JA, Cooper G. 78. Study Spine (2013) Apr;38(7): 581–590 Bioengineering (Basel). 2022 Jan 19;9(2):47. doi: 10.3390/bioengineering9020047. PMID: 35200401 Free PMC article. Review. 68. Bailey A, et al. Prospective, Multi-Center, Randomized, Controlled Study of Anular Repair in Lumbar Discectomy: Two-Year 79. Follow-Up Spine (2013) Feb 7. [Epub ahead of print] enough for the intervertebral disc space? 69. Martin Bl, et al. PMID: 33770262 No abstract available. Repeat surgery after lumbar decompression for herniated disc: the quality implications of hospital and surgeon variation 80. Kurzbuch AR, Fournier JY, Tuleasca C. Spine J (2012) Feb;12(2):89-97. intervertebral disc space? 70. Watters WC. et al. An Evidence-Based Review Of The Literature On The Consequences Of Conservative Versus Aggressive PMID: 33606100 No abstract available. Discectomy For The Treatment Of Primary Disc Herniation With Radiculopathy Spine J (2009) Mar;9(3):240-57. 46. 81. Kurzbuch AR, Tuleasca C, Fournier JY. 71. McGirt MJ, et al. Neurochirurgie. 2022 Jul;68(4):393-397. doi: 10.1016/j.neuchi.2021.12.009. Epub 2022 Jan 4. Recurrent disc herniation and long-term back pain after primary lumbar discectomy: review of outcomes PMID: 34995566 reported for limited versus aggressive disc removal Neurosurgery (2009) Feb;64(2):338-44; discussion 344-5. 82. Nunley P, Strenge K, Huntsman K, et al. 72. Carragee EJ, et al. A Prospective Controlled Study Of Limited Versus Subtotal Posterior Discectomy: Short-Term Outcomes In One-Year Results. (June 09, 2023) Cureus 15(6): e40195. DOI 10.7759/cureus.40195 Patients With Herniated Lumbar Intervertebral Discs And Large Posterior Anular Defect 83. Wang Y, He X, Chen S, Weng Y, Liu Z, Pan Q, Zhang R, Li Y, Wang H, Lin S, Yu H. Spine (2006) Mar 15;31(6):653-7. 73. Carragee EJ, et al. **Controlled Studies.** Clinical Outcomes After Lumbar Discectomy for Sciatica: The Effects of Fragment Type and Anular Comptence PMID: 37068762. J Bone Joint Surg Am. (2003) Jan;85-A(1):102-8. Eur Spine J. 2023 Aug 30. doi: 10.1007/s00586-023-07910-2. Online ahead of print. PMID: 37648908 74. Osterman H. et al. Risk Of Multiple Reoperations After Lumbar Discectomy: A Population-Based Study Spine (2003) Mar 15;28(6):621-7.

Reoperations After Lumbar Disc Surgery: A Population-Based Study Of Regional And Interspecialty

Nunley P, Strenge KB, Huntsman K, Bae H, DiPaola C, T AR, Shaw A, Sasso RC, Araghi A, Staub B, Chen S,

Lumbar Discectomy With Barricaid Device Implantation in Patients at High Risk of Reherniation: Initial

Thomé C, Kuršumovic A, Klassen PD, Bouma GJ, Bostelmann R, Martens F, Barth M, Arts M, Miller LE, Vajkoczy P, Hes R, Eustacchio S, Nanda D, Köhler HP, Brenke C, Flüh C, Van de Kelft E, Assaker R, Kienzler JC, Fandino J;

Effectiveness of an Annular Closure Device to Prevent Recurrent Lumbar Disc Herniation: A Secondary

JAMA Netw Open. 2021 Dec 1;4(12):e2136809. doi: 10.1001/jamanetworkopen.2021.36809.

Lumbar Intervertebral Disc Herniation: Annular Closure Devices and Key Design Requirements.

Kienzler JC, Fandino J, Van de Kelft E, Eustacchio S, Bouma GJ; Barricaid® Annular Closure RCT Study Group. Reply to the Letter: The annular closure device-panacea of lumbar disc herniation: how closed is closed

Acta Neurochir (Wien). 2021 Jun;163(6):1609-1610. doi: 10.1007/s00701-021-04765-8. Epub 2021 Mar 26.

The annular closure device - panacea of lumbar disc herniation: how closed is closed enough for the

Acta Neurochir (Wien). 2021 Jun;163(6):1611-1612. doi: 10.1007/s00701-021-04764-9. Epub 2021 Feb 19.

Lumbar discectomy with annulus fibrosus closure: A retrospective series of 53 consecutive patients.

Lumbar Discectomy With Bone-Anchored Annular Closure Device in Patients With Large Annular Defects:

Annulus Fibrosus Repair for Lumbar Disc Herniation: A Meta-Analysis of Clinical Outcomes From

Global Spine J. 2023 Apr 17:21925682231169963. doi: 10.1177/21925682231169963. Epub ahead of print.

- McClure JJ, Jentoft ME, Sandhu SS, Chen SG, Abode-Iyamah KO.
 Bone-anchored annular closure device leading to histiocytic-inflammation-induced neuropathy with resolution after removal: a case report.
 Eur Spine J. 2023 Aug 30. doi: 10.1007/s00586-023-07910-2. Online ahead of print.
 PMID: 37648908
- 85. Zhang Q, Tang J, Jiang Y, Gao G, Liang Y.

Is annular repair technique useful for reducing reherniation and reoperation after limited discectomy? Acta Orthop Belg. 2022 Sep;88(3):491-504. doi: 10.52628/88.3.10248. PMID: 36791702

86. Li WS, Li GY, Yan Q, Chen WT, Cong L.

The effectiveness and safety of annulus closure device implantation in lumbar discectomy for patients with lumbar disc herniation: a systematic review and meta-analysis.

Eur Spine J. 2023 Jul;32(7):2377-2386. doi: 10.1007/s00586-023-07629-0. Epub 2023 Apr 3. PMID: 37010608

Intrinsic Therapeutics, Inc.

30 Commerce Way Woburn, MA 01801 USA +1 781 932 0222 info@barricaid.com www.barricaid.com

WARNING: This product has labeling limitations. See package insert for additional warnings, precautions and possible adverse effects. CAUTION: USA law restricts this device to sale by or on the order of physician. All medical devices have associated risks. Please refer to the package insert and other labeling for a complete list of indications, contraindications, precautions and warnings (www.barricaid.com/us-en/instructions). For further information on Barricaid, contact your Intrinsic representative.

MLT64 Rev. G

Registered trademarks of Intrinsic Therapeutics, Inc. ©2024 Intrinsic Therapeutics, Inc. All Rights Reserved.