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Questions for Cervical Fusion Subject Matter Expert Panel

For all question's answers must be based on clinical literature with consideration of quality of evidence to support your answer.

1. What is the evidence and/or society guidelines concerning the provision of nonsurgical (conservative) care prior to proceeding with cervical spine fusion surgery?[1-3]
    a. Is there evidence to support a minimum trial (time frame and number of therapies) of conservative therapy prior to proceeding to non-emergent cervical spine fusion surgery?[1,2]
    b. What percentage of patient's symptoms resolve without surgery?[4]
2. Is there evidence or society guidance regarding the use of alternative procedural treatment modalities prior to the use of cervical fusion (laminoplasty, arthroplasty, foraminotomy, etc.)?[1,3,5-9]
3. Are there circumstances conservative treatment may not be appropriate?
4. What is the evidence and/or society guidelines concerning factors likely to influence surgical outcomes? (e.g. behavioral risk factors i.e. smoking or opioid use)[8,10,11]
5. What criteria do you consider before offering cervical fusion surgery?
    a. What degree of pain or functional disability? How is that measured?
    b. Do you require radiographic imaging? If so what imaging? What findings are consistent with a surgical candidate?
6. Is there evidence to support the efficacy and safety of cervical fusion surgery compared to non-fusion surgical procedures and/or conservative management for the following patients? [1,4,5,12- 18]
    A. Unstable Spine/ Cervical Instability
        a. Cervical Spine Fracture
        b. Cervical Spine Dislocation
        c. Trauma/spinal cord injuries
        d. Traumatic spondylolisthesis
    B. Cervical Myelopathy [5,15,19,20]
        e. Cervical Spondylotic Myelopathy
        f. Cervical Radiculopathy
        g. Cervical Myeloradiculopathy (Mixed)
        h. Mild myelopathic symptoms/signs?

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C. Central Spinal Stenosis[5]

i. Central Spinal Stenosis (nonmyelopathic patients with evidence of cervical cord compression without signs or symptoms of radiculopathy)

D. Others

j. Ankylosing spondylitis

k. Diffuse idiopathic skeletal hyperostosis

l. Malignancy/Tumors

Surgical Questions

7. Does anterior cervical decompression with fusion (ACDF) result in better outcomes (clinical or radiographic) than anterior cervical decompression (ACD) alone?[20]
8. What is the evidence and/or society guidelines concerning the efficacy of cervical total disc arthroplasty (disc replacement) compared to anterior cervical decompression with fusion (ACDF)?[20-24]
9. What are the indications for single- versus multilevel fusion, and what are the limitations for the number levels fused?[20,25-27]
10. What are the considerations for determining surgical approach (anterior, posterior, or combined)? Does evidence support one surgical approach is superior to others? If so what evidence?[4,17,19,20,25,28-31]
11. What is the anticipated relief period following a cervical fusion and how often are surgical revisions necessary? [20]
12. What surgical techniques are best for cervical spondylotic myelopathy?[31-33]
13. Does ACDF with instrumentation result in better outcomes (clinical or radiographic) than ACDF without instrumentation?[20]
14. Are there materials or methods that are superior to others, such as corpectomy vs discectomy, types of materials, use of plates, etc.? Is there evidence to support a role for artificial disc?

Key Articles:

1. Corp N, Mansell G, Stynes S, et al. Evidence-based treatment recommendations for neck and low back pain across Europe: a systematic review of guidelines. European Journal of Pain. 2021;25(2):275-295.
2. Berman D, Holtzman A, Sharfman Z, Tindel N. Comparison of Clinical Guidelines for Authorization of MRI in the Evaluation of Neck Pain and Cervical Radiculopathy in the United States. Journal of the American Academy of Orthopaedic Surgeons. 2023;31(2):64-70.
3. Rhee JM, Shamji MF, Erwin WM, et al. Nonoperative management of cervical myelopathy: a systematic review. Spine. 2013;38(22S):S55-S67.
4. Matz PG HL, Groff MW, Vresilovic EJ, Anderson PA, Heary RF, Kaiser MG, Mummaneni PV, Ryken TC, Choudhri TF, Resnick DK. Section on disorders of the spine and peripheral nerves of the American Association of Neurological Surgeons and the Congress of Neurological Surgeons: Guidelines for the management of acute cervical spine and spinal cord injuries. Neurosurgery. 2002.
5. Fehlings MG, Tetreault LA, Riew KD, et al. A clinical practice guideline for the management of patients with degenerative cervical myelopathy: recommendations for patients with mild,

moderate, and severe disease and nonmyelopathic patients with evidence of cord compression. Global spine journal. 2017;7(3_suppl):70S-83S.

6. Tobert DG, Antoci V, Patel SP, Saadat E, Bono CM. Adjacent Segment Disease in the Cervical and Lumbar Spine. Clin Spine Surg. 2017;30(3):94-101.
7. Tetreault LA, Rhee J, Prather H, et al. Change in function, pain, and quality of life following structured nonoperative treatment in patients with degenerative cervical myelopathy: a systematic review. Global spine journal. 2017;7(3_suppl):42S-52S.
8. Engquist M, Löfgren H, Öberg B, et al. Factors Affecting the Outcome of Surgical Versus Nonsurgical Treatment of Cervical Radiculopathy. Spine. 2015;40(20):1553-1563.
9. Engquist M, Löfgren H, Öberg B, et al. A 5-to 8-year randomized study on the treatment of cervical radiculopathy: anterior cervical decompression and fusion plus physiotherapy versus physiotherapy alone. Journal of Neurosurgery: Spine. 2017;26(1):19-27.
10. Harrop JS, Mohamed B, Bisson EF, et al. Congress of neurological surgeons systematic review and evidence-based guidelines for perioperative spine: preoperative surgical risk assessment. Neurosurgery. 2021;89(Supplement_1):S9-S18.
11. Kang K-C, Jang TS, Jung CH. Cervical radiculopathy: Focus on factors for better surgical outcomes and operative techniques. Asian Spine Journal. 2022;16(6):995.
12. McAnany SJ, Baird EO, Overley SC, Kim JS, Qureshi SA, Anderson PA. A meta-analysis of the clinical and fusion results following treatment of symptomatic cervical pseudarthrosis. Global spine journal. 2015;5(2):148-155.
13. Broekema AE, Groen RJ, de Souza NFS, et al. Surgical interventions for cervical radiculopathy without myelopathy: a systematic review and meta-analysis. JBJS. 2020;102(24):2182-2196.
14. Gao Q-Y, Wei F-L, Zhu K-L, et al. Clinical Efficacy and Safety of Surgical Treatments in Patients With Pure Cervical Radiculopathy. Frontiers in Public Health. 2022;10:892042.
15. Alomar SA, Maghrabi Y, Baeesa SS, Alves OL. Outcome of anterior and posterior endoscopic procedures for cervical radiculopathy due to degenerative disk disease: a systematic review and meta-analysis. Global Spine Journal. 2022;12(7):1546-1560.
16. Gao Y, Liu M, Li T, Huang F, Tang T, Xiang Z. A meta-analysis comparing the results of cervical disc arthroplasty with anterior cervical discectomy and fusion (ACDF) for the treatment of symptomatic cervical disc disease. The Journal of bone and joint surgery American volume. 2013;95(6):555.
17. Heary RF RT, Matz PG, Anderson PA, Groff MW, Holly LT, Kaiser MG, Mummaneni PV, Choudhri TF, Vresilovic EJ, Resnick DK. Section on disorders of the spine and peripheral nerves of the American Association of Neurological Surgeons and the Congress of Neurological Surgeons: Guidelines for the management of acute cervical spine and spinal cord injuries. Neurosurgery. 2002.
18. Furlan JC, Kalsi-Ryan S, Kailaya-Vasan A, Massicotte EM, Fehlings MG. Functional and clinical outcomes following surgical treatment in patients with cervical spondylotic myelopathy: a prospective study of 81 cases. Journal of Neurosurgery: Spine. 2011;1 4(3):348-355.
19. Fallah A, Akl EA, Ebrahim S, et al. Anterior cervical discectomy with arthroplasty versus arthrodesis for single-level cervical spondylosis: a systematic review and meta-analysis. PLoS One. 2012;7(8):e43407.
20. Bono CM, Ghiselli G, Gilbert TJ, et al. An evidence-based clinical guideline for the diagnosis and treatment of cervical radiculopathy from degenerative disorders. The Spine Journal. 2011; 11(1):64-72.

21. Hisey MS, Bae HW, Davis RJ, et al. Prospective, randomized comparison of cervical total disk replacement versus anterior cervical fusion. Journal of Spinal Disorders and Techniques. 2015;28(4):E237-E243.
22. Johansen TO, Sundseth J, Fredriksli OA, et al. Effect of arthroplasty vs fusion for patients with cervical radiculopathy: a randomized clinical trial. JAMA Network Open. 2021; 4(8):e2119606-e2119606.
23. Nunez JH, Escudero B, Omiste I, et al. Outcomes of cervical arthroplasty versus anterior cervical arthrodesis: a systematic review and meta-analysis of randomized clinical trials with a minimum follow-up of 7-year. Eur J Orthop Surg Traumatol. 2022.
24. Zhang Y, Lv N, He F, et al. Comparison of cervical disc arthroplasty and anterior cervical discectomy and fusion for the treatment of cervical disc degenerative diseases on the basis of more than 60 months of follow-up: a systematic review and meta-analysis. BMC Neurol. 2020; 20(1):143.
25. Li Z, Long C, Li B, Wei J. Efficacy and safety of surgical interventions for treating multilevel cervical spondylotic myelopathy via anterior approach: A network meta-analysis. Pain Physician. 2019; 22(4):E275.
26. Derman PB, Lampe LP, Hughes AP, et al. Demographic, Clinical, and Operative Factors Affecting Long-Term Revision Rates After Cervical Spine Arthrodesis. J Bone Joint Surg Am. 2016;98(18):1533-1540.
27. Zakaria HM, Bazydlo M, Schultz L, et al. Adverse events and their risk factors 90 days after cervical spine surgery: analysis from the Michigan Spine Surgery Improvement Collaborative. J Neurosurg Spine. 2019:1-13.
28. Hermansen A, Hedlund R, Zsigmond P, Peolsson A. A more than 20-year follow-up of pain and disability after anterior cervical decompression and fusion surgery for degenerative disc disease and comparisons between two surgical techniques. BMC Musculoskeletal Disorders. 2023; 24(1):1-8.
29. Zheng HL, Li B, Song SK, Chen PB, Jiang LS, Jiang SD. Anterior cervical discectomy and fusion to treat cervical instability with vertigo and dizziness: A single center, retrospective, observational study. Front Surg. 2022; 9:1047504.
30. Lee DY, Park YJ, Song MG, Kim KT, Kim DH. Comparison of anterior-only versus combined anterior and posterior fusion for unstable subaxial cervical injuries: a meta-analysis of biomechanical and clinical studies. Eur Spine J. 2021; 30(6):1460-1473.
31. Sattari SA, Ghanavatian M, Feghali J, et al. Anterior cervical discectomy and fusion versus posterior decompression in patients with degenerative cervical myelopathy: a systematic review and meta-analysis. J Neurosurg Spine. 2023:1-13.
32. Mummaneni PV, Amin BY, Wu JC, Brodt ED, Dettori JR, Sasso RC. Cervical artificial disc replacement versus fusion in the cervical spine: a systematic review comparing long-term follow-up results from two FDA trials. Evid Based Spine Care J. 2012; 3(S1):59-66.
33. Ghogawala Z, Terrin N, Dunbar MR, et al. Effect of ventral vs dorsal spinal surgery on patient-reported physical functioning in patients with cervical spondylotic myelopathy: a randomized clinical trial. Jama. 2021; 325(10):942-951.