

In an attempt to further define the evidence for intradiscal treatments, a post hoc comparison in 2020 by Ju et al aggregated single-site data from 4 separate multicenter RCTs [Study A: Growth factor BMP-7 (n = 15); Study B: active fibrin sealant (n = 10); Study C: Growth Factor rhGDF-5 (n = 3); Study D: cell-based stem cell treatment MPC-06-ID in HA (n = 10); and saline control group (n = 12)]. While there was both a significant decrease in VAS pain and an improvement in patient reported disability scores, the authors concluded there was no significant difference between the investigational group of biologics and the saline control group. The authors suggested that perhaps saline injection itself has a therapeutic effect, possibly by diluting pro-inflammatory mediators within the degenerated disk, decreasing intradiscal pressure, or a combination of the placebo effect. The small sample sizes and heterogeneity of combining multiple studies make it difficult to draw conclusions from this study⁸³ (see Table 9 for evidence summary).

Therapy Grading

Intradiscal regenerative therapy is burgeoning area of research and intervention. Different than interventions in the previous sections that have established histories with decades of experience, this intervention category is relatively recently introduced into the lexicon of therapeutic intervention. As a result, there is one RCT and several observational studies and case series which are utilized to form recommendations. Table 9 summarizes the current literature on this family of interventions and Table 10 summarizes those recommendations. There is evidence for the use of intradiscal PRP in the form of a single RCT, and several prospective observational studies and case series for both autologous bone marrow and adipose tissue-derived mesenchymal stem cells, as well as allogeneic mesenchymal stem cells and cellular allograft disc matrix for the treatment of persistent lumbar discogenic back pain. It is important to discern that the primary patient populations studied have previously failed the multidisciplinary standard of care. Regenerative Medicine holds the potential to provide an alternative intervention for these patients whose pain persists despite the recommended conservative management. In these selected patients, intradiscal biologics may improve pain and function without the need for advanced surgical treatments that can impair the spine's native biomechanics (Table 10).

Sacroiliac Joint Injections

The sacroiliac joint (SIJ) is a diarthrodial synovial joint with abundant innervation from the lumbosacral nerve roots.^{84,85} The joint itself is approximately two-thirds synovial and one-third ligamentous, with the synovial portion extending anterior and inferiorly and reinforced at its posterior and superior aspect by syndesmotic ligament.⁸⁶ The sacroiliac joint is accepted as a relatively common source of low back and/or buttock pain with or without lower extremity pain. The sacroiliac joint has been implicated as the primary pain generator in 10% to 27% of low back pain cases.^{87,88} SIJ dysfunction more commonly occurs with degenerative conditions or with an imbalance between the two SI joints; therefore, patients at increased risk for SIJ pain include those with leg length discrepancy, advanced age, inflammatory arthritis, pregnancy, trauma, and previous spine surgery.⁸⁹

There are no definite historical, physical, or radiological features to provide a definite diagnosis of sacroiliac joint pain.⁹⁰⁻⁹² A systematic review by Szadek et al evaluated the diagnostic validity of the International Association for the Study of Pain (IASP) criteria for sacroiliac joint pain and concluded that the thigh thrust test, the compression test, and 3 or more positive stressing tests contain sufficient discriminative power for diagnosing sacroiliac joint pain.⁹³

Table 10 ASPN Back Consensus Group Recommendations for Regenerative Therapies

Recommendation	Grade	Level	Level of certainty Net benefit
Intradiscal PRP in the treatment of discogenic LBP	I	I-B	Low
Intradiscal allogeneic mesenchymal stem cells in the treatment of discogenic LBP	I	I-B	Low
Intradiscal bone marrow derived MSCs	I	I-B	Low
Intradiscal adipose tissue derived MSCs	I	I-C	Low

Note: While these small moderate quality studies look promising, there is much yet to do in this space.

Abbreviations: LBP, low back pain; MSCs, mesenchymal stem cells.