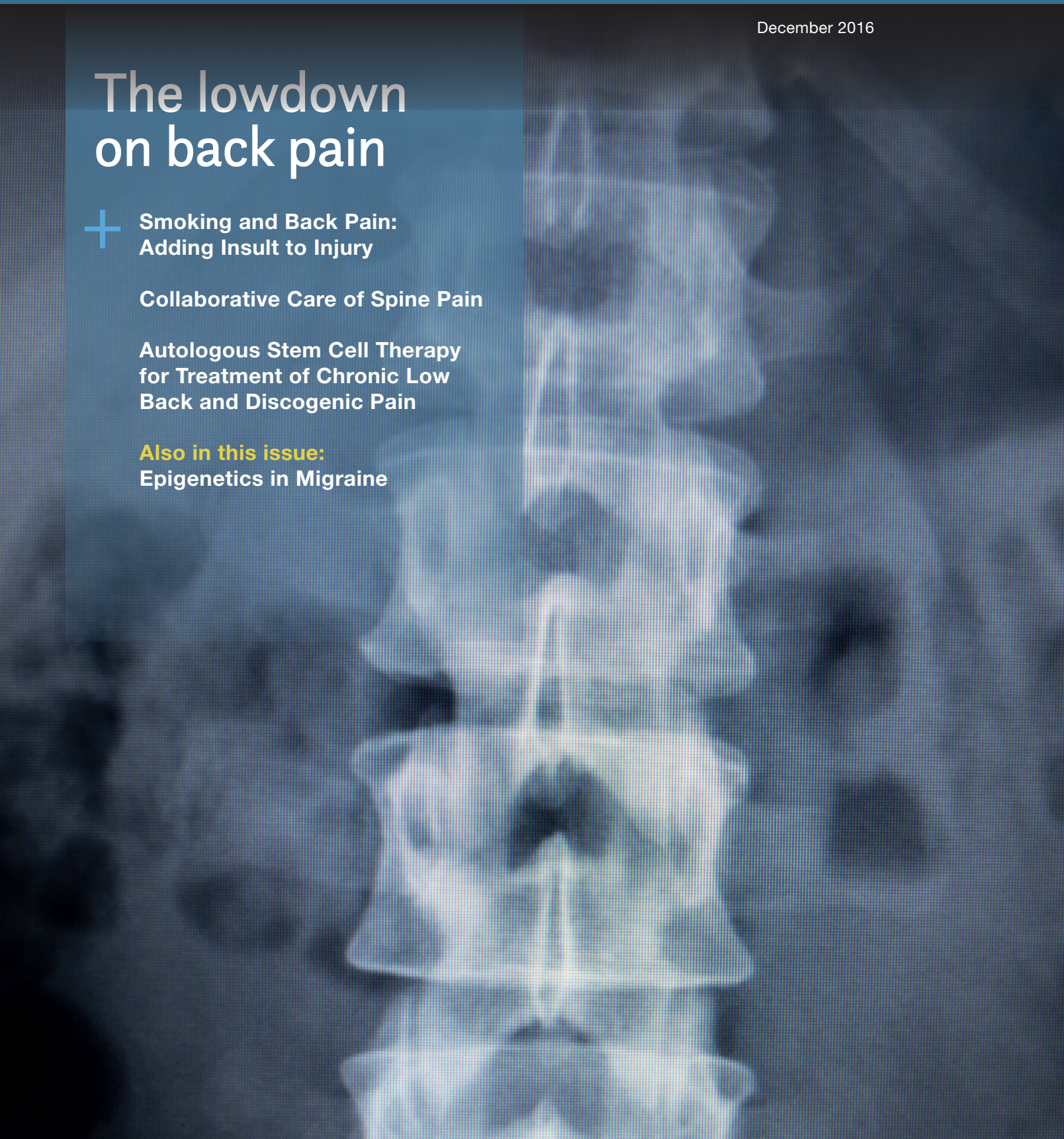
Academy of Integrative Pain Management

Integrative Pain Management for Optimal Patient Care

# The Pain Practitioner

December 2016



## The lowdown on back pain

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Autologous Stem Cell Therapy for Treatment of Chronic Low Back and Discogenic Pain

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# Autologous Stem Cell Therapy: A Naturopathic Approach to the Treatment of Chronic Low Back and Discogenic Pain

*By Harry Adelson, ND*


## SUMMARY

Low back pain is the leading cause of disability worldwide (1). An emerging approach to the treatment of chronic low back pain is the use of concentrated/isolated autologous mesenchymal stem cells (MSCs) that are harvested from a patient's own bone marrow and adipose tissue and reinjected into affected structures and tissue beds. The purpose of this retrospective survey was to evaluate patient-reported outcomes one year after treatment of low back and discogenic pain in patients injected with adipose-derived stromal vascular fraction suspended in bone marrow aspirate concentrate (SVF/BMAC). Of the patients surveyed (N = 30), there were no adverse outcomes and one non-responder. The average improvement reported was 77.5% from baseline. Based on this author's experience, injection of SVF/BMAC concentrate for low back pain appears to be safe and produces consistently satisfactory results.

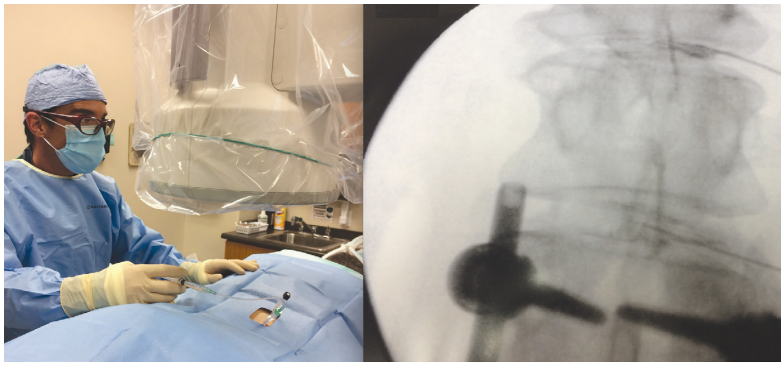



**Figure 1. Injection of lumbar discs with adipose-derived stromal vascular fraction suspended in bone marrow aspirate concentrate.**

## INTRODUCTION

Low back pain causes more global disability than any other condition (2). According to research, conservative treatment appears to be of limited benefit (3), the usefulness of lumbar epidural steroid injection has been called into question (4-6), and surgery for low back pain carries tremendous risk (7).

Naturopathic physicians in the US and Canada have a rich history of performing prolotherapy (8). The injection of autologous stem cells for the treatment of chronic musculoskeletal pain can be viewed as the natural evolution of prolotherapy (9), and its proposed mechanism of action, namely the regeneration of damaged or degenerated tissues through the triggering of the body's own healing response, is perfectly aligned with the guiding principles of naturopathic medicine (10).

MSCs have been called "patient-specific drug stores for injured tissues" because of their ability to secrete bioactive factors and signals at variable concentrations in response to local microenvironmental cues (11). MSCs release a spectrum of antiinflammatory, immunomodulatory, and trophic factors that trigger the regeneration and healing of connective tissues through activation of stem cells endogenous to the site (11). Stem cell therapy is based on the premise that all musculoskeletal structures contain populations of MSCs whose primary role is to maintain the health of their microenvironment; degeneration and pain occur when these populations either become depleted or lose their ability to function properly (12). Therefore, the goal of stem cell therapy is to repopulate degenerated structures and tissue beds with a robust population of viable MSCs (12). The site-specific injection of autologous stem cells has shown promise in musculoskeletal pain conditions such as osteoarthritis (13,14), sports/traumatic injury (15), low back and discogenic pain, neck pain with or without cervicogenic headaches (16), and osteonecrosis (17).

MSCs are found throughout the body in many tissue types, but they are particularly abundant and easily harvested from the medullary cavity of flat bones and adipose tissue. MSCs can be easily concentrated from aspirated bone marrow using simple centrifugation (18), thereby rendering bone marrow aspirate concentrate (BMAC). With a little more effort, MSCs can be isolated from lipoaspirated adipose tissue through a multi-step process of incubation and enzymatic digestion with collagenase, followed by centrifugation and filtration (19), thus rendering adipose derived stromal vascular fraction (SVF). It is the experience of this author that the injection of SVF/BMAC offers superior outcomes to either BMAC alone or SVF suspended in platelet-rich plasma alone (20).

## METHODS

Regenerative Injection Therapy is based on the premise that chronic low back pain is rarely due to a single pain generator (21). Desiccated discs can be a pain generator, but so can neovascularization in paravertebral tissue beds (22) and within the epidural space (23). Thus, over 15 years of private practice, I have developed a simple algorithm for treating chronic low back pain, outlined in Table 1.

In January 2016, we reviewed the charts of 112 patients treated for low back pain (Categories I-III) between January 1 and August 31, 2015. Patients who were between the ages of 18 and 85 at the time of treatment and who fit the following criteria were included in the study: Patients had to have lumbar discogenic pain (determined by patient report of midline lumbar pain that was made worse by bending forward) along with lumbar disc desiccation that was visible on MRI. They had to have undergone a single Category III stem cell treatment (see Table 1).

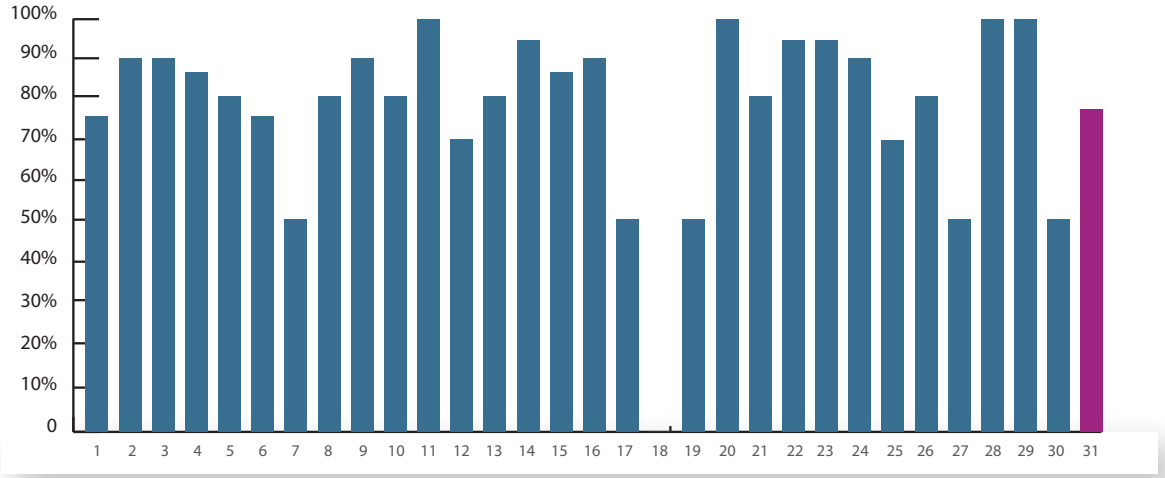
**Table 1. A Regenerative Injection Therapy Algorithm for the Treatment of Low Back Pain**

| | |
|---|---|
| **Category I:** Non-specific low back pain | 1. Perifacet injection L2/3-L5/S1 bilateral<br>2. Iliolumbar ligament injection bilateral<br>3. Sacroiliac ligament injection bilateral |
| **Category II:** Radiculopathy/paresthesia | 1. Transforaminal epidural at most affected level/side (bilateral if sides equal)<br>2. Perifacet injection L2/3-L5/S1 bilateral<br>3. Iliolumbar ligament injection bilateral<br>4. Sacroiliac ligament injection bilateral |
| **Category III:** Discogenic pain; determined by patient report of midline lumbar pain made worse bending forward accompanied by disc desiccation on MRI (decreased signal strength upon T2 weighting); with or without radiculopathy/paresthesia | 1. Intradiscal injection at affected level(s)<br>2. Transforaminal epidural at most affected level/side (if sides equal: bilateral, in case of no radiculopathy/paresthesia: unilateral at level of most affected disc)<br>3. Perifacet injection L2/3-L5/S1 bilateral<br>4. Iliolumbar ligament injection bilateral<br>5. Sacroiliac ligament injection bilateral |

They had not undergone lumbar fusion or laminectomy prior to treatment (although those who had undergone microdiscectomy were included). Finally, they had experienced continuous pain for no less than one year prior to treatment.

Between February and August, 2016, I phoned all the patients who fit the above criteria and who were between 12 months and 16 months post-treatment to ask them two questions: 1) What percentage improvement have you experienced since your stem cell injection?, and 2) Overall, are you satisfied with the stem cell treatment?

**Figure 2. Patient-reported improvement one year after treatment.**




## RESULTS

Of the patients surveyed (N = 30), none had any adverse reactions. One patient reported having experienced no benefit at all, but neither was he made worse by the treatment. Five patients reported 50% improvement. Four patients reported 100% improvement. The remaining 20 patients reported an average of 77.5% improvement (ranging between 50% and 100%). Overall, 29 out of 30 patients (96.7%) identified themselves as "satisfied" with their stem cell treatment.

## DISCUSSION

Based on our experience, injection of SVF/BMAC for low back and discogenic pain appears to be safe and produces consistently satisfactory results. Clearly, this simple survey does not claim to provide any hard evidence; it is intended as an empirical report of our clinical experience in this new and rapidly growing field. ❑ ***References are on page 37.***

**Harry Adelson, ND,** opened Docere Clinics in Salt Lake City in 2002, and from day one his practice has been 100% regenerative injection therapies for the treatment of musculoskeletal pain conditions. Since February of 2010, Dr. Adelson has performed more than 4,000 bone marrow and adipose-derived adult stem cell procedures, placing him in the company of those most experienced in the world with use of autologous stem cells for the treatment of musculoskeletal pain conditions. Dr. Adelson lives and practices in Park City,

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