

Global Congress on

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## Cutting edge concepts in the use of stem cell and PRP injections in an office setting

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The presentation concerns PRP and Stem Cell (both bone marrow and adipose) injections for musculoskeletal conditions in an office setting. Indications are given as to which type of cell and technique to use to accomplish repair. Stem cells, both bone marrow derived (BMAC) and adipose, are used for the more difficult problems. PRP injections are utilized for the less severe problems. Indications are given when to use stem cells versus PRP and when to use both. The newest concepts in stem cell science are presented. These concepts include the clinical use of MUSE cells, exosomes and blastomere like stem cells. Basic science of both PRP and stem cells are discussed. This presentation defines what constitutes an effective PRP preparation. Myths concerning stem cells are dispelled. One myth is that mesenchymal stem cells are the most important stem cell. This was the initial interpretation of Dr. Arnold Caplan the father of mesenchymal stem cell science. Dr. Caplan now feels that MSCs have an immunomodulation capacity which may have a more profound and immediate effect on joint chemistry and biology. We now learn in the talk that the hematopoietic stem cells are the drivers of tissue regeneration. Also discussed are adjuncts used which enhance the results. These therapies include supplements, LED therapy, lasers, electrical stimulation and cytokine therapy. The scientific rationale is presented for each of these entities as to how they have a direct on stem cells.

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## Patient-specific modeling of disease: When are iPS cell-based designs inappropriate

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Patient specific modeling has provided key insight into the mechanisms of human disease. In particular, the opportunity to utilize model systems such as induced pluripotent stem cells or murine animal models has invaluable increased the tool box available to pathobiologists. However, choosing which model is optimal for translation can prove difficult. Here, we present findings of Congenital Central Hypoventilation Syndrome, a rare human disorder that result in an impaired response to CO<sub>2</sub> in human patients. We developed patient specific iPS cell and transgenic mouse models of this disease, which provide insight into ventilator control in humans. We also discuss the appropriateness of iPS cell versus murine models in studying human disease.

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