

# 3<sup>rd</sup> International Conference on Cell and Gene Therapy

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## Mastering Regenerative Therapy (Bone Marrow Extracts) My long Experience

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**R**egenerative medicine added great advantage in the treatment of orthopedic and sport medicine therapy through a multiple therapeutic modules, since I started 2006 to inject PRP into the required sites to treat sport injuries and going through most of the modalities of such therapy, BME (bone marrow extracts), stem cell with cultivation, purified adipose tissue transfer and stem cell non cultivated, till recently the regenerate therapy. In addition to the effective treatment for managing a lot of musculoskeletal cases and the good results obtained, there is a significantly reduced risk of rejection or immune response using autologous biologics as compared to alternative treatment options. Also there is a minimal risk of allergic reactions or tissue rejection. The autologous regenerative therapy uses the normal regeneration and repair process of the human body from my long experience I would like to emphasize that patients or conditions that are most likely to respond to autologous, biologic-based products have not yet been internationally characterized. Therefore, clinical success depends on several factors including proper diagnosis, the severity of the condition being treated, patient age and comorbidities.

I will go through this talk in presenting a journey explain my clinical experience, the way I use and manage regenerative therapy and the success that I achieved during this journey.

Keywords: Knee, Osteoarthritis, Bone Marrow, Extracts Concentrate, Pain, and Balance.

### A: Introduction

Knee osteoarthritis is a chronic degenerative progressive disease that gradually deteriorates the articular cartilage and affects the synovial joints viscos formation it is very common with an annual incidence of 4 to 6 % female more than male especially the age after 50 years. The clinical manifestation of osteoarthritis is mainly pain, stiffness, effusion, limitation of movement, might causes deformity of the joint and affect daily performance activity and having debilitating effect on the quality of life this are accompanied by decline into the muscle strength, balance and joint proprioception which expose the patient to a risk of fall and instability. The no surgical management including body weight reduction, physical therapy, analgesics, corticoids injections, intra-articular hyaluronic acid and regenerative therapy like PRP, bone marrow extracts and stem cells for helping patient to relieve the symptoms, delay progression of osteoarthritis, modify the life style and minimize patient disability. So in our study bone marrow extracts consist of autologous concentrated cells the rich mixture of cells found in concentrated bone marrow aspirate has been shown to improve tissue healing functions, such as fibroblast proliferation, extracellular matrix production, anti-apoptosis signaling and revascularization. The cells included are

1. STEM CELLS Convert to osteoblasts, chondrocytes and other terminal tissue types.
2. PROGENITOR CELLS Convert to terminal tissue; support angiogenesis; release BMP-2 and BMP-6; activate dormant cells.
3. PLATELETS Are a rich source of growth factors that support proliferation and differentiation.
4. LYMPHOCYTES Support the migration and proliferation of endothelial progenitor cells.

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5. GRANULOCYTES Support angiogenesis through release of vascular endothelial growth factors (VEGF); mediate inflammation.
6. CD34+ CELLS Differentiate into endothelial lineage cells.

This give us a good biological nature therapy that focus the attention for treatment of osteoarthritis which showed us modification of inflammatory response and regulation of angiogenesis and cell differentiation to promote the synovial cell proliferation and recovery of cartilage morphology and could regulate the indigenous hyaluronic acid synthesis which lubricate the joints and fight stiffness and this showed as greater reduction of pain and favorable effect on function restoration for up to 12 months with all our patients of knee arthritis. It also shows main restoration of viscoelastic properties of the synovial fluid which help in reduction of tear and wear and reduction of pain also promote chondrocyte proliferation and increase cartilage synthesis. We believe that the growth factor will increase the viscosity and modify the inflammatory cytokines of degenerative progression on chondrocytes which decrease inflammation of osteoarthritis. Based on our clinical observation and evaluation of the patience for in period at least minimum 1 year we suggest the bone marrow extract as a good line of regenerative therapy to fight against degenerative and mechanical osteoarthritis in moderate to early severe cases as our protocol we emphasize that pain reduction and functional activity, balance reduction of risk of fall and improve the quality of life of patient with knee osteoarthritis.

## B: Study Design

1. Participants: Our prospective study conductive between year 2010 and 2020, all patients had signed study subject, written form with consent prior to enrollment into the injection the study was including osteoarthritic patient moderate to early severe (Grade 2 to Grade 3) included all above the age of 50 years up to 65 years of age, Unilateral or Bilateral osteoarthritis, 33 Male and 56 Female study exclusion criteria was any intra-articular injection done for the 6 months prior to the study, any autoimmune rheumatoid arthritis, any diabetic patient, any thrombocytopenia disease or anticoagulation therapy and any previous major knee surgery.
2. Bone marrow extracts preparation: Blood extracts 50 ML extracted from the iliac crest (3 punctures) and sample is collected in an especial jar for concentrate separator then anticoagulant is added without any activators the centrifuge 1200 rpm for 10 minutes and approximately, 6 ml of extract concentrate bone marrow was isolated and ready for injection.
3. The intra-articular injection of extracts: Done by the same surgeon 30 years' experience of intra-articular injection of the knee the patient was lying with extended knee a needle was inserted into the joint laterally via landmark guided supra lateral approach. The patient was allow to take only paracetamol 500mg 3 to 4 per day and no other treatment is allowed ( no physiotherapy, no analgesics, no NSAIDS and no intra-articular injection) and patient instructed to record the frequency and dosage of paracetamol and score of pain during the study.
4. Outcome: All outcomes measured before injection and 1, , 3, 4, 5, 6 and 12 months post-injection by the same physician and outcome where assist for pain, swelling, function, stiffness and quality of life. The score for pain from 0 (mildest) to 10 (most severe), also WOMAC subscales where evaluated and recorded considering the pain, stiffness and function and the test reliability for WOMAC was satisfactory 0.8, 0.91, 0.85 respectively so clinically the reduction of pain score in average was about 26% and improvement in function between 18% to 26%.

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5. Observation: This technique of regenerative therapy prove to ameliorate the clinical symptoms of the patient improve the balance and reduce the risk of fall with knee osteoarthritis through reduction of pain and stiffness with a satisfied significance which support the use of regenerative medicine in promoting tissue regeneration and inhibiting osteoarthritis inflammation and detorriation of cartilage though our results cannot be generalize for all types of osteoarthritis nor for this severe osteoarthritis population for further research and studies are encourage.

## C: Conclusion

To master the regenerative medicine

- You need experience from 3-5 years to Master the regenerative treatment
- You should specify your target, But No harm to adjust from time to time your target and protocol as this is a continuously progressing branch of medicine.

You should have intense focus on what to do and why you do

- Think as much as possible out of the Box.
- you should reply on Three Questions
- 1- What to Do and why?
- 2- How to Do and For How-long?
- 3- Is it accurate and accountable?
- So do it steadily right and have the ability to have self correction and Learning journey.
- 1-Attention -→ engaged in the process with easy start
- 2-Retenstion -→ Rehearse, Record and Focus
- 3- Production -→practice and count the response and feed-back
- 4- Motivation (goals) Revision and specify your work according to your experience.
- 5- Master your experience.
- How to Master Your Experience
- Good Observation: and always define your skills and sharpen it.
- Share your knowledge with experts and have a good monitoring, repeat and ameliorate your results as possible and measure your progress.
- Get a good References
- Fight on and overcome your struggles

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## Biography

Dr. Issam A. Mardini is working as an Assistant Professor of Department of Anesthesiology & Critical Care at The University of Pennsylvania Health System. He is also working as Attending Anesthesiologist, Hospital of the University of Pennsylvania. He received his MD (Medicine) from University of Damascus, Damascus, Syria, 1978 and Ph.D. (Physiology & Pharmacology) from University of South Dakota, 1985.. His research interests include: Acute pain management, perioperative pain control, chronic pain medicine, nerve blocks and regional anesthesia, injection/ablation for chronic pain, anesthesia for orthopedic and gynecological surgery, anesthesia for urological surgery, anticoagulation agents in the perioperative period and their interactions with regional anesthesia.

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