stem cell therapy.
Adipose-derived Stem Cell Therapy

Cell based therapies (including Stem Cells and Platelet-rich Plasma) offer exciting potential in treating conditions such as osteoarthritis and tendinopathy.

Adipose tissue is a rich source of adipose-derived stem cells. These cells have an ability to differentiate into cartilage cells.

Adipose-derived stem cells may improve symptomatic arthritis by:
- reducing inflammation
- assisting the healing mechanism
- replacing/regenerating damaged cartilage or tendon

It is important to understand that not all patients are suitable for stem cell therapy. Further, not all `stem cell' therapies are the same and it is important to understand the difference. This handout explains some of the questions that you may have regarding stem cell therapy.

Further web based resources offering information regarding the development of stem cell therapies include:
- Stem Cells Australia [http://stemcellaustralia.edu.au](http://stemcellaustralia.edu.au/)
- National Stem Cell Foundation [http://stemcellfoundation.net.au](http://stemcellfoundation.net.au/)
- International Cellular Society [http://www.cellmedicinesociety.org](http://www.cellmedicinesociety.org/)

Are stem cells safe?

Systematic review of articles on the use of mesenchymal stem cells in the treatment of various conditions has shown good evidence of safety.

Review of over 1000 patients who had received intra-vascular injections of mesenchymal stem cells did not identify any significant adverse events other than transient fever (Lalu, et al. 2012). Further review of patients who had received intra-articular (within the joint) injections similarly showed evidence of safety.

No association has been made between mesenchymal stem cell therapy and adverse events such as infection, death or malignancy.

Importantly adipose-derived stem cells are an autologous medium and are taken from your own body.

What is the evidence?

Laboratory based trials have confirmed the ability of adipose-derived stem cells to differentiate into cartilage (Diekman, et al. 2010).

Adipose-derived stem cells have shown cartilage regrowth and functional improvement in animal studies (Dragoo, et al. 2007).

Bone marrow derived stem cell trials have shown pain and function improvement with follow-up imaging indicating improvement in cartilage volume (Wakitani, et al. 2007).

Blood derived stem cell therapy when combined with orthopaedic arthroscopy has shown biopsy confirmed regeneration of cartilage like tissue (Saw, et al. 2011).

Adipose-derived stem cells have been shown to enhance the primary repair of ruptured tendons (Uysal, et al. 2012).

Intra-articular (within the joint) injections of pure adipose derived mesenchymal stem cells has resulted in regeneration of cartilage with resultant increase in overall cartilage volume and reduction in the size or cartilage lesions (Jo, et al. 2014).

Positive results in regeneration of cartilage have been shown with injections of 50-100Million 'pure' mesenchymal stem cells.
What is Involved?

Adipose-derived stem cell therapy involves a harvest procedure performed under local anaesthetic and light sedation.

Adipose tissue is taken from the body (usually the abdomen) using a procedure similar to liposuction. Harmed adipose tissue undergoes further processing to extract the adipose-derived stem cell component. Stem cells undergo expansion to produce increased cell numbers and improve efficacy.

Patients will receive multiple injections of adipose-derived stem cells into their arthritic joint or tendon. Conditions may require orthopaedic intervention prior to stem cell therapy.

All patients who undergo adipose-derived stem cell therapy will have formal follow-up with their treating physician.

How is Melbourne Stem Cell Centre different?

Melbourne Stem Cell Centre (MSCC) is a research driven organisation with a clear focus on using evidence based techniques in stem cell therapies.

MSCC stem cell therapies use `pure' high dose mesenchymal stem cell preparations that have been shown to not only improve pain and function but also to stimulate tissue regeneration.

Other `stem cell' clinics commonly use techniques that result in therapies that have less than 10% stem cells. These techniques/therapies have not been associated with tissue (ie. cartilage) regeneration.

Contra-Indications

Whilst current research indicates that adipose-derived stem cell injections are a safe therapy, it is contra-indicated in the following conditions:

- pregnancy
- cancer
- some bleeding disorders
- organ failure
- immunosuppression
- uncontrolled hypertension or diabetes

What are the risks?

There are risks associated with all medical procedures.

Harvest Procedure

- Infection - risk is minimised through use of a sterile harvesting technique and also prophylactic antibiotics.
- Pain/bruising at the site of harvest.
- Abdominal asymmetry - the risk of asymmetry post liposuction is limited due to the small volume (100-200mls) of adipose tissue required.

Stem Cell Injections

- Infection - to reduce chance of infection all injections are done under sterile conditions using ultrasound guidance for accuracy.
- Pain/Discomfort - it is not uncommon for people to experience pain post injection of stem cells. You will be supplied with a script for appropriate analgesia/pain relief. Some people may need crutches in the initial period due to discomfort.
- Swelling - it is expected that your joint will swell post the injection of stem cells. This can be controlled using ice and a compression bandage and will improve usually within days.
Cost

Currently there is no Medicare or Private Health Fund rebate for this procedure. The cost will have three components and you should discuss this with the clinic:

- Stem Cell Isolation fee
- Facility fee
- Clinician fee

Research

- Lalu, ML., McIntyre, L., et al. (2012) “Safety of cell therapy with mesenchymal stromal cells (safe cell): A systematic review and meta-analysis of clinical trials”, PLOS One; 7(10), open access e47559