osteoarthritis.
Active Management of OsteoArthritis

Arthritis is a major cause of disability and chronic pain in Australia.
>3.95 Million Australians suffer from arthritis
Up to two thirds of people suffering from osteoarthritis are of working age.
Osteoarthritis is a progressive condition.
Traditional treatments are only directed toward pain relief/analgesia.
We believe in the active management of arthritis.
Whilst pain relief remains a primary objective, we use a multidisciplinary approach that aims to actively prevent/reduce progression of arthritis.

Treatment Plan/Options

Primary Medical Therapy
- Analgesia - Simple Analgesics and/or non-steroidal anti-inflammatories
- Supplements - Glucosamine Sulphate
- Exercise - Exercise Physiology/Physiotherapy
- Biomechanical Assessment - Podiatry
- Weight Loss - Nutritionist/Dietician

Advanced Medical Therapy
- Stem Cell Therapy
- Platelet-rich Plasma
- Viscosupplement Injections

What is Involved?

Prior to any treatment you will receive a thorough `arthritis health care’ consultation with one of our sports medicine physicians. Current pain management therapies will be optimised.
If relevant, further nutritional and exercise consultations will be arranged.
Your suitability for for other `advanced medical therapy’ options will be assessed.
Formal imaging (XRays or MRI) will be arranged if required.
Your response to treatment will be regularly followed up to maximise potential improvement.
Primary Medical Therapy

Analgesia

• Paracetamol
• Non Steroidal Anti-inflammatories
  
  *It is important to consult with your doctor prior to using anti-inflammatories in the treatment of your arthritis.

Supplements

• Glucosamine
  
  • Glucosamine is an amino-acid that forms the common ‘back bone’ of cartilage matrix.
  • Evidence suggests that glucosamine supplements may offer both pain relief and reduce the progression of arthritis
  • Dose
    • At least 1500mg/day of Glucosamine Sulphate (NOT Glucosamine Hydrochloride)
  • Chondroitin ? Shark Fin ??
    • Many glucosamine preparation have additional additives. Some evidence suggests additional benefits with Glucosamine + Chondroitin Sulphate preparations.
  • Risks
    • Allergy/anaphylaxis - Glucosamine is derived from shell fish.
  • Research :

Exercise

• Regular and appropriate exercise can be effective in reducing pain and disability associated with arthritis
• A structured program created and supervised by a professional rehabilitation Exercise Physiologist or Physiotherapist is recommended.
  • Exercise Principles (FITT)
    • Frequency : At least 3 session per week for > 8weeks
    • Intensity : Moderate Intensity
    • Type of exercise : Aerobic, resistance and load bearing
    • Time : At least 30minute sessions
  • Research :

Biomechanical Assessment

• Podiatry assessment and relevant biomechanical adjustment can often help to unload areas of arthritis and therefore reduce pain and improve function.

Weight Loss

• Increased weight is a risk factor for the development of osteoarthritis in weight bearing ie. (hip and knee) and also non weight bearing joints (ie. hand).
• Loss of 5kg has been shown to be effective in reducing the risk of knee arthritis by a factor of up to 50%.
• It is important to have a structured weight loss program developed by a qualified Nutritionalist or Dietician.
  • Research :
Advanced Medical 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.

Adipose tissue is a rich source of adipose-derived mesenchymal 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

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:

- 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).

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 of cartilage lesions (Jo, et al. 2014).

Positive results in regeneration of cartilage have been shown with injections of 50-100 Million ‘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.

Harvested 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.

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 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 due to lack of data on:

- 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
Platelet-rich Plasma (PRP) is a growth factor rich medium that is developed from your own blood. It is not synthetic. Studies have shown significant reduction in osteoarthritic knee pain within 5 weeks post injection and continued improvement in symptoms for up to 1-2 years. There is no evidence to suggest that Platelet-rich Plasma therapy results in regeneration of cartilage.

Why use PhotoActivated Platelet-rich Plasma?

PRP therapy is indicated in mild to moderate osteoarthritis where pain is not controlled by other conservative measures such as simple analgesics.

PRP has been shown to improve pain control and theoretically may slow the progression of arthritis.

PRP therapy is an `autologous' medium - it is developed from your own blood and does not contain any animal products and is not synthetic.

What is Involved?

PRP therapy involves three injections into the injured area over two weeks. Patients are required to cease taking anti-inflammatory tablets one week prior to the PRP procedure. Patients taking regular aspirin should continue to take this as prescribed by their general practitioner.

Injections are done under sterile conditions, with local anaesthetic and using ultrasound guidance. On each occasion you will be required to donate blood for generation of the PRP. Each procedure will take approximately 45 minutes.

It is recommended that you have someone to drive you home after an injection due to some potential residual effects of the local anaesthetic or discomfort from the procedure.

All patients who undergo PRP therapy will have follow-up with their treating physician.

Patients will be required to fill out questionnaires to allow appropriate analysis of their treatment response.

Risks

Bleeding/Bruising

Infection

- To reduce chance of infection all injections are done under sterile conditions using ultrasound guidance for accuracy.
- PRP has natural anti-bacterial properties that reduce chance of infection.

Pain/Discomfort

- Injections can be uncomfortable. Where possible a regional nerve block is performed to improve comfort.
- Some people may experience a vasovagal episode during or post injection where they feel lightheaded and sweaty. This is self limiting.

Contra-Indications

Whilst very safe, use of platelet-rich plasma is contra-indicated in the following conditions -

- pregnancy
- cancer
- some bleeding disorders
Evidence

Research has shown PRP to be effective in achieving pain and functional improvement in mild to moderate osteoarthritis.

Research Articles

Advanced Medical Therapy - ViscoSupplement Injections

Viscosupplements are a form of hyaluronic acid.
Viscosupplements are designed to lubricate and ‘cushion’ the arthritic joint.
Viscosupplement injections have been shown to reduced arthritis related pain within 12 weeks.
Reduction in pain can last for up to 6 months

What is Involved?

Viscosupplement therapy involves 1-5 injections into the arthritic joint.
Injections are done under strict sterile surgical conditions, with local anaesthetic and using ultrasound guidance.
It is recommended that you have someone to drive you home after an injection due to some potential residual effects of the local anaesthetic or discomfort from the procedure.

Risks/Complications

Bleeding/Bruising
Infection
• To reduce chance of infection all injections are done under strict sterile conditions using ultrasound guidance for accuracy.

Pain/Discomfort post procedure
• A proportion of patients experience mild discomfort post injection
• Regular simple analgesics such as paracetamol are recommended

Post injection ‘flare up’
• Up to 10% of patients may experience a post injection inflammatory ‘flare’.
• This may require aspiration of the joint and injection of cortisone to reduce the inflammatory response.

Contra-Indications

Use of visco-supplement is contra-indicated in the following conditions:
• pregnancy
• previous ‘flare up’
• allergies to bird products - ie. feathers, eggs, poultry.

Cost

Cost of the Viscosupplement is ~$500. This cost may be partially covered by your health fund. It is advised that you contact your health fund to enquire about funding.

Research