

Patient Treatment Information

Treatment: Adipose-derived stem cell treatment for cartilage lesions.

Doctor: Dr Dan Bates

Introduction:

The below information is for patients considering having stem cell therapy for treatment of osteoarthritis or cartilage lesions of their joints. Stem Cell therapy for cartilage lesions or osteoarthritis is an experimental procedure. Beyond the information we provide you, we strongly recommend you understand and consider all other treatment options prior to proceeding. We also recommend you read further about stem cells and the potential issues about their use. Good places to start are

- Australian Stem Cell Centre <http://www.stemcellcentre.edu.au/>
- International Society for Stem Cell Research <http://www.isscr.org/public/index.htm>
- NSW Stem Cell Network <http://www.stemcellnetwork.org.au/>
- Stem Cell Network <http://www.stemcellnetwork.ca/index.php?page=for-patients&hl=eng>
- International Cellular Society <http://www.cellmedicinesociety.org/>

If you have any questions or concerns please speak with your treating doctor.

It is important to note that stem cell therapy in its many forms is currently experimental. The cells are believed to aid in the repair and possible regeneration of the tissue being treated. Unfortunately, they are not the cure-all that is sometimes portrayed in the mass media. Thus to get the best effect out of the cells you must take part in a well constructed rehabilitation program and gradually return to activity in a timely and controlled fashion. Please do not hesitate to ask for assistance from your treating doctor or your current physiotherapist or allied health clinician to implement a rehab program.

Dr Dan Bates

What is the process?

The process of treating your cartilage lesion will require multiple steps.

1. Pre-assessment
2. Reasons for being refused treatment
3. Risks
4. Treatment and repeat treatment.
5. Follow-up

Pre-Assessment:

The purpose of pre-assessment is to assess your condition and its suitability for treatment with stem cells. It is also used to decide whether other, more appropriate or less invasive, measures may be employed to treat your condition. We will also assess any risks the stem cells or other health issues may pose to you while undergoing this procedure. The pre-assessment will involve

- Full history and examination with focus on your injury.
- Blood tests including Hep B, Hep C, HIV and HTLV.
- X-Rays and a MRI with cartilage mapping.

This will provide baseline staging of your condition and allow us to follow any clinical improvement or regeneration that may occur. You will also be asked to fill in a number of functional and pain scales as a baseline of your symptoms.

Why would you be refused treatment?

The list below outlines the reasons you may be refused treatment. All reasons to refuse treatment are based on the belief that it is of potentially more harm to you to proceed than to not proceed with the treatment.

- You do not consent to the treatment
- You refuse to take part in post-treatment follow up
- You are allergic to
 - Soy
 - Eggs
 - Local anaesthetic
- You are taking medications such as
 - Blood thinners (eg Warfarin, Coumadin, Clopidogrel)
- You have organ failure
 - Kidney failure
 - Liver failure

- Heart failure
- Lung failure
- Serious, poorly controlled psychiatric disease
- Cancer
 - You have a current diagnosis of cancer
 - You are undergoing ongoing monitoring following treatment
- Pregnancy
 - You are pregnant
 - You are trying to fall pregnant
 - You are currently breast feeding
- You are immunosuppressed
 - You are currently taking immunosuppressive drugs or immunomodulators
 - You have had an organ transplant
- Blood disorders
 - You have a bleeding disorder
 - You have had recurrent deep vein thromboses or clots in your lungs.
 - You are taking warfarin, clexane or equivalent blood thinners
- Infection
 - You have a current infection including local infections or systemic infections such as colds and flu.
- Heart disease
 - You have uncontrolled hypertension
 - You have uncontrolled ischaemic heart disease
 - You have heart failure
- Diabetes
 - You have uncontrolled diabetes

What are the risks?

Infection

Blood born infections

- As the stem cells are from your own body, harvested on the one day and reinjected within 3 hours, there is no risk of contracting HIV, Hep A, Hep B, Hep C, or HTLV.

Local infections

- There is a small risk of infection at the site of the fat harvest and in the joint that is injected. To minimise the risk of infection
 - The procedure is performed using a sterile technique
 - The cells are extracted in a Class II biohazard hood in accordance with the Australian standard for handling of human tissue
 - The injection is performed using a sterile technique
 - You will be provided with 5 days of antibiotics to be taken after the procedure.
 - You will be educated to recognise the signs of infection
 - You will be provided with contact details to speak with your doctor in you are concerned

Allergic reaction:

- There is a risk of allergic reaction to the emulsifying agent as it contains products derived from soy and egg. Other substances such as local anaesthetic will be used in the procedure, to which some people may also be allergic.

Pain:

- There is a risk you may suffer a small degree of pain during the harvest procedure and the injection procedure. To minimise this risk you will be injected with local anaesthetic to numb the area before the harvest and the joint injection.
- It is likely you will have some mild tenderness at the site of the fat harvest. This can last for up to 3 weeks after the treatment and can be controlled with paracetamol if required.
- You will likely have a degree of pain in the joint that is injected following the procedure. This occurs as the cells can cause an inflammatory reaction that results in the joint swelling for up to 48 -72 hours, after which pain will return to your pre-treatment level before it begins to improve.
- To minimise this pain you will be provided with
 - Panadeine Forte or equivalent
 - Ice pack
 - Crutches or sling as appropriate
- The associated swelling at the injection site may last for 4-5 days after the procedure. To minimise the swelling
 - Ice regularly 20 minutes on, 20 minutes off as regularly as possible
 - Compress the knee with tubigrip or a light bandage

Bruising:

- There is a risk of bruising at the site of the fat harvest, which may last up to 2 weeks after the procedure.
- This is minimised by the use of adrenaline in the fluid injected under your skin to constrict blood vessels in the area and by providing you with abdominal compression after the procedure.

Scarring:

- There may be a small 3 mm scar at the site of the liposuction. Where possible the procedure will be performed through the side of your belly button to minimise visibility. There may be some small bands of scar that form under the skin after the harvest. These are generally not visible and can be dealt with using massage over the area.
- If it is not possible to perform the procedure about your belly button, fat will be taken from a site with enough fat

Abdominal asymmetry:

- There is a small risk that you may have some asymmetry after the fat is withdrawn from your abdomen. The volume of fat harvested is restricted to 50-100ml to minimise the likelihood this will occur.

Procedure anxiety:

- You may experience some anxiety before or during the procedure. You will be provided with reassurance and education about the procedure and are welcome to bring a friend or family member to support you during the procedure. Ample local anaesthetic will also be used for all procedures. If you have any ongoing distress you will be referred to appropriate counseling.

As with any invasive medical procedure, emergency equipment will be readily available.

Cancer:

The use of stem cells is a very new part of medicine. There is a risk that the stem cells may move, be attracted to cancer cells or promote their growth. To date, there are 2 studies that have followed 227 patients for 2 years post injection of stem cells and shown no evidence of increased risk of cancer. This is supported by another study following 41 people for 11 years following joint injection of stem cells, which also showed no increased incidence of cancer. To decrease the risks we suggest

- No patient with current cancer be treated with stem cells
- Previous cancer patients be cleared by their oncologist before undergoing the procedure
- All patients be followed for 2 years post procedure to assess any ongoing risk.

Treatment:

The treatment is a 3 step process

- 1.1. Making Platelet Rich Plasma (PRP)
- 1.2. Fat harvest and extraction of stem cells
- 1.3. Injection of cells.

Making Platelet Rich Plasma:

A 68.5ml blood sample will be collected by the treating doctor. This will be processed to make the PRP. This is done by placing the blood in a centrifuge for 10 minutes. The blood separates into 3 layers, the middle layer is collected and spun again to concentrate the platelets. The PRP is then activated using calcium. The PRP is used to activate the stem cells after they have been harvested and extracted.

Fat harvest and extraction of cells:

The harvest is done using local anaesthetic for pain relief. 20-40ml of fat will be taken from your abdomen. This is done by injecting 100-200ml of normal saline, local anaesthetic and adrenaline below your skin. The fat is then extracted using a small cannula and a 20ml syringe.

The fat is emulsified and the cells separated using a centrifuge. This takes 30-40 minutes.

The cells are mixed with the PRP prior to injection.

Injection of the cells:

The cells will be counted and then injected into your joint using either ultrasound or X-ray guidance.

Repeat Injections:

Currently, it is not possible to store stem cells for future use. We hope to be able to do this in the future. Until that time we will need to repeat the above procedure for each injection. The exact number of injections required to treat your condition will vary depending on the joint and degree of damage. In most instances 2-4 injections will be required. We suggest the 1st injection be performed, and a MRI be performed at 6 months to assess the degree of cartilage response. The MRI will be combined with the clinical and pain scales to assess your response to treatment. Based on this information, the need for a second or further injections will be assessed.

After care:

You may have some leakage of fluid from the site of the fat harvest over night. You will be provided with a dressings to help minimise this. These will be checked and changed the next day at your review with your treating doctor.

You may also experience some pain and swelling in the joint that is injected. You will be asked to regularly ice the joint for 12-24 hours after the procedure. We will provide you with an ice pack to facilitate this. To help control any pain you will be given pain relief and crutches or a sling as appropriate. You will also be provided with contact information for your treating doctor if you have any concerns.

Follow-up

How will I be monitored into the future?

You will be followed over the next 2 years using clinical and MRI findings.

- Pre-treatment - Validated scale, pain scale and MRI
- Day 0 - Treatment
- Day 1 - Review with Treating doctor and Pain scale
- Day 2-14 - Daily pain scale rated 0-10/10
- Week 4 - Validated scale and pain scale
- Week 8 - Validated scale and pain scale
- Week 26 - Validated scale, pain scale and repeat MRI
- Week 52 - Validated scale and pain scale
- Week 104 - Validated scale and pain scale

Validated scales are questionnaires that have been tested against disease processes and been shown to be useful in following progression of the disease or the response to treatment. The most appropriate scale for your injury or condition will be chosen to follow your response to therapy. In some cases you may be required to fill out 2 or more scales.

What is the likelihood this will be successful?

As this is a very new area it is difficult to accurately predict the outcome of your treatment. The information we gather from your treatment will allow us to better predict for others into the future. Below is an estimation of the likelihood of a positive outcome, based on the information we have to date and the grade of your condition.

Osteoarthritis:

- Grade 1- Good
- Grade II - Good
- Grade III - Fair
- Grade IV – Poor

Osteochondral defects

- Grade 1- Good
- Grade II - Good
- Grade III - Fair
- Grade IV – Fair to Poor

Where do the stem cells come from?

These are your stem cells that have been harvested from the fat about your abdomen. If you have no easily accessible fat about your abdomen it may be taken from your hips, buttocks or legs. Only your own stem cells are used.

What are the costs?

The cost for fat harvest, stem cell extraction and guided injection may vary depending on the procedure used, number of cells required and number of joints involved in the treatment. There is currently NO Medicare, private insurance, workcover or TAC rebate for the procedure, an issue which we are endeavouring to rectify at the moment. MRI's are at a cost of \$295 per MRI performed at Victoria House Medical Imaging.

How long does it take?

The procedure takes about 90-120 minutes. You will be able to walk out of the procedure with minimal discomfort, however we recommend that you organise for someone to drive you home, as pain or discomfort at the harvest or the injection site may prevent you from safely driving a car. Our staff can organise a taxi or car service for you if required. If you are from interstate it is strongly recommended you stay overnight in a local hotel. Staff can also facilitate this for you if needed.

What activity can I do after the procedure?

Depending on the site of the injection, you may require crutches for 48 hours after the procedure. After that you are encouraged to walk normally without making your pain greater than 2/10 during or after exercise.

We ask that you avoid running between the first and second procedure and for 8 weeks after the second procedure. If this is not possible due to sporting commitments we will guide you with a modified loading program.