



Autologous Stem Cell Therapy for
Cartilage Lesions

OVERVIEW AND OPTIONS

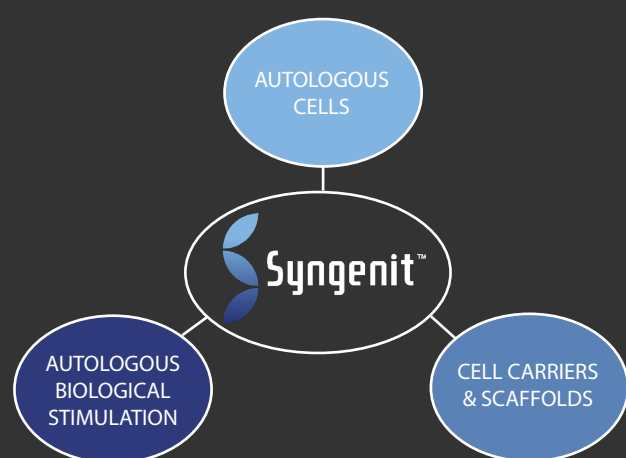
WHAT IS SYNGENIT?

Syngenit™ provides patients with a choice of injection-based or surgical treatments for cartilage damage. Syngenit uses Bone Marrow Aspirate Concentrate (BMAC) as a source of concentrated stem cells. These cells are obtained from bone marrow aspirated from the patient which is normally performed under a General Anaesthetic (GA). The clinician may offer a local anaesthetic if appropriate. Bone marrow aspiration takes a few minutes to complete and is typically from the pelvis or tibia (shin bone). Depending on the procedure, the total clinical time is 30 to 60 minutes for Syngenit Injectables or Injectables Plus. Syngenit Surgical is normally completed in 60 to 90 minutes. A review of the first 100 patients (2016-2019) demonstrates a significant improvement in patient outcomes using the Syngenit Surgical procedure.



MRI example of a patient who underwent syngenit surgical procedure for a knee cartilage defect.

THE PRINCIPALS OF REGENERATIVE MEDICINE IN ORTHOPAEDIC CONDITIONS



Autologous (definition): Cells or tissues obtained from the same individual.

The principal of Syngenit is to use materials from the patient (such as stem cells) where possible and to re-implant them in a biologically optimal environment enabling regeneration and healing. This is a single clinical intervention completed within the operating room. It does not involve removing autologous materials for laboratory manipulation and/or expansion and the need for a second procedure at a later date.

IS THERE ANY EVIDENCE THIS WORKS?

There have been multiple peer-reviewed publications evidencing the use of BMAC in the regeneration of cartilage defects from 2009 to date. The Royal National Orthopaedic Hospital, Stanmore, UK (which acts as a referral centre) routinely provides the Syngenit Surgical procedure to patients meeting their selection protocol and has published results. Current clinical results are more supportive for surgical intervention than injections.

WHY IS PATIENT BONE MARROW USED?

Bone Marrow Aspirate is used because it is a source of stem cells and is relatively easy to obtain from the patient. Stem cells have the potential to differentiate into different types of cells including cartilage.

Depending on the condition being treated, the stem cell concentrate may be reintroduced into the patient using the following options:



The BMAC is suspended in Sodium Hyaluronate and injected back into the patient.



The BMAC is used in conjunction with a fibrin glue which is derived from the patient blood. This combination may be given by injection or through a small surgical incision for certain defects.



This is for larger cartilage defects requiring surgery. The BMAC is applied to a pad which is placed into the defect and retained with the autologous glue through a small incision.



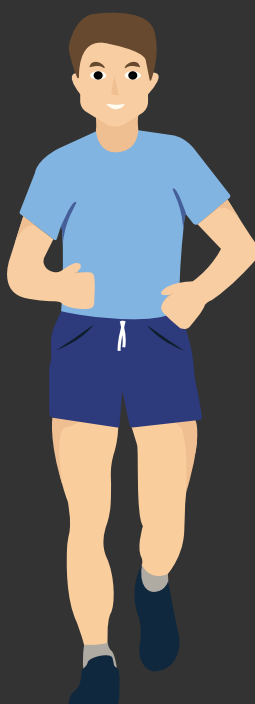
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PATIENT SUITABILITY

Clinicians familiar with treating cartilage damage can advise on the most appropriate options.

Patients should ideally meet the optimal selection criteria because clinical evidence suggests improved outcomes when factoring patient age, previous interventions, an appropriate weight (BMI) and being a non-smoker.

The current UK analysis of patient outcomes suggests certain criteria will give a more satisfactory result. Here is a patient that fits these criteria.



This will be my first cartilage regeneration surgery on this knee. Previous surgeries can impact results.

I am aged 55 or less.
The current cut off for this operation is age 55.

I have a BMI under 35 and I am in good shape.

I am a non-smoker. Smoking is detrimental to cell health and healing

I have an otherwise healthy knee.
This is not a solution for osteoarthritis

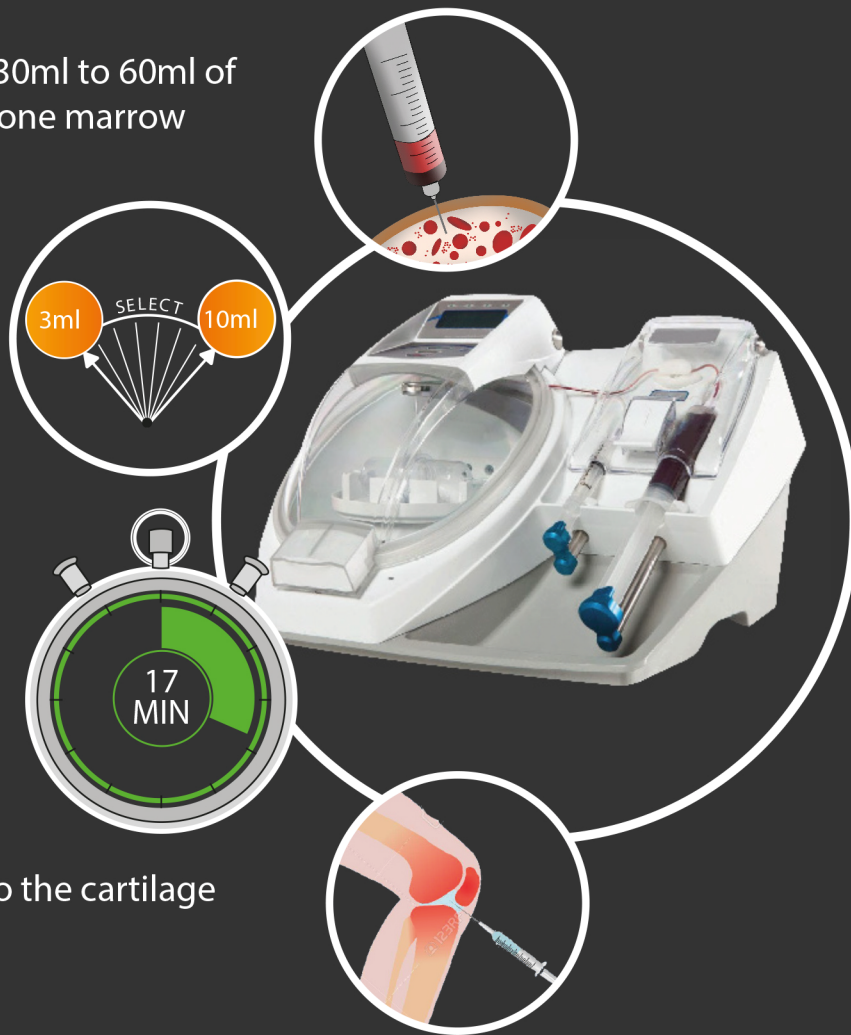
OVERVIEW

Aspirate 30ml to 60ml of patient bone marrow

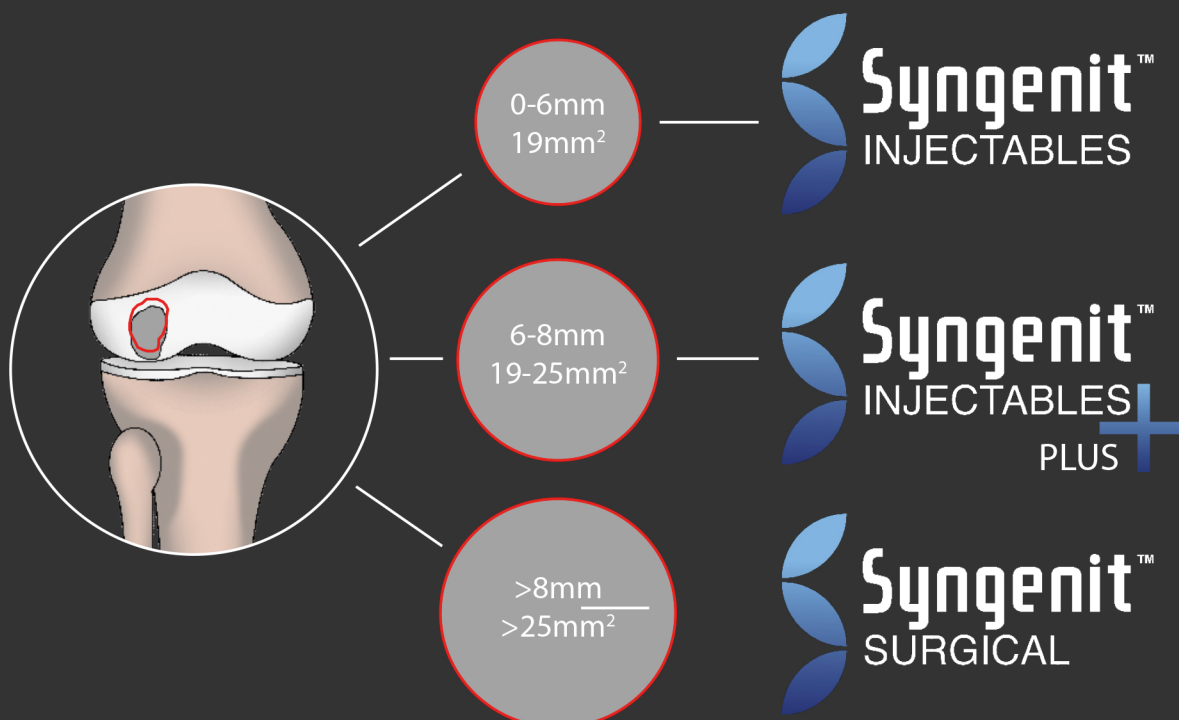
Select 3ml to 10ml of bone marrow aspirate concentrate (BMAC)

BMAC processing time

Inject into the cartilage defect.



Defect Sizes and their solutions.

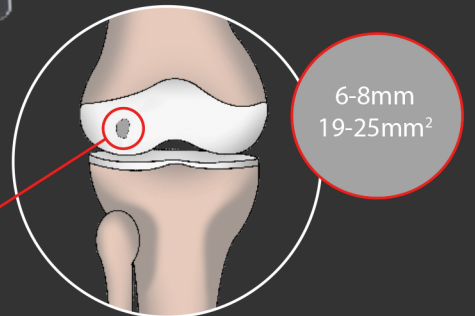




Suspend BMAC in Sodium Hyaluronate and inject



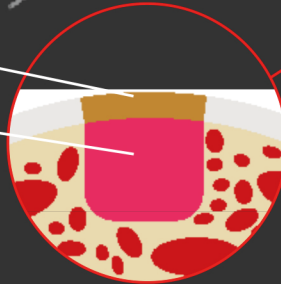
BMAC + Autologous
fibrin glue for injection



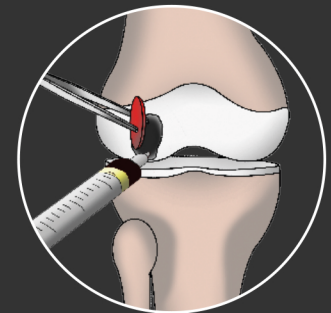
6-8mm
19-25mm²

Autologous fibrin glue 'Cap'

BMAC+ Autologous fibrin glue



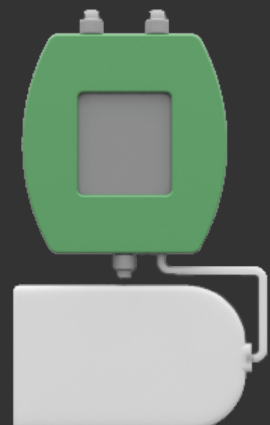
Surgical application of BMAC in
conjunction with autologous fibrin
glue for defects 6 to 8mm



This is for larger cartilage defects requiring surgery. The BMAC is applied to a pad which is placed into the defect and retained with the autologous glue through a small incision.



Syngenit Adipose is an intraoperative
system enabling a quick and efficient
means to obtain autologous stem cells
derived from adipose tissue.





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