

# Knee Cartilage Restoration

## Methods used in knee cartilage restoration:

**A) Arthroscopic debridement and microfracture:** In a patient who has an isolated focal chondral defect, the physician can insert a small camera to locate the damaged tissue and debride the torn areas away. They then make small holes in the bone. This is called a “microfracture”. The purpose of the microfracture is to allow these holes to serve as channels allowing the bone marrow cells to propagate through the channels to the hole. These bone marrow cells will then form a cartilage covering that resembles normal articular cartilage.

**B) Osteochondral Autograft:** In this technique, the surgeon removes a piece of cartilage from a portion of the knee that does not bear weight and transfers the plug to a damaged portion in the knee. This is very similar to a hair plug transfer. This has excellent results in full thickness cartilage defects in areas less than 2 square centimeters.

**C) Allograft Reconstruction:** If there is a focal defect larger than 2 square centimeters, that is too large for an osteochondral autograft, then an allograft reconstruction is an excellent option. The surgeons will implant a piece of freshly donated cartilage and bone from a cadaver into the patient’s bone. The donated cartilage and bone will grow into the patient’s bone as it were the patient’s own. This has excellent results for patient who have large defects.

**D) Autologous Chondrocyte Implantations:** The autologous chondrocyte implantation is also known as the Carticel procedure. This was developed in Sweden over 20 years ago. It was approved by the FDA in 1995. This is the most exciting area of cartilage restoration to date. This procedure, as a result of bio-technology, uses the patient’s own cartilage to restore defects in the joint surface. This is a 2 stage procedure. In the first stage, the surgeon harvests a few small samples of cartilage cells from a portion of the

knee that is non-weight bearing. The cells are then placed into a sterile test tube and sent to a laboratory where through advanced culturing techniques, the cell numbers increase from a few hundred thousand cells to over 12 million cells. The surgeon then returns at a later date and re-implants these cells into the knee joint through a second, open operative procedure. Then, a soft tissue flap is sewn over the defect. The cells are placed into the defect where they begin to grow and multiply. The uniqueness of this procedure is that the cells which fill the defect are the patient's own cartilaginous cells and if heal as planned, they return to almost a pre-injury status, re-establishing the articular cartilage.