NICE National Institute for Health and Care Excellence

NICE guidance

Single-step scaffold insertion for repairing symptomatic chondral knee defects

HealthTech guidance

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www.nice.org.uk/guidance/htg728

Your responsibility

This guidance represents the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, healthcare professionals are expected to take this guidance fully into account, and specifically any special arrangements relating to the introduction of new interventional procedures. The guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

All problems (adverse events) related to a medicine or medical device used for treatment or in a procedure should be reported to the Medicines and Healthcare products Regulatory Agency using the Yellow Card Scheme.

Commissioners and/or providers have a responsibility to implement the guidance, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity, and foster good relations. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties. Providers should ensure that governance structures are in place to review, authorise and monitor the introduction of new devices and procedures.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

Contents

This guidance replaces IPG793 and IPG560.

1 Recommendations

1.1 Single-step scaffold insertion can be used as an option for repairing symptomatic chondral knee defects with standard arrangements in place for clinical governance, consent and audit.

1.2 Healthcare professionals should enter details about everyone having single-step scaffold insertion for repairing symptomatic chondral knee defects onto a suitable registry, such as the International Cartilage Regeneration & Joint Preservation Society Registry.

1.3 Patient selection should be done by a multidisciplinary team experienced in managing the condition.

1.4 The procedure should only be done by surgeons with specific training in this procedure.

Why the committee made these recommendations

There is good clinical evidence for the efficacy and safety of this procedure. The evidence shows that it reduces symptoms, stimulates cartilage regeneration, and is safe in the short and medium term. It is an established procedure and more long-term data is being collected. So, it can be used with standard arrangements.

2 The condition, current treatments and procedure

The condition

2.1 Chondral cartilage is the material that covers the end of the bones in the knee joint, to protect them from friction when moving. Damage to this cartilage (chondral knee defect) can cause symptoms such as knee pain and stiffness, and reduced mobility. Untreated full-thickness cartilage lesions may be associated with significant pain and, eventually, arthritis. This is a major cause of disability.

Current treatments

2.2 There are several approaches to managing chondral knee defects. Surgical options depend on the characteristics of the person and the defect. There are 2 main categories of procedure:

- Procedures that mainly aim for symptom relief include:
  - debridement
  - osteotomy
  - knee replacement.
- Procedures that aim for symptom relief and also to re-establish the cartilage surface include:
  - autologous chondrocyte implantation (in which chondrocytes harvested from the knee are cultured and implanted into the damaged cartilage), which is recommended for defects over 2 cm^2 in NICE's technology appraisal guidance on autologous chondrocyte implantation for treating symptomatic articular cartilage defects of the knee
  - marrow stimulation techniques (such as Pridie drilling and microfracture)

- mosaicplasty
- osteochondral allograft transplantation
- focal articular resurfacing implants.

Sometimes matrix-induced autologous chondrocyte implantation is done. This is a 2-step procedure because cells have to be cultured outside the body. The cells are harvested for culturing in the first operation, then the cultured cells and scaffold are introduced in the second.

The procedure

2.3 In this procedure, a scaffold is inserted into the area of damaged cartilage to encourage cells to grow into new cartilage. This is a single-step procedure because the cells are not cultured outside the body. A range of techniques can be used to introduce the cells that grow into new cartilage, supported by the scaffold. For example, tiny holes can be drilled into the bone (microfracture) to release the cells, or substances like bone marrow aspirate can be put into the area of damage. Whichever method is used, it is always done in the same operation as the scaffold insertion.

2.4 There are different types of scaffold and ways of doing the procedure. For example, some scaffolds are solid and some are injectable gels. Some of the solid scaffolds must be cut to size and applied over the defect. Other scaffolds are a standard size and shape, and are implanted into the subchondral bone in the damaged area.

2.5 The procedure aims to repair the damaged cartilage, reduce symptoms and keep the joint working.

3 Committee considerations

The evidence

3.1 NICE did a rapid review of the published literature on the efficacy and safety of this procedure. This comprised a comprehensive literature search and detailed review of the evidence from 12 sources, which was discussed by the committee. The evidence included 5 systematic reviews and meta-analyses, a systematic review and network meta-analysis, 4 randomised controlled trials, a 5-year follow-up analysis of a randomised controlled trial and a registry study. It is presented in the summary of key evidence section in the overview. Other relevant literature is in the appendix of the overview.

3.2 The professional experts and the committee considered the key efficacy outcomes to be: improved quality of life and mobility, and reduced pain.

3.3 The professional experts and the committee considered the key safety outcomes to be: pain, bleeding, infection and failure to improve symptoms.

3.4 Patient commentary was sought but none was received.

Committee comments

3.5 The committee was informed that:

- Complex defects may need to be referred to a regional specialist centre.
- Like other procedures for chondral knee defects, after the surgery, a rehabilitation programme needs to be followed.
- Different technologies can be used to do this procedure, and they have different amounts of evidence.

3.6 The committee noted that:

- A variety of scaffolds can be used in this procedure. Some, but not all, contain animal products.
- Techniques for introducing the cells that grow into new cartilage are evolving.

Update information

January 2026: Interventional procedures guidance 793 has been migrated to HealthTech guidance 728. The recommendations and accompanying content remain unchanged.

August 2025: Recommendations 1.3 and 1.4 were added to specify who should be involved with patient selection, and that surgeons need specific training to do the procedure.

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Endorsing organisation

This guidance has been endorsed by Healthcare Improvement Scotland.