

BMAC: risks and benefits

A personalised decision aid

Consider the added harvest

BMAC carries harvest-site risks and cost in addition to treatment-site risks. A biological rationale and the presence of progenitor cells do not establish a worthwhile clinical benefit.

Possible benefits and limits

Potential aim	What must be made clear
Improve pain or function in selected joint problems	The extra benefit over simpler options is uncertain. Major knee studies have not shown superiority over saline or corticosteroid.
Support a cartilage operation	Evidence from combined surgery cannot prove the effect of BMAC alone or guarantee normal cartilage restoration.
Support healing in selected nonunions	Underlying stability, alignment, infection control and bone biology still need assessment and treatment.
Use an autologous preparation	Your own marrow avoids donor-cell exposure but does not remove procedural risks. The product contains mixed cells, not a pure cultured stem-cell population.

Risks and burdens

Issue	What to weigh
Harvest-site pain and bruising	An extra area may be sore, with a possible effect on mobility and sleep. Persistent pain is possible.
Bleeding / haematoma / infection	May affect either site; occasionally further treatment is necessary.
Nearby-structure injury	Possible from aspiration or injection; the relevant anatomy and individual risk should be discussed.
Anaesthesia / surgery risks	Depend on the accompanying procedure and health. They require their own assessment.
No extra benefit	Cost, harvest discomfort, recovery and repeat treatment may be incurred without useful improvement.

Suitability requires assessment

Active infection, major blood or platelet problems, bleeding risk, immune suppression, relevant cancer history or pregnancy may alter suitability. A clinician must decide whether additional tests or a specialist opinion are needed.

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Ask before proceeding

- Why is BMAC being recommended instead of a simpler or established option?
- Is the evidence about an isolated injection or BMAC used during a larger operation?
- Which harvest site and processing system will be used, and what anaesthesia is needed?
- What are the expected recovery restrictions and the complete cost?
- What governance applies to this preparation and use?
- What outcome will be measured, when will we review it, and what is the next option if it fails?

Personal benefit-risk record

Diagnosis / severity / previous care	
Proposed BMAC role: injection or surgical adjunct	
Meaningful goal and baseline function	
Evidence and uncertainties explained	
Harvest and treatment-site risks relevant to patient	
Alternatives and reason for chosen option	
Review date / rehabilitation / failure plan	

No guarantee of repair

Do not interpret BMAC as a proven cure for arthritis or a promise that fracture or cartilage healing will occur. Clinical benefit must be assessed with symptoms, function and any imaging that the diagnosis requires.

Evidence and further reading

1. Shapiro et al. BMAC versus saline for knee osteoarthritis. *American Journal of Sports Medicine*. January 2017.
2. Mautner et al. Cell-based versus corticosteroid injections for knee osteoarthritis. *Nature Medicine*. 2 November 2023; author correction 22 December 2023.
3. Murphy et al. BMAC and microfracture for osteochondral lesions of the talus. *Foot and Ankle Surgery*. August 2019.
4. Hernigou et al. Percutaneous autologous bone-marrow grafting for tibial nonunion. *JBJS American*. July 2005.
5. AAOS: Concentrated bone marrow aspirate for knee osteoarthritis - technology overview. Approved 3 December 2021; evidence search to 14 March 2021.
6. Cambridge University Hospitals: Bone marrow aspiration and trephine biopsy. Current online patient information; accessed 10 October 2026.
7. MHRA: Advanced therapy medicinal products - regulation and licensing in UK. Updated 11 September 2026.

Links checked 10 October 2026. This material synthesises the sources; local protocols may differ.