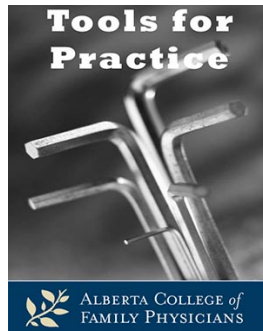


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Glucosamine: Naturally effective?

Clinical Question: Does glucosamine improve pain and function in osteoarthritis?

Bottom Line: Multiple meta-analyses indicate that glucosamine does not reliably improve pain or function in osteoarthritis. Any suggestion of benefit with certain formulations is at high risk of bias associated with low quality studies, industry funding, and selective reporting/publication.

Evidence:

- There are at least 20 systematic reviews and meta-analyses of glucosamine for osteoarthritis (mostly knee, mostly versus placebo). We focused on six from the last five years¹⁻⁶ plus the Cochrane review.⁷ Systematic reviews vary from two to 25 Randomized Controlled Trials (RCTs) with 414 to 4963 patients.
 - Most use Standard Mean Differences (SMD), a statistical tool to combine multiple different scales. It has limited clinical utility.
 - Pain: Widely variable results, SMD -0.16 (non-significant) to -0.51 (significant).
 - Some subgroups higher: ^{1-4,7} Rotta brand SMD -1.11 (significant).⁷
 - In larger studies:¹ Change in pain scale is 0.4 out of 10.
 - Although statistically significant, clinically meaningful change is 0.9.
 - Function: Results vary with trial duration and assessment tool, SMD -0.08 (non-significant) to -0.54 (significant).^{2,7}
 - Joint Space Narrowing:^{1,4-7} Results vary with only one result reaching clinical significance (>0.5mm)⁵ at 0.51mm less narrowing (more cartilage) than placebo.⁶
 - This is a surrogate marker.
 - Adverse effects: None.⁷
 - Issues with evidence:
 - Industry funding significantly inflated effects,^{1,3,4} negative studies are likely unpublished,^{3,4} longer duration studies show less effect,² included studies have inconsistent results,^{2,3,4} higher quality studies show little/no effect,^{2,3,4,7} newer studies show less/no effect,⁴ and only certain brands/compounds are effective.^{3,4,7}

Context:

- Osteoarthritis is common with 13.9% of adults aged 25 years and older and 33.6% of those 65+ affected (US figure).⁸
- Glucosamine preparations are not regulated outside Europe and are available over-the-counter, which may result in various concentrations of the active ingredient.⁷
- Guideline recommendations are variable but generally not positive.⁹ Examples: The European League Against Rheumatism recommends glucosamine in knee osteoarthritis¹⁰ while the American College of Rheumatology and Osteoarthritis Research Society International do not recommend glucosamine.¹¹⁻¹²
- Approximate yearly cost of glucosamine is \$60 at 500mg TID.

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Disclosure:

Authors have no conflicts to disclose.

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