



Glucosamine & Chondroitin: Natural remedies for osteoarthritis?

Clinical Question: Does glucosamine and/or chondroitin improve pain for patients with osteoarthritis?

Bottom Line: Glucosamine and chondroitin do not appear to be effective in higher-quality, larger and/or publicly funded studies. If studies at high risk of bias are included, at best ~10% more people will have meaningful reduction in pain with either treatment over 35-45% of people with placebo. There is reason to doubt the effectiveness of either treatments.

Evidence:

- Results statistically significant unless indicated.
 - Glucosamine:
 - 11 systematic reviews:¹⁻¹¹ glucosamine 1500mg/day versus placebo [2-25 randomized controlled trials (RCTs), 414-4963 patients]:
 - Proportion of patients attaining meaningful pain reduction (generally $\geq 30\%$ reduced pain) from two meta-analyses:
 - Most recent meta-analysis (9 RCTs, 1643 patients).¹After 4-156 weeks:
 - 47% glucosamine versus 37% placebo, number needed to treat (NNT)=11.
 - Other analysis found similar.²
 - Change in 100-point pain scale: meta-analysis³ re-run by PEER. Baseline pain of 52, placebo reduced pain ~ 13 , glucosamine reduced pain:
 - Larger RCTs, same as placebo.
 - Smaller RCTs, ~ 12 better than placebo.
 - Chondroitin:
 - 11 systematic reviews:^{1,3,4,10-17} chondroitin 800-1200mg/day versus placebo (6-18 RCTs, 362-4044 patients):
 - Proportion of patients attaining meaningful pain reduction:
 - Most recent analysis (9 RCTs, 2477 patients).¹ After 12-48 weeks:
 - 57% chondroitin versus 45% placebo, NNT=9.
 - Other meta-analysis found no difference (1 RCT, 330 patients).¹²
 - Change in 100-point pain scale: meta-analysis³ re-run by PEER. Baseline pain of 56, placebo reduced pain ~ 19 , chondroitin reduced pain:
 - Larger RCTs, ~ 4 better than placebo.

- Smaller RCTs, ~12 better than placebo.
- Combination:
 - 6 systematic reviews:^{4,10-12,18} glucosamine/chondroitin combined versus placebo:
 - Only one RCT examined meaningful pain reductions: effect similar to components alone.¹²
 - Change in 100-point pain scale: not different from placebo.^{3,18}
- Limits: mostly knee osteoarthritis studied.¹ No benefit of glucosamine or chondroitin over placebo in publicly funded¹, high-quality, or larger RCTs.^{4,12}

Context:

- Many meta-analyses report “standard mean differences” which are difficult to apply clinically and are not reported here.^{2,4,5,7,9-17}
- Pain studies should consider both percentage of patients reaching meaningful improvement and changes in scale.
- Adverse events infrequently reported.
- Osteoarthritis online calculator¹⁹ or PEER simplified decision aid²⁰ can assist with patient-informed decision making.

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Disclosures:

Authors do not have any conflicts of interest to declare.

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