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## Q/ What are the best treatments for reducing osteoporotic compression fracture pain?

### EVIDENCE-BASED ANSWER

**A/ VERTEBRAL AUGMENTATION** with vertebroplasty or balloon kyphoplasty yields a small reduction in both acute and chronic pain scores in adults with osteoporotic compression fractures compared with conservative therapy or sham treatment (strength of recommendation [SOR]: **B**, meta-analysis of randomized controlled trials [RCTs]).

When compared with placebo, usual treatment, or other analgesia, calcitonin reduces the severity and duration of pain at rest and with mobility 1 week after an osteoporotic compression fracture and with mobility at 6 months postfracture (SOR: **B**, meta-analysis of RCTs).

### Evidence summary

A 2015 meta-analysis of 8 RCTs compared pain reduction in adults >50 years with osteoporotic compression fractures who received either vertebral augmentation (vertebroplasty or balloon kyphoplasty; 495 patients) or conservative or sham treatment (492 patients).<sup>1</sup> Pain was measured by the visual analog scale (VAS) periodically between 1 week and 1 year.

The study included patients of both sexes who had an acute or chronic osteoporotic vertebral compression fracture that caused pain and functional limitations in daily activities. It excluded patients with neoplasm, pre-existing chronic pain or functional disability unrelated to vertebral fractures, and vertebral fractures unaccompanied by signal changes on magnetic resonance imaging.

Vertebral augmentation resulted in small to moderate reductions in pain scores compared with placebo at 1 to 4 weeks (7 trials, 938 patients; standardized mean difference [SMD]=0.3; 95% confidence interval [CI], 0.1-0.5), 2 to 3 months (7 trials, 953 patients; SMD=0.3; 95% CI, 0.1-0.4), and 1 year (5 trials, 744 patients; SMD=0.3; 95% CI, 0.1-0.4). The study is considered low-quality because of increased heterogeneity.

### Calcitonin reduces pain but with some adverse effects

A 2011 meta-analysis of 10 RCTs (467 patients) examined the analgesic effectiveness of calcitonin in adults >60 years, of either sex, with osteoporotic compression fractures who received calcitonin in the acute phase (<10 days after fracture) and chronic phase (>3 months after fracture).<sup>2</sup> For acute fractures, pain was measured at 1, 2, 3, and 4 weeks following treatment. For chronic fractures, pain was measured at 1, 3, and 6 months post-treatment.

Calcitonin was administered in varying doses by various routes (200 IU intranasal, 50-200 IU intramuscular or subcutaneous injection, or 200 IU rectal suppository) and compared with placebo, usual treatment, or other analgesia. The VAS was varied (10 cm, 100 mm, or 5-point) and assessed pain and length of time to mobilization with patients at rest, sitting, standing, and walking by using mean deviation (MD) and SMD.

In the acute phase, calcitonin resulted in greater pain relief 1 week after fracture at rest (4 trials; 260 patients; 10-cm VAS; MD=-3.4; 95% CI, -4 to -2.8) and with walking

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(4 trials, 228 patients; SMD=2.6; 95% CI, -4.1 to -1.1) compared with the control group. At 6 months, calcitonin had reduced pain in mobile patients more than in the control group (7 trials, 207 patients; SMD=-0.5; 95% CI, -0.9 to -0.1).

Statistically significant adverse effects of calcitonin included gastrointestinal disturbances and flushing compared with placebo. Adverse effects were more predominant in the studies that used injectable calcitonin

and in the chronic pain group. The study is considered low-quality because of increased heterogeneity in the acute pain studies. **JFP**

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#### References

1. Li L, Ren J, Liu J, et al. Results of vertebral augmentation treatment for patients of painful osteoporotic vertebral compression fractures: a meta-analysis of eight randomized controlled trials. *PLoS ONE*. 2015;10:e0138126.
2. Knopp-Sihota JA, Newburn-Cook CV, Homik J, et al. Calcitonin for treating acute and chronic pain of recent and remote osteoporotic compression fractures: a systematic review and meta-analysis. *Osteoporos Intl*. 2012;23:17-38.