INTRODUCTION:
The management of lumbar spinal stenosis (LSS) represents a significant cost to the healthcare system resulting from the functional limitations and diminished quality of life in patients. Calcitonin is presently indicated for the treatment of postmenopausal osteoporosis, Paget's disease, spine pain related to vertebral compression fractures, and spinal metastases. In spinal stenosis patients, it has been suggested to have both analgesic and anti-inflammatory properties. The aim of this meta-analysis was to review the published randomized control trials to determine the effect of calcitonin on walking distance and Visual Analog Pain Scale (VAS) for pain in patients with lumbar spinal stenosis compared to placebo.

METHODS:
The authors searched MEDLINE, EMBASE, PEDro, and the Cochrane Controlled Trials Register from 1966 to 2008. Only randomized controlled clinical trials of calcitonin for the treatment of patients with a clinical diagnosis of LSS were included. Three researchers independently selected the trials and details of the reported data were extracted, and an extensive analysis of relevant variables was carried out. Publication bias was to be tested using the funnel plot visually and quantitatively, i.e., the rank correlation test and the graphical test, with or without heterogeneity. Data on walking distance (in meters) and visual analog scale (0-10) were pooled across four studies to conduct this meta-analysis. A mean difference of treatment effect and 95% confidence intervals (CI) were calculated for each study. For the pooled effects, a weighted mean difference (WMD) was calculated. Heterogeneity was tested using the Cochran’s Q test and a chi-square test; p <0.1 was considered statistically significant. Possible sources of heterogeneity were assessed by sensitivity analyses, after the primary analyses were completed.

RESULTS:
Four studies with a total of 255 patients made-up this meta-analysis. Heterogeneity was not found for either of the two primary outcomes. Publication bias was not significant. No study-adjustment covariate was needed in the analysis because heterogeneity was not significant. Primary analysis revealed no statistically significant difference between the treatment and control groups on either of the primary outcomes using fixed effects modeling while adjusting for study duration, treatment dose and study quality: walking distance p-value = 0.79; VAS p-value = 0.63. The sensitivity analyses showed no effect on the conclusions and no single study supplied more weight than another study.

DISCUSSION:
Lumbar spinal stenosis is a significant problem which afflicts millions of adults annually. Despite its rising prevalence, there has been a dearth of research investigating new non-surgical treatment modalities. This lack of medical therapeutic research is compounded by recently published evidence that initial surgical treatment options appear to be no more effective than non-surgical treatment in predominant symptom improvement, and patient satisfaction with their current state at 8 to 10 year follow-up. Thus the need for evidence based treatment options for lumbar spinal stenosis cannot be overstated. Despite the importance of this issue, the authors were only able to identify four randomized, double blind, controlled trials involving a total of 255 adults. Overall, the evidence described here supports the author’s hypothesis that calcitonin not an effective analgesic and does not significantly affect the walking distance in patients diagnosed with lumbar spinal stenosis. The included studies demonstrated no clear benefit with respect to the two main endpoints of pain relief and walking distance. Pain was rated on a 0-10 VAS pain score and walking distance measured in meters on an unobstructed surface. For VAS, three studies showed an improvement in pain scores in the treatment group compared to the control group. However, the variability in most studies shows that the 95% confidence intervals crossed the zero-line, indicating a non-significant difference between groups. Thus while a small improvement in pain is observed in these trials, the variability and confidence intervals in these studies show no significant difference between calcitonin and placebo groups. Similar results were observed with the second parameter of walking distance. The variability in the four studies analyzed is much greater than the magnitude of the effects.

In conclusion, when compared with placebo, calcitonin does not appear to provide a statistically significant improvement in pain symptoms or walking distance in patients with lumbar spinal stenosis. The route of administration appears to play no role in it’s efficacy as an analgesic. While calcitonin does have a role as an analgesic in osteoporotic vertebral compression fractures, these same effects are not observed in the cohort of this meta-analysis. Despite the lack of improvement seen with calcitonin, future studies must continue to focus on medical treatments for lumbar spinal stenosis.