# Heavy metal concentrations in hair after scoliosis surgery with cobalt-chromium alloy implants

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## Abstract

### Introduction

Titanium alloys have mainly been used as implants for scoliosis surgery. Recently, however, Co-Cr alloy implants have gained favor because of the higher corrosion resistance. Because implants for scoliosis surgery fix several vertebrae across a wide area and remain in the human body for a long period, accumulation of heavy metals in the body represents a potential medical problem. We compared Co, Cr, Ni, and Mo concentrations in hair between preoperatively and 3 and 6 months postoperatively.

### Materials and methods

Participants comprised 10 postoperative patients with a mean age of 25.4 years (range, 12-64 years). We measured heavy metal concentrations at 3 months postoperatively in 10 patients, and at 6 months postoperatively in 7 patients with PIXE. Further we compared Ti alloy implants have used patients in hair between 3 and 6 months postoperatively.

### Results

In the case of Co-Cr alloy implants no significant differences in concentrations were seen between preoperatively and 3 or 6 months postoperatively. In the case of Ti alloy implants 3 and 6 months postoperatively were significantly higher than preoperatively.

### Conclusion

No significant changes in each concentration were seen after comparing preoperatively to 3 or 6 months postoperatively. While Ti alloy implants 3 and 6 months postoperatively were significantly higher than preoperatively. It is suggested that Co-Cr alloy implants better than Ti alloy implants at corrosion resistance. Although no adverse effects of Co-Cr alloy implants in the human body were seen during the short term in this study, research and analysis of a greater number of patients is needed to guarantee long-term safety.