# A cluster-randomized controlled trial of a blood conservation algorithm in patients undergoing total hip joint arthroplasty.

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Transfusion. 2007 May;47(5):832-41.

**BACKGROUND**: The optimum strategy for reducing allogeneic blood transfusion in patients undergoing total hip joint arthroplasty (THJA) is unknown.
**STUDY DESIGN AND METHODS**: The effectiveness of a comprehensive blood conservation algorithm (BCA) was evaluated by means of a cluster randomization trial. Thirty hospitals performing primary THJA were randomly assigned to implement the algorithm or to continue with usual care (UC). Subsequently, the institutional rate of allogeneic transfusion was determined for 60 consecutive patients who underwent surgery at each site. The BCA consisted of patient and provider education, hemoglobin-based recommendations for specific blood conservation strategies (recombinant human erythropoietin [rHuEPO] or autologous blood donation [ABD]) and transfusion guidelines. The main outcome measure was the institutional allogeneic transfusion rate.
**RESULTS:** One hospital withdrew consent after randomization, resulting in 14 hospitals assigned to BCA and 15 to UC. In the BCA arm, the institutional rates of rHuEPO use and ABD participation were 20.1 and 27.1 percent compared to 0.6 and 25.8 percent, respectively, in the UC arm. The allogeneic transfusion rate was substantially reduced in hospitals assigned to the BCA group ($p = 0.02$; absolute risk reduction, 9.6% [26.1% UC vs. 16.5% BCA]). Multivariate analysis of patient-level data showed that assignment to the UC arm was an independent risk factor for allogeneic transfusion ($p = 0.037$; odds ratio, 1.8; 95% confidence interval, 1.0-3.1) when adjusted for other prognostic factors. No differences were observed in the use of autologous blood. CONCLUSION: A comprehensive approach to blood conservation was superior to UC for reducing allogeneic transfusion in patients undergoing THJA.