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## Biomechanics For Preoperative Planning And Surgical Simulations In Orthopaedics

Robert V. O'Toole, [Branislav Jaramaz](#), [Anthony M. Di Gioia](#), Christopher D. Visnic, and Robert H. Reid  
*Computers in Biology and Medicine*, Vol. 25, No. 2, 1995, pp. 183-191.

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### Abstract

Surgical simulations are particularly appropriate for the large volume and expense of joint replacement procedures in orthopaedics. A first generation surgical simulator has been developed to model the implantation procedure for cementless acetabular and femoral components in total hip replacement surgery. The simulator is based upon finite element analysis and predicts the early postoperative mechanical environment that results from a proposed surgery. Since the short- and long-term clinical success of cementless hip replacement components is very dependent upon the initial mechanics of the bone-implant system, such simulations can help orthopaedic surgeons to develop better preoperative plans.

### Notes

- **Associated Center(s) / Consortia:** [Vision and Autonomous Systems Center](#)

### Text Reference

Robert V. O'Toole, [Branislav Jaramaz](#), [Anthony M. Di Gioia](#), Christopher D. Visnic, and Robert H. Reid, "Biomechanics For Preoperative Planning And Surgical Simulations In Orthopaedics," *Computers in Biology and Medicine*, Vol. 25, No. 2, 1995, pp. 183-191.

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