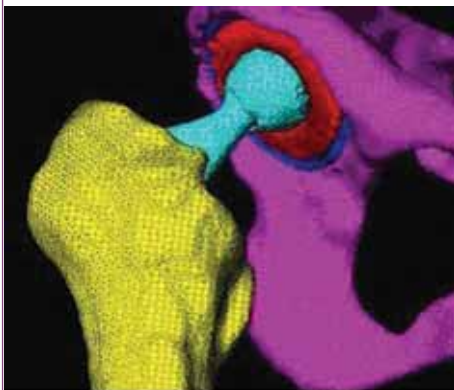


## Improving the success of hip implants

National Physical Laboratory

Over 2 million people in the UK are affected by osteoarthritis or osteoporosis. More than 90 per cent are over 60 years old, and this will rise in line with life expectancy. By 2010, the number of sufferers in the UK could rise by 20 per cent. The projected increase in total hip replacement operations will add £250 million to the NHS's costs.

This project, funded through the DTI's National Measurement System, was designed to be a first step in developing tools that could reduce the failure rate of hip replacement implants, thereby significantly reducing



both health risks to patients and costs for the NHS, while helping UK companies to address the world's orthopaedic market of £9 billion with improved products.

The project involved four orthopaedic industry partners, an NHS hospital, a simulations software developer and the University of Exeter's Biomechanical Engineering Centre.

Led by the National Physical Laboratory, the collaborators set out to explore whether 3D computer models generated from patient specific scans could be used to assess bone strength and predict how successful the integration of bone and implants had been.

During the study, real human femurs, prosthetic implants and simulated 3D computer models were subjected to a variety of load-bearing tests and the results were compared.

The results showed good correlation between the real bone or implant and the corresponding computer simulation. The collaborators are now considering further work to predict how a particular implant will perform in an individual's body.

Industrial Partners, Simpleware Ltd, CH Medical Ltd  
Yale Systems Ltd, Stryker Howmedica Osteonics, Abaqus UK Ltd,  
NHS: Princess Elizabeth Orthopaedic Centre, Exeter

National Physical Laboratory: [www.npl.co.uk](http://www.npl.co.uk)