

Treating modern back pain with help from old bones

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Some of the bones being used in the research are hundreds of years old. Credit: EPSRC

The research brings together archaeology and anthropology expertise at the University of Bristol with the latest computer modelling techniques developed at the University of Leeds.

Spines from up to 40 skeletons housed in museums and university [anatomy](#) collections are being analysed in the research, funded by the Engineering and Physical Sciences Research Council (EPSRC).

The data generated, on different spine conditions and on how spines vary in size and shape, are playing a key role in the development of innovative computer models. This will enable the potential impact of new treatments and implant materials (such as keyhole spinal surgery and artificial disc replacements) to be evaluated before they are used on

patients.

Ultimately, it will also be possible to use the models to pinpoint the type of treatment best suited to an individual patient.

This is the first software of its kind designed for the treatment of back conditions. The research will also speed up the process of clinical trials for new treatments, which currently can take up to ten years.

The data provided by the old bones will be used to supplement similar data collected from bodies donated to science, which are limited in number and mainly come from older age groups.

Dr. Ruth Wilcox, from the University of Leeds, who is leading the project said: “The idea is that a company will be able to come in with a design for a new product and we will simulate how it would work on different spines. The good thing about computer models is that we can use them over and over again, so we can test lots of different products on the same model. If we were doing this in a laboratory we would need many new donated spines each time we wanted to test a treatment out.”

This computer modelling breakthrough is possible thanks to recent advances in micro-CT (computed tomography) scanning, and to new techniques developed at the University of Leeds enabling data from micro-CT scans to be transformed into sophisticated computer models. Computed tomography (CT) scans use X-rays to build up 3-dimensional images from multiple cross-sectional pictures of body organs or tissues.

Dr. Kate Robson Brown from the University of Bristol’s [Archaeology](#) and [Anthropology](#) Department said: “The wider the pool of spinal data at our disposal, the more effective the computer models will be in terms of demonstrating the impact of treatments on different back conditions and back types. The computer modelling software should be available for

testing newly developed products and treatments in the next few years and along the way this cutting-edge research could even provide new insight into how our ancestors evolved.”

David Willetts, Minister for Universities and Science said: "[Back pain](#) is an extremely common condition, but everyone has a slightly different [spine](#) so developing new treatments can be a real challenge. This investment could significantly improve quality of life for millions of people around the world, so it's fantastic that the research is being carried out in the UK. It's also truly fascinating that old bones and very new technology can come together to deliver benefits for patients."

Provided by University of Bristol

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