

# Tackling knee pain

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(Medical Xpress) -- Running backwards can provide important insights on forces in the knee joint which can help people struggling with knee pain, a University study has found.

The study, carried out by researchers from the [Arthritis](#) Research UK Biomechanics and Bioengineering Centre based in the University's School of Healthcare Studies, shows how backwards [running](#) generally exerts less pressure on the knee joint.

As running backwards is not a very practical solution the team hope to build on their findings and be able to suggest forward running styles that could enable people with anterior [knee pain](#) to stay active.

Working with the Cardiff and Vale University Health Board researchers collected and analysed data relating to the compressive forces acting on the knee joint from 20 people who were taught techniques to run

forwards and backwards.

In 85 per cent of the participants, researchers found that the compressive forces behind the knee cap are increased in forward running compared to running backwards.

Participants were recruited and taught to run at a speed of 2.8 to 3.4 m/s. Speeds when running forwards and backwards were virtually identical for all participants. Data was collected by placing reflective markers on the participants' legs, video recording the session with infrared cameras and then assessing the gait using computer software. The force exerted when the foot hits the ground was measured using force plates under the floor.

Discussing the findings, Nick Barton, a physiotherapist in Cardiff and Vale University Health Board said: "Many people including runners experience problems with their knees. We showed that compressive forces behind the knee cap were reduced in the majority of cases and this was independent of running speed.

"It is therefore possible that running backwards, as part of a specific rehabilitation programme prescribed by a physiotherapist, may help in returning patients back to a good level of activity".

People with runner's knee experience soreness, discomfort or even a grating sensation in their knee when there is increased pressure on the joint. This often stops them from exercising normally.

Dr Paulien Roos, an Academic Fellow at the Arthritis Research UK Biomechanics and [Bioengineering](#) Centre and School of Healthcare Studies added: "Although backward running may not be a practical solution, this study provided important insights on how loading of the knee joint can be reduced in running.

"The participants in our study landed on their heels during forward running, but always landed on their forefoot when they ran backwards. The initial foot contact was important in defining the compressive forces in the knee and suggests there is an opportunity to investigate various running styles for therapeutic application".

Commenting on the study, Arthritis Research UK's medical director, Professor Alan Silman, said: "We fund research to help keep people active. This study provides us with a better idea of which running styles reduce forces on the knee to help prevent injuries such as runners' [knee](#)."

"It's important people use the proper technique to exercise safely but we do not recommend people start running backwards due to the potential trip hazards. If you are unsure about your running technique, a qualified sports coach, fitness instructor or member of gym staff can give you advice".

The study was published in April 2012 in the *Journal of [Biomechanics](#)*: 'Patellofemoral joint compression forces in backward and forward running', Paulien E. Roos, Nick Barton and Robert W.M. van Deursen

This paper was reviewed in May 2012 in the journal *Lower Extremity Review*.

Provided by Cardiff University

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