

Best foot forward

Motion analysis is helping everyday runners stay one step ahead of injury, writes **Steve Meacham**.

It's 10am on a beautiful Sydney day, but I'm feeling like some kind of freak exhibitionist. Why? I'm wearing nothing but a flimsy pair of skin-tight lycra shorts and two dozen little white patches or "anatomical markers".

And I am jogging self-consciously along the lines of a netball court while a state-of-the-art digital camera records my every movement.

I'm undergoing my first ever "biomechanical assessment". Sitting behind the video camera, tapping away at his laptop computer, is Jason McLaren, an exercise and sports scientist who claims to offer Sydney's most comprehensive motion analysis service aimed at the person in the street rather than the elite athlete.

I've been referred to McLaren by my physiotherapist. For 30 years I've run virtually every day, including marathons and half marathons. But recently my injuries have been getting worse. Groin strains, sore achilles, hamstring problems, calf strains – and, most recently, a bad back damaged while stepping off a kerb during a run. Now, after all these years, I need someone to teach me how to run properly.

McLaren, 33, is a bachelor of applied science who has divided his working life between the Sydney Academy of Sport and the running shoe industry. He is also a keen runner and middle-distance coach.

Three years ago he recognised that it wasn't only the higher-end athletes who could benefit from breakthroughs in biomechanics. Ordinary runners could also improve their performances – and reduce their chances of injury with the same kind of expert analysis.

He set up ISPORT, which offers a



On the right track ... Jason McLaren analyses a client's running action.

complete portable motion analysis service. Most of his clients are runners, but he is assessing an increasing number of netballers, soccer players, cricketers – even professional rugby league players.

Today we're going through the first stage, video capturing. McLaren has applied white stickers to all my key joints, and now I am jogging across the court while he films me from a number of directions and records the results on his laptop. The process takes about 45 minutes. When he is happy that he has captured each

separate component, he'll go away and analyse what I'm doing wrong. In time, I'll be given a customised CD-ROM of my action, an injury prevention and management plan, and specific stretches and exercises to help modify my running technique.

McLaren examines the individual in his/her specific athletic environment. As anyone who has taken part in the City to Surf knows, there is no such thing as a "typical" running style.

"You should never copy a champion athlete because every person is made differently," says McLaren. "There are basic rules, obviously, but each human body is different. There are biomechanical variables."

Two weeks later I'm back at the same netball court, listening while McLaren runs through my "faults". It's a long list. He has prepared a written report, with photographs of my running action marked with angles and lines of stress. But he also runs through the CD-ROM, with annotated video grabs showing what's going wrong.

From side on we can see that my leading foot is landing too far ahead of my body, acting as a brake because I am striking the

ground first with my heel. That is forcing my knee to collapse. What's worse is that my right knee is collapsing by 26 degrees, three degrees more than my left knee. Further analysis shows that each foot stays on the ground for 180 milliseconds per stride, when 100 milliseconds would considerably reduce the stress of my body.

The footage of me running to and from the camera captures other problems. My right knee is moving too far over to the left, and I have a pronounced hip drop on that right side. To counter this, I've been running with my left arm too far out from my body.

The result of all this asymmetrical action is that I'm suffering injuries. The solution is to modify my running style via a number of specific exercises which McLaren gives me to help develop flexibility and strengthen particular muscle groups.

Serious changes need to be made if I'm going to continue running. Yet part of me feels quite chuffed. With all those faults McLaren has identified, I must be a walking miracle.

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IN THE LONG RUN INJURY WILL CATCH UP

Running has changed hugely as a sport over the past 30 years. People are running longer distances and more often.

Eventually the repetitive impact of cumulative distance builds up, and injuries start happening. We might upgrade to a different pair of running shoe – but the problem may be in the running action itself.

In fact, some American experts believe better running shoes may actually be causing

injuries they are designed to prevent because they encourage "lazy" runners.

A recent report in *The New York Times* quoted Dr Irene Davis, director of the Running Injury Clinic at the University of Delaware.

She claimed that 65 to 80 per cent of all runners are injured in an average year. The most common complaints are aching Achilles tendons, sore knees and inflamed arches.