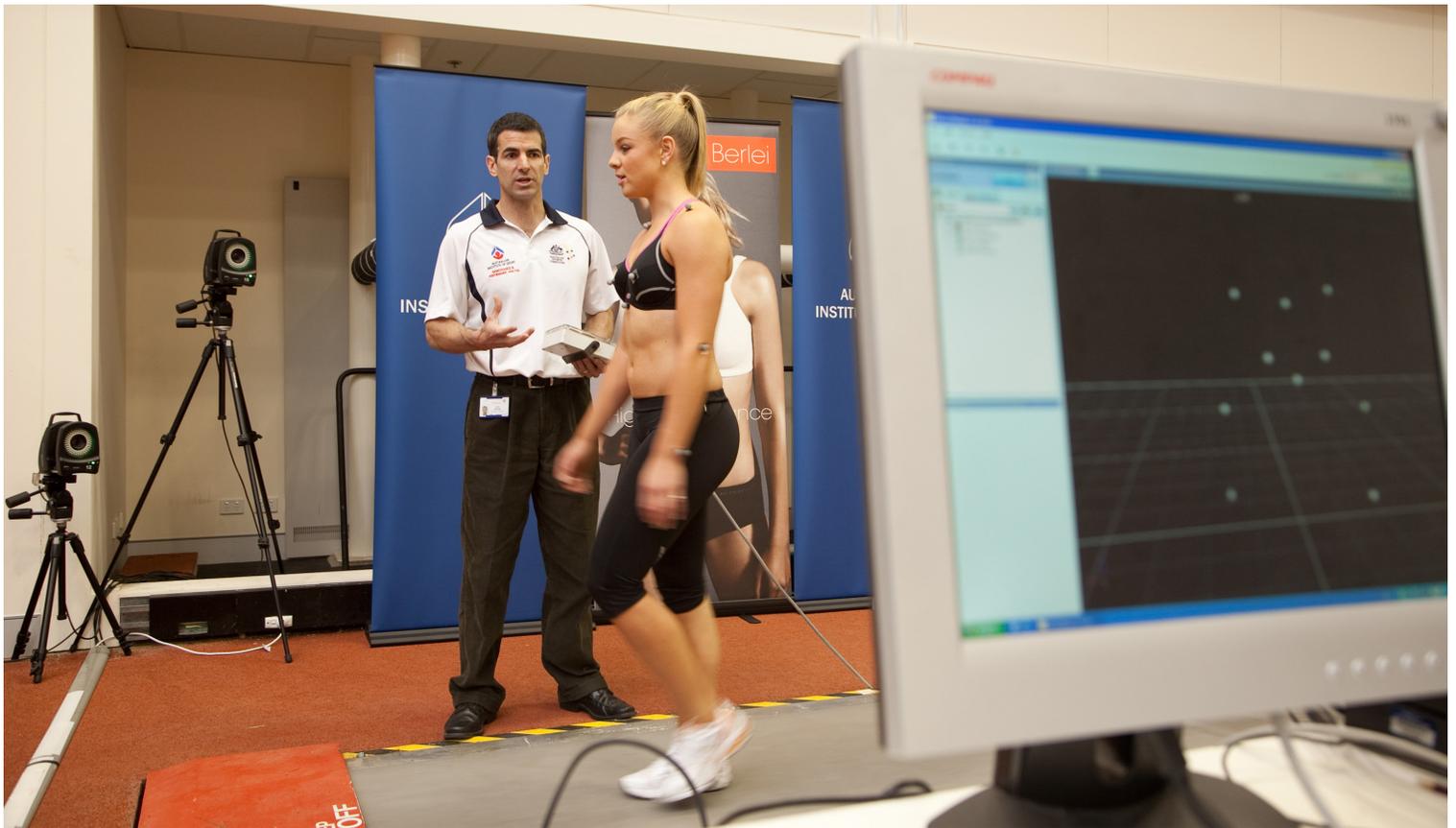


**VICON**

# Australian Institute of Sport + Berlei



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**Dr. Nick Brown, AIS Biomechanics Department**

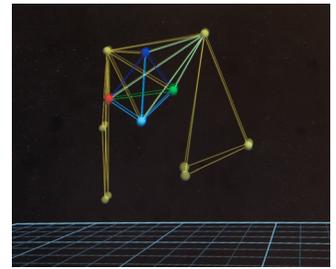
# Australian Institute of Sport + Berlei



Vicon MX40



AIS & Berlei Test Lab



Vicon Nexus

## Challenge

The Australian Institute of Sport (AIS) is Australia's premiere sports training institute and has developed an international reputation as the world's best practice model for high-performance athlete development.

Berlei, a major sponsor of the AIS, wanted to work with the biomechanics unit to measure breast bounce and be able to accurately test its latest sports bra designs to understand the level of bounce reduction they offer. Research has shown that up to 56% of women suffer breast pain during physical activity such as dancing, jogging or boxing, which can ultimately lead to damage of the chest ligaments, sagging of the breasts or back pain.

"Our research with Berlei relates to breast bounce and comfort. It's important for athletes because performance can be limited by breast discomfort," said Dr. Nick Brown Head of the AIS Biomechanics department. As such, the AIS required a motion capture system that was able to precisely quantify vertical bounce, and give them feedback in real-time.

## Solution

The AIS used an eight camera Vicon MX40 motion capture system with Nexus software to help Berlei test the level of bounce reduction their sports bras offer. This testing helps design new sports bras that provide even more positive biomechanical advantage. Their lab also includes a treadmill surrounded by the Vicon cameras and involves placing six reflective markers on the participant's chest in a set formation. The light emitted by the cameras is reflected back and the markers' 3D positions are used to create a digital skeleton within Vicon Nexus software.

Brown added, "As well as the digital information collected with the Vicon system, we also ask each participant to give a self assessment of breast pain and bra comfort after a walk, a jog and a run versus the unsupported test."

## Results

"Because we're working directly with the Berlei design and product development team, they can take the feedback straight away to help them develop something new, moving the product range forward.

I believe Berlei are the only sports bra manufacturer to test their bras in this way. The beauty of the Vicon system is that it enables us to precisely quantify vertical bounce using the Nexus software, relative to the trunk. Therefore showing us how much the bra reduces bounce," praised Brown. "This can mean up to a 60% bounce reduction versus an unsupported test."

Brown comments on the benefits of Vicon motion capture, "Berlei's designers love to see the results coming back in real time. At the end of a working day we have up to sixty 10 second trials that have been fully digitalized. The speed that the data is processed is impressive, making it convenient and easy to demonstrate the differences to Berlei in real time and get feedback straight away."

All Berlei sports bras are tested through the AIS biomechanics department and findings have been responsible for significant advances in the product design of Berlei's sports bras. As a result, all Berlei sports bras are tested and endorsed by the AIS.

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 T: +1 303.799.8686  
 Los Angeles  
 T: +1 303.799.8686

Oxford  
 T: +44 (0) 1865 261800  
 Singapore  
 T: +65 6400 3500