

# Australian cricket team uses guided missile technology to improve bowling

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Australian researchers have developed a revolutionary algorithm using submarine and guided missile technology to reduce injury and improve performance in cricket fast bowlers. The "torpedo technology" is being used by the Australian team in preparations for the upcoming Sri Lanka Series.

Sports scientists at Australian Catholic University's School of Exercise Science developed the algorithm as the current manual reporting of professional cricketers' workloads - which only measures how many deliveries a bowler balls, and not the intensity of the effort - was inadequate.

The scientists have recommended in the *British Journal of Sports Medicine* that coaches, instead, use missile-guiding microtechnology implanted in newly-developed wearables, which would run the so-called "smart algorithms". "These 'smart algorithms' rely on the interaction of the accelerometers, magnetometers and gyroscopes housed within the wearable unit - the same technology used to navigate submarines, guided missiles and spacecraft," leading sports scientist and co-author Dr Tim Gabbett said.

Co-author and fellow ACU sports scientist Dean McNamara said once the algorithm detects a delivery, a measure of bowling intensity could be attached to that individual delivery via the accelerometer and gyroscope technology. "Tagging individual balls with an intensity measure provides both immediate analysis such as identifying effort balls, or potentially a

drop in performance due to fatigue, or longer term workload analysis," he said.

The pair explained how the missile-guiding accelerometers, magnetometers and gyroscopes offered a "stable measure of bowling 'load' across repeated bowling spells". "Measuring bowling intensity for individual balls or sessions provides context for the acute and chronic workload of the individual bowler, and ultimately the preparedness of the bowler for the maximal workload of the immediate competition. Automated measures of bowling workload and intensity provide opportunity to enhance the monitoring of fast bowling preparation for both injury prevention and performance outcomes," McNamara said.

The ACU sports scientists said while the high-tech wearables - "something substantially more than the standard GPS units used by elite athletes" - could be used in professional baseball (pitcher), rugby union, rugby league, tennis, football and many other sports, cricket's need for a better measure of athlete workload was pressing due to an explosion in popularity of new forms of the game, which has seen the world's elite bowlers back up year-on-year without respite.

An over is a measure of workload - six consecutive deliveries by a bowler, with a delivery carrying the ball to the batsman 20m away at speeds varying from 80 to 160 km/h. "Across the three forms of cricket (Test, one-dayers and T20), a bowler's workload may vary from 60 to four overs," Dr Gabbett said.

"Because of this varying workload and intensity, cricket provides a complex challenge for clinicians and coaches. Arguably, no other professional sport has experienced greater changes in competitive workload demands than cricket over the past 10 years; perhaps most specifically via the introduction of T20 cricket," he said. "Progressing a bowler to a window of decreased injury likelihood requires [workload](#) to

be viewed as a moving target. This is largely due to the varying formats of competition across the year."

McNamara said the university was already using its innovative technologies to help professional sporting teams around the world, including Australian cricket teams, and the Wales rugby union team who play the New Zealand All Blacks in a three Test series starting on June 11.

**More information:** Dean J McNamara et al. How submarine and guided missile technology can help reduce injury and improve performance in cricket fast bowlers, *British Journal of Sports Medicine* (2016). [DOI: 10.1136/bjsports-2015-095935](https://doi.org/10.1136/bjsports-2015-095935)

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