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Biology to Behaviour: Advances in Talent Development

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How do we keep potential champions in sport long enough to prevail? Since youth sports began in the early 20th century, kids have competed based on chronological age. Twelve-year-olds against other 12-year-olds. Fifteen-year-olds against other 15-year-olds. Yet while chronological age increases at the same rate for everyone, biological age does not. Kids develop at different rates. Some earlier. Some later. Thus, athletes with the same birth date can differ considerably in their biology. How does this affect talent identification? While skill plays an obvious role in top junior performance, an increasing body of research shows the significant impact of biological maturation.

Studies examining selection in youth sports indicate a distinct bias towards early developing athletes. Simply put, bigger, faster, stronger kids are more likely to make the team. Why is this true? In junior cricket, biologically older players bowl faster, throw further, hit harder, and perform better in tests of body strength, increasing cricket performance. In football and basketball, advantages in strength, power and speed give the early-maturing player the edge in competition. Crucially, such physical advantages show up in the evaluations of coaches during selection. A bias that, in some cases, is not lost until the transition from junior to senior sport.

The fact that potentially skilled but later-maturing athletes are less likely to make the team, and/or more likely to be deselected, is a failure of our talent system. Because short-term outcomes trump long-term development, kids with promise but who can't yet compete physically, are overlooked. However, new approaches that assess individual growth rates are starting to appear, with exciting implications for athlete development. New research in swimming shows, for instance, how maturation-based corrective adjustments may start levelling the playing field for young athletes.

Changes in biology not only influence who makes the team but a young athlete's development trajectory once they get there. Most noteworthy is how they cope with training volume and intensity. Rapid increases in height and weight common during the adolescent growth spurt change the way an individual experiences sport.

Coordination can be lost. Skill can digress. Bones and tendons become more sensitive to stress. And all at a time when for a talented young athlete, demand typically goes up!

The adolescent growth spurt is a crucial stage of development. Major physical and physiological changes lead to fluctuations in performance and a heightened risk of injury. Importantly, new research investigating methods to control load exposure and stabilise the stress response amongst developing athletes is encouraging for healthy athlete development.

What is youth sport for? How we identify potential sport champions, as well how we develop them once they appear, starts with answering this question.

Topic: Sports Medicine and Orthopedics

Presentation Invited

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