

REVIEW OF LITERATURE

PERFORMANCE TESTS: "DETECTING THE CHANGE"

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SUMMARY PLUS

INTRODUCTION

The main scope of sport science is the enhancement of human performance via assessment, testing and evaluation of training, nutritional considerations and others interventions. Efficient testing is realized through specific laboratory and field examinations.

AIM

The purpose of this review is to analyze and indicate the methodological weaknesses of classic laboratory and field testing and to review specific alternative types of testing in order to promote thoughtful usage of them in sport research.

FIELD and CLASSIC LABORATORY TESTS vs. PERFORMANCE TESTS

Field tests have low reliability, validity and accuracy, since there are factors which are difficult to be controlled by sport scientists (i.e. environmental conditions, lack of portable, highly accurate measuring instruments, etc). For such reasons the use of laboratory tests (e.g. VO_{2max} and Wingate tests) is imperative. However, there is a critical point that questions the applicability of the results of a classic laboratory test to performance of an individual in a real race. The aforementioned weaknesses of common and popular field and laboratory tests leads to an inability to trace, sometimes, changes in performance which rises the need of designing and practicing of special performance tests in the laboratory that simulate conditions of race or game.

TYPES OF PERFORMANCE TESTS

There are specific types of tests, which assess sport performance in accordance with certain criteria (time trial, time to exhaustion, covered distance etc). Numerous performance tests have been published in the literature which may be grouped to the following four general categories:

Constant work or time trials tests: an individual has to complete, as quickly as possible, a predefined amount of work or a predefined distance;

Constant duration tests: an individual has to complete or to cover, in a predefined time period, as much work or distance, respectively;

Constant power or constant load tests: an individual has to maintain up to exhaustion a

constant power output. Criteria of exhaustion entail the difficulty of maintaining speed, cadence or power output set;

Critical power tests: an individual has to perform repeatedly a constant power or work or duration test over a few days with different intensity each time. Power and duration of each test are combined in a mathematical model to give estimates of maximum aerobic power and anaerobic work capacity.

Finally, the above tests are also divided, by others, in two experimental designs: a) the open-loop designs, which include constant power test, and b) the closed-loop designs that contain constant work and duration tests.

CONCLUSIONS

The tests that are presented in this review are useful tools to monitor and evaluate human performance, in a complimentary way to the classic laboratory testing. The selection of the right performance test should be based on specific characteristics (i.e. aim) of the research and the specificity of sport endeavor or activity which is under investigation. Methodological consideration (i.e. validity, reliability) of each test should be also taken into consideration nevertheless these criteria are out of the scope of the present review.

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