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Assessing athlete fitness economically: The importance of the modified queen's college step test in a developing country: Experiences from Sri Lanka

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Despite Sri Lanka's economic hardships, its athletes continue to achieve impressive international success. Limited funding, however, restricts crucial scientific support and accessibility to high-tech exercise physiology services. The original Queen's College Step Test (QCST) estimates VO2peak using resting and peak heart rate data from a standardized stepping exercise. The newly introduced Modified Queen's College Step Test (M-QCST) enhances the traditional QCST by increasing the stepping rate to 30 steps per minute to better elicit maximum heart rate. Crucially, M-QCST continuously monitors heart rate (HR) and peripheral oxygen saturation at peak exercise and during recovery (90 seconds, 3, 5, and 10 minutes). This provides detailed insights into cardiovascular and respiratory recovery. The other benefit of M-QCST is its practicality: low-cost, non-invasive, minimal equipment needs, portable for outdoor use, and easy to administer and perform. Combining physiological insights with practicality makes M-QCST a valuable tool for cardiopulmonary fitness and health assessments. Literature suggests that indicators of parasympathetic dominance are better predictors of endurance performance than VO2max in athletes. Furthermore, immediate HR recovery predicts optimal remodeling of cardiac regulation, characterized by dominant parasympathetic input. Thus, M-QCST derived peak HR and immediate HR recovery (first 90 seconds) are vital for assessing parasympathetic influence on the regulation of the heart and, consequently, endurance performance. Additionally, peak and recovery of peripheral oxygen saturation, a simple and non-invasive measure, effectively indicates an individual's cardiopulmonary adaptations during exertion and recovery. The M-QCST has been successfully utilized for years in sports medicine clinics in Sri Lanka for cardiopulmonary fitness assessment of school level and professional level athletes. Athletes, assessed and monitored using the M-QCST have subsequently performed at the international level, bringing pride to the country. In conclusion, the M-QCST is an economical, fairly accurate, portable, and non-invasive method well-suited for addressing exercise physiology needs in developing countries with financial limitations.

Biography

Dr. K.D.C. Upendra Wijayasiri (MBBS (SL), Dip.Spo.Med(Col), PhD, CTHE) is a dedicated Sports Physician and Clinical Exercise Physiologist with expertise in cardiopulmonary fitness assessment of both clinical patients and sports personnel. He is a specialist in Cardiaopulmonary rehabilitation in Sri Lanka. In addition to his clinical role, Dr. Wijayasiri is a Senior Lecturer in Physiology at the Department of Physiology, Faculty of Medicine, Sir John Kotelawala Defense University, Sri Lanka. He also serves an honorary Clinical Exercise Physiologist and a Sports physician at the University Hospital of the same university. With advanced training, a strong research background, and numerous international affiliations, Dr. Wijayasiri brings a global perspective to his work. He has conducted several pioneering research studies in this field in Sri Lanka, earning recognition in many international publications. On His commitment to integrating clinical practice with academic excellence has made significant contributions to the advancement of cardiopulmonary fitness assessment and cardiopulmonary rehabilitation and sports medicine in Sri Lanka.

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