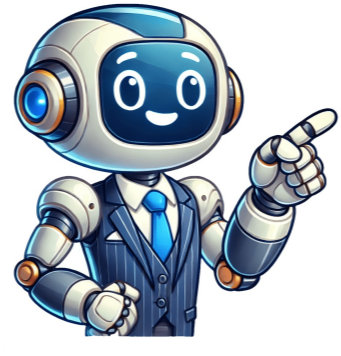


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## Margaria kalamen stair test

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P
=
m
g
h
t


{\displaystyle P={mgh \over t}}

 where, m is the mass of the athlete h is the vertical height between the third and ninth steps t is the time between stepping on the third and ninth steps g is acceleration due to gravity, approximately 9.81 m/s2 To obtain power in units of watts, that is, SI units, the mass must be expressed in kilograms and the time in seconds. American football coaches use a slight variation of this test. In the football stair climb test the athlete runs up twenty steps four at a time.[6] ^ J Kalamen, "Measurement of maximum muscle power in man", Ohio State University, Columbus, 1968 ^ R Margaria, P Aghemo, E Rovelli, "Measurement of muscular power (anaerobic) in man", Journal of Applied Physiology, vol. 21, no. 5, pp. 1662-1664, 1 September 1966. ^ a b Sharon A. Plowman, Denise L. Smith, Exercise Physiology for Health Fitness and Performance, p. 68, Lippincott Williams & Wilkins, 2013 ISBN 1451176112. ^ Morc Coulson, David Archer, Practical Fitness Testing: Analysis in Exercise and Sport, p. 183, Bloomsbury Publishing, 2015 ISBN 1408195844. ^ Thomas R. Baechle, Roger W. Earle, Essentials of Strength Training and Conditioning, p. 258, Human Kinetics, 2008 ISBN 0736058036. ^ Nick Draper, Helen Marshall, Exercise Physiology: For Health and Sports Performance, p. 276, Routledge, 2014 ISBN 1317902602. Retrieved from " Testing and measurement are the means of collecting information upon which subsequent performance evaluations and decisions are made. In the analysis, we need to consider the factors influencing the results. Objective The objective of this test (Margaria 1996 & Kalaman 1968)[1,2] is to monitor the development of the athlete's strength and speed (power). Required Resources To conduct this test, you will require: Stopwatch Assistant Flight of 12 steps about 17.5 cm high Weighing Scales How to conduct the test The test requires the athlete to sprint up a set of steps. The athlete warms up for 10 minutes The assistant marks a starting line with cones 6 metres in front of the first step The assistant places a cone on and to one side of the 3rd, 6th and 9th steps The assistant measures the vertical distance from the 3rd to the 9th step (metres) The assistant weighs the athlete (kg) The athlete starts at the 6-metre line The assistant gives the command "GO" The athlete sprints to the steps and up the flight of steps taking three steps at a time landing on the 3rd, 6th and 9th steps The assistant starts the stopwatch when the athlete's foot lands on the 3rd step The assistant stops the stopwatch when the athlete's foot lands on the 9th step and records the time Power (Watts) is calculated from the formula: P = (M x D) x 9.8 ÷ t where P = Power (Watts) M = Athlete's weight (kg) D = Vertical distance (m) - 3rd to 9th step t = Time (s) Analysis Analysis of the test result compares it with the athlete's previous results for this test. It is expected that, with appropriate training between each test, the analysis would indicate an improvement in the athlete's speed and strength (power). Target Group This test is suitable for active athletes but not for individuals where the test would be contraindicated. Reliability Test reliability refers to how a test is consistent and stable in measuring its intended measure. Reliability will depend upon how strict the test is conducted and the individual's level of motivation to perform the test. The following link provides various factors influencing the results and test reliability. Validity Test validity refers to the degree to which the test measures what it claims to measure and the extent to which inferences, conclusions, and decisions based on test scores are appropriate and meaningful. This test provides a means to monitor training on the athlete's physical development. Advantages Minimal equipment required Simple to set up and conduct Disadvantages Specific facilities required - steps Assistant required to administer the test References MARGARIA, R. et al. (1996) Measurement of muscular power (anaerobic) in man. J. Appl. Physiol, 21, p. 1662-1664 KALAMAN, J. (1968) Measurement of maximum muscle power in man. Doctoral dissertation, Ohio State University, Columbus. Page Reference If you quote information from this page in your work, then the reference for this page is: MACKENZIE, B. (2005) Margaria Kalamen Power Test [WWW] Available from: [Accessed Home > Fitness Testing > Tests > Speed & Power > Margaria-Kalamen The Margaria Kalamen Power Test is a simple test of power of the lower extremities, involving running up a flight of stairs. The test described here was introduced by Kalamen (1968), and is a variation of the original Margaria Step Test developed by Margaria et al. (1966). test purpose: to test the power of the lower extremities. equipment required: stopwatch, timing mats (optional, like this one), tape measure, flight of 12 steps with a starting line of 6 meters in front of the first step. Each step is approximately 17.5 cm high with the 3rd, 6th and 9th step clearly marked. The vertical distance between the 3rd and 9th step must be accurately measured for use in the results formula. pre-test: Explain the test procedures to the subject. Perform screening of health risks and obtain informed consent. Prepare forms and record basic information such as age, height, body weight, gender and test conditions. Mark out test area. Perform a standard warm-up. Measure and record step height. See more details of pre-test procedures. running stairs procedure: The athlete's weight is determined in kilograms. The athlete is given a few practice runs up the steps to warm up. The athlete stands ready at the starting line 6 meters in front of the first step. On the command "Go", the athlete sprints to and up the flight of steps, taking three steps at a time (stepping on the 3rd, 6th and 9th steps), attempting to go up the steps as fast as possible. The time to get from the 3rd step to the 9th step is recorded (either using a stopwatch or using switch mats placed on the 3rd and 9th steps), starting when the foot was in first in contact with the 3rd step, and stopped when the foot contacts the 9th step. Allow three trials of the test, with 2-3 minutes recovery between each trial. scoring: Power (Watts) is calculated from the formula below, where P = Power (Watts), M = Body mass (kg), D = Vertical distance, between steps 3 & 9 (meters), t = Time (seconds). 9.8 is the constant of gravity: P = ( M x D ) x 9.8 / t disadvantages: the ability to successfully conduct this test requires the availability of steps of the appropriate height and with a clear run up area. reliability: the accuracy of this test will be reduced if a stopwatch is used instead of timing mats for measurement of the time. If using a stopwatch, you should have two people record simultaneously and use the average of the two measurements. It is also important to give the participants adequate practice so that they can confidently run up the stairs with maximum effort. references: Margaria, R., Aghemo, P. and Rovelli, E. (1966) Measurement of muscular power (anaerobic) in man. Journal of Applied Physiology 22: 1662-1664. Kalamen, J. (1968) Measurement of maximum muscular power in man. Doctoral thesis, Ohio State University A similar test of leg power is the standing long jump test See the list of anaerobic tests for other fitness tests of leg power. Any comments, suggestions, or corrections? Please let us know. Beckenholdt, SE and Mayhew, JL. Specificity among anaerobic power tests in male athletes. J Sports Med Phys Fitness 23: 326-332, 1983.Hetzler, Ronald K; Vogelpohl, Rachele E; Stickley, Christopher D; Kuramoto, Allison N; DeLaura, Mel R; Kimura, Iris F. Development of a Modified Margaria-Kalamen Anaerobic Power Test for American Football Athletes. Journal of Strength and Conditioning Research 24(4):p 978-984, April 2010. | DOI: 10.1519/JSC.0b013e3181b2ba42Margaria R, Aghemo P, Rovelli E. Measurement of muscular power (anaerobic) in man. J Appl Physiol. 1966 Sep;21(5):1662-4. doi: 10.1152/jappl.1966.21.5.1662. PMID: 5923240.Murray, D.P., Bera, S.G., Brown, L.E., Findley, B.W. (2007). 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