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| **Cardiorespiratory Fitness-Exercise Test Estimate [One Mile Walk]** | |
| **Protocol Id** | 150101 |
| **Version #** | 1 |
| **Description of Protocol** | The participant is asked to complete a one-mile walk test as quickly as possible on a track. A technician utilizes a stopwatch to time the walk. The participant wears a heart rate monitor that records h/her heart rate continuously through the test. After the test is completed the technician records the heart rate from the last 10 seconds of the test. In addition, the participant’s age, sex, and body weight are needed to complete an equation to determine maximal oxygen consumption (VO2max). |
| **Specific Instructions** | A heart-rate monitor (e.g., Polar® heart-rate monitor) should be used since the heart-rate (HR) that is used in the equation is taken during the last 10 sec of the test and not after the test is completed (HR will decline rapidly after test is completed). If HR is taken after the test is completed, this will introduce error to the prediction of VO2max.  The HR monitor must store HR so the technician can easily access the results after the test is completed. The manufacturer’s user manual should be followed for proper calibration and usage.  A screening instrument such as the PAR-Q (Physical Activity Readiness Questionnaire, The Canadian Society for Exercise Physiology) should be completed with the participant prior to the one-mile walk to make certain he/she is physically capable of performing the walk. If the person is elderly or in poor health, a physician’s examination and approval is preferable prior to the test.  Polar® is a trademark of Polar Electro Oy |
| **Protocol Text** | **Track or pre-measured one-mile distance**  Note: if a track is not used, the location where the timed walk takes place must be flat and pre-measured to equal 1 mile.  First, obtain the participant’s weight in pounds via a reliable scale, and also record his/her sex, and current age. Secure the HR monitor chest strap and watch to the participant. Explain that you will time the participant as he/she walks as quickly as possible for one-mile.  Once the participant is ready at the starting line, say "go" and start the stopwatch. Time the participant until he/she completes the entire 1 mile walk. Record the time in minutes and seconds and then convert to seconds [(minutes x 60) + seconds].  Insert the person’s weight, age, sex, time, and heart rate into the following scoring equation to determine VO2max (maximal oxygen consumption).  Scoring  VO2max = 6.9652 + (0.0091 \* WEIGHT) - (0.0257 \* AGE) + (0.5995 \* SEX1) - (0.2240 \* TIME) - ( 0.0115 \* HEART RATE)  1Male = 1, Female = 0  Units of VO2maxare liters of oxygen per minute (l/min) |
| **Selection Rationale** | This is a standard assessment of aerobic capacity that has been widely utilized for the past two decades. It is low burden for healthy participants and relatively easy for a technician to administer. |
| **Source** | Kline, G., Porcari, J., Hintermeister, R., Freedson, P. S., Ward, A., McCarron, R. F., Ross, J., & Rippe, J. M. (1987). Estimation of VO2 max from a one-mile track walk, gender, age and body weight. *Medicine and Science in Sports and Exercise*. *19*: 253-259. |
| **Language** | English |
| **Participant** | Ages 20 to 69 While the validation of the 1 mile walk test was conducted in middle aged and elderly adults, the PhenX Working Group recommends that the protocol can be used with participants as young as 20 years of age and with older age groups provided that a physician approves the test in frail or medically compromised study participants. |
| **Personnel and Training Required** | A technician who has been trained in monitoring a walk test, and properly recording the data. |
| **Equipment Needs** | One-mile track or pre-measured flat walking area. A heart-rate monitor with chest strap and wrist receiver that stores heart rate data is recommended. |
| **Standards** | |  |  |  |  | | --- | --- | --- | --- | | **Standard** | **Name** | **ID** | **Source** | | Common Data Elements (CDE) | Person Cardiorespiratory Fitness One Mile Walking Test Estimate Text | 3060845 | [CDE Browser](https://cdebrowser.nci.nih.gov/CDEBrowser/search?elementDetails=9&FirstTimer=0&PageId=ElementDetailsGroup&publicId=3060845&version=1.0) | | Logical Observation Identifiers Names and Codes (LOINC) | Cardioresp fitness 1 mi walk proto | 62814-9 | [LOINC](http://s.details.loinc.org/LOINC/62814-9.html?sections=Web) | |
| **General References** | *Physical Activity Readiness Questionnaire (PAR-Q)* © 2002. Used with permission from the Canadian Society for Exercise Physiology. |
| **Protocol Type** | Physical Measurement |
| **Derived Variables** | None |
| **Requirements** | |  |  | | --- | --- | | **Requirement Category** | **Required** | | Average time of greater than 15 minutes in an unaffected individual  Average time of greater than 15 minutes in an unaffected individual | No | | Major equipment  This measure requires a specialized measurement device that may not be readily available in every setting where genome wide association studies are being conducted. Examples of specialized equipment are DEXA, Echocardiography, and Spirometry | No | | Specialized requirements for biospecimen collection  This protocol requires that blood, urine, etc. be collected from the study participants. | No | | Specialized training  This measure requires staff training in the protocol methodology and/or in the conduct of the data analysis. | No | |