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| **Domain:** | Reproductive Health |
| **Measure:** | Testes Development |
| **Definition:** | The orchidometer is one method used to measure testes size which is an indication of testes development. The orchidometer consists of a string of twelve numbered wooden or plastic elipsoid beads of increasing size measured as volume. |
| **Purpose:** | The purpose of the orchidometer is to measure testes size. Because testicular growth correlates with the onset of puberty and the initiation of spermatogenesis, this measure is used to confirm pubertal onset and the presence of sperm production. Small testes may indicate either primary or secondary hypogonadism and large testes (macroorchidism) may indicate fragile X syndrome, a common cause of mental retardation. |
| **Essential PhenX Measures:** | Current Age Gender |
| **Related PhenX Measures:** | Assessment of Pubertal Development History of Prepubertal Development Male Reproductive Tract Birth Defects |
| **Collections:** | Development |
| **Keywords:** | Reproductive health, testes development, pubertal development, puberty, orchidometer |

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| **Protocol Release Date:** | October 20, 2010 |
| **PhenX Protocol Name:** | Testes Development |
| **Protocol Name from Source:** | The Expert Review Panel has not reviewed this measure yet. |
| **Description:** | A physician uses an orchidometer to measure testes size and determine the onset of puberty and later pubertal development. The orchidometer beads, which are of increasing volume from 1 ml to 25 ml are compared with the size of the subject's testicles. The examiner is careful to only include testicular tissue in the comparison. |
| **Specific Instructions:** | The orchidometer, a series of ellipsoids of increasing volume, are used to determine testes size. Each testis is measured with the patient standing in a warm room. The ellipsoid is held up to each isolated testis and a measurement is estimated, making sure not to include the epididymis in the measurement. One measurement is adequate, but it never hurts to do more than once (Prader A., 1966, 1975). The testicular examination requires two hands and should be performed in a warm room. The hands may be lubricated with surgical lubricant or warm, soapy water if necessary. The patient is supine. One hand is placed near the anterior superior iliac spine and the other on the scrotum. The first hand is swept from the anterior iliac spine along the inguinal canal to gently express any retained testicular tissue into the scrotum. A true undescended or ectopic inguinal testis may slide or "pop" under the examiner's fingers during this maneuver. A low ectopic or retractile testis will be felt by the second hand as the testis is milked into the scrotum by the first hand.(Cooper and Docimo 2010; Drutz 2010). Examination of older children and adult testes is routinely performed in the standing position. Examination of adults with a suspected undescended testis should be done in both the supine and standing positions with adequate cremasteric relaxation to differentiate true UDT or ectopic testes from retractile testes (Eyre 2010). Normal testicular length and volume, by age\*   |  |  |  | | --- | --- | --- | | Age (year) | Length, cm  (mean ± SD) | Volume, ml (approximate) | | < 2 | 1.4 ± 0.4 |  | | 2 – 4 | 1.2 ± 0.2 |  | | 4 – 6 | 1.5 ± 0.6 | 1 | | 6 – 8 | 1.8 ± 0.3 |  | | 8 – 10 | 2.0 ± 0.5 | 2 | | 10 – 12 | 2.7 ± 0.7 | 5 | | 12 – 14 | 3.4 ± 0.8 | 10 | | 14 – 16 | 4.1 ± 1.0 | 20 | | 16 – 18 | 5.0 ± 0.5 | 29 | | 18 – 20 | 5.0 ± 0.3 | 29 |   \*Note: Testicular volume can vary by a factor of two. Adapted from Keefer, JR. Endocrinology. In: Harriet Lane Handbook, 15th ed, Siberry, GK, Iannone, R (Eds), Mosby, St. Louis 2000. p.227. |
| **Protocol:** | Editor's note: The photographs accompanying this protocol have been omitted. Please find these photographs, along with the protocol at the [slink[www.nfaap.org/netFORUM/eweb/DynamicPage.aspx?webcode=aapbks\_productdetail&key=59ff0b1b-e2b2-499d-8c3b-a8eb3bbaea5d">following citation.  Marcia E. Herman-Giddens; Carlos J. Bourdony; Steven A. Dowshen; and Edward O. Reiter. Using an Orchidometer. In: *Assessment of Sexual Maturity Stages in Girls and Boys.* ISBN 13: 978-1-58110-443-1, pp. 35-36.  **Using the orchidometer**  1. Gently grasp the testicle between the thumb and third finger while holding the beads in the opposite hand. Manipulate the testis to expose it for comparison as shown.\*  Opposing the fingertips just behind the testis should result in gentle stretching of the scrotal skin over the anterior surface of the testis, permitting more accurate measurement.  2. Start with a bead that is likely to be smaller than the testicle.  While maintaining the grasp, maneuver to a bead with a higher number to assess for a better match.  3. Further check by comparing with the next larger bead. Then record the number of the largest bead that the testis is *at least* as large as. *If the testis size is between beads, record the number on the smaller bead.*  Repeat for the opposite testis. Record right and left separately.  \*Editor's Note: Photographs of the proper procedure for using the orchidometer can be found at the following citation:  Marcia E. Herman-Giddens; Carlos J. Bourdony; Steven A. Dowshen; and Edward O. Reiter. Using an Orchidometer. In: *Assessment of Sexual Maturity Stages in Girls and Boys.* ISBN 13: 978-1-58110-443-1, pp. 35-36. |
| **Selection Rationale:** | This protocol is an extensively used clinical method for assessing testicular size and has been validated in a number of studies. While there are several other methods for testicular measurement in addition to the orchidometer, the most accurate of which is ultrasound, the orchidometer is the most commonly used method. |
| **Source:** | Marcia E. Herman-Giddens; Carlos J. Bourdony; Steven A. Dowshen; and Edward O. Reiter. Using an Orchidometer. In: *Assessment of Sexual Maturity Stages in Girls and Boys.* ISBN 13: 978-1-58110-443-1, pp. 35-36.  Kronenberg: Williams Textbook of Endocrinology, 11th ed. Copyright © 2008 Saunders. |
| **Life Stage:** | Any age |
| **Language of source:** | English |
| **Participant:** | Males, aged newborn to end of life |
| **Personnel and Training Required:** | Physician uses the orchidometer to measure stage of puberty. The examiner should be trained by someone familiar with the use of the orchidometer. |
| **Equipment Needs:** | Orchidometer |
| **Standards:** | |  |  |  |  | | --- | --- | --- | --- | | **Standard** | **Name** | **ID** | **Source** | | Common Data Element (CDE) | Person Reproductive History | 3007491 | [CDE Browser](https://cdebrowser.nci.nih.gov/CDEBrowser/search?elementDetails=9&FirstTimer=0&PageId=ElementDetailsGroup&publicId=3007491&version=1.0) | | Logical Observation Identifiers Names and Codes (LOINC) | Testes development proto | 62676-2 | [LOINC](http://s.details.loinc.org/LOINC/62676-2.html?sections=Web) | |
| **General references:** | Cooper C., Docimo S. Undescended testes (cryptorchidism) in children and adolescents. In: UpToDate, Drutz JE (Ed), UpToDate, Waltham, MA, 2010.  Drutz JE. Undescended testes (cryptorchidism) in children and adolescents. In: UpToDate, Duryea TK (Ed), UpToDate, Waltham, MA, 2010.  Eyre RC. Evaluation of nonacute scrotal pathology in adult men. In: UpToDate, O'Leary MP (Ed), UpToDate, Waltham, MA, 2010.  Keefer, JR. Endocrinology. In: Harriet Lane Handbook, 15th ed, Siberry, GK, Iannone, R (Eds), Mosby, St. Louis 2000. p.227.  Marcia E. Herman-Giddens; Carlos J. Bourdony; Steven A. Dowshen; and Edward O. Reiter. Using an Orchidometer. In: *Assessment of Sexual Maturity Stages in Girls and Boys.* ISBN 13: 978-1-58110-443-1, pp. 35-36.  Prader A. (1975). Delayed adolescence. *Clin Endocrinol Metab.*, *4*(1):143-55.  Prader A. (1966). Testicular size: Assessment and clinical importance. *Triangle, 7*:240-243.  Slora EJ, Bocian AB, Herman-Giddens ME, et al. (2009). Assessing inter-rater reliability (IRR) of Tanner staging and orchidometer use with boys: a study from PROS. *J Pediatr Endocrinol Metab., 22*(4):291-9. |
| **Mode of Administration:** | Physical Measurement |
| **Derived Variables:** | None |
| **Requirements:** | |  |  | | --- | --- | | **Requirement Category** | **Required** | | Major equipment | No | | Specialized training | Yes | | Specialized requirements for biospecimen collection | No | | Average time of greater than 15 minutes in an unaffected individual | No | |
| **Process and Review:** | The Expert Review Panel has not reviewed this measure yet. |