

# Height Measures

## Evaluating alternatives to standing height in the ambulatory setting

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**BACKGROUND:** Height measurement is a key clinical component to measure body mass index and body surface area used for patient care, including calculating chemotherapy doses. Some patients cannot feasibly or safely stand for height measurement because of a number of diseases and disabilities. The literature is unclear regarding alternatives to standing height for patients unable to stand.

**OBJECTIVES:** The purpose of this research study was to test equivalence of a number of measurements to find a reliable alternative to standing height for ambulatory oncology clinic patients who are unable to or cannot safely stand.

**METHODS:** A repeated-measures design was used to measure the height of 60 volunteer adult participants using a convenience sample of 30 men and 30 women. Standing height was compared to self-reported height, recumbent length, arm span, half-arm span, demispan, and knee height measurements.

**FINDINGS:** Results indicated that demispan was equivalent to standing height with a mean difference of  $-0.69$ . A practice change to use demispan in patients who cannot stand has been proposed and accepted at the authors' organization. The use of demispan was a feasible alternative to standing height in cost of supply and technique.

### KEYWORDS

arm span; body height; demispan; half-arm span; knee height; recumbent height

### DIGITAL OBJECT IDENTIFIER

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**IN THE HEALTHCARE SETTING, A MEASUREMENT OF HEIGHT** is needed to calculate body mass index (BMI) and body surface area (BSA) for patient care, such as assessing nutritional status (Perry, 2007), and calculating medication doses, such as chemotherapy (Polovich, Olsen, & LeFebvre, 2014). Standing height using a stadiometer is the gold standard (Gordon, Fredman, Orwig, & Alley, 2013); however, not all patients can stand safely or at all because of a number of common disabilities and disease processes. The literature has varying results for the best alternative to obtaining a height measurement for patients who cannot stand.

### Background

Canda (2009) studied multiple measurements, including stature, sitting height, arm span, upper arm, forearm, hand, thigh, lower leg, and foot. The highest correlation for measuring stature was length of the long bones followed by length of spinal column. Many commonly used clinical measurements are studied in the literature, with most involving the long bones. The following literature review reflects studies of common alternative measurements to standing height in the healthcare setting.

### Self-Report

Some previous studies have supported using self-report of height as an alternative method of measurement (Brown, Feng, & Knapp, 2002; Burton, Brown, & Dobson, 2010; Froehlich-Grobe, Nary, Van Sciver, Lee, & Little, 2011; Ng et al., 2011). Froehlich-Grobe et al. (2011) found that, while recumbent length yielded the most accurate height estimate, self-report and knee heights were reasonable alternatives when a recumbent length measurement cannot be obtained. Burton et al. (2010) found substantial agreement with self-report recorded via survey, particularly for married women and women of healthy weight. However, caution should be used with self-reporting because of bias (Gordon et al., 2013). For example, Wen and Kowaleski-Jones (2012) found that there is a tendency to over-report height and under-report weight. Because of the potential for bias, the Oncology Nursing Society's chemotherapy and biotherapy guidelines recommend that weights and heights be measured (not stated) values (Polovich et al., 2014).

### Recumbent

Obtaining recumbent measurements in the ambulatory setting may not be safe or feasible if a bed or stretcher is not readily available. With this method, the patient is asked to remove footwear and assisted to lie down. A measurement is taken from the top of the head to the base of the feet. As