

Appendix C

Maintenance and Calibration of Growth Measurement Equipment

General Information:

- The purpose of this appendix is to provide maintenance and calibration guidelines that can be used to ensure the accuracy and reliability of childhood growth measurement equipment.
- Regular calibration and maintenance helps ensure that growth measurement equipment produces accurate and reliable measurements when proper measurement techniques are followed. Quality equipment which is regularly calibrated and accurate is one of three components essential to achieving accurate measurements.

The following guidelines should be use for maintenance and calibration of equipment:

1) Care of measurement equipment

Refer to AHS, [Infection Prevention and Control \(IPC\)](#) for more detailed information and current standards.

- Follow AHS [Infection Prevention and Control \(IPC\)](#) policies and protocols for hand hygiene, cleaning and disinfecting of measuring equipment (non critical multi-use medical equipment/devices) and cleaning/transporting of portable equipment.
- Store equipment at normal indoor temperature, protected from humidity and wetness.

2) When to check calibration

Table 5: Growth Measurement Equipment Calibration Schedule

Equipment	Check Calibration	Responsible	Calibration equipment used:
Stationary equipment			
Infant scales	Upon installation and monthly thereafter	End user	Calibration weights
Length board (infantometer) and stadiometer	Upon installation and monthly thereafter	End user	Calibration rod
Wheel chair scale for non ambulatory children	Upon installation and yearly	Professional calibration	Professional calibration
Child/adolescent Scale	Upon installation and yearly thereafter	Professional calibration	Professional calibration
Recumbent length board for non ambulatory children	Upon installation and monthly thereafter	End user	Calibration rod

Equipment	Check Calibration	Responsible	Calibration equipment used:
	Portable equipment		
Infant scales	At least once per day if used daily Before each use, if used less frequently	End user	Calibration weights
Length board (pediatric) and stadiometers	At least once per day if used daily Before each use, if used less frequently	End user	Calibration rod
Child/adolescent scale	Upon installation and yearly thereafter	Professional calibration	Professional calibration

3) Equipment to use when checking calibration

The following equipment is used to check calibration of growth measurement equipment.

- a) Calibration weight: A standard weight used to check the calibration of the stationary and portable scales.
- b) Calibration rod: A rod of known and fixed length is used to check the calibration of stationary and portable equipment that measures length/height. A calibration rod is used to calibrate the stadiometer and infant length board.

4) Maintenance and calibration of an infant scale

- a) Check for damage. Equipment that shows evidence of damage and/or cannot be cleaned adequately must be repaired or replaced.
- b) Check calibration:
 - i. Zero the scale.
 - ii. Gently place the calibration weight (e.g. 5 kg) in the centre of the scale. To ensure an accurate measurement reading, the weight(s) must be placed evenly over the center area of the scale.
 - iii. Read the measurement to the nearest gram.
 - iv. Repeat steps a second time. (i.e. weigh the calibration weight a total of two times).
 - v. The measurement reading should be exactly the same as the known weight of the calibration weight each time (e.g. a 5.00 kg calibration weight should read 5.000 kg on the scale).
 - vi. An acceptable tolerance range is +/- 0.01 kg over or under the weight of a known calibration weight (e.g. a scale with a 5 kg weight on it should read between 4.99-5.01 kg).
 - vii. Record the outcome on the 'Calibration Record' and indicate any action taken if needed.

- viii. If the scale reads outside the acceptable tolerance range (e.g. 5.02 kg), calibrate the scale following the calibration guidelines for the piece of measurement equipment (calibration guidelines are available from the manufacturer for each model). If you are unable to calibrate the scale and the error is consistent, adjust measurements accordingly (e.g. off by 0.02 kg or more consistently, subtract 0.02 kg).
- c) Professional calibration:
 - i. Professional calibration should be conducted if a piece of measurement equipment, when checked with standard weights, is found to be weighing inaccurately and the site is unable to calibrate it 'in-house' following manufacturer's directions.
 - ii. Professional calibration is recommended yearly (or according to manufacturer's direction if different) for infant scales that are not checked with standard weights according to the schedule outlined in ***Growth Measurement Equipment Calibration Schedule*** (Table 5).

5) Maintenance and calibration of length boards

- a) Check that the joints of the length board are tight and straight. If not, tighten or straighten them.
- b) Check that the measuring tape can be read. If it is too worn to be read, it should be replaced.
- c) Check for damage. Equipment that shows evidence of damage and/or cannot be cleaned adequately must be repaired or replaced.
- d) Check calibration:
 - i. A rod of known and fixed length can be used to check the calibration of stationary and portable infant length boards.
 - ii. Place the rod directly on the base with one end firmly against the head board.
 - iii. Bring the footboard to rest firmly against the other end of the calibration rod.
 - iv. Read the measurement to the last completed millimetre.
 - v. The measurement reading should be exactly the same as the known height/length of the calibration rod (e.g. a 95 cm calibration rod should be measured as 95 cm with the length board).
 - vi. An acceptable tolerance range is 1.0 cm over or under the length or a known calibration rod (e.g. a length board being checked with a 95 cm rod should read between 94 and 96 cm).
 - vii. Record the outcome on the 'Calibration Record' and indicate any action taken if needed.
 - viii. If the length board reads outside the acceptable tolerance range (e.g. 97 cm), calibrate the length board if possible following the calibration guidelines for your piece of measurement equipment (calibration guidelines are available from the manufacturer for each model).
 - ix. If you are unable to calibrate and the error is consistent, adjust measurements accordingly until the length board can be calibrated or replaced (e.g. off by 2 cm adjust measurements by subtracting or adding 2 cm). It should be documented that this was done

- x. If measurements are off by variable amounts, or you are unable to calibrate your piece of equipment, notify your manager and follow local procedures for professional calibration.
- e) Professional calibration:
 - i. Professional calibration should be conducted if the infant length board is found to be measuring inaccurately and the site is unable to calibrate it 'in-house' following manufacturer's directions.
 - ii. Professional calibration is recommended yearly (or according to manufacturer's direction if different) for infant length boards that are not checked with standard rods according to the **Growth Measurement Equipment Calibration Schedule** (Table 5).

6) Maintenance and calibration of a stadiometer

- a) Check that the joints of the stadiometer are tight and straight. If not, tighten or straighten them.
- b) Check that the measuring tape can be read. If it is too worn to be read, it should be replaced.
- c) Check for damage. Equipment that shows evidence of damage and/or cannot be cleaned adequately must be repaired or replaced.
- d) Check calibration:
 - i. Place one end of the calibration rod on the stadiometer base.
 - ii. Lower the stadiometer head piece to rest firmly against the top end of the calibration rod.
 - iii. Ensure that the rod stands perpendicular to the base.
 - iv. Read the measurement to the last completed millimetre.
 - v. Record the outcome on the 'Calibration Record' and indicate any action taken if needed.
 - vi. The measurement reading should be exactly the same as the known height/length of the calibration rod (e.g. an 95 cm calibration rod should be measured as 95 cm).
 - vii. If the measurement is not consistent with the length of the calibration rod, adjust according to manufacturer's instructions.
 - viii. If you are unable to calibrate and the error is consistent, adjust measurements accordingly until the stadiometer be calibrated or replaced (e.g. off by 2 cm adjust measurements by subtracting or adding 2 cm). It should be documented that this has been done.
- e) Professional calibration:
 - Professional calibration should be conducted if the stadiometer is found to be measuring inaccurately and the site is unable to calibrate it 'in-house' following manufacturer's directions.
 - Professional calibration is recommended yearly (or according to manufacturer's direction if different) for stadiometers that are not checked with standard rods according to the **Growth Measurement Equipment Calibration Schedule** (Table 5).

7) Maintenance and calibration of a child/adolescent scale

- a) Check for damage. Equipment that shows evidence of damage and/or cannot be cleaned adequately must be repaired or replaced.
- b) Professional calibration:
 - i. Professional calibration is recommended yearly (or according to manufacturer's direction if different) for child/adolescent scales.
 - ii. Record the outcome of calibration in the 'Calibration Record'.