1. Welch Allyn Spot Monitor ................................................................. 4
   Starting up the Spot Monitor device .................................................. 4
   Login .................................................................................................. 4
   Taking the measurement ..................................................................... 5
   Best practice for taking blood pressure in adults: ............................... 10
   Best practice for taking blood pressure in small children: .................... 10
   Common mistakes ............................................................................... 10
   Error Messages .................................................................................. 11
   Care and Maintenance of the Connex Spot Monitor ............................ 11
2. Masimo Pulse Oximetry ..................................................................... 12
   Setting up the pulse oximetry device .................................................. 13
   Taking the measurement ..................................................................... 14
   Common Errors ................................................................................. 15
   Care and Maintenance of the device ................................................... 16
3. Peak flow .......................................................................................... 17
4. Anthropometry Measurements .......................................................... 17
   Equipment and Calibration .................................................................. 18
   Maternal weight (All DYAD visits) ...................................................... 19
   Maternal mid upper arm circumference (All DYAD visits) ................... 19
   Maternal waist:hip circumference ratio (DYAD visit 2) ...................... 21
   Infant and child weight (DYAD Visits 1, 2 and 3) ................................. 22
   Child weight (DYAD Visit 4) ............................................................... 23
   Infant length (DYAD Visit 1 and 2) ..................................................... 23
   Child height (Visit 3 and 4, for children 2 years old and over) .............. 25
   Infant and child mid-upper arm circumference (All DYAD visits) ........ 25
   Infant and child head circumference .................................................. 26
   Main sources of error ......................................................................... 27
   Quality control ................................................................................... 28
   Standardisation Procedure .................................................................. 28
   Standardisation Data Analysis ............................................................. 28
5. Sample Collection ............................................................................. 30
   Maternal blood ................................................................................. 30
   Vaginal Swabs .................................................................................... 30
   Breastmilk .......................................................................................... 31
   Urine .................................................................................................... 32
Infant Blood Collection ........................................................................................................... 34
Child Stool ............................................................................................................................... 36
Appendix 1. Equipment Calibration Form .................................................................................. 37
Appendix 2. Sample Anthropometry Standardisation Form CHILD ........................................... 38
Appendix 3. Sample Anthropometry Standardisation Form ADULT .......................................... 39
Appendix 4. Breast Milk Sample Collection Form ...................................................................... 40
1. Welch Allyn Spot Monitor

IN PRECISE-DYAD, the Welch Allyn Spot monitor is used to measure blood pressure and pulse rate from mothers at every visit and from children over 1 year old of age at DYAD visits 2, 3 and 4.

Starting up the Spot Monitor device

- You can use the monitor with power from the mains outlet. Battery power can be used after the battery has been charged. If the battery is low and needs recharging, an error message will display indicating the approximate time remaining on the battery.
- Turn on the device by clicking on the Power button (4 on picture below) located on the lower-left corner at the front of the monitor. When the device is powering up, the LED flashes until the monitor displays the Welch Allyn logo and a power-up tune sounds.

Login

- When the device finishes powering-up, the Login screen will display.
- Select the Spot profile (1 on the picture below) at the bottom of the screen.
Taking the measurement

- Ensure that the cuff is properly connected to the monitor via the hose to the port on the back-bottom of the monitor (2 in the figure below).
• Fit the cuff to the participant. Ensure that the **cuff is the right size**, it is placed in the **correct position** and that the patient is in the **right position**.

**Right size cuff**

- There are two adult cuff sizes for the device: the standard (size 11 for arm circumference between 25 cm-34 cm) will fit most women or large (size 12 for arm circumference between 32 cm-43 cm) and a two cuff sizes for children, size 07 (for arm circumference between 9-13 cm and size 08) and size 08 (for arm circumference between 12-16 cm.) It is important that you use the correct cuff for the size or the participant.

- When you fit the cuff the Artery Index Marker should fall within the range markings on the cuff (see picture below). If it does not then the cuff is either too small or too large and you must use a different size cuff.
Correct position of the cuff

- The Artery Index Marker should be placed over the participant’s brachial artery (two fingers over the bend of the elbow, where you can feel the pulse).
- The Velcro should be tightened so that the cuff is secure on the arm but not tight.
- You should be able to insert two fingers between the cuff and the arm.

Right patient position

- Blood pressure should always be checked in the sitting position.
- Her legs should not be dangling or crossed. Her feet should be supported or on the ground.
- If the patient cannot sit up, lie her on her left side and make sure to document this. Check BP in the inferior arm.
- If the patient cannot turn on her side, place a wedge under her right hip. Check BP in the inferior arm.
- Avoid letting the arm hang down either in a sitting or lying position. Support the arm on a table/cushion or by their side. The arm should be at the level of the heart.

- In the case of toddlers and small children, take the measurement while they are sitting on their mother’s/caregiver’s lap.
• Ask the participant to relax, not to move and not to tense their arm muscles until the measurement results are displayed. The patient should breathe normally and not talk while the measurement is being taken.

• Touch the Patient button in the main screen (1) and then touch the New Patient button (2) in the next screen. In the following screen, enter the patient PTID in the Patient ID (3) text box. Ensure that the correct patient type (Adult or Paediatric) is selected in the Type (4) field. You can change between patient types by clicking the down arrow and selecting the appropriate profile from the drop-down list.

• Select OK (5) to return to the main screen.
Note: It is very important that you check that the correct demographic type (adult or paediatric) is selected before taking the measurement. The device is configured to inflate at different pressures depending on whether it is measuring adult or paediatric blood pressure. Using the wrong profile will result in an erroneous measurement or may harm the patient.

- Touch the START button in the main screen (6). The measurement will be taken automatically in around 15 seconds and shown on the screen.
- During the measurement, the START button becomes an orange STOP button and the current inflation rate is displayed.
- The result, comprising the systolic and the diastolic blood pressure values (7) and the pulse rate (8) are displayed and a longer beep sound is heard.
Select **Save (9)** to save the measurement in the history log. The log can record up to 400 measurements that are saved a 24 hour period. The log can be accessed by clicking the **Review (10)** button. Record the measurements in the database.

Repeat the process to get a second measurement and record the measurement in the database.

If the two measurements differ by more than 10mmHg, repeat the measurement a third time and record the values in the database.

**Note:** The content of this screen changes depending on which tab is selected at the bottom of the screen (Home, Patient, Review, Settings). The **Home** tab must be selected to have access to this screen and take the blood pressure measurements.

**Best practice for taking blood pressure in adults**

- Before taking the blood pressure, the patient should remain seated and at rest for 5 minutes.
- Explain the procedure and gain permission
- Remove all tight clothes from around the arm.
- Explain what the patient will experience:
  - Tight feeling
  - Minor discomfort perhaps
  - Pins and needles in fingers
- Ask her not to talk during the measurement.

**Best practice for taking blood pressure in small children**

- The child should be calm and still while the measurement is being taken, and for at least the previous five minutes. If the child is moving, crying or speaking this will affect the blood pressure reading.
It may be easier to take the measurement on toddlers while they are sleeping or distracted drinking from a bottle or sucking on a pacifier.

**Error Messages**

If any of the blood pressure measurement is out of range or cannot be determined, the NIBP section of the screen will show a “++” or “−−” in front of the measurement. All other NIBP parameters will display no values.

When the monitor is unable to take the blood pressure measurement, it will display an error message indicating a suggested action. For example, the following message may appear if the monitor detected that the patient moved while the measurement was being taken:

*Unable to determine NIBP; check connections; limit patient movement. 050003*

**Care and Maintenance of the Connex Spot Monitor**

Visually inspect the monitor, cables, cords and cuffs for any sign of damage, wear or contamination.

Follow the steps below to connect and disconnect the cuffs, for example to exchange between sizes and to clean them:

- Disconnect the cuff by placing your thumb and forefinger on the hose connector spring tabs.
- Squeeze and pull the spring tabs until the connector releases.
- Connect the Blood Pressure cuff by placing your thumb and forefinger on the hose connector spring tables and squeeze firmly.
- Align the hose connector with the hose connector port on the bottom of the monitor.
- Insert the hose connector, pressing firmly until both of the spring tabs click into place.

*Note: Always grasp the hose by the connector spring tabs. Do not pull on the hose itself.*

a) **Cleaning the Connex Spot Monitor**

- Power down the monitor and disconnect the power cord from the power source before wiping the top, sides, front with 70% isopropyl alcohol solution applied to a clean cloth.
• Wipe the LCD screen dry with a clean cloth, allow all other components to air dry.

b) **Cleaning the cuffs:**

• Remove fitting and tubes from cuff, seal the open port with the plug. Close the hook and loop.

• You can use one or more of the following methods and allow to air dry:
  - Wipe with mild detergent and water solution (1:9 solution). Rinse.
  - Wipe with 0.5% bleach and water solution. Rinse.
  - Wipe with 70% isopropyl alcohol.

c) **Charging**

• The LED in the centre of the power plug symbol indicates the battery charging status.
  - Green indicates that AC power is present and that the battery is fully charged.
  - Amber indicates that AC power is present and that the battery is charging.

d) **Security and Care of Devices**

• The manager of each area should allocate a safe designated place for the devices to be stored when not in use.
• Devices are portable and where possible should be attached to firmer objects such as trolleys or tables using the cable wire and ferrules provided.
• Never attempt to open the devices, keep them out of direct sunlight and away from moisture.

2. **Masimo Pulse Oximetry**

The Masimo pulse oximetry device allows the measurement of several non-invasive spot check measurements. For the PRECISE-DYAD study, we will be using this device to measure SPO$_2$ (functional oxygen saturation of arterial haemoglobin) and the haemoglobin concentration of women and children at every visit. In addition, the heart rate of the child is also be measured using this device in visit 1 (6 weeks to 6 months) only.
Setting up the pulse oximetry device

Attach the sensor cable to the device. Each sensor only allows for 1,000 spot checks so these will need to be replaced, after this. The number of measurements remaining on the sensor is displayed in the top right corner of the screen.

The main power screen is a touch screen where the results are displayed and allows for navigation of the device to change settings.

The home/power button allows navigation back to the homepage as well as allowing the device to be powered on and off.

The device can be charged by plugging the device in through mains electricity.

There are two sensitivity modes for taking measurements, NORM (normal) and APOD (Adaptive probe off detection sensitivity). For most participants, we want the setting to be APOD. However, if there is strong light and you are failing to get a reading, you should change the setting to NORM.

To do this:

- In the top right corner, there is a downwards arrow. Press this and options will appear.
- Select sensitivity
- Change the sensitivity from APOD to NORM

If you have changed the sensitivity to NORM, ensure you change it back to APOD for future participants.
Taking the measurement

- To turn the device on/off hold down the ‘Home’ button for 2 seconds. The Home button will illuminate green when the power is on.
- In the next screen will ask you to enter a label and gender. Under label, enter the participant ID. If you are taking a child’s measurement, enter their mother’s participant ID followed by -01. Repeat for each child if there is more than one. This will allow you to open their results again at a later date, if they are needed.
- Attach the probe to the participant. When taking the measurement from an adult participant, choose a finger that is the appropriate size for the sensor. When using the device on a child participant, take the measurement from one of their big toes instead. Use the attachment to check the finger/toe is the correct size. Place the finger in the measurement callipers, if the colour present is green, the finger is the correct size. If it is red, the finger is too small or large so select another finger.
• Once the sensor initialises, a progress bar will display at the top of the device until a SbHb (haemoglobin concentration) is recorded.

• The spot check measurements are displayed for 5 minutes or until the sensor is removed. Once you have the SpHb measurement, remove the sensor from the participant.

• Record the pulse oximetry (SpO2), haemoglobin concentration (SpHb), perfusion index (PI) and carboxyhaemoglobin saturation in the database.

• If the measurement is being taken from a child, record the pulse oximetry (SpO2), haemoglobin concentration (SpHb). In case of infants during their first DYAD visit (6 weeks to 6 months), also record the heart rate (PR bpm).

• Press ‘Done’ this will take you back to the home screen.

### Common Errors

<table>
<thead>
<tr>
<th>Error</th>
<th>Potential causes</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low SIQ message</td>
<td>• Sensor is damaged or not functioning</td>
<td>• Verify sensor type</td>
</tr>
<tr>
<td>(low signal quality)</td>
<td>• Improper sensor type or application</td>
<td>• Check if blood flow to the sensor site is restricted</td>
</tr>
<tr>
<td></td>
<td>• Excessive motion</td>
<td>• Check the placement of the sensor. Move the sensor to another finger</td>
</tr>
<tr>
<td></td>
<td>• Low perfusion</td>
<td>• Minimise or eliminate motion.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Set the settings to maximum sensitivity.</td>
</tr>
<tr>
<td>Difficulty obtaining a reading</td>
<td>• Inappropriate sensor or sensor size</td>
<td>• Allow time for parameter reading to stabilise</td>
</tr>
<tr>
<td></td>
<td>• Low perfusion</td>
<td>• Verify proper sensor type and size for the participant and re-apply sensor</td>
</tr>
<tr>
<td></td>
<td>• Excessive motion artefact</td>
<td>• Check if blood for to sensor site is restricted</td>
</tr>
<tr>
<td></td>
<td>• Excessive ambient lighting</td>
<td>• Replace sensor</td>
</tr>
<tr>
<td></td>
<td>• Interference from line frequency induced noise</td>
<td>• Shield the sensor from excessive or strobing light</td>
</tr>
</tbody>
</table>
| Parameter readings displayed as dashes | • Parameter may not be stabilised  
• Device may not be configured with the parameter  
• Sensor is not compatible with the parameter | • Allow time for parameter reading to stabilise  
• Verify proper sensor type and size for the participant and re-apply sensor  
• Check if blood flow to sensor site is restricted  
• Replace sensor  
• Verify device and sensor are compatible with the parameter |
|---|---|---|
| Dimly lit parameters | • Low quality signal | • Assess the participant  
• Verify proper sensor type and size for the participant and re-apply sensor  
• Check if blood flow to sensor site is restricted  
• Replace sensor  
• Minimise or eliminate motion at the measurement site  
• Set to MAX sensitivity |
| Unexpected parameter readings | • Low SiQ or Pi values  
• Inappropriate sensor size or sensor measurement location | • Reposition the sensor to a site with strong SiQ and Pi. Average readings from three different sites to improve accuracy.  
• Verify proper sensor for patient size.  
• Verify proper sensor site |

To find previous measurements taken, on the home screen, click on the clipboard icon on the bottom left of the screen. This will bring up all the measurements taken using the label provided. You will be able to search these by participant ID.

**Care and Maintenance of the device**

- When cleaning the device use a soft damp cloth with one of the following cleaning solutions: 70% Isopropyl alcohol, Cidex plus (3.4% glutaraldehyde) or 10% chlorine bleach to water solution. Wipe the surface until it is free of any residues. Wipe again with a clean cloth. Do not use the device until it is properly dry.
- Battery – when the battery run time is significantly reduced, completely discharge and recharge the battery.
- The manager of each area should allocate a safe designated place for the devices to be stored when not in use.
3. Peak flow

1. Ask the subject to find a comfortable position (sitting or standing).

2. Reset the peak flow meter so the pointer is pushed back to the first line of the scale – this is usually 60.

3. Ask the patient to hold the peak flow meter so it’s horizontal and make sure that their fingers are not obstructing the measurement scale.

4. Ask the patient to breathe in as deeply as they can and place their lips tightly around the mouthpiece.

5. Ask the patient to breathe out as quickly and as hard as they can.

6. Record the measurement and repeat the process to obtain 3 measurements.

Cleaning

Ensure the peak flow meter is thoroughly cleaned after each use. To clean the device, wipe the exterior surfaces of the peak flow meter and inside of the cap with an alcohol wipe (IPA 70 – 90%) after every use. After 50 uses or immediately after contamination is observed, wash and disinfect the peak flow meter thoroughly as per the manufacturer’s instructions.

Inspect the peak flow meter regularly for signs of wear and damage, if any is evident replace the meter.

4. Anthropometry Measurements

One of the aims of the study is to investigate how undernutrition during the early years of life has a harmful and irreversible impact on child development. Likewise, how poor maternal nutrition (both pre- and post-partum) may impact of infant and young child feeding practices and on childhood growth and development. The way we will determine the influence of nutrition and nutrient supply is through anthropometric measurements, such as height and weight, of both the women and their babies at different time points in the study.

For the data to be comparable across different sites and data collectors, it is necessary to implement standardised procedures to ensure that measurements are being collected consistently by all data collectors.
collectors. Each member of staff taking anthropometric measurements should be fully trained in how to take accurate and precise measurements of both infants and adults. In addition, they should undergo regular monitoring (standardisation) and, where necessary, re-training, to ensure the procedures are consistent within and between the multiple study sites to allow the data to be pooled.

Each site should appoint a lead anthropometrist, who will then oversee training and regular monitoring of the other measurers. During training the lead anthropometrist should ensure measurers understand the reason for implementing specific procedures and the importance of adhering to them.

**Equipment and Calibration**

When using the anthropometry equipment, the scales, stadiometer and infantometer must be calibrated to ensure you can get precise readings. The measuring tapes do not need to be calibrated. The calibration should be recorded (see appendix 1 for calibration log).

Seca baby scale – this should be calibrated twice per week using a 5 kg calibration weight if in a fixed location, or if moved, every time it is used.

- Ensure the scales are on a flat, even surface
- Turn the scales on so that the weight ‘0.000’ appears
- Place the 5 Kg weight in the middle of the scales. The display should now ready 5.00 Kg.
- If the reading does not say ‘5.00’, remove the weight, ensure the scales is on a flat surface and nothing is interfering with the weighing platform. Repeat the measurement again. Record the value on the calibration form (see appendix 1)
- If the reading still deviates, inform the lead anthropometrist.

Harpenden Infantometer – this should be calibrated twice a week using calibration rods if in a fixed location, or if moved, every time it is used.

- Ensure the infantometer is on a flat even surface
- Check the minimum value on the display with the minimum value on the board. Mark the minimum value on the calibration form
- Use the calibration rod (the length may vary across sites), and place this between the headboard and the footboard and take a reading. Check that the display reads the expected value and record this on the calibration form.
- Review the calibration form. If there are constant deviations of more than 3mm from the expected length, repeat the process.
- If the reading still deviates, inform the lead anthropometrist.

Seca adult scales - these should be calibrated twice per week using 40 Kg of calibration weights if in a fixed location, or if moved, every time they are used.

- Ensure the scales are on a flat even surface
- Turn the scales on so that the weight ‘0.000’ appears
- Place weights totalling 40 Kg in the middle of the scales. The display should now ready 40.0 Kg.
- If the reading does not say ‘40.0’, remove the weight, ensure the scales are on a flat surface and nothing is interfering with the weighing platform. Repeat the measurement again.
• If the reading still deviates, inform the lead anthropometrist.

Seca adult stadiometer - this should be calibrated twice a week, using calibration rods if in a fixed location, or if moved, every time it is used.

• Ensure the stadiometer is on a flat even surface

• Using a calibration rod (the length will vary across sites), place the rod under the headboard ensuring it is perfectly vertical. Place the headboard on the rod and read the value displayed. Record this value on the calibration form.

• Review the calibration form. If there are constant deviations of more than 3mm from the expected length, repeat the process.

• If the reading still deviates, inform the lead anthropometrist.

Maternal weight (All DYAD visits)

1. The woman should wear minimal, light clothing.

2. Ask the mother to remove any heavy objects and take off her shoes.

3. Ensure the scales are on a perfectly flat surface with no obstructions.

4. Turn the scales on by gently pressing a foot on the surface of the scales.

5. Ask the mother to stand on the scales, placing her feet on the footmarks pasted on the scales, and remain still until the weight appears. Make sure that the mother is not leaning on something or holding onto anything and that nothing is holding or touching her (or her clothing).

6. Read and record the weight in the database.

7. Please take the weight measurement once more and record on the form as it appears on the display, i.e. to one decimal place.

Maternal mid upper arm circumference (All DYAD visits)

1. You must use a tape that is appropriate/specially manufactured for the purpose (e.g. is non-stretchy).

2. The measurement should be taken on the non-dominant arm.

3. Before taking the arm circumference, you need to identify the point at which the measurement is taken. The mid upper arm landmark is taken as the point on the lateral side of the upper arm, midway between the lateral border of acromion and the tip of the olecranon when the arm is flexed to 90 degrees.

3. The subject should be asked to stand with their arm hanging freely. Stand to the side of the subject and feel for the lower border of the acromion process of the scapula. This is easily located as the outer and the lowest border of the flat bony prominence over the shoulder.
4. The olecranon is the most proximal process of the ulna and can be easily identified as the point of the elbow.

5. Place the upper end of the measuring tape on the acromial process and run the tape down along the arm to touch the tip of the olecranon process. Read the distance between these 2 points and note it on the form. Divide the distance by 2 and mark the halfway point with a pen. This point is the standard midpoint.

6. The participant must be sitting and the arm hanging straight but relaxed. The mid upper arm circumference (MUAC) is taken at the position of the standard. After determining the midpoint of the upper arm, follow the four steps below to measure the MUAC:

**Focus:** Thread the tape around the arm. Hold the two ends of the tape with a grasp (with the index finger and thumb of each hand).

**Secure:** Hold the tape with the index finger and thumb with your right hand only at the junction where the tape passes through the slot.

**Inspect:** Look and feel the tension of the tape around the arm for any noticeable gaps or the tape pulling too tight. Adjust the tension of the tape if necessary, re-secure and re-inspect.

**Read:** Make sure not to pull the tape as you read the measurement.

7. Record the arm circumference in centimetres and to the nearest mm.

8. Repeat the process to obtain two measurements. You do not need to remove the tape after each measurement for the second record, but just release and take the second reading while maintaining the tape at the midpoint. If there is a discrepancy between the two readings, >0.5cm, the measurement should be taken again.
Maternal waist:hip circumference ratio (DYAD visit 2)

Waist measurement

1. You must use a tape that is appropriate/specially manufactured for the purpose (e.g. is non-stretchy).

2. Ask the subject to stand with arms hanging loosely at the sides, feet slightly apart, and weight evenly distributed across the feet.

3. Ask the subject to relax and take a few deep, natural breaths.

4. Before locating the anatomical sites on the participant, kneel or seat on a stool, slightly to one side of the participant. This will allow better viewing of the results while minimising participant discomfort.

5. Feel for the lower margin of the last palpable rib and the top of the iliac crest (top of the pelvic bone). Once the anatomic sites have been located, ask the participant to mark both sites with their fingers while you place the tape in the measuring site.

6. Place the tape at the midpoint between the lower margin of the last palpable rib and the top of the iliac crest (top of the pelvic bone). The tape should be held snugly, not too tight (compressing the skin) or too loose, lying flat on the skin, and at a level parallel to the floor.

7. Waist measurement should be done at the end of a normal expiration when the lungs are at their functional residual capacity. The participant must have her arms by the side, relaxed and looking straight ahead. Ensure that participant does not deliberately hold themselves in or out.

8. Record the measurement in centimetres and to the nearest full mm.
9. Repeat the process to obtain two waist measurements. If there is a discrepancy between the two readings, >0.5 cm, the measurement should be taken again.

**Hip measurement**

1. Ask the participant to stand upright with arms relaxed at the side and heels together.

2. To identify the hip, ask the participant to rotate their foot. Place the tape at the widest level of the buttocks, over the trochanters (the bony projections on the side of the femur). If the participant’s abdominal fat hangs over the hips due to obesity, ask the participant to lift the extra tissue and place the tape underneath to measure at the largest circumference of the buttocks.

3. Wrap the tape snugly around the participant but don’t compress the skin. Make sure the tape is flat on the skin, levelled and parallel to the floor.

4. Record the measurement in centimetres and to the nearest full mm

5. Repeat the process to obtain two hip measurements. If there is a discrepancy between the two readings, >0.5 cm, the measurement should be taken again.

**Infant and child weight (DYAD Visits 1, 2 and 3)**

1. This procedure is suitable for babies and children up to 2 years old using the Infant Scales Seca 336.

2. Check the scale is on a flat, level surface, with no obstructions.

3. Turn scale on.

4. The baby/child should be naked. In cold climates, an incandescent light bulb can be positioned over the scale to warm the surface of the weighing pan, making it more comfortable for the baby. In cultures where it is unacceptable for the baby to be undressed, the scale can be tared using a blanket (see instruction in box below).

**To tare the scale:**

Place the blanket or cloth on the scale; press the NET button for 2 seconds. The word NET appears. Wait until the display stops flashing and shows 0.000. Then place the baby (without any clothing) on the scale and wrap the blanket around him/her. Record the value on the form as it appears on the scale.

4. Place the baby/child carefully on the scale and wait for the baby/child to stop moving.

5. Once the baby has stopped moving, record the weight on the form in kilograms.

6. Repeat the process to obtain two measurements.
NOTE: If the baby is agitated and cannot be calmed, ask for the mother’s help. If the baby remains very agitated, it is best to give the baby back to the mother until he/she calms down.

Child weight (DYAD Visit 4)

1. This procedure is suitable for children 3 years and older using adult scales (i.e. Digital column scale Seca model 777 or Adult Slimline Stand on Scales Seca model 803)
2. The child should be wearing minimal clothing (i.e. underwear only) and no shoes.
3. Ensure the scales are on a perfectly flat surface with no obstructions.
4. Turn the scales on by gently pressing a foot on the surface of the scales.
5. Guide the child to stand on the scales, placing his/her feet on the footmarks pasted on the scales, and remain still until the weight appears. Make sure that the child is not leaning on something or holding onto anything and that nothing is holding or touching him/her (or his/her clothing)
6. Read and record the weight in the database.
7. Please take the weight measurement once more and record on the form as it appears on the display, i.e. to one decimal place.

Infant length (DYAD Visit 1 and 2)

1. The measuring board should be placed on a raised hard surface so that it is level and stable.
2. Foot and headwear must be removed from the child.
3. The measurement is best achieved with two people. If two staff members are not available, ask the mother/caregiver for support.
4. The infant should be placed on the board with their head positioned against the headboard. The child’s head could glide down as the child moves, making a gap between the head and the base of the board. To reduce the gap, make sure you move the child’s whole body by lifting the child from the hips. **DO NOT PULL THE CHILD’S NECK** as this will artificially lengthen the body.
5. The head should be held gently but firmly so the Frankfort plane is vertical (a vertical line between the ear canal and lower border of eye socket is perpendicular to the measuring board).
6. To keep the infant’s head in the correct position, the measurer should gently cup their hands over the infant’s ears.

7. The second (lead) measurer positions the infant so the spine and legs are straight and the toes point vertically. Gentle pressure is applied to the knees to straighten the legs. Sometimes it is very difficult to get the toes to point vertically. In this case the legs should be lifted up simultaneously so that the knees are straight but the legs bend 45 or more degrees at the hip, until the toes can be brought up, or the ankle bent to 90 degrees. The legs can then quickly be lowered so the heel touches the plate.

8. To take the measurement, slide the footboard so that it touches the infant’s feet. The soles of the feet should be flat with the toes pointing vertically. If the infant bends their toes, gently stroke the soles slightly and draw the footboard up when they unbend their toes. Take care that the knees are straightened only as far as they can without harming the infant. Be aware that for newborns and very preterm infants, it is impossible to straighten their knees to the same degree as older infants as they can be very fragile and easily injured if too much pressure is applied to the legs. Therefore, only minimum pressure should be applied.

9. When taking the measurement the footboard should be pressed against the feet gently so there is a small compression of the tissue on the feet. The measurement should be recorded to the last completed 1mm. For example, if the measurement is between 61.3cm and 61.4cm, record 61.3cm.

10. Repeat the process to obtain two measurements. You don’t need to take the child off the board after each measurement, but just release the foot piece and readjust the child before taking the second recording (Repeat steps 3-7). When you are finished taking the measurement, gently pick the child up, while supporting both the head and the body, and return the child to the mother/caregiver. If there is a discrepancy between the two readings, >0.5cm, the measurement should be taken again.
Child height (Visit 3 and 4, for children 2 years old and over)

1. This measurement can be taken using the Light Duty Stadiometer Seca Model 213/214 or the Digital column scale Seca model 777.

2. Ask the child to stand barefoot, with heels together, legs straight and shoulders relaxed.

3. Ensure the participant stands upright with their heels, buttocks and shoulders against the measuring rod.

4. Ensure the heels are not lifted from the ground.

5. Position the headboard on the child’s head.

6. Check that the child is looking straight ahead, with the lower margins of their eyes in the same horizontal plane as their ear canal.

7. Ask the child to ‘breathe in and stand tall’. Apply gentle but firm pressure to help the child stretch.

8. Tell the child to ‘breathe out and relax’ while the measurer maintains pressure on the head.

9. Read the measurement from the same height as the top of the head. Record the measurement in centimetres and to the nearest full mm.

10. Repeat the process to obtain two measurements. If there is a discrepancy between the two readings, >0.5 cm, the measurement should be taken again.

Infant and child mid-upper arm circumference (All DYAD visits)

1. You must use a tape that is appropriate/specially manufactured for the purpose (e.g. is non-stretchy).

2. The measurements should be taken from the non-dominant arm.

3. Before taking the arm circumference, you need to identify the point at which the measurement is taken. The mid upper arm landmark is taken as the point on the lateral side of upper arm, midway between the lateral boarder of acromion and the tip of the olecranon when the arm is flexed at 90 degrees.

4. The infant/child should be held with their arm hanging freely. Stand to the side of the infant and feel for the lower border of the acromion process of the scapula. This is easily located as the outer and the lowest border of the flat bony prominence over the shoulder.

4. The olecranon is the most proximal process of the ulna and can be easily identified as the point of the elbow.
5. Place the upper end of the measuring tape on the acromial process and run the tape down along the arm to touch the tip of the olecranon process. Read the distance between these 2 points and note it on the form. Divide the distance by 2 and mark the halfway point with a pen. This point is the standard midpoint. After determining the midpoint of the upper arm, follow the below four steps to measure the MUAC:

**Focus:** Thread the tape around the arm. Hold the two ends of the tape with a grasp (with the index finger and thumb of each hand).

**Secure:** Hold the tape with the index finger and thumb with your right hand only at the junction where the tape passes through the slot.

**Inspect:** Look and feel the tension of the tape around the arm for any noticeable gaps or the tape pulling too tight. Adjust the tension of the tape if necessary, re-secure and re-inspect.

**Read:** Make sure not to pull the tape as you read the measurement.

6. To obtain the arm circumference, the infant/child’s arm must be hanging straight but relaxed. The mid upper arm circumference (MUAC) is taken at the position of the standard midpoint. Ensure the tape measure is held closely to the skin, and touches everywhere, but is not too tight as to indent the skin.

7. Record the arm circumference in centimetres and to the nearest mm.

8. Repeat the process to obtain two measurements. You don’t need to remove the tape after each measurement, but just release and take the second reading while maintaining the tape at the midpoint. If there is a discrepancy between the two readings, >0.5 cm, the measurement should be taken again.

**Infant and child head circumference**

A metal tape measure marked in centimetres and millimetres is used to measure head circumference.

1. Any hair ornaments or head bands should be removed.

2. The infant/child is held on the assistant measurer or mother’s lap. The lead measurer sits by the side of the mother or measurer holding the infant/child.

3. Loop the tape ensuring the side of the tape with centimetres is on the outside for the reading, with the zero end in the inferior position.

4. The measurer anchors the tape just above the eyebrows, with the zero point on the tape closest to them. The tape is then positioned at the back of the head over the fullest protuberance of the skull. The second measurer can help to position the tape correctly (i.e. by keeping it level on the other side of the head).
5. Once the tape is in the correct position, pull the tape tightly to compress the hair and skin. Be careful not to pull the tape too tightly as to injure the infant/child.

6. Take the reading in centimetres to the last completed 1 mm and remove the tape from the infant/child’s head.

7. Record the measurement in the database.

8. Repeat the process to obtain two measurements. If there is a discrepancy between the two readings, >0.5 cm, the measurement should be taken again.

Main sources of error

Error in infant measurements can come from the child being agitated and therefore making it difficult to take accurate measurements. If a baby is crying, reassure the mother and explain you are not hurting them. It may be best to delay the measurements rather than taking an inaccurate one.

Digit preference – when the anthropometrist rounds up or down to get ‘0’ or ‘5’. When we analyse the data we will look at how often each of the digits is used as a final number. We would expect each digit to be used about 10% of the time; however, if ‘0’ or ‘5’ are being used much more frequently, it is suggesting the team are rounding their measurements.

Data transposition is when the numbers are transposed when written; for example, 39.8 is recorded instead of 38.9. Measurements should be recorded straight away to minimise any errors in the number recorded.

Errors with scales can appear when the batteries are low. Ensure you have spare batteries on site for the scales to ensure you get accurate readings.

The accuracy and precision of measurements are independent of each other and are determined by the anthropometrist and the instruments.

Accuracy

If the instrument is not calibrated correctly, it will give values which are too low or high compared to the true value. It is important the equipment is calibrated frequently to ensure accurate measurements are obtained.

Measurer accuracy means they consistently obtain measurements close to the true value. If the measurer is inaccurate, it means they constantly record values higher than the true value (positive bias) or lower than the true value (negative bias). Measurers should be trained so that they obtain values similar to those of the lead anthropometrist, as they are considered the ‘gold standard’. Lack of accuracy will be identified through the standardisation sessions.

Precision

Instrument precision will be affected if the equipment is not calibrated frequently. Uncalibrated equipment is not precise, and any measurements taken will not be accurate.
Measurer precision is determined by consistently measuring using the same technique. If precise, the measurer will record the same value when re-measuring the same child (within a time period when the child has not grown, or the equipment has become uncalibrated). Lack of precision will be identified in the standardisation sessions where two measurements are taken from the same child on the same day but not at the same time. If a measurer is precise, these two measurements will be similar to each other and similar to the gold standard.

Quality control

To ensure we are collecting reliable data, standardisation sessions are held to ensure the measurers are following the recommended techniques, to monitor their accuracy and precision and, if required, take corrective measures. The measurers repeat measurements on a minimum of 10 volunteers. The repeated measurements are independent (i.e. each measurer measures all 10 volunteers and then measures them all in a second round, recording the results on a separate form). These test-retest data will be entered into a customised spreadsheet to calculate reliability statistics. Depending on the number of measurers at a site, one or two days is required for the standardisation sessions which should take place every 6 months.

Standardisation Procedure

Lead anthropometrists should aim to work with groups of no more than 5 measurers at a time, to prevent upsetting those being measured. Each measurer will measure 10 different participants twice; however they will take a break between measurements to check for precision. Starting with the first participant, the lead anthropometrist takes the required measurement followed by each of the measurers in turn. Each measurer should record their own measurements for each participant on their anthropometry standardisation form (see Appendix 2). After each measurement, all the forms containing measurements should be given to the lead anthropometrist. The group should then repeat the process a second time, re-measuring each participant starting with the first participant measured. They must record their measurement on the second part of the standardisation form (see Appendix 2).

The measurements taken by the measurers should then be compared to those taken by the lead anthropometrist to ensure the measurers’ precision and accuracy. Measurers who have consistently recorded measurements which deviate from the lead anthropometrists should then undergo re-standardisation training with the lead anthropometrist.

Standardisation Data Analysis

Precision

To measure the accuracy of the measurers, we must compare each of their values to those of the lead anthropometrist. Each measurement type has a level of deviation that is acceptable (e.g. in infant length, it is acceptable for the measurer to be up to 0.7 cm different from the lead anthropometrist before the measurer is considered to be accurate). The acceptable levels of deviation are in the table below.

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Acceptable deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant length/ height</td>
<td>0.7 cm</td>
</tr>
</tbody>
</table>
If the measurers’ results are similar to those of the gold standards, they are said to be unbiased. However, if the measurements deviate from the gold standards, they are said to be biased.

The ‘Technical Error of Measurement’ (TEM), shows how precise a measurer is. The TEM compares the measurers’ own values when they have measured the same subject multiple times to see if they are consistently getting the same measurement. If they consistently get the same measurement, they are said to be precise. If however, a measurer gets significantly different values when measuring the same subject, they are said to be imprecise.

The table below demonstrates the variance in precision and accuracy, which can be observed during training and standardisation activities. The measurements of the lead anthropometrist represent the “Gold Standard” both in terms of precision and accuracy and which all measurers should aim for; the measurements taken by measurers 1 and 2 vary little, if at all, from the measurements taken by the lead anthropometrist and these measurers therefore do not require retraining or re-standardisation. The measurements taken by measurers 3, 4 and 5, however, demonstrate unacceptable degrees of variance from the Gold Standard; these measurers should therefore be required to undergo re-standardisation training with the lead anthropometrist until they achieve the same level of precision and accuracy as the lead anthropometrist.

<table>
<thead>
<tr>
<th>Measurer</th>
<th>Measurement</th>
<th>Precision</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead Anthropometrist</td>
<td>50.1</td>
<td>Precise</td>
<td>Unbiased</td>
</tr>
<tr>
<td>1</td>
<td>50.1</td>
<td>Precise</td>
<td>Unbiased</td>
</tr>
<tr>
<td>2</td>
<td>50.2</td>
<td>Precise</td>
<td>Unbiased</td>
</tr>
<tr>
<td>3</td>
<td>48.1</td>
<td>Imprecise</td>
<td>Unbiased</td>
</tr>
<tr>
<td>4</td>
<td>48.2</td>
<td>Precise</td>
<td>Negatively biased</td>
</tr>
<tr>
<td>5</td>
<td>52.3</td>
<td>Precise</td>
<td>Positively biased</td>
</tr>
</tbody>
</table>

The measurements should be entered into the PRECISE-DYAD data analysis spreadsheet, where the values will automatically be calculated and will inform the team if measurers need to be re-trained.
5. Sample Collection

Maternal blood

**Required supplies:**

1 x maternal blood kit
1 x serum vacutainer (red cap)
1 x EDTA vacutainer (purple cap)
Gauze sponges
Sharps container
Tourniquet
Antiseptic wipes
Gloves

Blood should be collected by a trained phlebotomist, midwife or research technician.

1. Attach a unique participant ID label to each of the collection tubes and to the label on the kit bag.

2. A certified phlebotomy technician should draw blood into each of the vacutainer tubes using the blood collection kit provided. The order of the draw is: 6 ml serum tube (red top) then 7 ml EDTA tube (purple top).

3. The serum tube should be inverted gently 5 times slowly (not shaken) to ensure that the reagents mix with the blood sample.

4. The EDTA tube should be inverted gently 8 to 10 times slowly (not shaken) to ensure that the reagents mix with the blood sample.

5. Record the time of sample collection, either write this on the kit bag or scan the participant ID into Open Specimen to record the sample collection time.

6. Set the timer for 30 minutes as soon as the blood draw has been completed as a reminder to centrifuge the tubes.

7. Place serum tube in the rack to clot at room temperature for 30 minutes after blood draw.

8. Place the EDTA tube in the rack for processing.

Vaginal Swabs

**Required supplies:**

1 x vaginal swab kit
2 x FluidX tubes pre-filled with protease solution (stored in the freezer)

2 x FluidX tubes pre-filled with TE buffer (take the 2ml tubes with orange tubes from the kits and fill with 1ml of TE solution stored in the fridge)

Gloves

1. Participants will be asked to lie on a couch, having removed their underwear, with a sheet over their waist to maintain dignity. The participant will be asked to bend their legs with their feet together moved close to their bottom; knees moved outwards.

2. The research nurse/midwife wearing latex free gloves will part the labia and gently insert conjoined four swabs (2 eSwabs and 2 dacron swabs) into the mid-vagina (approximately 4-5 cm) and rotate gently 360 degrees for 15-20 seconds. The exposure is needed for the vaginal fluid to enter the swab stick. Failure to retain the stick for this duration might result in insufficient vaginal fluid collection, making the sample useless.

3. After removal of swabs from vagina, take the 2 eswabs, and cut off the top of each swab and place one into each of the 1.8 ml pre-barcoded FluidX tubes with orange caps.

4. Take the two pre-made tubes with the PBS + protease inhibitor in them (green cap). Carefully open each of the two tubes and cut off the swab tip. Make sure that the tip is covered by the fluid (by gently rotating the tube before freezing).

5. Keep tubes on ice for transportation to the laboratory. Please note that the sample must be processed within an hour of collection.

Record the time of sample collection, either write this on the kit bag or scan the participant ID into Open Specimen to record the sample collection time.

Breastmilk

The breastmilk sample will be collected from the mother at DYAD visit 1. The breast milk collection can be carried out by research staff or the mother (depending on cultural acceptability) following instructions should be given to mothers when training them to collect breastmilk samples.

Required supplies:

2 x cleaning wipes

2 x gloves

1 x sterile container

1 x permanent marker

1 x Ziploc bag

1. Breast Cleaning – Put on a glove on the hand the that the participant (or you) will use to clean the ‘study breast’ (to be chosen by the participant) and clean the breast twice with provided wipes using a newly-opened wipe each time. When appropriate, the participant may cleanse the breast with water and soap before cleaning with the wipes.

2. Express with hand.
3. Milk collection - express by hand at least one tablespoon of milk, by dripping or squirting directly from the nipple into the sterile container. Ensure the samples are caught clean directly into the container (without touching the participant’s skin).

4. If, for some reason, not enough milk can be expressed from the ‘study breast’, it is acceptable to combine milk from both breasts. If this happens, just clean the “second” breast as described in Step 1 (with new glove and wipes) prior to collecting milk and include a note on the collection form as to what was done.

5. Swirl the expressed milk around to ensure the composition is consistent. Place it in an ice tray immediately after collection.

6. Record the following information on the form provided in the kit bag (Appendix 4)
   a. Time of sample collection
   b. Study breast: Left/Right
   c. Was breast cleaned with water and/or soap before it was cleaned with wipe? Yes/no
   d. Time since breast was last suckled

Record the time at which the sample collection was completed. Indicate from which breast the sample was collected. If not enough milk could be expressed from the ‘study breast’ and the milk from both breasts was combined, note that this was done.

The breast should ideally be cleaned with water and soap before cleaning it with the cleaning wipe provided in the kit however some circumstances might make it difficult to complete this step before collection. If it was not possible to clean the breast with water and/or soap, indicate so.

Record the time since the breast was last suckled or pumped. You can prompt the participant by asking at what time the child was last fed / at what time she last pumped the breast.

**When the woman cannot produce any milk at the study facility**

Breastmilk collection by the woman at home WILL NOT BE DONE in this study. Where for any reason, other than pathological, a woman is not able to provide urine breastmilk the visit, the study teams should take the following actions:

1. Explain to the woman that the breastmilk sample collection is an important part of the study
2. Explain that they may be asked to stay at the facility or return to the facility (if their homes are in close proximity to the facility) within 30 minutes.
3. If for some reason they are unable to wait at the facility, study team should proceed with the blood sampling and retain the remaining kit separately (to avoid label confusion). THIS IS TO BE PERFORMED ONLY EXCEPTIONALLY, as it can lead to substantial labelling and misidentification problems.

**Urine**
Urine samples will be collected from the mother at DYAD visit 2 and visit 3. A urine sample would also be collected in DYAD visit 1, **only if urine was not collected during PRECISE 42-days post-partum visit.**

**Required supplies:**

1 x urine kit
1 x 90ml urine collection cup

1. Provide woman with the participant ID-labelled urine collection cup.

2. Ask the woman to provide a sample:
   - Ask her to remove the lid from the urine collection cup.
   - Begin to urinate into the toilet.
   - Pass the collection container into the urine stream.
   - Urinate at least 30 to 59 ml into the collection container.
   - Finish urinating into the toilet.
   - Screw the lid and return the container to the PRECISE lab technician for processing

3. Collect the urine cup, ensure the lid is screwed on tightly and record the time of sample collection, either write this on the kit bag or scan the participant ID into OpenSpecimen to record the sample collection time.

**When the woman cannot produce any urine at the study facility**

Urine collection by the woman at home WILL NOT BE DONE in this study. Where for any reason, other than pathological, a woman is not able to provide urine during the visit, the study teams should take the following actions:

1. Explain to the woman that the urine sample collection is an important part of the study and that the study team will provide them bottled water to drink to help them fill their bladder and to be able to pass urine.

2. Explain that they may be asked to stay at the facility or return to the facility (if their homes are in close proximity to the facility) within 30 minutes or whenever they feel the urge to void.

3. Impress upon them to stay at the facility and explain that there may be instances where when they are at home and feel the urge to pass urine, they may not be able to hold till they return to the facility and the opportunity might be missed.

4. If for some reason they are unable to wait at the facility, the study team should proceed with the blood sampling and retain the remaining kit separately (to avoid label confusion). **THIS IS TO BE PERFORMED ONLY EXCEPTIONALLY, as it can lead to substantial labelling and misidentification problems**
Infant Blood Collection

Infant blood collection will take place in all DYAD visits. In Visit 1 (6 weeks to 6 months), blood is collected by heel prick. In visit 2 (12 months), visit 3 (24 months) and visit 4 (36 months) blood is collected either by venepuncture (preferred) or finger prick. The decision on how to collect blood will be up to the participant and the confidence of the staff in collecting the samples.

**Heel and finger prick (all DYAD visits if blood sample is not taken by venepuncture)**

We will either collect a blood spot using 2 or 3 drops of blood from the heel (visit 1) or finger (for children older than 1 year old).

**Required supplies:**

1 X Lancet *(max depth allowed according WHO guidelines: heel-prick 2.4mm and finger-prick 1.5mm)*  
1 x Whatman card  
x Gloves  
Disinfectant  
Cotton wool or gauze

1. Flip over the card cover to expose the active zone (circle), but not touching the active zones on the paper.

2. Clean the selected area of skin with a skin disinfectant and allow to dry for 30 seconds. Warming up of the foot/finger facilitates dilatation of blood vessels and ensures faster and easier protocol completion

3. According to WHO guidelines, in **heel-pricks**, the depth should not go beyond 2.4 mm. The recommended depth for a **finger-prick** for a child over 6 months is 1.5 mm

4. Position the foot/finger with the puncture site downwards. Take care to keep away from bony prominences. Press the loaded lancing device against the skin and push the white plunger.

5. While holding the foot/finger correctly, apply and release pressure to allow a drop of blood to form. Allow a large drop of blood to collect.

6. Once a drop of blood has formed, lightly touch the drop to the pre-printed circle on the blood spot card, allowing it to soak onto the circle. Allow enough blood to soak through to completely fill the pre-printed active zone on the filter paper. Do not layer successive drops of blood or apply blood more than once in the same collection circle.

7. When finished, clean the site and apply pressure with clean gauze to stop the bleeding. Apply an adhesive bandage.
Venepuncture (DYAD visits 2-4)

We will collect a 5 ml sample of blood from children older than 1 year old if the participant consents and the nurse has received appropriate training and is confident performing a venepuncture in small children. Otherwise, the blood samples should be collected by finger prick.

**Required supplies:**

1 x child blood kit (23G needles)
1 x 2 mL serum vacuette (red cap)
1 x 3 mL EDTA vacuette (lavender cap)
Gauze sponges
Sharps container
Tourniquet
Antiseptic wipes
Gloves

Blood should be collected by a trained phlebotomist, midwife or research technician using a 23G butterfly needle and syringe. This SOP does not detail the entire collection process.

1. Attach a unique participant ID label to each of the collection tubes and to the label on the kit bag.
2. A certified phlebotomy technician should draw blood using a 23G butterfly needle and syringe.
3. Remove the caps from the EDTA and serum tubes and transfer 2 mL of blood into the serum tube (red top with white ring) then 3 mL into the EDTA tube (lavender top).

**Note:** If you are not able to draw 5 ml of blood, the priority should be given as follow:

- Total 5 ml blood = 2ml serum + 3ml EDTA
- Total 4 ml blood = 2ml serum + 2ml EDTA
- Total 3 ml blood = 1ml serum + 2ml EDTA
- Total 2 ml blood = 0ml serum + 2ml EDTA

4. The serum tube should be inverted gently 5 times slowly (not shaken) to ensure that the reagents mix with the blood sample.
5. The EDTA tube should be inverted gently 8 to 10 times slowly (not shaken) to ensure that the reagents mix with the blood sample.
6. Record the time of sample collection, either write this on the kit bag or scan the participant ID into Open Specimen to record the sample collection time.
7. Set the timer for 30 minutes as soon as the blood draw has been completed as a reminder to centrifuge the tubes.

8. Place serum tube in the rack to clot at room temperature for 30 minutes after blood draw.

9. Place the EDTA tube in the rack on icepack for processing.

Child Stool

The stool sample will be collected from the child’s stool at DYAD visit 1 and 3 if the child happens to produce stool during the DYAD visit.

**Required supplies:**

- 2 x stool swabs to be stored in lysis shield tube with green cap
- 1 x indelible marker
- 1 x Ziploc bag

1. Using the sterile swab provided to swab the child’s stool to collect a small amount of stool. Roll the cotton swab in the stool to coat the tip.

2. Place the swab (covered in stool) into a green capped tube and snap off the swab head at the break point leaving the tip of the swab in the tube.

3. Close the tube tightly and shake for 30 seconds.

4. Repeat this process for the second swab placing the sample in the second green capped tube.

5. Record the time of sample collection using the indelible marker provided.

6. Place the tubes back in the zip lock bag provided.
# Appendix 1. Equipment Calibration Form

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>Infantometer</th>
<th>Date</th>
<th>5 kg weight</th>
<th>Date</th>
<th>Baby scale</th>
<th>Date</th>
<th>Length</th>
<th>Date</th>
<th>Adult scales</th>
<th>Date</th>
<th>40kg</th>
<th>Date</th>
<th>Adult stadiometer</th>
<th>Date</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

Appendix 2. Sample Anthropometry Standardisation Form CHILD

**FIRST MEASUREMENT SERIES**
(Head Circumference, Length / Height, MUAC, Weight)

SESSION NUMBER

CHILD’S NAME

CHIL编号 NUMBER

MEASURER’S NAME

HEAD CIRCUMFERENCE . (cm)

LENGTH / HEIGHT . (cm)

MID UPPER ARM CIRCUMFERENCE . (cm)

WEIGHT . (kg)

**SECOND MEASUREMENT SERIES**
(Head Circumference, Length/ Height, MUAC, Weight)

SESSION NUMBER

CHILD’S NAME

CHIL编号 NUMBER

MEASURER’S NAME

HEAD CIRCUMFERENCE . (cm)

LENGTH / HEIGHT . (cm)

MID UPPER ARM CIRCUMFERENCE . (cm)

WEIGHT . (kg)
Appendix 3. Sample Anthropometry Standardisation Form ADULT

FIRST MEASUREMENT SERIES
(Mid upper arm circumference, waist measurement and hip measurement)

SESSION NUMBER

ADULT'S NAME __________________ ADULT NUMBER __________

MEASURER'S NAME

MID UPPER ARM CIRCUMFERENCE

WAIST CIRCUMFERENCE

HIP CIRCUMFERENCE
(cm)
(cm)
(cm)

SECOND MEASUREMENT SERIES
(Standing height, Sitting height, Lower leg length, Mid upper arm circumference)

SESSION NUMBER

ADULT'S NAME __________________ ADULT NUMBER __________

MEASURER'S NAME

MID UPPER ARM CIRCUMFERENCE

WAIST CIRCUMFERENCE

HIP CIRCUMFERENCE
(cm)
(cm)
(cm)
<table>
<thead>
<tr>
<th><strong>Participant ID:</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data collector initials:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Time of sample collection:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Study Breast:</strong></td>
<td>Left</td>
</tr>
<tr>
<td><strong>Was breast cleaned with water and/or soap before it was cleaned with wipe?</strong></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Time since breast was last suckled:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Appendix 4. Breast Milk Sample Collection Form**