

## **Appendix L**

### **NDNS Years 10-11 Measurement Protocols**

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# 1. HEIGHT MEASUREMENT

## 1.1 THE EQUIPMENT

You are provided with a portable stadiometer. It is a collapsible device with a sliding head plate, a base plate and three connecting rods marked with a measuring scale.

Please take great care of this equipment. It is delicate and expensive. Particular care needs to be paid when assembling and dismantling the stadiometer and when carrying repacking it in the box provided.

- Do not bend the head or base plate
- Do not bend the rods
- Do not drop it and be careful not to knock the corners of the rods or base plate pin
- Assemble and dismantle the stadiometer slowly and carefully

The stadiometer will be sent to you in a special cardboard box. Always store the stadiometer in the box when it is not in use and always pack the stadiometer carefully in the box whenever you are sending it on by courier. Inside the box with the stadiometer is a special bag that you should use for carrying the stadiometer around when you are out on assignment.

If you have any problems with your stadiometer, report these to Brentwood immediately. Do not attempt measurements with a stadiometer that is broken or damaged.

### **The rods**

There are three rods marked with a measuring scale divided into centimetres and then further subdivided into millimetres. (If you are not familiar with the metric system note that there are ten millimetres in a centimetre and that one hundred centimetres make a metre). The rods are made of aluminium and you must avoid putting any kind of pressure on them which could cause them to bend. Be very careful not to damage the corners of the rods as this will prevent them from fitting together properly and will lead to a loss of accuracy in the measurements.

### **The base plate**

Be careful not damage the corners of the base plate as this could lead to a loss of accuracy in the measurements.

Protruding from the base plate (see diagram overleaf) is a pin onto which you attach the rods in order to assemble the stadiometer. Damage to the corners of this pin may mean that the rods do not stand at the correct angle to the base plate when the stadiometer is assembled and the measurements could be affected.

### **The head plate**

There are two parts to the head plate; the blade and the cuff. The blade is the part that rests on the respondent's head while the measurement is taken and the cuff is the part of the head plate that slips over the measurement rods and slides up and down the rods. The whole unit is made of plastic and will snap if subjected to excessive pressure. Grasp the head plate by the cuff whenever you are moving the headplate up or down the rods, this will prevent any unnecessary pressure being applied to the blade which may cause it to break.

### **Assembling the stadiometer**

You will receive your stadiometer with the three rods banded together and the head plate attached to the pin so that the blade lies flat against on the base plate. Do not remove the head plate from this pin.

Note that the pin on the base plate and the rods are numbered to guide you through the stages of assembly. (There is also a number engraved onto the side of the rods, this is the serial number of the stadiometer). The stages are as follows:

- Lie the base plate flat on the floor area where you are to conduct the measurements.
- Take the rod marked number 2. Making sure the yellow measuring scale is on the right hand side of the rod as look at the stadiometer face on, place rod 2 onto the base plate pin. It should fit snugly without you having to use force.
- Take the rod marked number 3. Again make sure that the yellow measuring scale connects with the scale on rod 2 and that the numbers run on from one another. (If they do not check that you have the correct rod). Put this rod onto rod number 2 in the same way you put rod 2 onto the base plate pin.
- Take the remaining rod and put it onto rod 3.

### **Dismantling the stadiometer**

Follow these rules:

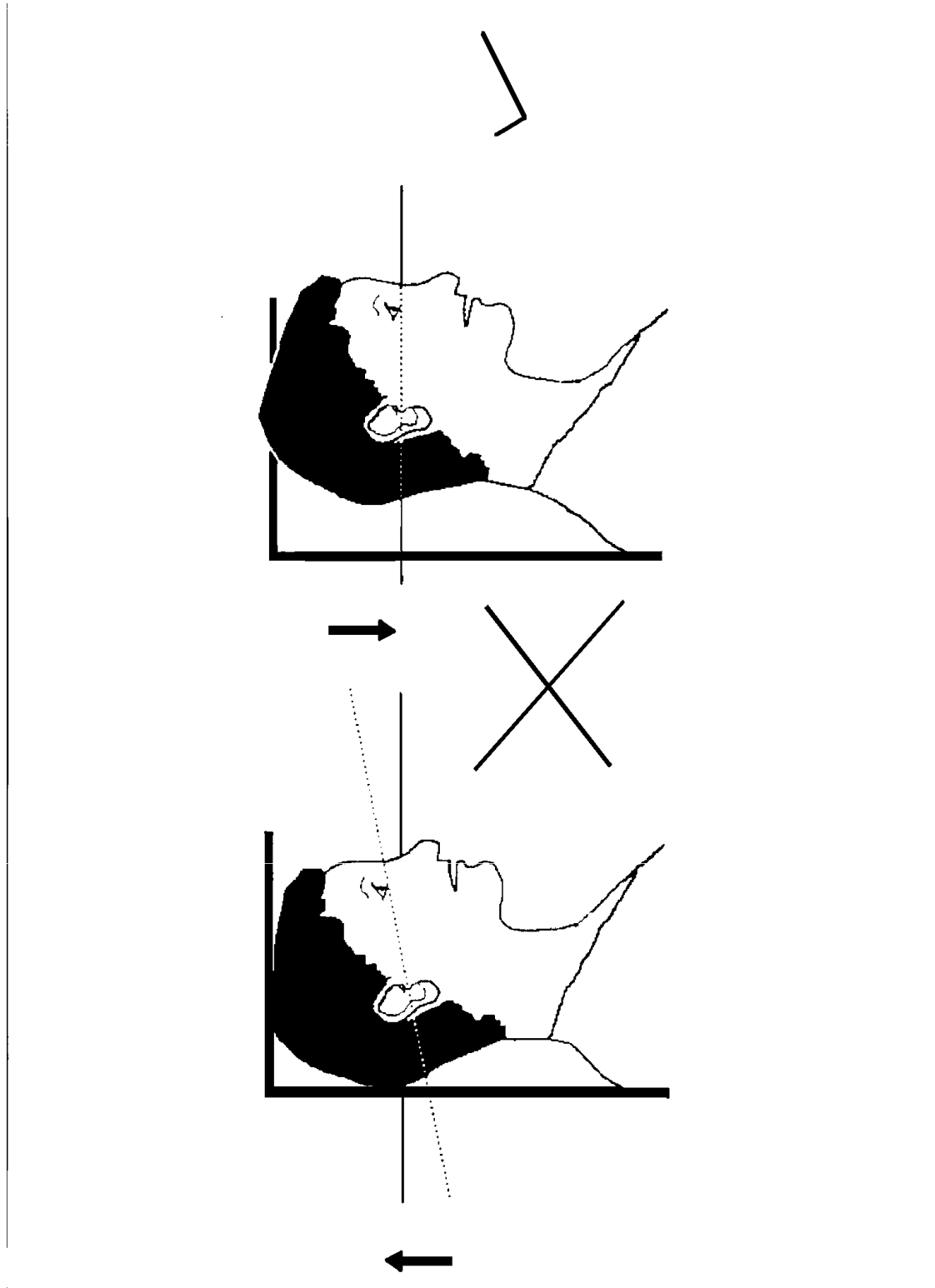
- Before you begin to dismantle the stadiometer, you must remember to lower the head plate to its lowest position, so that the blade is lying flat against the base plate
- Remove one rod at a time

## **1.2 THE PROTOCOL - ADULTS (16+)**

- Ask the respondent to remove their shoes in order to obtain a measurement that is as accurate as possible.
- Assemble the stadiometer and raise the headplate to allow sufficient room for the respondent to stand underneath it. Double check that you have assembled the stadiometer correctly.
- The respondent should stand with their feet flat on the centre of the base plate, feet together and heels against the rod. The respondent's back should be as straight as possible, preferably against the rod but NOT leaning on it. They should have their arms hanging loosely by their sides. They should be facing forwards.
- Move the respondent's head so that the Frankfort Plane is in a horizontal position (i.e. parallel to the floor). The Frankfort Plane is an imaginary line passing through the external ear canal and across the top of the lower bone of the eye socket, immediately under the eye (see diagram). This position is important if an accurate reading is to be obtained. An additional check is to ensure that the measuring arm rests on the crown of the head, i.e. the top back half. To make sure that the Frankfort Plane is horizontal, you can use the Frankfort Plane Card to line up the bottom of the eye socket with the flap of skin on the

ear. The Frankfort Plane is horizontal when the card is parallel to the stadiometer arm.

- Instruct the respondent to keep their eyes focused on a point straight ahead, to breath indeeply and to stretch to their fullest height. If after stretching up the respondent's head is no longer horizontal, repeat the procedure. It can be difficult to determine whether the stadiometer headplate is resting on the respondent's head. If so, ask the respondent to tell you when s/he feels it touching their head.



- Ask the respondent to step forwards. If the measurement has been done correctly the respondent will be able to step off the stadiometer without ducking their head. Make sure that the head plate does not move when the respondent does this.
- Look at the bottom edge of the head plate cuff. There is a green arrowhead pointing to the measuring scale. Take the reading from this point and record the respondent's height in centimetres and millimetres, that is in the form 123.4, at the question *Height*. You may at this time record the respondent's height onto their Measurement Record Card and at the question *MbookHt* you will be asked to check that you have done so. At that point the computer will display the recorded height in both centimetres and in feet and inches. At *RelHite* you will be asked to code whether the measurement you obtained was reliable or unreliable.
- Height must be recorded in centimetres and millimetres, e.g. 176.5 cms. If a measurement falls between two **millimetres**, it should be recorded to the **nearest even millimetre**. E.g., if respondent's height is between 176.4 and 176.5 cms, you should round it down to 176.4. Likewise, if a respondent's height is between 176.5 and 176.6 cms, you should round it up to 176.6 cms.
- Push the head plate high enough to avoid any member of the household hitting their head against it when getting ready to be measured.

### 1.3 THE PROTOCOL - CHILDREN (2-15)

The protocol for measuring children differs slightly to that for adults. You must get the co-operation of an adult household member. You will need their assistance in order to carry out the protocol, and children are much more likely to be co-operative themselves if another household member is involved in the measurement. If possible, measure children last so that they can see what is going on before they are measured themselves.

Children's bodies are much more elastic than those of adults. Unlike adults they will need your help in order to stretch to their fullest height. This is done by stretching them. This is essential in order to get an accurate measurement. It causes no pain and simply helps support the child while they stretch to their tallest height.

It is important that you practice these measurement techniques on any young children among your family or friends. The more practice you get before going into the field the better your technique will be.

- In addition to removing their shoes, children should remove their socks as well. This is not because the socks affect the measurement. It is so that you can make sure that children don't lift their heels off the base plate. (See 3 below).
- Assemble the stadiometer and raise the head plate to allow sufficient room for the child to stand underneath it.
- The child should stand with their feet flat on the centre of the base plate, feet together and heels against the rod. The child's back should be as straight as possible, preferably against the rod, and their arms hanging loosely by their sides. They should be facing forwards.
- Place the measuring arm just above the child's head.

- Move the child's head so that the Frankfort Plane is in a horizontal position (see diagram). This position is as important when measuring children as it is when measuring adults if the measurements are to be accurate. To make sure that the Frankfort Plane is horizontal, you can use the Frankfort Plane Card to line up the bottom of the eye socket with the flap of skin on the ear. The Frankfort Plane is horizontal when the card is parallel to the stadiometer arm.
- Cup the child's head in your hands, placing the heels of your palms either side of the chin, with your thumbs just in front of the ears, and your fingers going around towards the back of the neck. (See diagram).
- Firmly but gently, apply upward pressure lifting the child's head upwards towards the stadiometer headplate and thus stretching the child to their maximum height. Avoid jerky movements, perform the procedure smoothly and take care not to tilt the head at an angle: you must keep it in the Frankfort plane. Explain what you are doing and tell the child that you want them to stand up straight and tall but not to move their head or stand on their tip-toes.
- Ask the household member who is helping you to lower the headplate down gently onto the child's head. Make sure that the plate touches the skull and that it is not pressing down too hard.
- Still holding the child's head, relieve traction and allow the child to stand relaxed. If the measurement has been done properly the child should be able to step off the stadiometer without ducking their head. Make sure that the child does not knock the head plate as they step off.
- Read the height value in metric units to the nearest millimetre and enter the reading into the computer at the question "Height." At the question "MbookHt" you will be asked to check that you have entered the child's height onto their Measurement Record Card. At that point the computer will display the recorded height in both centimetres and in feet and inches.
- Push the head plate high enough to avoid any member of the household hitting their head against it when getting ready to be measured.

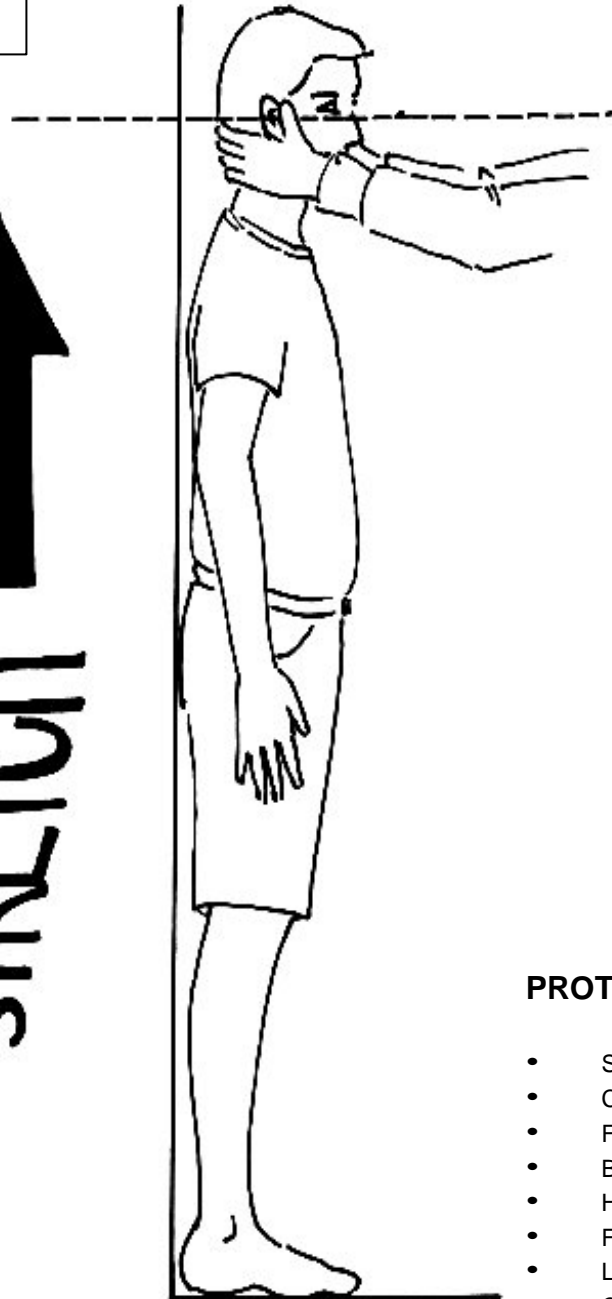
**REMEMBER YOU DO NOT TAKE A HEIGHT MEASUREMENT FROM CHILDREN UNDER 2 YEARS OLD.**

## **1.4 HEIGHT REFUSED, NOT ATTEMPTED OR ATTEMPTED BUT NOT OBTAINED**

At *RespHts* you are asked to code whether the measurement was taken, refused, attempted but not obtained or not attempted. If for any reason you cannot get a height measurement, enter the appropriate code at this question and you will automatically be routed to the relevant follow up questions (*ResNHi* and *NoHtBC*) which will allow you to say why no measurement was obtained.

Cup the child's head in your hands, placing the heels of your palms either side of the chin, with your thumbs just in front of the ears, and your fingers going round towards the back of the neck.

**↑**  
**STRETCH**



**HORIZONTAL**

**APPLY GENTLE  
UPWARDS PRESSURE**

### **PROTOCOL**

- SHOES OFF
- CHILDREN – SOCKS OFF
- FEET TO THE BACK
- BACK STRAIGHT
- HANDS BY THE SIDE
- FRANKFORT PLANE
- LOOK AT A FIXED POINT
- CHILDREN – STRETCH & BREATHE IN
- ADULTS - BREATHE IN
- LOWER HEADPLATE
- BREATHE OUT
- STEP OFF
- READ MEASUREMENT



## 1.5 ADDITIONAL POINTS - ALL RESPONDENTS

- If the respondent cannot stand upright with their back against the stadiometer and have their heels against the rod (e.g. those with protruding bottoms) then give priority to standing upright.
- If the respondent has a hair style which stands well above the top of their head, (or is wearing a turban), bring the headplate down until it touches the hair/turban. With some hairstyles you can compress the hair to touch the head. If you cannot lower the headplate to touch the head, and think that this will lead to an unreliable measure, record this at question *RelHite*. If it is a hairstyle that can be altered, e.g. a bun, if possible ask the respondent to change/undo it.
- If the respondent is tall, it can be difficult to line up the Frankfort Plane in the way described. When you think that the plane is horizontal, take one step back to check from a short distance that this is the case.

**PLEASE NOTE:** the child head stretch on NDNS is the same as used on HSE but different to that used on Child of the New Century. Please use the NDNS/HSE stretch when measuring children for NDNS interviews.

## 2. WEIGHT MEASUREMENT

### 2.1 THE EQUIPMENT

There are several different types of scales used on NDNS. They differ in the type of power supply they use, where the weight is displayed and the way the scales are turned on. Before starting any interviewing, check which scales you have been given and that you know how they operate. The most common types are:

#### **Soehnle Scales**

- These scales display the weight in a window on the scales.
- The Soehnle scales are turned on by pressing the top of the scale (e.g. with your foot).
- There is no switch to turn the scales off, they turn off automatically.
- The scales take 1 x 9v rectangular MN1604 6LR61 batteries.

#### **Seca 850**

- These scales display the weight in a window on the scales.
- The Seca 850 is switched on by pressing the top of the scales (e.g. with your foot). There is no switch to turn the scales off, they turn off automatically.
- The scales take 4 x 1.5v AA batteries/1 x 9v rectangular MN1604 6LR61.

#### **Seca 870**

- These scales display the weight in a window on the scales.
- The Seca 870 is switched on by briefly covering the solar cell (for no more than one second). The solar cell is on the right-hand side of the weight display panel. NB You may experience difficulties switching the scales on if there is insufficient light for the solar cell. Make sure that the room is well lit.
- The scales have an fixed battery which cannot be removed.

#### **Tanita THD-305**

- These scales display the weight in a window on the scales.
- The Tanita is switched on by pressing the button on the bottom right hand corner of the scales. The scales will automatically switch off after a few seconds.
- The scales take 4 x 1.5v AA batteries.

**When you are storing the scales or sending them through the post please make sure you remove the battery to stop the scales turning themselves on.  
(This does not apply to the Seca 870 scales)**

### **Batteries (Soehnle, Seca 850 and Tanita)**

It should not be necessary to have to replace the batteries, but always ensure that you have some spare batteries with you in case this happens. If you need to change the battery, please buy one and claim for it. The batteries used are commonly available.

The battery compartment is on the bottom of the scales. When you receive your scales you will need to reconnect the battery. Before going out to work, reconnect the battery and check that the scales work. If they do not, check that the battery is connected properly and try new batteries. If they do still not work, report the fault to your Area Manager/NDNS Manager or directly to Brentwood.

The reading is only in metric units, but as for height, the computer provides a conversion. If the respondent would like to know their weight in stones and pounds you will be able to tell them when the computer has done the calculation. You also have a conversion chart on the back of the coding booklet.

#### **WARNING**

The scales have an inbuilt memory which stores the weight for 10 minutes. If during this time you weigh another object that differs in weight by less than 500 grams (about 1lb), the stored weight will be displayed and not the weight that is being measured. This means that if you weigh someone else during this time, you could be given the wrong reading for the second person.

So if you get an identical reading for a second person, make sure that the memory has been cleared. Clear the memory from the last reading by weighing an object that is more than 500 grams lighter (i.e. a pile of books, your briefcase or even the stadiometer). You will then get the correct weight when you weigh the second respondent.

You will only need to clear the memory in this way if:

- You have to have a second or subsequent attempt at measuring the same person
- Two respondents appear to be of a very similar weight
- Your reading for a respondent in a household is identical to the reading for another respondent in the household whom you have just weighed.

If you have any problems with your scales, report these to Brentwood immediately. Do not attempt measurements with scales that are broken or damaged.

## **2.2. THE PROTOCOL**

1. Turn the display on by using the appropriate method for the scales. The readout should display 888.8 (1888 for the Seca 870) momentarily. If this is not displayed check the batteries, if this is not the cause you will need to report the problem to the *National Centre* at Brentwood. While the scales read 888.8 do not attempt to weigh anyone.
2. Ask the respondent to remove shoes, heavy outer garments such as jackets and cardigans, heavy jewellery, loose change and keys.
3. If necessary, turn the scales on again. Wait for a display of 0.0 before the respondent stands on the scales.

4. Ask the respondent to stand with their feet together in the centre and their heels against the back edge of the scales. Arms should be hanging loosely at their sides and head facing forward. Ensure that they keep looking ahead - it may be tempting for the respondent to look down at their weight reading. Ask them not to do this and assure them that you will tell them their weight afterwards if they want to know.

The posture of the respondent is important. If they stand to one side, look down, or do not otherwise have their weight evenly spread, it can affect the reading.

5. The scales will take a short while to stabilise and will read 'C' until they have done so. (The Seca 870 displays alternate flashing lines in the display window. With the Tanita scales the weight will flash on and off when stabilised). If the respondent moves excessively while the scales are stabilising you may get a false reading. If you think this is the case reweigh, but first ensure that you have erased the memory.
6. The scales have been calibrated in kilograms and 100 gram units (0.1 kg). Record the reading into the computer at the question *XWt1* before the respondent steps off the scales. At question *MBookWt* you will be asked to check that you have entered the respondent's weight into their Measurement Record Card. At that point the computer will display the measured weight in both kilos and in stones and pounds.

#### **WARNING**

The maximum weight registering accurately on the scales is 130kg (20½ stone). (The Seca 870 can weigh up to a maximum of 150kg or 23 ½ stone). If you think the respondent exceeds this limit code them as "Weight not attempted" at *RespWts*. Do not attempt to weigh them.

#### **Weighing Children**

You must get the co-operation of an adult household member. This will help the child to relax and children, especially small children are much more likely to be co-operative themselves if an adult known to them is involved in the procedure.

Children wearing nappies should be wearing a dry disposable. If the nappy is wet, please ask the parent to change it for a dry one and explain that the wetness of the nappy will affect the weight measurement.

In most cases it will be possible to measure children's weight following the protocol set out for adults. However, if accurate readings are to be obtained, it is very important that respondents stand still. Ask the child to stand perfectly still - "Be a statue." For very young children who are unable to stand unaided or small children who find this difficult you will need to alter the protocol and first weigh an adult then weigh that adult holding the child as follows:

- Code as "Weight obtained (child held by adult)" at *RespWts*
- Weigh the adult as normal following the protocol as set out above. Enter this weight into the computer at *WtAd1*.
- Weigh the adult and child together and enter this into the computer at *tChA1*.

The computer will then calculate the weight of the child and you will be asked to check that you have recorded the weight onto the child's Measurement Record Card at *MBookWt*. Again, the computer will give the weight in both kilos and in stones and pounds.

**Weight refused, not attempted or attempted but not obtained**

At *RespWts* you are asked to code whether the measurement was taken, refused, attempted but not obtained or not attempted. If for any reason you cannot get a height measurement, enter the appropriate code at this question and you will automatically be routed to the relevant follow up questions (*ResNWt* and *NoWtBC*) which will allow you to say why no measurement was obtained.

## **2.2 MEASUREMENT RECORD CARD**

When you have taken the respondent's height and weight, offer the respondent a record of his/her measurements. Make out a Measurement Record Card and give it to the respondent. There is room on the Measurement Record Card to write height and weight in both metric and imperial units if the respondent wants both. The computer does the conversion for you. There is space to write in the respondent's Body Mass Index (BMI) as well, if the respondent is aged 16+ (the computer will calculate this for you). Remember to give respondents the BMI leaflet if you give them their BMI.

## 3. BLOOD SAMPLING

### 3.1 Introduction

Blood sample donation and subsequent correct sample distribution is a very important part of the NDNS. One of the main objectives of NDNS is to measure indicators of blood function, nutrition and other measures of health to relate these to dietary and social data.

The blood will be analysed for a large number of analytes including haematology measures (white blood count, haemoglobin, platelets etc), serum lipids (cholesterol, triglycerides), markers of inflammatory status, and markers of mineral and vitamin status.

The samples will **not** be tested for any viruses, such as HIV/AIDS, or for bacterial infections, nor will they be used for genetic testing.

Respondents will receive a gift card<sup>1</sup> as a thank you for providing a blood sample.

Blood sampling is extremely important on NDNS and we need to obtain high response rates. Some respondents will be reluctant to provide a blood sample but try to introduce it simply as 'the next stage' of the nurse visit. Reassure respondents that you (or the paediatric phlebotomist/extended role nurse, where relevant) are highly trained and experienced in taking blood samples. Explain that a blood sample will make the information they have already provided us with even more useful. Also use the fact that they can receive clinically relevant results as a selling point – many respondents feel this is a very positive incentive to providing a blood sample, often even more so than the token of appreciation.

### 3.2 Eligibility for blood sampling

#### General eligibility

All respondents aged 1.5 years and over, with the exceptions outlined in the Nurse Protocols, section 18.2, are eligible to give blood.

Respondents aged 4 and older will be asked to fast for 8 hours overnight before providing a blood sample. Respondents under the age of 4 will not be asked to fast. Year 11 respondents aged 4 and older who are unwilling or forgot to fast are eligible to provide blood sample.

#### Obtaining blood samples from diabetics

Most diabetics can provide fasting blood samples, but there are some precautions to take into account, as outlined below. CAPI will take you through the relevant questions. The preference is to obtain a fasting sample, if possible. You will provide reassurance about this, but if the respondent remains anxious a non-fasting sample can be taken.

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<sup>1</sup> £20 in Year 10 and £15 in Year 11.

### **Acceptable procedures according to medication:**

- Respondents on oral hypoglycaemic medication should be able to fast without complications
- Respondents on a combination of night time insulin and daytime tablets should also be able to fast unless they are known to have low blood sugar levels first thing in the morning. If they do have low blood sugar in the morning, they could still fast but should reduce their night-time insulin by a small amount and have breakfast as soon as possible after the blood is taken.
- Respondents on insulin alone can also provide a fasting sample but should be given special consideration. They should postpone their morning insulin and should be seen as early in the day as possible.

In every case, diabetics should have breakfast as soon as possible after blood is taken.

## **3.3 Overview of blood taking procedures**

A fasting blood sample will be obtained from those aged 4 years and above. Those aged under 4 years will not be asked to fast but CAPI includes questions about whether the child has had something to eat or drink that morning, to ascertain whether it is a fasting or non-fasting sample.

A maximum of two attempts at blood taking are permitted with adults (16+) and only one attempt with children.

The volume of blood taken in each of Year 10 and Year 11 varied according to the age of the respondent, as follows:

Year 10:

<i>Age</i>	<i>Volume</i>	<i>No. of monovette specimen tubes</i>
Adult 16+yrs	35.1 mL	8
Child 7-15yrs	21.1 mL	6
Child 1.5-6yrs	10.9 mL	4

Year 11:

<i>Age</i>	<i>Volume</i>	<i>No. of BD vacutainer specimen</i>
Adult 16+yrs	30 mL	6
Child 7-15yrs	20 mL	4
Child 1.5-6yrs	12 mL	3

The volume differs by age to ensure that we abide by guidelines for taking blood from children for research purposes. To keep children's blood sample volume as low as possible, some analytes will not be measured in younger children.

Blood samples will be taken by you from respondents aged 11 and over. For respondents aged 1.5 to 10 years, the sample will be taken by someone with skills and recent experience in paediatric phlebotomy. If this is not you, you will accompany a paediatric phlebotomist (for children aged 1.5-5 years old) or an extended role nurse (for children aged 6-11 years old) during the visit to the respondent's home.

Some blood samples will be posted to Addenbrooke's Hospital in Cambridge for analysis of routine analytes. Most of the blood tubes will be taken to local laboratories where samples

will be centrifuged and aliquots of blood, serum, and red blood cells will be frozen for temporary storage.

An outline of the blood sampling tasks carried out prior to and at each visit is provided below:

***Phone call before the first nurse visit***

- Assess eligibility for blood sampling and explain procedure in detail.
- Obtain verbal consent to make appointment to revisit for blood sampling and instruct about overnight fast (age 4 and above only).
- If respondent is aged <11, inform respondent (and parent/guardian) that blood will be taken by a paediatric phlebotomist (if necessary).
- Arrange appointment with paediatric phlebotomist (if necessary).
- Record details in CAPI.

***Prior to first visit***

- If not yet done, arrange appointment with nurse/paediatric phlebotomist (if necessary).
- Ensure you have all phlebotomy items.
- Ensure cold packs are ready for use (i.e. placed in freezer).
- Prepare label strips.

***First nurse visit***

- Re-check eligibility for blood sampling and ensure respondent understands procedures.
- Confirm and obtain appropriate written consents.
- Obtain blood sample, filling tubes in priority order.
- Label blood tubes with pre-printed labels (**only** once blood has been obtained).
- Record details in CAPI.
- Leave blood sampling gift card with respondent.

***Immediately after the visit***

- Send tubes and associated documentation (labelled and completed EN1 Postal Blood Form) to Addenbrookes using the correct postal pack.
- Take blood specimens, storage tubes, relevant labels, contaminated waste, and documentation to the local laboratory.
- Record details in CAPI.
- Use antibacterial wipes to wipe the cold packs before placing them into a new plastic bag in the freezer in preparation for the next appointment.
- Use antibacterial wipes to clean the insides of the carrying box.

***Second nurse visit***

- If you were unable to obtain the blood sample from all the participants in the household, you can return to the household to do so, following the same steps as outlined above

## **3.4 The blood tubes**

The number of tubes to be filled depended on the age of the respondent and the fieldwork year. The tubes should be filled in the following order so that, if a situation arises where there will be insufficient blood to fill all the tubes, the analyses with the highest priority can still be undertaken.



The tubes, plus details of the analytes carried out on the sample contained in each, are detailed below. The destination for each tube is also provided.

Year 10:

<b>Tube:</b>	<b>Goes to:</b>	<b>Label:</b>
<i>Respondents aged 16+ years</i>		
1. 2.6mL EDTA (red top) 2. 4.7mL serum gel (brown top) 3. 4.5mL serum (white top) 4. 7.5mL Li Hep TM (orange top) 5. 7.5mL LiHep TM (orange top)	Addenbrookes Addenbrookes Field Lab Field Lab Field Lab	E N1 (3) SE N1 (5) SE N2 (6) LH N1 (7) LH N2 (8)
6. 1.2mL Fluoride (yellow top) 7. 4.5mL Li Hep (orange top) 8. 2.6mL EDTA blood tube (red top)	Field Lab Field Lab Field Lab	F N1 (10) LH N3 (9) E N2 (4)
<i>Respondents aged 7-15 years</i>		
1. 2.6mL EDTA (red top) 2. 7.5mL Li Hep TM (orange top) 3. 2.6mL serum gel (brown top) 4. 4.5mL serum (white top) 5. 2.7mL Li Hep (orange top) 6. 1.2mL Fluoride (yellow top)	Addenbrookes Field Lab Addenbrookes Field Lab Field Lab Field Lab	E N1 (3) LH N1 (7) SE N1 (5) SE N2 (6) LH N2 (8) F N1 (10)
<i>Respondents aged 1.5 to 6 years</i>		
1. 2.6mL EDTA (red top) 2. 4.5mL Li Hep (orange top) 3. 1.1mL serum (brown top) 4. 2.7mL serum (white top)	Addenbrookes Field Lab Addenbrookes Field Lab	E N1 (3) LH N1 (7) SE N1 (5) SE N2 (6)

Year 11:

<b>Blood Tube:</b>	<b>Goes to:</b>	<b>Label:</b>
<i>Participants aged 16+ years</i>		
1. 2mL EDTA (lilac top) 2. 6mL Silica Serum Trace Element (royal blue top) 3. 6mL Lithium Heparin (green top) 4. 6mL Silica Serum Trace Element (royal blue top) 5. 6mL Lithium Heparin (green top) 6. 4mL EDTA (purple top)	BioRepository Field Lab Field Lab Field Lab Field Lab Field Lab	EN1 SEN1 LHN1 SEN2 LHN2 EN2
<i>Participants aged 7-15 years</i>		
1. 2mL EDTA (lilac top) 2. 6mL Silica Serum Trace Element (royal blue top) 3. 6mL Lithium Heparin (green top) 4. 6mL Silica Serum Trace Element (royal blue top)	BioRepository Field Lab Field Lab Field Lab	EN1 SEN1 LHN1 SEN2
<i>Participants aged 1.5 to 6 years</i>		
1. 2mL EDTA (lilac top) 2. 6mL Silica Serum Trace Element (royal blue top) 3. 4mL Lithium Heparin (green top)	BioRepository Field Lab Field Lab	EN1 SEN1 LHN1

We are aware that typical clinical practice is not to use EDTA tubes first due to risk of contamination of subsequent samples. However, this is considered less of an issue with the move to BD Vacutainer tubes compared to other tubes because of the way the rubber comes down over the end of the tube as you remove each one. So far, obtaining blood in EDTA tubes first has not proved to be a problem with samples in other surveys (National Survey of Health and Development) where a very similar priority protocol is used. Although there is a slight risk of contamination, there is agreement that priority should be set by the analyte order agreed by the consortium, including PHE.

### **3.5 Equipment and Consumables**

In Y10, the blood samples were collected using the Sarstedt Monovette® blood-collection system with multify needle (or Monovette fixed needle if preferred). Nurses were provided with the following Monovettes for blood specimen collection:

- 2.6mL, EDTA Monovette (red top)
- 7.5mL Lithium heparin Monovette for trace metal analysis (orange top)
- 4.5mL, 2.7mL Lithium heparin Monovette (orange top)
- 4.5mL, 2.7mL serum Monovette (white top)
- 4.7mL, 2.6mL, 1.1mL serum Monovette (brown top)
- 1.2mL fluoride Monovette (yellow top)

The remaining of blood taking equipment remained the same across years.

In Y11, the blood samples were collected using the BD vacutainer sampling tubes. Nurses were provided with the following equipment for blood taking:

- Blood tubes for blood specimen collection:
  - 2mL EDTA (lilac top)
  - 6mL Silica Serum Trace Element (royal blue top)
  - 6mL Lithium Heparin (green top)
  - 6mL Silica Serum Trace Element (royal blue top)
  - 6mL Lithium Heparin (green top)
  - 4mL EDTA (purple top)
- Tourniquet
- Disinfectant gel
- Alcohol swabs/cotton wool balls or gauze swabs/plasters
- Micropore tape
- Adhesive dressing
- Ametop gel & tegaderm dressing (See section 17.9)
- Disposable vinyl gloves
- BD vacutainer needles and butterflies
- Antibacterial/viral wipes
- Scissors
- Pen (permanent marker)
- Biohazard sharps box
- Biohazard labelled mini-grip bag

Nurses were also provided with the following equipment for the packaging and delivery/posting of samples:

- Plastic postal containers

- Pre-addressed padded envelopes
- Specimen and document bags
- Parcel tape
- Pre-printed labels for all tubes including those to be passed on to the laboratory
- Pulp tray for specimen tubes
- Pre-packs of 2ml empty micro tubes to be delivered to local lab
- Carrying box for specimen delivery to local lab
- Cold packs
- Instant cold packs (limited to use in emergencies and on overnight assignments)

### 3.6 Obtaining written consents for blood sampling

Written consents are needed for the following:

- Giving a blood sample
- Notifying GP of clinically relevant blood analyte results
- Providing clinically relevant blood analyte results to the respondent (or parent/guardian of child respondents)
- Storage of blood sample.

There are 3 variants of the blood sampling consent forms in the consent booklets:

- Adult consent form for participants aged 16 years and over.
- Parental/Guardian consent form for participants aged 4 – 15 years.
- Child assent form for participants aged 5-15 years.
- Parental/Guardian consent form for participants aged 1.5 - 3 years.

The appropriate blood consent form must be signed at the visit at which blood is taken, **before** blood is taken.

The different sections of the consent forms should be pointed out to the respondent and the form should be given to the respondent to read. After the respondent (parent/guardian) has read the consent form please encourage him/her to ask any questions they may have with regards to the procedure. Once they are content to sign, please ensure the respondent (or parent/guardian) initials all those boxes (procedures) they would like to consent to.

There are also tick boxes on the parental/guardian consent/child assent sheets to indicate whether the respondent/parent consented to give a blood sample with or without the use of Ametop gel. **Please ensure the appropriate box is ticked.**

You must check that all appropriate boxes are initialled and signatures collected. If a respondent is aged 1.5-15 years, you must make sure that you obtain the written consent of their parent or the person who has parental responsibility using appropriate consent sheets. Children should be encouraged to provide written assent if they wish (and are able) to do so.

Please also note that if the respondent does not wish to receive a report of their blood analyte results nor do they want results to be sent to the GP, **they must sign the disclaimer at the bottom of the consent sheet.** This is to ensure that they understand that if there are any findings outside the normal range, we will not be able to notify their GP or anyone else as we do not have their permission to do so. Is a parent/guardian of a child respondent does not wish to receive a report of their child's results, they need to sign a similar disclaimer but also agree for a survey doctor to contact them to discuss results directly relevant to their

child's health. If they don't consent for the survey doctor to contact them, blood sample cannot be taken.

### 3.7 Labelling the blood tubes

You will be provided with sets of barcoded labels sheets 2 for labelling blood tubes and dispatch notes. If the participant agrees to provide a blood sample, you will assign a labels sheet to them. If an individual refuses or is ineligible to provide a blood sample, do not assign a sheet of labels to them.

**Each label on the sheet will contain the following information:**

- The label purpose code (which tells you where the barcode label should be placed);
- The barcode;
- A sheet ID number (each label on the sheet has the same ID number; numbers are unique to that sheet).

The labels will be used on documents and on blood and urine tubes. You will be supplied with labels sheets in two colours – white and yellow. At basic addresses where you have two participants, please ensure you have a sheet in each colour so you can **allocate adults (those aged 19+) with a white labels sheet and children (those aged 1.5-18 years) a yellow labels sheet**.



Note that it is your responsibility to label blood tubes for all respondents, even when blood is being taken from young children by a paediatric phlebotomist.

CAPi will guide you through which labels are to be used for each respondent, and which should be affixed to which tube or sent onto the laboratory. The protocol is also outlined in the following section.

#### Labelling blood tubes

For each respondent you will be given a pre-packed set of blood tubes and a pre-packed set of empty clam shells.

The plastic bags containing the blood tubes will show the corresponding age range and the expiry date of the tubes. Please check the date and if the expiry date has passed, use a different pack. The expired blood tubes set should be returned to the Brentwood office.

The correct label for each tube should be peeled off and the top of the label should be positioned onto the tube first and then wrapped round the tube horizontally, ensuring the

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<sup>2</sup> Blood labels were specific to the serial number in Year 10 and generic (usable for any serial number) in Year 11.

label does not crease. It is important that the label is not creased, otherwise the bar-code scanner cannot read the bar-code. If applied correctly even on the smallest tube, there is no risk of overlap that would obscure any label information.

**It is very important that once allocated the correct set of labels are used for the correct respondent. If incorrect serial numbers/labels are used there is a risk of matching the blood results to the wrong respondent. The respondent's GP could therefore be sent the wrong results, possibly leading to unnecessary worry or a problem not being picked up.**

### **3.8 Protocol for taking the blood sample.**

Before taking blood, check that the respondent has understood the purpose of the blood sample, and the protocols for taking it, and read the information leaflets. You will also obtain the necessary consents and follow the protocol outlined below:

- Check one last time if the respondent has a bleeding or clotting disorder, is on anticoagulant drugs or has ever had a fit (for under 16s) / has had a fit in the last 5 years (for 16+). If such a problem is identified then do not attempt to obtain a blood sample.
- Follow appropriate protocols if respondent is diabetic.
- Explain the purpose and procedures for taking blood.
- If aged 4+, check not had anything to eat or drink for 8hours. If not fasted, ask to make a new appointment if respondent still willing to provide a fasting blood sample. If the respondent is not willing to fast, you can take a non-fasting blood sample.
- If respondent is aged <16, explain the option of using Ametop or Cryogestic spray (vapocoolant) for respondents aged 6-16.
- Obtain necessary written consents.
- Prepare the phlebotomy items required, for ready accessibility.
- Make sure that the respondent is at ease and seated comfortably or reclining for the phlebotomy procedure and ensure they cannot hurt themselves if they should faint.
- Ask the respondent to roll up their left sleeve and rest their arm on a suitable surface.
- Ask them to remove their jacket or any thick clothing, if it is difficult to roll up their sleeve.
- The antecubital fossae may then be inspected. It may be necessary to inspect both arms for a suitable choice to be made, and the respondent may have to be repositioned accordingly. Do not ask the respondent to clench his/her fist.
- Select a suitable vein and clean the venepuncture site gently with an alcohol swab. Allow the area to dry completely before the sample is drawn
- Put on your gloves.
- Apply the tourniquet around the respondent's arm, using minimal pressure and for the shortest duration of time. Do not leave the tourniquet in place for longer than 1 minute.
- Ask the respondent to keep his/her arm as still as possible during the procedure.

- Make sure the Sharps bin is readily available to receive used Multifly or other needles and take the usual rigorous precautions against needle-stick accidents. Never resheath a used needle.
- Tape the Multifly to the arm with Micropore tape across only half the width of the butterfly section, and with one end folded over, so as to make a non-adhesive flap for easy removal.
- Collect the blood samples according to priority by placing the specimen tubes in the correct order in the sample tray provided.
- Check for plaster allergies before applying a plaster. If allergic, use a cotton ball secured with micropore tape.
- Ask the respondent to press afterwards on the bleeding point with their arm slightly raised, which helps reduce bruising.
- Mix all tubes by gentle inversion five times except for the white and brown topped serum tubes (which do not need to be inverted).
- Record details in CAPI.

### 3.9 Ametop gel

#### Use of Ametop gel

All children (aged 15 and younger) who consent to give a blood sample must be offered a local anaesthetic; Ametop gel. Ametop gel cannot be used on open wounds, eczematous skin, or if the respondent has had an allergic reaction to any local or general anaesthetic. This means that you may not take a blood sample from these respondents, unless they consent to giving a sample without using Ametop or they are eligible and consent to the use of Cryogesis spray.

Ametop is a prescription medication and contains amethocaine (the active ingredient), which is applied to the skin. It is important that you ask the question below (also within CAPI) to determine whether the respondent has any known anaesthetic allergies.

*Has the person giving this blood sample ever had a bad reaction to a local or general anaesthetic bought over the counter at a chemist, or given at the doctor, the dentist or in hospital?*

Use a new Ametop tube for each respondent and make sure you remove tubes from the household on completion of phlebotomy. For safety, Ametop must not be left lying around where young children could get at it. Any Ametop tubes you have left at the end of your assignment should be returned to the Brentwood office.

#### The pros and cons of using Ametop gel

The advantages of Ametop are that it reduces sensation of needle prick, it is easy to apply, and it is generally safe.

One disadvantage is that it takes 30 minutes to work, and so may increase anxiety. Ametop gel also has minimal side-effects and occasionally mild local skin reactions are experienced in people known to be allergic to similar drugs. Other possible side effects include reddening of skin (this is the action of the amethocaine & is to be expected) and a slight swelling or itching where the gel has been applied.

None of the local skin side-effects (if they occur) requires treatment. The reddening will disappear by itself over a period of hours. A local allergic reaction may involve itching but is unlikely to require treatment. In the very rare instance of a blister forming, remove the Ametop immediately.

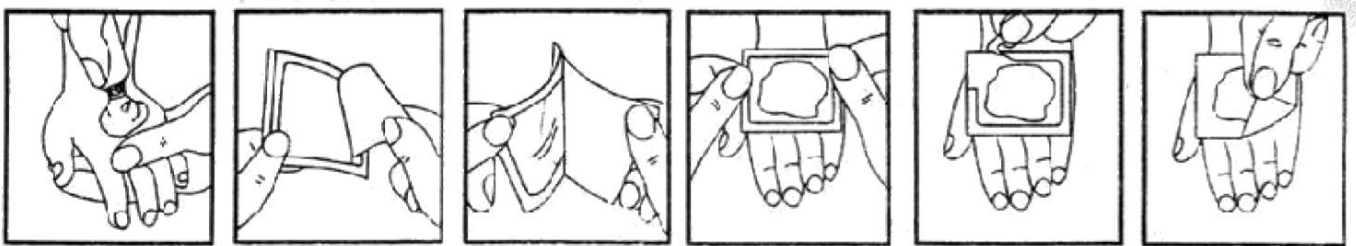
You will need to explain the pros and cons of using Ametop to each respondent and parent, in addition to giving them the leaflet to read. It is important that respondents understand that you are not a doctor and cannot treat unexpected reactions.

### Applying Ametop gel

Ametop gel must only be applied to healthy skin; therefore, it must not be applied to sore or broken skin (eg. eczema or cuts). Make sure the Ametop gel is kept away from eyes or ears.

If the young person requires Ametop to be applied prior to venepuncture, inspect the antecubital fossae and decide which arm you will use for blood-taking. If both arms are suitable, use the left arm.

Apply Ametop gel over the antecubital fossa. Cover with a Tegaderm dressing (a vapour permeable and self-sticking film dressing) to keep the Ametop in place. See details about how to apply Ametop below. **Please note the illustration shows Ametop being used on the hand. National Centre policy is to only take blood samples from the arm.**



1. Squeeze  $\frac{3}{4}$  of a tube in a mound on the area to anaesthetised. **Do not rub in.**

2. Peel the beige coloured 'centre cut-out' from the dressing.

3. Peel the paper layer marked 3M Tegaderm from the dressing.

4. Apply the adhesive dressing with its paper frame to cover the Ametop. **Do not spread the gel.**

5. Remove the paper frame using the cut mark. Smooth down the edges of the dressing carefully and leave in place for 30 minutes. The time of application can be written on the occlusive dressing.

6. After 30 minutes (max. 60mins), remove the dressing. Wipe off the Ametop. Clean entire area with alcohol and begin procedure.

As you may well be aware, removing the Tegaderm is sometimes painful so take care on hairy arms!

## 3.10 Cryogesic® Fine Spray

### Use of Cryogesic® Fine Spray

Ethyl chloride (Cryogesic®) is a vapo-coolant and provides targeted pain relief when sprayed onto the skin prior to venepuncture. It has no anaesthetic properties but because of the coolant effect on the skin as the ethyl chloride evaporates, it reduces the sensitivity of the skin to pain. Cryogesic® takes effect within seconds of being sprayed onto the skin. The effect also wears off quickly as the skin warms back up and is therefore a useful alternative to the topical anaesthetic

gels and creams (e.g. Ametop® or EMLA®) which require application to the venepuncture site 30 minutes prior to the procedure, which in children can heighten anxiety needlessly. It is also useful for participants aged 6yrs and over (on the day of venepuncture) who are allergic to Ametop® gel.

Some people can be allergic to the spray, which may cause itching, swelling or bruising where the spray has been applied. Some change in skin colour may occur, but this is normal. None of these effects are serious or harmful.

### **Applying Cryogesic® Fine Spray**

Written consent must have been gained before these steps followed.

- Once sampling vein identified, prepare tourniquet and equipment ready for venepuncture (as the needle needs to be inserted within 30 seconds of the vapo-coolant working). Put on gloves.
- Depending on the age of the participant (if a child), enlist the parent / legal guardian to gently steady the child's arm. Hold the canister 2 – 3 inches above the area to be cooled.
- Press the nozzle gently for a maximum of 5 seconds, to allow a fine spray to coat the skin, which on contact turns to a white film on the skin, and which feels cold to the participant.
- Using a gauze swab, immediately but gently wipe the white film from the skin surface in one swipe – in direction of shoulder to wrist, in order to visualise the vein again.
- Check with the participant that their skin feels cold and they are happy to proceed.
- Apply tourniquet and then insert needle to take blood sample as per Venepuncture and Project Blood Sampling protocols.
- On completion of the blood sampling activity, the use of Cryogesic® Spray must be recorded by the Nurse into the CAPI and within the appropriate consent booklet against the participant's study number and name.

## **3.11 Taking blood from children**

Unless the NDNS nurse is a trained paediatric phlebotomist, bloods from those aged 10 and younger will be taken by a trained paediatric phlebotomist or an extended role nurse. NDNS nurses will be taking blood samples themselves from those aged 11 and over. It is important to make the child feel as comfortable and as at ease as possible. Smiling, making eye contact and speaking so that the child can understand easily are ways to facilitate this. Also, ask the child for permission to do something rather than insisting or telling. This can encourage a sense of control in the child and minimises fear.

### **Precautionary Restraint (A.K.A. Cuddle Restraint)**

If the parent/guardian is willing (note this is optional), they can help you to gently restrain the child to reduce any accidents due to pulling away at the pin prick or panicked movements. Ask the child to sit on the parent's lap. The child should be sitting so that their legs are between the parent's legs. The child should have their arm wrapped around the parent's back and vice versa for the parent. This exposes the chosen arm to the nurse while occupying the child's arms and legs.

NOTE: It is important to ask the child to sit on the same side of the parent as the arm identified



for venepuncture.

Please note that if the child has turned 11 since the interviewer visit and is 11 when you are gaining agreement for blood sampling, you, the nurse, should take the blood from this child. This is the only scenario where you should base age on actual, current age rather than the age set at the interviewer visit. CAPI will prompt you to arrange to take blood if the child has turned 11 since the interviewer stage.

### 3.12 Scheduling appointments

Due to restrictions on when laboratories can process samples and the fact that the vast majority of respondents will be providing fasting samples, **blood sampling can only take place on Monday-Friday mornings<sup>3</sup>**.

We appreciate that these restrictions mean you will need to make a second or even third visit to a household to collect blood samples (e.g. you may have to make one evening visit to collect all the measurements except the blood sample then another morning visit to take the blood sample(s)).

In order to minimise the number of visits, if a household contains two respondents you should schedule appointments for when both respondents are available.

When a household contains a respondent aged 10 or younger, you also need to schedule the blood taking appointment to fit in with the availability of your paediatric phlebotomist or extended role nurse partner.

### 3.13 Liaison with paediatric phlebotomist

Blood from young children, aged 10 or younger, will be taken from someone with recent experience in paediatric phlebotomy. If this is not you, you will be allocated an extended role nurse (for children aged 6-10 years) or a paediatric phlebotomist (for children aged 1.5- 5 years), who will accompany you on visits to take blood from young children.

The earlier you know whether you have a child aged 18 months to 10 years, the better. This means both you and the phlebotomist or extended role nurse, as well as the office, can be better prepared to deal with this. As soon as you know you will be visiting an address with a child aged 18 months to 10 years, you should call XXXX. XXXX has a list of paediatric phlebotomists and extended role nurses who have been recruited and trained for NDNS. She will be able to tell you the name, phone number and address of the best placed phlebotomist or extended role nurse.

You should then call the phlebotomists or extended role nurse to make them aware that you potentially have an address where there might be some work for them to do. At this initial contact, you should ascertain the phlebotomists general availability during the fieldwork period (e.g. any days when the phlebotomist or extended role nurse is on holiday or otherwise engaged). This will help when arranging blood-taking visits.

During the first visit when willingness to give a blood sample is ascertained, you can call the phlebotomist or extended role nurse to arrange the follow-up visit whilst you are still in the household. Ideally, you will have the phlebotomist or extended role nurse availability in advance and can make an appointment then and there. If this is not possible, you will need to arrange the visit as soon as possible afterwards and confirm details with the household

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<sup>3</sup> Blood samples could only be taken Monday-Thursday morning in Year 10.

over the phone.

**Important points when working with a phlebotomist or extended role nurse:**

- The NDNS nurse is responsible for providing and taking all equipment, including tubes, labels, and needles to the respondent's address.
- The NDNS nurse is responsible for obtaining written consent and making sure signed consents are obtained in the consent booklet.
- The NDNS nurse is responsible for entering information into the laptop and must follow the usual blood taking block in the CAPI.
- The phlebotomists or extended role nurse will be asked to complete and sign a paper version of the venepuncture checklist. NDNS nurses will need to enter this information into the CAPI and should post the paper version to the office.
- The NDNS nurse is responsible for all labelling, despatch and delivery of samples.

**In essence – the phlebotomists or extended role nurse will take the blood sample only – the NDNS nurse does everything else. This is because you are more experienced and have better training in all these areas.**

### **3.14 Blood sampling token of appreciation**

Respondents of all ages will receive a Love2Shop gift card <sup>4</sup> as a thank you for providing a blood sample. Remember this should **not** be presented as 'payment' but as a token of appreciation. Whilst you're still in the household, you need to activate the gift card in CAPI.

The CAPI program will automatically prompt you to enter the last 8 digits of the gift card number that is shown on the front of the card, for each participant.

When prompted by CAPI you should write the relevant gift card amount on the front of the card, give the card to the participant and inform them that the card will be activated and live to use after approximately 48 hours. Please note that this is dependent on you transmitting the case promptly and may take up to 72 hours if the case is transmitted on a Friday.

Point out to the participant that they can check the value of the card by either going to the Love2Shop website and looking at the card account, or by using a QRL code scanner (e.g. through an app on a smart phone or tablet). The QRL code is usually on the back of the card.

If you have left over gift cards at the end of an assignment, you can use them for subsequent NDNS assignments as long as they are valid for at least 6 months prior to the expiry date. They are not of any monetary value until activated by Love2shop upon receipt of your transmission of the completed case.

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<sup>4</sup> £20 in Year 10, £15 in Year 11.

### 3.15 Other important points

Please refer to the Nurse Protocols for important information regarding:

- Venepuncture checklist
- Fainting respondents
- Needle stick injuries

The Nurse Protocol also provides general information regarding the handling and disposal of needles and other materials. Also note that for NDNS, sharps bins can be filled with needles from several respondents and taken to the local field laboratory for disposal when full. Other contaminated waste generated should be placed in the biohazard labelled mini- grip bag provided and taken to the local field laboratory for disposal.

### 3.16 Labelling & despatch of blood samples

Most blood tubes will be taken by you to the field laboratories, for the blood to be processed; but some will need to be sent in the post to Addenbrookes Hospital, Cambridge.

**It is absolutely crucial that tubes are delivered to the correct destination.**

#### 3.16.1 Dispatching blood samples to NIHR BRC-MRC BioRepository located in the Addenbrooke's Hospital in Cambridge

##### Overview

The blood tube to be posted to NIHR BRC-MRC BioRepository must be the first tube filled - **the 2 mL EDTA blood tube (lilac top) with the label EN1**. The same blood tube is used for all participants, regardless of age.

It is essential that the tubes are properly labelled as the NIHR BRC-MRC BioRepository will be receiving blood tubes from many different studies and respondents from around the UK.

##### Packaging the tubes for posting

The consent booklet contains a tear-out NIHR BRC-MRC BioRepository EN1 Postal Blood Form. You must complete the top 'Nurse' section only and post the form with the EDTA blood tube the yellow lab dispatch polylope.

You should attach the EN1-POST barcode label (from the labels sheet assigned to the participant) in the space provided and clearly and legibly complete the following information on the EN1 Postal Blood Form:

- The date the sample was taken.
- The time the sample was taken.
- The date the sample was despatched/posted to NIHR BRC-MRC Biorepository.

The labelled lilac-topped EDTA tube should be placed in the single slot plastic

dispatch pack, snapped shut and then placed inside the yellow polylope lab envelope. (Please note: only one participant sample per dispatch polylope!).

Include the labelled and completed EN1 Postal Blood Form in the yellow lab polylope.

The postal pack containing the blood tube should be posted on the way to the local laboratory. Be sure to check that the post box has a same day collection.

### 3.16.2 Taking blood samples to local field laboratory for immediate processing

#### Overview

Most blood tubes will be taken to the field laboratories, for the blood to be processed. The number of blood tubes to be taken to the local laboratory depends on the age of the respondent and is summarised in the tables below.

Year 10:

Tube:	Goes to:	Label:
<i>Respondents aged 16+ years</i>		
4.5mL serum (white top) 7.5mL Li Hep TM (orange top) 7.5mL Li Hep TM (orange top) 1.2mL Fluoride (yellow top) 4.5mL Li Hep (orange top) 2.6mL EDTA blood tube (red top)	Field Lab Field Lab Field Lab Field Lab Field Lab Field Lab	SE N2 (6) LH N1 (7) LH N2 (8) F N1 (10) LH N3 (9) E N2 (4)
<i>Respondents aged 7-15 years</i>		
7.5mL Li Hep TM (orange top) 4.5mL serum (white top) 2.7mL Li Hep (orange top) 1.2mL Fluoride (yellow top)	Field Lab Field Lab Field Lab Field Lab	LH N1 (7) SE N2 (6) LH N2 (8) F N1 (10)
<i>Respondents aged 1.5 to 6 years</i>		
4.5mL Li Hep (orange top) 2.7mL serum (white top)	Field Lab Field Lab	LH N1 (7) SE N2 (6)

Year 11:

Blood Tube:	Goes to:	Label:
<i>Participants aged 16+ years</i>		
6mL Silica Serum Trace Element (royal blue top) 6mL Lithium Heparin (green top) 6mL Silica Serum Trace Element (royal blue top) 6mL Lithium Heparin (green top) 4mL EDTA (purple top)	Field Lab Field Lab Field Lab Field Lab Field Lab	SEN1 LHN1 SEN2 LHN2 EN2
<i>Participants aged 7-15 years</i>		
6mL Silica Serum Trace Element (royal blue top)	Field Lab	SEN1

6mL Lithium Heparin (green top) 6mL Silica Serum Trace Element (royal blue top)	Field Lab Field Lab	LHN1 SEN2
<i>Participants aged 1.5 to 6 years</i>		
6mL Silica Serum Trace Element (royal blue top) 4mL Lithium Heparin (green top)	Field Lab Field Lab	SEN1 LHN1

### Packaging and delivering the tubes to the field laboratory

The samples must be delivered to the laboratory within **2 hours** of the sample being taken. You must not take a blood sample if you cannot deliver it to the local laboratory within this time. However, if delayed, ring the lab to inform them of the situation and still deliver blood samples.

After the blood samples have been taken and when transporting them to the field laboratory it is important that they are kept in the cool box provided. You should also have 2 pre-frozen ice/cold packs in the box to keep the samples cool during transit. The samples for the respondent should be put in a plastic bag and placed in the cool box so they stay upright during transportation. If two respondents (from the same or different households) have given blood samples in a morning, their samples can be transported together in the cool box; in this case it is particularly important that the samples are labelled and bagged correctly.

Each respondent's set of samples must be handed over to the designated person at the field laboratory together with the relevant despatch note, FL (see next section), microtube pack and remaining assigned barcoded labels.

### Blood Sample Despatch Notes for field laboratory

The consent booklet contains three different types of field laboratory despatch notes, one for adults 16+ (with Pink checklist box), 7-15 year olds (with Green checklist box) and 1.5-6 year olds (with Blue checklist box).

You should label the appropriate field lab despatch note for the age of your participant, using label FL and clearly and legibly complete all parts of the nurse section with the following information:

- The number of the barcode label set (appears underneath the barcodes).
- Participant's serial number.
- Whether the participant provided a fasting or non-fasting blood sample.
- The date the sample was taken.
- The time the sample was taken.
- The time the sample was delivered to the field laboratory.
- Whether you have delivered all the items on the checklist to the field laboratory (i.e. the samples; remainder of the labels the field laboratory will use; the microtubes for the right age group; the despatch note)
- The remainder of the form will be completed by the local field laboratory staff.

### Liaison with field laboratory

Samples may be delivered to your designated field laboratory on Mondays to Thursdays in the morning. It is very important that you **always notify the field laboratory of sample**

**deliveries in advance.** Delivery times should be discussed with your contact person. As you will usually be taking fasting blood samples in the morning there is minimal risk that you are likely to deliver samples outside the normal opening hours of the laboratory but if this does happen (e.g. you get stuck in traffic), you must endeavour to contact the field laboratory to let them know. You must also notify the laboratory immediately you know that a scheduled delivery is not going to take place, e.g. because of a broken appointment or the respondent not being able/willing to provide a sample. This notification is a matter of courtesy to save the laboratory preparing the stabilising agents unnecessarily and then waiting for a delivery that is never going to arrive.

Contact details (i.e. name, address and telephone number) of the local laboratory recruited for your area will be given in a separate document, along with any special delivery instructions. Each document contains the name and telephone number of the contact person (including a deputy) at the local laboratory, opening hours of the laboratory, and any helpful information on parking and location.

Any difficulties encountered with the local laboratory during the study should be reported to HNR as soon as possible. It is the responsibility of HNR to resolve any difficulties between local laboratories and study nurses. You will be provided with a named contact person at HNR that can be contacted by phone or e-mail.

Please remember to fill in the time of delivery on the field laboratory dispatch note before handing it over to the laboratory staff.

You must also complete a Field Lab Delivery Receipt and obtain the name and signature of the person accepting the blood samples from you. This receipt must then be returned to the Nurse Centre.

Please remember to record details of the samples collected on the “Despatch Note for all Samples” form (DESP OFFICE) which can be found at the back of the Office Consent booklet.

## 4. WAIST AND HIP CIRCUMFERENCES

This measurement is taken from participants aged 11+ years.

### Purpose

There has been increasing interest in the distribution of body fat as an important indicator of increased risk of cardiovascular disease. The waist-to-hip ratio is a measure of distribution of body fat (both subcutaneous and intra-abdominal). Analyses suggest that this ratio is a predictor of health risk like the body mass index (weight relative to height).

### Equipment

EasyCheck 150mm length tape calibrated in mm (with push button closure).

The tape is passed around the circumference and the end is secured through the push button

### Eligibility

Waist and hip measurements will only be carried out on respondents **aged 11 and over**. The respondent is ineligible for the waist and hip measurement if:

- Chairbound
- Has a colostomy/ileostomy
- Pregnant

If (a) and/or (b) apply, record this on the computer (question WHPNABM). If there are any other reasons why the measurement was not taken, record this on the computer and type in the reason.

### Preparing the respondent

The interviewer will have asked the respondent to wear light clothing for your visit. Explain to the respondent the importance of this measurement and that clothing can substantially affect the reading.

If possible, without embarrassing you or the respondent, ensure that the following items of clothing are removed:

- all outer layers of clothing, such as jackets, heavy or baggy jumpers, cardigans and waistcoats
- shoes with heels
- tight garments intended to alter the shape of the body, such as corsets, lycra body suits and support tights

If the respondent is wearing a belt, ask them if it would be possible to remove it or loosen it

for the measurement.

Pockets should be emptied.

Some respondents may be wearing religious or other symbols which they cannot remove and which may affect the measurement. Do not embarrass or offend the respondent by asking them to remove such things.

If the respondent is not willing to remove bulky outer garments or tight garments and you are of the opinion that this will significantly affect the measurement, record this on the Schedule at questions *WJRel* and/or *HJRel*. Some respondents may be wearing articles of clothing which cannot be removed and will affect the measurement (e.g. saris) – this should also be recorded.

If possible, ask the respondent to empty their bladder before taking the measurement.

### **Using the EasyCheck tape**

All measurements should be taken to the nearest millimetre. If the length lies half-way between two millimetres, then round to the nearest even millimetre. For example, if the measurement is halfway between 68.3 and 68.4, round up to 68.4. And if the measurement is halfway between 68.8 and 68.9, round down to 68.8. Please note that you must enter the measurement to one decimal place - do not round it to the nearest centimetre. For example, enter '78.2', not just '78'. If you do not enter a decimal point, the computer will give you a warning. If the measurement is exactly, say, 78cm, then all you need to do is suppress the warning and it will automatically fill in the '.0' for you. Otherwise, you must go back and amend your answer. As a further check, the computer will also ask you to confirm that a measurement ending in '.0' is correct.

Ensure the respondent is standing erect in a relaxed manner and breathing normally. Weight should be evenly balanced on both feet and the feet should be about 25-30cm (1 foot) apart. The arms should be hanging loosely at their sides.

If possible, kneel or sit on a chair to the side of the respondent.

Pass the tape around the body of the respondent and secure the end of the tape with the push button.

To check the tape is horizontal you have to position the tape on the right flank and peer round the participant's back from his/her left flank to check that it is level. This will be easier if you are kneeling or sitting on a chair to the side of the respondent.

Hold the plastic slider flat against the body and flatten the end of the tape to read the measurement at the red line in the plastic slider. Do not pull the tape towards you, as this will lift away from the respondent's body, affecting the measurement.

### **Measuring waist circumference**

The waist is defined as the point midway between the iliac crest and the costal margin (lower rib). To locate the levels of the costal margin and the iliac crest use the fingers of the right hand held straight and pointing in front of the participant to slide upward over the iliac crest. Men's waists tend to be above the top of their trousers whereas women's waists are often under the waistband of their trousers or skirts.



Do not try to avoid the effects of waistbands by measuring the circumference at a different position or by lifting or lowering clothing items. For example, if the respondent has a waistband at the correct level of the waist (midway between the lower rib margin and the iliac crest) measure the waist circumference over the waistband.

Ensure the tape is horizontal. Ask the participant to breathe out gently and to look straight ahead (to prevent the respondent from contracting their muscles or holding their breath).

Take the measurement at the end of a normal expiration. Measure to the nearest millimetre and record this on the schedule.

Repeat this measurement again.

If you are of the opinion that clothing, posture or any other factor is significantly affecting the waist measurement, record this on the schedule.

### **Measuring hip circumference**

The hip circumference is defined as being the widest circumference over the buttocks and below the iliac crest. To obtain an accurate measurement you should measure the circumference at several positions and record the widest circumference.

Check the tape is horizontal and the respondent is not contracting the gluteal muscles. Pull the tape, allowing it to maintain its position but not to cause indentation. Record the measurement on the schedule to the nearest millimetre, e.g. 95.3. If the length lies half-way between two millimetres, then round to the nearest even millimetre.

If clothing is significantly affecting the measurement, record this on the schedule.

Repeat this measurement again.

### **General points**

The tape should be tight enough so that it doesn't slip but not tight enough to indent clothing. If clothing is baggy, it should be folded before the measure is taken.

If the respondent is large, ask him/her to pass the tape around rather than having to "hug" them. Remember though to check that the tape is correctly placed for the measurement being taken and that the tape is horizontal all the way around.

If your second waist or hip measurement differs by 3cm or more from the first, the computer will give you a warning. If you have made a mistake when entering the figures (e.g. typed 78.2 instead of 68.2), you should type over the mistake. If it was not a mistake, you should suppress the warning and take a third measurement.

If you have problems palpating the rib, ask the respondent to breathe in very deeply. Locate the rib and as the respondent breathes out, follow the rib as it moves down with your finger. If your respondent has a bow at the back of her skirt, this should be untied as it may add a substantial amount to the waist circumference.

Female respondents wearing jeans may present a problem if the waistband of the jeans is on the waist at the back but dips down at the front. It is essential that the waist measurement is taken midway between the iliac crest and the lower rib and that the tape is horizontal. Therefore in this circumstance the waist measurement would be taken on the waist band at the back and off the waist band at the front. Only if the waistband is over the waist all the way around can the measurement be taken on the waistband. If there are belt loops, the tape should be threaded through these so they don't add to the measurement.

## **Recording problems**

We only want to record problems that will affect the measurement by more than would be expected when measuring over light clothing. As a rough guide only record a problem if you feel it affected the measurements by more than 0.5cm. We particularly want to know if waist and hip are affected differently.

At WJRel and HJRel, record how reliable the waist and hip measures are, and whether any problems that were experienced were likely to increase or decrease the measurement. This information is important for analysis of the results. As a general rule, if you believe that the measurements you took are 0.5cm more or less than the true measurement because of problems you encountered (e.g.. clothing the respondent was wearing), this should be counted as unreliable.

## **Respondent feedback**

Offer to write the measurements on the Measurement Record Card.

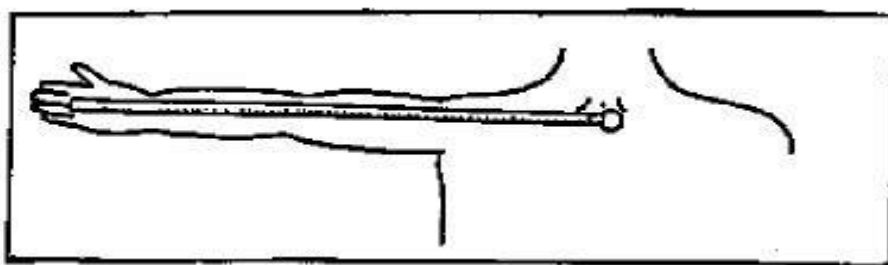
The measurements will be given in inches as well as centimetres by the computer. You can record the measurements on the MRC using centimetres, inches or both.

## 5. DEMISPAN

This measurement is taken from participants aged 65+ years or those aged 16-64 years where the interviewer collected a valid weight measurement but was not able to collect a valid height measurement.

### Purpose

The demispan measurement is an alternative measure of height. It is the distance between the midline of the sternal notch and the base of the fingers between the middle and ring fingers, with the arm out-stretched laterally (see Figure below).



The demispan measurement is taken when it is difficult to measure height accurately. For example if the respondent cannot stand straight or is unsteady on their feet as is quite often in the case of the elderly and some disabled people. It is used as a proxy for a height measurement as there is a relationship between demispan and 'true height'. Additionally, height decreases with age to a varying degree depending on individuals, and thus the standard measure of height may be less useful for some older respondents. The long bones in the arm do not get shorter however, and thus can be used to estimate accurately a respondent's 'true height'.

### Eligibility

Demispan measurements will be carried out on respondents **aged 65 and over**. Demispan measurements will be carried out on those aged 16-64 where the interviewer collected a valid weight measurement but was not able to collect a valid height measurement.

### Exclusion criteria

Respondents are excluded from the demispan measurement if they cannot straighten either arm without pain or discomfort.

### Equipment

You will need:

- A thin retractable demispan tape calibrated in cm and mm
- A skin marker pencil
- Micropore tape
- Alcohol and non-alcohol swab

### Using the demispan tape

A hook is attached to the tape and this is anchored between the middle and ring fingers at the finger roots. The tape is then extended horizontally to the sternal notch.

The tape is fairly fragile. It can be easily damaged and will dent or snap if bent or pressed too firmly against the respondent's skin. Also the ring connecting the hook to the tape is a

relatively weak point. Avoid putting more strain on this ring than necessary to make the measurements. When extending the tape, hold the tape case rather than the tape itself as this puts less strain on the hook and tape. When placing the tape against the sternal notch, do not press into the sternal notch so much that the tape kinks.

### Preparing the respondent

Explain to the respondent the purpose of conducting the demispan measurement and explain the procedure. Further explain that the measurement requires minimal undressing because certain items may affect the accuracy of the measurement. The items of clothing that will need to be removed include:

- Ties
- Jackets, jumpers and other thick garments
- Jewellery items such as chunky necklaces/bracelets
- Shoulder pads
- High heeled shoes
- Shirts should be unbuttoned at the neck

If the respondent does not wish to remove any item that you think might affect the measurement, record that the measurement was not reliable in CAPI.

For the purpose of consistency, where possible the **right arm** should always be used. If this is not possible, carry out the measure on the left arm and make a note of this in CAPI.

### Procedure

1. Locate a wall where there is room for the respondent to stretch his/her arm. They need to stand with their back to the wall but not support themselves on it, standing approximately 3 inches (7cm) from the wall.
2. Ask the respondent to stand with weight evenly distributed on both feet, head facing forward.
3. Have them raise their **right arm** and extend it horizontally to their side until it is parallel with the floor. The right wrist should be in neutral rotation and neutral flexion. Rest your left arm against the wall allowing the respondent's right wrist to rest on your left wrist.
4. When the respondent is in the correct position, mark the skin at the centre of the sternal notch using the skin marker pencil. This mark must be made when the respondent is standing in the correct position. Explain to the respondent that the mark will wash off afterwards.
5. If clothing, jewellery or subcutaneous fat obscures the sternal notch, use a piece of micropore tape on the clothing or jewellery. If the respondent refuses to the use of the marker pen or the tape, proceed with the measurement but record it as unreliable in CAPI.
6. Ask the respondent to relax while you get the demispan tape.
7. Place the hook between the middle and ring fingers of the respondent so that the tape runs smoothly across the arm.
8. Ask the respondent to get into the position they were in previously, with their arm raised horizontally, the wrist in neutral flexion and rotation. Check they are in the correct

position.

9. Extend the tape to the sternal notch. If no mark was made, feel for the correct position and extend the tape to this point.
10. Ask the respondent to stretch his/her arm checking that they remain in the same position, the hook has not moved on their fingers and that the respondent is not leaning on the wall or bending at the waist.
11. Record the measurement in CAPI, in centimetres and millimetres. Always report to one decimal place. If the length lies halfway between 2 millimetres, then round to the **nearest even millimetre** (see section 2.4).
12. Ask the respondent to relax and loosen up the right arm by shaking it gently.
13. Repeat steps 2-11. Explain to the respondent that the measure needs to be taken again for accuracy. If the second measure is significantly different to the first, CAPI will give you an error message. At this point you can check to make sure that you have entered the readings correctly or take a third measure if there is another reason for the measurements being different. This is to be taken in the same way as the previous two. CAPI will work out which two of the three readings to use.
14. If the respondent wishes, record the results on their measurement record card. You can use the conversion chart on your showcards to convert the results into inches.
15. If the skin marker is used, offer the alcohol or non-alcohol wipe to the respondent to wipe the skin mark off.

### **Additional points**

- If the respondent is unable to stand in the correct position or finds it difficult to stand steadily, ask them to sit for the measurement. Use an upright chair and position it close to a wall. If a respondent is unable to sit or stand, the measurement can be taken when the respondent is lying down. In both cases still try to support the arm if possible. You may need to sit or kneel to take the reading.
- Record in CAPI how the measurement was taken (i.e. with respondent standing, sitting, etc).
- If there is no wall available for the respondent to stand in front of and extend their arm horizontally, have them stand in front of any other flat surface e.g. in front of a cupboard or window, ensuring that they are not supporting their body weight on this surface.
- If the respondent is much taller than you take the measurement with the respondent sitting.
- If the respondent's arm is much longer than yours is, support the arm close to the elbow rather than wrist level. Your arm must not be between the elbow and shoulder, as this will not provide sufficient support.
- Before packing the tape away ensure the hand hook and length of tape is wiped to reduce potential cross infection between households.

## 6. BLOOD PRESSURE PROTOCOL

Blood measure was measured in participants aged 4+ years in Year 10 only. The measurement was not included in Year 11.

### Blood Pressure

High blood pressure is an important risk factor for cardiovascular disease. It is important that we look at the blood pressure of everyone in the survey using a standard method so we can see the distribution of blood pressure across the population. This is vital for monitoring change over time, and monitoring progress towards lower blood pressure targets set in the Health of the Nation.

*Timing-* Blood pressure can be higher than normal immediately after eating, smoking, drinking alcohol or taking vigorous exercise. This is why respondents are asked to avoid doing these for 30 minutes before you arrive. As already suggested, if you can juggle respondents within a household around to avoid having to break this "half-hour" rule, do so. But sometimes this will not be possible and you will have to take their blood pressure within this time period. In which case enter all the codes that apply at *ConSubX*.

### Protocol for Blood Pressure Recording: Omron Hem-907

This section describes the protocol for measuring blood pressure using the Omron HEM 907. More detailed information may be obtained from the instructions booklet inside the box. If you have any further questions or problems then please contact XXXX.

### Equipment

- Omron HEM 907 blood pressure monitor Child/ small adult cuff (17-22 cm) Standard adult cuff (22-32 cm)
- Large adult cuff (32-42 cm)
- AC adapter

The Omron HEM -907 blood pressure monitor is an automated machine. It is designed to measure systolic blood pressure, diastolic blood pressure and pulse rate automatically at pre-selected time intervals. On this study three readings are collected at one-minute intervals.

The Omron 907 is equipped with a rechargeable battery, which is usable for approximately 300 measurements when fully charged. To recharge the battery, connect the monitor to the mains. A battery symbol will appear in the CHARGING display when the battery is charging. When ready to use the symbol will disappear. A dark battery symbol in the BATTERY display indicates that the battery is charged and the machine is usable. The battery can be charged in approx. 12 hours. When the battery symbol in the BATTERY display starts to flash there are 20- 30 measurements left, you need to charge the battery soon. When a light battery symbol appears in the BATTERY display the battery needs to be put on charge immediately. The Omron 907 is **NOT** designed to work off the mains adaptor; it should be run off the battery power pack. The mains adaptor should **ONLY** be used to charge the battery pack.

**PLEASE REMEMBER TO CHARGE THE BATTERY !!**



## Preparing the respondent

The respondent should not have eaten, smoked, drunk alcohol or taken vigorous exercise in the 30 minutes preceding the blood pressure measurement as blood pressure can be higher than normal immediately after any of these activities. As already suggested, if you can juggle respondents within a household around to avoid having to break this "half-hour" rule, do so. But sometimes this will not be possible and you will have to take their blood pressure within this time period. In which case enter all the codes that apply.

Ask the respondent to remove outer garments (e.g. jumper, cardigan, jacket) and expose the right upper arm. The sleeve should be rolled or slid up to allow sufficient room to place the cuff. If the sleeve constricts the arm, restricting the circulation of blood, ask the respondent if they would mind taking their arm out of the sleeve for the measurement.

## Selecting the correct cuff

**Adults aged 16 and over:** Do **not** measure the upper arm circumference. Instead, choose the correct cuff size based on the acceptable range which is marked on the inside of the cuff. You will note that there is some overlap between the cuffs. If the respondent falls within this overlap range then use the **standard** cuff where possible.

**Children aged 4 to 15:** It is important to select the correct cuff size. The appropriate cuff is the largest cuff which fits between the axilla (underarm) and the antecubital fossa (front of elbow) without obscuring the brachial pulse and so that the index line is within the range marked on the inside of the cuff. You will be provided with a child's cuff as well as the other adult cuffs. Many children will not need the children's cuff and instead will require an adult cuff. You should choose the cuff that is appropriate to the circumference of the arm.

**Adults and Children:** The appropriate cuff should be connected via the grey air tube to right end side of the monitor.

## Procedure

Wrap the correct sized cuff round the upper **right** arm and check that the index line falls within the range lines. Use the left arm only if it is impossible to use the right. If the left arm is used, record this on the schedule. Locate the brachial pulse just medial to the biceps tendon and position the arrow on the cuff over the brachial artery. The lower edge should be about 1-2 cm above the cubital fossa (elbow crease).

Do not put the cuff on too tightly as bruising may occur on inflation. Ideally, it should be possible to insert two fingers between cuff and arm. However, the cuff should not be applied too loosely, as this will result in an inaccurate measurement.

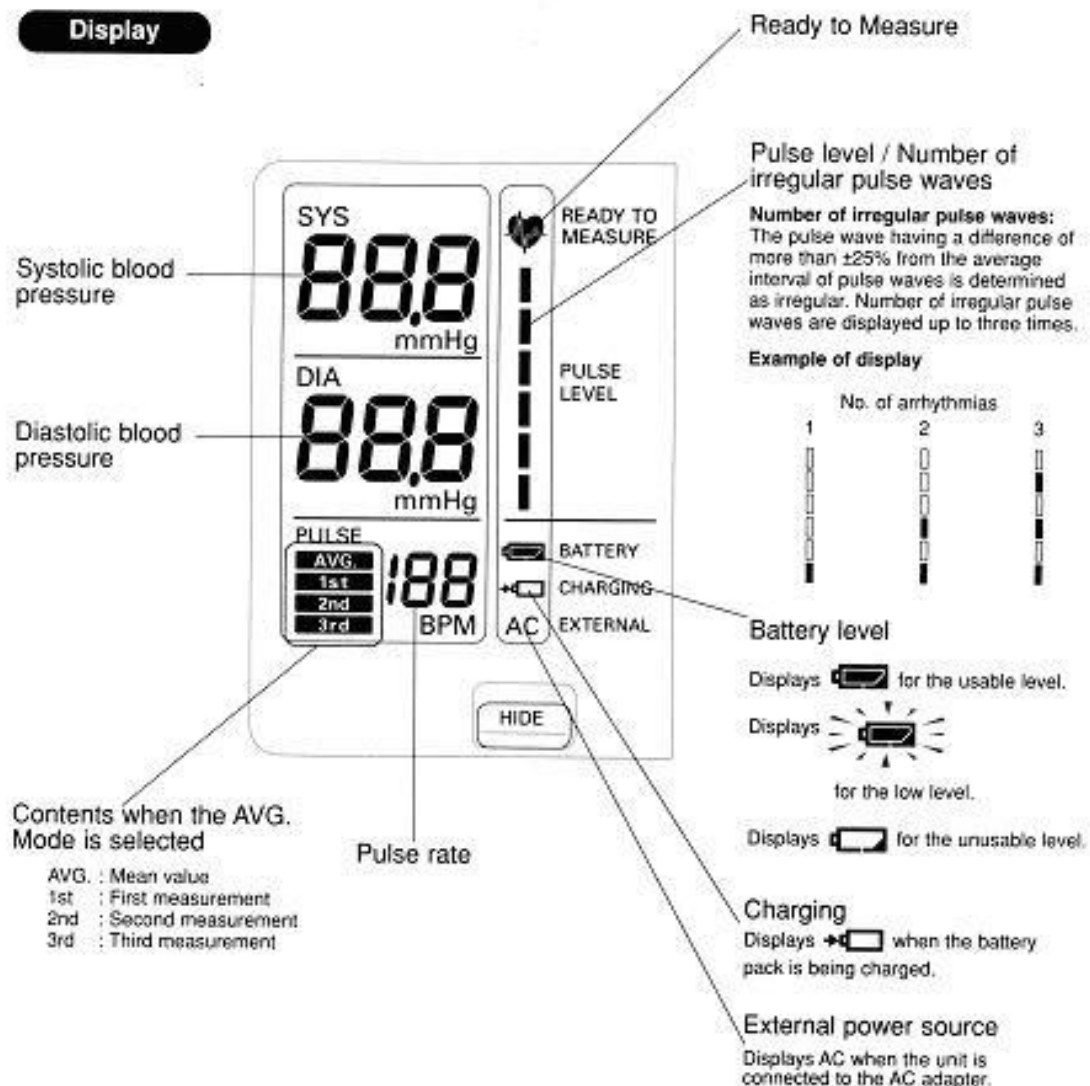
The respondent should be sitting in a comfortable chair with a suitable support so that the right arm will be resting at a level to bring the antecubital fossa (elbow) to approximately heart level. They should be seated in a comfortable position with cuff applied, legs uncrossed and feet flat on the floor.

Explain that before the blood pressure measurement we need them to sit quietly for five minutes to rest. They should not smoke, eat or drink during this time. Explain that during the measurement the cuff will inflate three times and they will feel some pressure on their arm during the procedure.

It is important that children as well as adults rest for five minutes before the measurement is taken. However, making children sit still for five minutes can be unrealistic. They may move around a little, but they should not be running or taking vigorous exercise. As with adults, they should not eat or drink during this time.

After 5 minutes explain you are starting the measurement. Ask the respondent to relax and not to speak until the measurement is completed as this may affect their reading.

The following picture shows the main features of the Omron HEM-907.



## How to operate the monitor

See Picture of Omron HEM-907 monitor above.

1. Switch the monitor on by pushing the **ON/OFF** button. Wait for the **READY TO MEASURE** symbol to light, indicating the machine is ready to start the measurement (approx 2 sec).
2. Check that the **MODE** Selector is set to **AVG** and the **P-SET** (pressure setting) Volume is set to **AUTO**.

3. Press the **START** button to start the measurement. The cuff will now start to inflate and take the first measurement. When the first measurement is complete the LCD displays show systolic pressure, diastolic pressure, and pulse rate. Record the readings on the interview schedule.
4. Blood pressure will then be recorded at one-minute intervals thereafter. After each interval record the reading from the LCD displays on the interview schedule.
5. After the three measurements are complete press the **ON/OFF** button to turn off the power and remove the cuff.
6. If there are any problems during the blood pressure measurements or the measurement is disturbed for any reason, press the **STOP** button and start the procedure again. If the respondent has to get up to do something, then ask them to sit and rest for five minutes again.

### **Error readings**

They appear on the LCD display:

**Er1, Er2.** Check that the tube connecting the cuff to the monitor is properly inserted and it is not bent. Check that the cuff is properly wrapped around the arm. Repeat the measurement.

**Er3.** Check that the tube connecting the cuff to the monitor is not bent. Repeat the measurement.

**Er4.** This could be because of a motion artefact. Ask the respondent to sit as still as possible and take the measurement again. If you still get another Er4 error reading, it could be because the respondent has a very high blood pressure. Set the P-SET Volume to 260 and repeat the measurement.

**Er5, Er6.** Check that the cuff is properly wrapped around the arm. Repeat the measurement.

If any of these errors readings persist, record that it wasn't possible to get a reading and explain to the respondent that this sometimes happens. Then contact Brentwood and inform them that there is a problem with the monitor.

**Er7, Er8.** Check that the respondent does not move, ask the respondent to sit as still as possible and take the measurement again. If you still get an error reading the pulse may be irregular. Do NOT palpate the pulse. Record that it wasn't possible to get a reading and explain to the respondent that this sometimes happens.

**Er9.** Technical fault. Contact Brentwood immediately and inform them that there is a problem with the monitor.

### **CAPi:**

**Readings** - Record the blood pressure readings in the order shown on the screen. Double check each entry as you make it to ensure you have correctly entered the reading. If you have got to this point and then become aware that you are not going to be able to get a reading after all, you should enter '996' then press <End>. This will automatically enter '999' in each box, to save you having to type it in 12 times. Blood pressure readings given

by the Omron are systolic blood pressure, diastolic blood pressure and pulse: the Omron does not give MAP. **NAttBP** - If you failed to get a reading, or you only managed to obtain one or two readings, enter a code to show what the problem was. If necessary, write in full details at *OthNBP*.

### **Feedback to respondents**

Offer the respondent his/her blood pressure readings. If (s)he would like them, enter them on the Measurement Record Card (MRC). If an adult respondent has a raised blood pressure you must give her/him advice based on the result. This will be calculated by the computer and will appear on the screen for you to read out exactly as written. Write any advice given onto the MRC. The interviewer should have given them a MRC with the height and weight recorded on it. If the respondent has lost it, or claims never to have had one, make out a new one, ensuring the name is on the front of the card.

It is not the purpose of this survey to provide respondents with medical advice. Nevertheless, many respondents will ask you what their blood pressure readings mean. Make sure you are very familiar with the guidance below. We wish it to be strictly followed. It is very important that as little anxiety as possible is caused but at the same time we have a duty to advise people to see their GPs if blood pressure is raised.

#### **a) Child respondents (aged 4 to 15)**

We do not wish you to comment on the child's blood pressure readings to the parents. If they seek comment, reiterate what you have already said about not being able to interpret a single blood pressure measurement without checking to see whether it is normal for the child's age and height. Reassure them that if it is found to be abnormal, the Survey Doctor will get in touch with them or their child's GP, if they give permission for the results to be sent to their child's GP, and advise them as to what steps they should take. This rule applies for **all** readings you obtain.

#### **b) Adult respondents (aged 16+)**

In answering queries about an adult's blood pressure it is very IMPORTANT to remember that it is not the purpose of the survey to provide respondents with medical advice, nor are you in a position to do so as you do not have the respondent's full medical history. But you will need to say something. What you say in each situation has been agreed with the survey doctor. The computer screen will tell you what to say in each situation. It is very important that **you make all the points relevant to the particular situation and that you do not provide a more detailed interpretation as this could be misleading**. Read the information below very carefully and make sure you always follow these guidelines. This information will be based on the highest systolic and highest diastolic reading from the last two readings. This will usually, but not always, be from the same reading. For example, occasionally it may be the systolic from the second reading and the diastolic from the third reading.

Definitions of raised blood pressure differ slightly. We are using the ones given below for this survey. They are the same as those used in the Health Survey for England. It is important that you adhere to these definitions, so that all respondents are treated in an identical manner. These are shown below.

ADULTS ONLY			
SURVEY DEFINITION OF BLOOD PRESSURE RATINGS			
For men and women aged 16+			
<u>Rating</u>	<u>Systolic</u>		<u>Diastolic</u>
Normal	<140	and	<85
Mildly raised	140 - 159	or	85 – 99
Raised	160 - 179	or	100 – 114
Considerably raised	180 or more	or	115 or more

*Points to make to a respondent about their blood pressure (given on screen):*

**Normal:**

'Your blood pressure is normal'

**Mildly raised:**

'Your blood pressure is a bit high today.'

'Blood pressure can vary from day to day and throughout the day so that one high reading does not necessarily mean that you suffer from high blood pressure.'

'You are advised to visit your GP within 2 months to have a further blood pressure reading to see whether this is a once-off finding or not.'

**Raised:**

'Your blood pressure is a bit high today.'

'Blood pressure can vary from day to day and throughout the day so that one high reading does not necessarily mean that you suffer from high blood pressure.'

'You are advised to visit your GP within 2 weeks to have a further blood pressure reading to see whether this is a once-off finding or not.'

**Considerably raised:**

'Your blood pressure is high today.'

'Blood pressure can vary from day to day and throughout the day so that one high reading does not necessarily mean that you suffer from high blood pressure.'

'You are strongly advised to visit your GP within 5 days to have a further blood pressure reading to see whether this is a once-off finding or not.'

**Note:** If the respondent is elderly and has considerably raised blood pressure, amend your advice so that they are advised to contact their GP within the next week or so about this reading. This is because in many cases the GP will be well aware of their high

blood pressure and we do not want to worry the respondent unduly. It is however important that they do contact their GP about the reading within 7 to 10 days. In the meantime, we will have informed the GP of their result (providing the respondent has given their permission).

### Action to be taken by the nurse after the visit

If you need to contact the Survey Doctor, do not do this from the respondent's home - you will cause unnecessary distress.

#### a) Children

No further action is required after taking blood pressure readings on children. All high readings are viewed routinely by the Survey Doctor. However, in the rare event that you encounter a child with a very high blood pressure, i.e. systolic 160 or above or diastolic 100 or above please call the Survey Doctor.

#### b) Adults

The chart on the next page summarises what action you should take as a result of the knowledge you have gained from taking an adult's blood pressure readings. For this purpose you should only take into account **the last two of the three readings** you take. We do not want you to use the first reading as it is prone to error for the reason stated above.

BLOOD PRESSURE	ACTION
<b>Normal/mildly raised/raised BP</b> <i>2<sup>nd</sup> or 3<sup>rd</sup> reading:</i> Systolic less than 180 mmHg <b>and</b> Diastolic less than 115 mmHg	No further action necessary  If you feel that the circumstances demand further action, inform the Survey Doctor who will then inform the respondent's GP urgently if she deems it necessary.**
<b>Considerably raised BP</b> <i>2<sup>nd</sup> or 3<sup>rd</sup> reading:</i> Systolic at or greater than 180 mmHg <b>or</b> Diastolic at or greater than 115 mmHg	Contact the Survey Doctor at the earliest opportunity and she will inform the respondent's GP.**  If the respondent has any symptoms of a hypertensive crisis* call an ambulance immediately. The Survey Doctor must be informed at a later stage.

\* A hypertensive crisis is an extremely rare complication of high blood pressure. Its signs and symptoms include diastolic bp > 135 mmHg, headache, confusion, sleepiness, stupor, visual loss, seizures, coma, cardiac failure, oliguria, nausea & vomiting.

\*\* You must still contact the Survey Doctor even if respondents tell you that their GP knows about their raised BP.

All high or unusual readings will be looked at by the Survey Doctor when they reach the office. If the reading is high, then the Survey Doctor will contact the respondent directly.

In all instances, follow the protocol.

## 7. INFANT LENGTH MEASUREMENT

The measurement is taken for children aged under two years.

### Introduction

The infant length measurement, when taken in conjunction with other growth parameters, can be used as an indicator of an infant's nutritional status. Taking this measurement across many years allows trends in infant length to be monitored and provides a means for the evaluation of current policies, interventions and treatments relating to infant health and nutrition.

### Equipment

You will need:

- A Rollameter baby measure mat
- A Frankfort Plane card
- Antibacterial /viral wipes



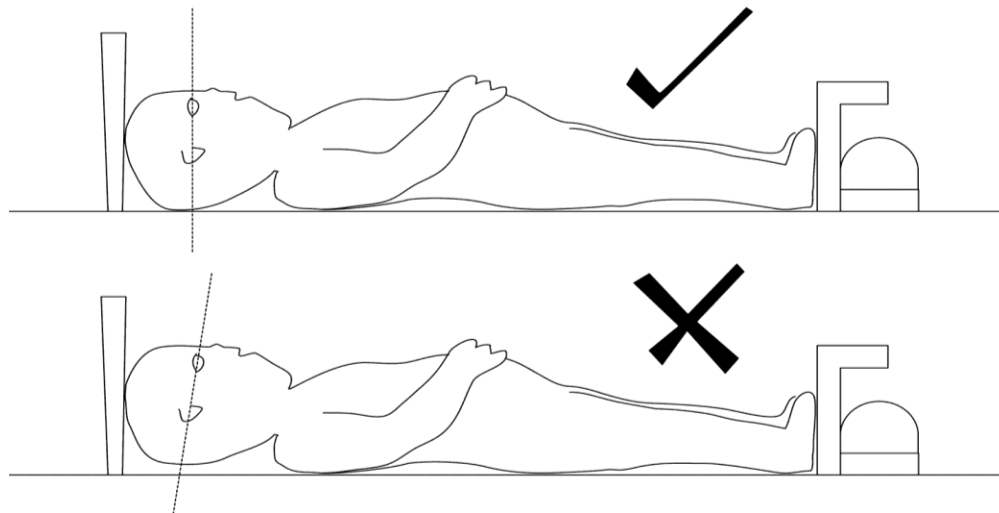
### Preparing the respondent

Explain to the parent or legal guardian of the infant the reason for taking the length measurement. Further explain that you will need their assistance in taking this measure and how they can help.

### Procedure

1. Ask the parent to remove any bulky clothing or shoes that the infant is wearing as it may result in an inaccurate measurement. It is not necessary for them to remove the infant's nappy.
2. Unroll the Rollameter and lay it flat on any suitable flat, firm surface, preferably the floor. It is essential that the Rollameter is fully unrolled and as flat as possible, therefore doing the measurement on a deep pile carpet or rug is not appropriate. If the carpet is too thick, take the measurement in another uncarpeted room, e.g. kitchen or bathroom.
3. Wipe the surface of the Rollameter with a Milton Wipe and allow to dry for 30 secs.
4. The measurement can be taken with the infant on a Rollameter on a raised surface, e.g. a table, ONLY if the baby is held by an adult at all times, even if the baby has never previously rolled over.

4. Place the child on the foam bed of the Rollameter with his/her head touching the headpiece on which the name Rollameter is printed.
5. Move the child's head so that Frankfort Plane is in a position at right angles to the floor/table. The Frankfort Plane is an imaginary line passing through the external ear canal and across the top of the lower bone of the eye socket, immediately under the eye (see Figure 1). This position is important if an accurate reading is to be obtained. Ask the parent to hold the child in this position and make sure their head is in contact with the headpiece.



**Figure 1 The infant Frankfort Plane**

6. Straighten the child's legs by holding the legs by the ankles with one hand and applying a gentle downward pressure.
7. With your free hand, move the footrest on which the measuring tape is mounted to touch the child's heels by depressing the red button on the tape measure.
8. The measurement is read from the red cursor in the tape window. The measurement is recorded in centimetres and millimetres to the nearest millimetre. If the measurement lies between two millimetres then you should round to the **nearest even millimetre** (see section 2.4)
9. Wipe Rollamat with Milton wipe before placing back into carry pot.



## 8. SURVEY DOCTOR CONTACT DETAILS

### Year 10

In Year 10, the following instruction was provided to the fieldworkers:

The Survey Doctor is **Dr. Sumantra Ray** of the MRC Epidemiology Unit in Cambridge. He is available on XXXX during working hours. Out of office hours, Dr. Ray has a mobile phone (on which you can leave a message, if necessary), phone no. XXXX. His phone is not switched on all the time but he will usually check for messages and call back within a couple of hours. You are likely to need to speak to a doctor more urgently than that only in circumstances in which you should be calling an ambulance.

If you need to leave a message, leave the following details:

- Your name
- Contact telephone number
- The survey
- Briefly, the type of problem
- If you want the Survey Doctor to ring you back at a specific time etc, leave those details as well.

Do not hesitate to contact Dr Ray whenever you feel you need advice about what to do after seeing a respondent. If you need to speak with the Survey Doctor in the evening please try to do so before 10 pm.

If you cannot make contact with Dr. Ray, speak to XXXX, who will contact her on your behalf.

When Dr Ray will be unavailable for more than a couple of hours (e.g. annual leave), she will divert her calls to XXX (another doctor in the same department) or another doctor. Just dial Dr Ray's mobile phone number as usual but do not be surprised if XXXX or someone else answers on occasion.

### Year 11

In Year 11, fieldworkers requiring advice about a respondent were instructed to telephone the clinicians/NDNS Survey co-ordinator at the MRC Epidemiology Unit (Monday – Friday, 9am – 5pm).