THE NATIONAL
CHILDREN'S
STUDY
HEALTH   GROWTH   ENVIRONMENT

Physical Measures Child Blood Pressure Instrument

Event:	12- and 24- Month
Participant:	Child
Domain:	Physical Measures
Type of Document:	Data Collection Instrument
Allowable Mode:	In Person
Allowable Method:	CAPI
Recruitment Groups:	EH, PB, HI
Version:	1.0
Release:	MDES 3.0

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Physical Measures Child Blood Pressure Instrument

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Physical Measures Child Blood Pressure Instrument

(TIME_STAMP_BP_ST) PROGRAMMER INSTRUCTION:
- INSERT DATE/TIME STAMP

BP001. Thank you for agreeing to participate in the National Children's Study. I'd like to collect {C_FNAME/the child}'s blood pressure information.

DATA COLLECTOR INSTRUCTIONS:
- EXPLAIN THE BLOOD PRESSURE PROTOCOL TO THE PARENT OR CAREGIVER.
- IF THE PARENT OR CAREGIVER REFUSED THE BLOOD PRESSURE MEASUREMENTS, SELECT REFUSED. OTHERWISE, SELECT CONTINUE.

>   CONTINUE...................................... 1   **(RESP_REL)**
>   REFUSED...................................... -1

PROGRAMMER INSTRUCTIONS:
- IF **C_FNAME** COLLECTED DURING PREVIOUS INTEVIEW AND VALID RESPONSE PROVIDED, PRELOAD **C_FNAME**.
- OTHERWISE, IF **C_FNAME** NOT COLLECTED DURING PREVIOUS INTERVIEW OR VALID RESPONSE NOT PROVIDED, DISPLAY "the child".
- PRELOAD PARTICIPANT DATE OF BIRTH. SET AS **CHILD_DOB**.
- PRELOAD PARTICIPANT SEX; SET AS **CHILD_SEX**.

BP002/(BP_REF_REASON). I am sorry that you have chosen not to participate in this activity. Can you please tell me why?

>   CONCERN ABOUT DISCOMFORT...1 **(BP_END_REF)**
>   CHILD SICK..2 **(BP_END_REF)**
>   CHILD TIRED/UNHAPPY...3
>   OTHER ....-5
>   REFUSED..-1 **(BP_END_REF)**
>   DON'T KNOW..-2 **(BP_END_REF)**

BP003/(BP_REF_REASON_OTH).

>   SPECIFY:_____

>   REFUSED..-1 **(BL2000)**
>   DON'T KNOW..-2 **(BL2000)**

BP004/(BP_END_REF). That's fine. Thank you for your time.

PROGRAMMER INSTRUCTION:
- GO TO **TIME_STAMP_BP_ET.**

BP005/(RESP_REL). WHAT IS THE RELATIONSHIP OF THE PARENT OR CAREGIVER TO CHILD?

MOTHER..1 **(BP_ARM_USED)**
FATHER..2 **(BP_ARM_USED)**
OTHER...-5

BP010/(RESP_REL_OTH).

SPECIFY_____

PROGRAMMER INSTRUCTION:
- LIMIT TEXT TO 255 CHARACTERS.

BP015/(BP_ARM_USED). RECORD ARM USED TO MEASURE BLOOD PRESSURE.

RIGHT……………………………1
LEFT………………………….......2
REFUSED………………………..-1 **(BP_MEAS_REASON)**
COULD NOT OBTAIN………….…-2 **(BP_MEAS_REASON)**

PROGRAMMER INSTRUCTIONS:
- IF **AN_UP_ARM_CIR** COLLECTED PREVIOUSLY AND VALID RESPONSE PROVIDED, PRELOAD FROM ANTHROPOMETRY MODULE AND GO TO **BP_CUFF_SIZE_CALC**.
- OTHERWISE, IF **AN_UP_ARM_CIR** NOT COLLECTED PREVIOUSLY OR VALID RESPONSE NOT PROVIDED, GO TO **BP_HUMERUS_LTH**.

BP020/(BP_HUMERUS_LTH). HUMERUS LENGTH.

|___|___|. |___| CM

REFUSED………………………..-1 **(BP_MEAS_REASON)**
COULD NOT OBTAIN………….…-2 **(BP_MEAS_REASON)**

PROGRAMMER INSTRUCTION:
- IF MEASUREMENT IS <0 OR > 80 CM, DISPLAY HARD EDIT.

DATA COLLECTOR INSTRUCTION:
- UPPER ARM CIRCUMFERENCE NOT AVAILABLE FROM ANTHROPOMETRY EXAM. OBTAIN HUMERUS LENGTH NOW.

BP025/(BP_MID_HUMERUS_LENGTH).

PROGRAMMER INSTRUCTIONS:
- CREATE DERIVED VARIABLE **BP_MID_HUMERUS_LENGTH** WHERE **BP_MID_HUMERUS _LENGTH** = **BP_ HUMERUS_LENGTH**/2 AND STORE AS **BP_MID_HUMERUS_LENGTH.**
- DISPLAY **BP_MID_HUMERUS _LENGTH**.

BP030/(BP_UP_ARM_CIRC_MEAS). UPPER ARM CIRCUMFERENCE, MEASURED AT THE MIDPOINT OF THE HUMERUS.

|___|___|. |___| CM

REFUSED………………………..-1 **(BP_MEAS_REASON)**
COULD NOT OBTAIN….……..….-2 **(BP_MEAS_REASON)**

DATA COLLECTOR INSTRUCTION:
- TAKE UPPER ARM CIRCUMFERENCE AT THE HUMERUS MIDPOINT.

PROGRAMMER INSTRUCTION:
- DISPLAY MIDPOINT OF HUMERUS.
- REFER TO APPENDIX A (ANTHROPOMETRY EDIT RANGES) IN CHILD ANTHROPOMETRY INSTRUMENT:
  - o IF MEASUREMENT FALLS OUTSIDE MINIMUM OR MAXIMUM EXPECTED UPPER ARM CIRCUMFERENCE BASED ON AGE AND GENDER, DISPLAY SOFT EDIT.
  - o IF MEASUREMENT IS < 0 OR > 70 CM, DISPLAY HARD EDIT.

BP035/(BP_CUFF_SIZE_CALC). DETERMINE APPROPRIATE BLOOD PRESSURE CUFF SIZE.

PROGRAMMER INSTRUCTIONS:
- IF **BP_UP_ARM_CIRC_MEAS** $\leq$ 8 CM, DISPLAY RECOMMENDED CUFF SIZE AS "COULD NOT OBTAIN", CODE **BP_CUFF_SIZE_USED** AS -2, AND GO TO **BP_MEAS_REASON**.
- IF **BP_UP_ARM_CIRC_MEAS** $\geq$ 8 CM AND $\leq$ 11.9 CM, **BP_CUFF_SIZE** = "INFANT"
- IF **BP_UP_ARM_CIRC_MEAS** $\geq$ 12 CM AND $\leq$ 16.9 CM, **BP_CUFF_SIZE** = "CHILD"
- IF **BP _UP_ARM_CIRC_MEAS** $\geq$ 17 CM AND $\leq$ 21.9 CM, **BP_CUFF_SIZE** = "SMALL ADULT"
- **IF BP_ UP_ARM_CIRC_MEAS** $\geq$ 22 CM AND $\leq$ 29.9 CM, **BP_CUFF_SIZE = "**ADULT"
- **IF BP_ UP_ARM_CIRC_MEAS** $\geq$ 30 CM AND $\leq$ 37.9 CM, **BP_CUFF_SIZE = "**LARGE ADULT"
- **IF BP_ UP_ARM_CIRC_MEAS** $\geq$ 38 CM AND $\leq$ 50 CM, **BP_CUFF_SIZE = "**THIGH"
- **IF BP_UP_ARM_CIRC_MEAS** $\geq$ 50 CM, DISPLAY RECOMMENDED CUFF SIZE AS "COULD NOT OBTAIN", CODE **BP_CUFF_SIZE_USED** AS -2, AND GO TO **BP_MEAS_REASON.**
- DISPLAY RECOMMENDED CUFF SIZE.

BP040/(BP_CUFF_SIZE_USED). SELECT BLOOD PRESSURE CUFF SIZE USED FOR MEASUREMENTS.

INFANT..1
CHILD...2
SMALL ADULT................................3
ADULT..4
LARGE ADULT...............................5
THIGH...6
COULD NOT OBTAIN......................-2

DATA COLLECTOR INSTRUCTION:
- SELECT CUFF SIZE USED.

PROGRAMMER INSTRUCTIONS:
- FOR **(BP_SYS_MEAS1)(BP_DIA_MEAS1)(BP_PULSE_MEAS1)**, **(BP_SYS_MEAS2)(BP_DIA_MEAS2)(BP_PULSE_MEAS2)**, AND **(BP_SYS_MEAS3)(BP_DIA_MEAS3)(BP_PULSE_MEAS3)** BELOW:
  - o IF THE DIFFERENCE BETWEEN THE SYSTOLIC AND DIASTOLIC IS LESS THAN 20, DISPLAY MESSAGE "THE DIFFERENCE BETWEEN THE SYSTOLIC BP AND DIASTOLIC BP IS LESS THAN 20 MMHG. ARE YOU SURE?"
    - ▪ REQUIRE SELECTION OF YES/NO TO THIS QUESTION.
      - IF YES IS SELECTED, ACCEPT THE VALUE AND GO TO NEXT FIELD.
      - IF NO SELECTED, DISPLAY MESSAGE "PLEASE ENTER A CORRECTED VALUE FOR SYSTOLIC BP AND/OR DIASTOLIC BP." ALLOW ENTRY IN SYSTOLIC AND/OR DIASTOLIC FIELDS.
  - o IF THE DIFFERENCE BETWEEN SYSTOLIC AND DIASTOLIC BP IS GREATER THAN 100, DISPLAY MESSAGE "THE DIFFERENCE BETWEEN THE SYSTOLIC BP AND DIASTOLIC BP IS GREATER THAN 100 MMHG. ARE YOU SURE?"
    - ▪ REQUIRE SELECTION OF YES/NO TO THIS QUESTION.
      - IF YES IS SELECTED, ACCEPT THE VALUE AND GO TO NEXT FIELD.
      - IF NO SELECTED, DISPLAY MESSAGE "PLEASE ENTER A CORRECTED VALUE FOR SYSTOLIC BP AND/OR DIASTOLIC BP." ALLOW ENTRY IN SYSTOLIC AND/OR DIASTOLIC FIELDS.
  - o IF SYSTOLIC OR DIASTOLIC BP IS > 290, DO NOT ACCEPT THIS VALUE. DISPLAY MESSAGE "THIS VALUE IS NOT WITHIN ACCEPTABLE LIMITS. PLEASE ENTER A VALUE WITHIN THE ACCEPTABLE RANGE (<290)." REQUIRE SELECTION OF "OK" TO CONFIRM MESSAGE WAS READ. ALLOW NEW ENTRY IN THAT FIELD.
  - o IF DIASTOLIC BP IS GREATER THAN THE SYSTOLIC BP, DISPLAY MESSAGE "DIASTOLIC BP MUST BE LESS THAN SYSTOLIC BP. PLEASE ENTER A VALUE WITHIN THE ACCEPTABLE RANGE." REQUIRE SELECTION OF "OK" TO CONFIRM MESSAGE WAS READ. ALLOW NEW ENTRY IN SYSTOLIC AND/OR DIASTOLIC FIELDS.

o IF SYSTOLIC BP = -1 OR -2, DO NOT ACCEPT A VALUE FOR DIASTOLIC BP. DISPLAY MESSAGE "PLEASE ENTER A VALUE FOR SYSTOLIC BP." REQUIRE SELECTION OF "OK" TO CONFIRM MESSAGE WAS READ. ALLOW NEW ENTRY IN THAT FIELD.

o IF SYSTOLIC BP IS ZERO, DO NOT ACCEPT THIS VALUE. DISPLAY MESSAGE "SYSTOLIC BP CANNOT EQUAL ZERO. PLEASE ENTER A VALUE WITHIN THE ACCEPTABLE RANGE OR SELECT COULD NOT OBTAIN." REQUIRE SELECTION OF "OK" TO CONFIRM MESSAGE WAS READ. ALLOW NEW ENTRY IN THAT FIELD.

BP045/(BP_SYS_MEAS1)(BP_DIA_MEAS1)(BP_PULSE_MEAS1). RECORD BLOOD PRESSURE 1 MEASUREMENTS.

SYSTOLIC: |___|___|___| mmHg
DIASTOLIC: |___|___|___| mmHg
PULSE: |___|___|___| BPM

REFUSED………………………..-1 **(BP_MEAS_REASON)**
COULD NOT OBTAIN……….....…-2 **(BP_MEAS_REASON)**

DATA COLLECTOR INSTRUCTION:
- OBTAIN FIRST SET OF BLOOD PRESSURE MEASUREMENTS.

BP050/(BP_POSITION_MEAS1). RECORD THE CHILD'S POSITION FOR BLOOD PRESSURE MEASUREMENTS 1.

SEATED...1
SUPINE...2
UPRIGHT...3

BP055/(BP_STATE_MEAS1). RECORD THE CHILD'S STATE FOR BLOOD PRESSURE MEASUREMENTS 1.

AWAKE..1
SLEEPING.......................................2
CRYING...3

BP060/(BP_SYS_MEAS2)(BP_DIA_MEAS2)(BP_PULSE_MEAS2). RECORD BLOOD PRESSURE 2 MEASUREMENTS.

SYSTOLIC: |___|___|___| mmHg
DIASTOLIC: |___|___|___| mmHg
PULSE: |___|___|___| BPM

REFUSED………………………..-1 **(BP_MEAS_REASON)**
COULD NOT OBTAIN……….....…-2 **(BP_MEAS_REASON)**

DATA COLLECTOR INSTRUCTION:
- OBTAIN SECOND SET OF BLOOD PRESSURE MEASUREMENTS.

BP065/(BP_POSITION_MEAS2). RECORD THE CHILD'S POSITION FOR BLOOD PRESSURE MEASUREMENTS 2.

      SEATED..1
      SUPINE..2
      UPRIGHT..3

BP070/(BP_STATE_MEAS2). RECORD THE CHILD'S STATE FOR BLOOD PRESSURE MEASUREMENTS 2.

      AWAKE..1
      SLEEPING......................................2
      CRYING..3

BP075/(BP_SYS_MEAS3)(BP_DIA_MEAS3)(BP_PULSE_MEAS3). RECORD BLOOD PRESSURE 3 MEASUREMENTS.

      SYSTOLIC: |___|___|___| mmHg
      DIASTOLIC: |___|___|___| mmHg
      PULSE: |___|___|___| BPM

      REFUSED………………………..-1 **(BP_MEAS_REASON)**
      COULD NOT OBTAIN…………..-2 **(BP_MEAS_REASON)**

DATA COLLECTOR INSTRUCTION:
- OBTAIN THIRD SET OF BLOOD PRESSURE MEASUREMENTS.

BP080/(BP_POSITION_MEAS3). RECORD THE CHILD'S POSITION FOR BLOOD PRESSURE MEASUREMENTS 3.

      SEATED..1
      SUPINE..2
      UPRIGHT..3

BP085/(BP_STATE_MEAS3). RECORD THE CHILD'S STATE FOR BLOOD PRESSURE MEASUREMENTS 3.

      AWAKE..1 **(BP_CALC)**
      SLEEPING......................................2 **(BP_CALC)**
      CRYING..3 **(BP_CALC)**

BP090/(BP_MEAS_REASON). ENTER THE REASON YOU COULD NOT OBTAIN THE BLOOD PRESSURE MEASURES.

REFUSAL... 1 **(BP_CALC)**
LANGUAGE ISSUE, SPANISH................................... 2 **(BP_CALC)**
LANGUAGE ISSUE, NON SPANISH......................... 3 **(BP_CALC)**
PARTICIPANT ILL/ EMERGENCY............................. 4 **(BP_CALC)**
NO TIME... 5 **(BP_CALC)**
EQUIPMENT FAILURE... 6 **(BP_CALC)**
SAFETY EXCLUSION.. 7 **(BP_CALC)**
PHYSICAL LIMITATION.. 8 **(BP_CALC)**
PULSE NOT OBLITERATRED.................................. 9 **(BP_CALC)**
TECHNICIAN ERROR..10 **(BP_CALC)**
OTHER..-5

BP095/(BP_MEAS1_REASON_OTH)

SPECIFY _____

REFUSED.. -1
DON'T KNOW.. -2

BP115/(BP_CALC). AVERAGE SYSTOLIC BLOOD PRESSURE, DIASTOLIC BLOOD PRESSURE, AND PULSE.

DATA COLLECTION INSTRUCTION:
- COMPLETE THE REPORT OF FINDINGS USING DISPLAYED INFORMATION.
- GIVE REPORT OF FINDINGS TO PARENT/CAREGIVER.

PROGRAMMER INSTRUCTIONS:
- CALCULATE THE AVERAGE PULSE RATE, SYSTOLIC AND DIASTOLIC BLOOD PRESSURE FOR THE REPORT OF FINDINGS AS FOLLOWS:
  - o IF 3 VALUES COLLECTED FOR MEASURE:
    - ▪ IGNORE THE FIRST SET OF VALUES AND CALCULATE THE AVERAGE FOR THE REMAINING 2 SETS OF MEASURES.
  - o IF 2 VALUES COLLECTED FOR MEASURE:
    - ▪ USE THE SECOND VALUE AS THE AVERAGE.
  - o OTHERWISE, IF 1 VALUE COLLECTED FOR MEASURE:
    - ▪ USE THAT VALUE AS THE AVERAGE.
  - o DO NOT USE VALUES OF "COULD NOT OBTAIN" OR "REFUSED" IN THE AVERAGES.
  - o IF THERE ARE NO VALUES WHICH ARE <u>NOT</u> "COULD NOT OBTAIN" OR "REFUSED" THE AVERAGE SHOULD BE SET TO "COULD NOT OBTAIN."
- SAVE SYSTOLIC BLOOD PRESSURE AVERAGE AS **BP_SYS_AVG**.
- SAVE DIASTOLIC BLOOD PRESSURE AVERAGE AS **BP_DIA_AVG**.
- SAVE PULSE AVERAGE AS **BP_PULSE_AVG**.
- IF VALID MEASURE CALCULATED, DISPLAY **BP_SYS_MEAS_AVG, BP_DIA_MEAS_AVG,** AND **BP_PULSE_MEAS_AVG.**
- IF VALID MEASURE COULD NOT BE OBTAINED, DISPLAY "COULD NOT BE OBTAINED" AND THEN GO TO **BP125**.

BP120/(BP_REFERRAL_LEVEL). BLOOD PRESSURE REFERRAL LEVEL.

PROGRAMMER INSTRUCTIONS:
- CREATE CATEGORY AND REFFERAL LEVEL BASED ON INSTRUCTIONS IN APPENDICES A THROUGH G:
  - o IF REFERRAL CATEGORY =1, DISPLAY, "IN THE REPORT OF FINDINGS CHECK BOX 'IS WITHIN NORMAL RANGE'"AND 'NO ACTION IS NEEDED.'" PLEASE NOTE THAT THERE IS NO REFERRAL LETTER."
  - o IF REFERRAL CATEGORY = 2, DISPLAY, "IN THE REPORT OF FINDINGS CHECK BOX 'NORMAL BUT AT THE HIGH END OF NORMAL'AND 'DISCUSS THESE FINDINGS WITH A HEALTH CARE PROVIDER AT NEXT VISIT.' PLEASE NOTE THAT THERE IS NO REFERRAL LETTER.'"
  - o IF REFERRAL CATEGORY = 3, DISPLAY, "IN REPORT OF FINDINGS CHECK BOX 'HIGH' AND 'SEE A HEALTH CARE PROVIDER WITHIN 2 WEEKS.'' GIVE PARENT/CAREGIVER A REFERRAL LETTER."
  - o IF REFERRAL CATEGORY = 4, DISPLAY, "IN REPORT OF FINDINGS CHECK BOX 'VERY HIGH' AND 'SEE A HEALTH CARE PROVIDER IMMEDIATELY.' GIVE PARENT/CAREGIVER A REFERRAL LETTER."
  - o IF REFERRAL CATEGORY = N/A, DISPLAY "IN REPORT OF FINDINGS CHECK BOX "N/A" AND DO NOT CHECK A RECOMMENDED ACTION BOX. PLEASE NOTE THAT THERE IS NO REFERRAL LETTER."

BP125. Thank you for having {CHILD'S NAME/the child} complete these blood pressure measures.

(TIME_STAMP_BP_ET) PROGRAMMER INSTRUCTION:
- INSERT DATE/TIME STAMP

APPENDIX A: BP SPECS- PROGRAMMER'S INSTRUCTIONS
FOR ROF AND REFERRALS

IF **CHILD_SEX** = 1:
- IF VALID RESPONSE PROVIDED FOR **AN_RECUMB_LENGTH_MEAN**, CALCULATE CHILD'S AGE USING CURRENT DATE AND **CHILD_DOB** AND THEN CHECK CHILD'S AGE AND **AN_RECUMB_LENGTH_MEAN** AGAINST APPENDIX B, APPENDIX C, AND TABLE A-1 (REFERRAL TABLE).
- OTHERWISE, IF VALID RESPONSE NOT PROVIDED FOR **AN_RECUMB_LENGTH_MEAN**, CALCULATE CHILD'S AGE USING CURRENT DATE AND **CHILD_DOB** AND THEN CHECK CHILD'S AGE AGAINST APPENDIX D AND TABLE A-1 (REFERRAL TABLE).

IF **CHILD_SEX** = 2 OR 3:
- IF VALID RESPONSE PROVIDED FOR **AN_RECUMB_LENGTH_MEAN**, CALCULATE CHILD'S AGE USING CURRENT DATE AND **CHILD_DOB** AND THEN CHECK CHILD'S AGE AND **AN_RECUMB_LENGTH_MEAN** AGAINST APPENDIX E, APPENDIX F AND TABLE A-1 (REFERRAL TABLE).
- OTHERWISE, IF VALID RESPONSE NOT PROVIDED FOR **AN_RECUMB_LENGTH_MEAN**, CALCULATE CHILD'S AGE USING CURRENT DATE AND **CHILD_DOB** AND THEN CHECK CHILD'S AGE AGAINST APPENDIX G AND TABLE A-1 (REFERRAL TABLE).

TABLE A-1. REFERRAL TABLE

Category	Statement Displayed
N/A	IN REPORT OF FINDINGS CHECK BOX "N/A" AND DO NOT CHECK A RECOMMENDED ACTION BOX. PLEASE NOTE THAT THERE IS NO REFERRAL LETTER.
Category 4	IN REPORT OF FINDINGS CHECK BOX "VERY HIGH" AND "SEE A HEALTH CARE PROVIDER IMMEDIATELY." GIVE PARENT/CAREGIVER A REFERRAL LETTER.
Category 3	IN REPORT OF FINDINGS CHECK BOX "HIGH" AND "SEE A HEALTH CARE PROVIDER WITHIN 2 WEEKS." GIVE PARENT/CAREGIVER A REFERRAL LETTER.
Category 2	IN THE REPORT OF FINDINGS CHECK BOX "NORMAL BUT AT THE HIGH END OF NORMAL"AND "DISCUSS THESE FINDINGS WITH A HEALTH CARE PROVIDER AT NEXT VISIT." PLEASE NOTE THAT THERE IS NO REFERRAL LETTER.
Category 1	IN THE REPORT OF FINDINGS CHECK BOX "IS WITHIN NORMAL RANGE" AND "NO ACTION IS NEEDED." PLEASE NOTE THAT THERE IS NO REFERRAL LETTER.

APPENDIX B: REFERALL LEVELS BASED ON AGE AND PERCENTILE LENGTH/HEIGHT, BOYS 1-2 YEARS

Boys - Age 1

Percentile of length = Less than 10 %

Systolic (mm Hg)	Diastolic (mm Hg)			
	<49	49-53	54-66	≥ 67
< 94	1	2	3	4
94-97	2	2	3	4
98-110	3	3	3	4
≥ 111	4	4	4	4

Percentile of length = 10-24 %

Systolic (mm Hg)	Diastolic (mm Hg)			
	<50	50-53	54-67	≥ 68
< 95	1	2	3	4
95-98	2	2	3	4
99-111	3	3	3	4
≥ 112	4	4	4	4

Percentile of length = 25 - 49%

Systolic (mm Hg)	Diastolic (mm Hg)			
	<51	51-54	55-68	≥ 69
< 97	1	2	3	4
97-100	2	2	3	4
101-113	3	3	3	4
≥ 114	4	4	4	4

Percentile of length = 50 - 74%

Systolic (mm Hg)	Diastolic (mm Hg)			
	<52	52-55	56-69	≥ 70
<99	1	2	3	4
99-102	2	2	3	4
103-115	3	3	3	4
≥ 116	4	4	4	4

Percentile of length = 75 - 89%

Systolic (mm Hg)	Diastolic (mm Hg)			
	<53	53-56	57-70	≥ 71
< 100	1	2	3	4
100-103	2	2	3	4
104-117	3	3	3	4
≥ 118	4	4	4	4

Percentile of length = 90 - 94%

Systolic (mm Hg)	Diastolic (mm Hg)			
	<53	53-57	58-71	≥ 72
< 102	1	2	3	4
102-105	2	2	3	4
106-118	3	3	3	4
≥ 119	4	4	4	4

Percentile of length = 95% and higher

Systolic (mm Hg)	Diastolic (mm Hg)			
	<54	54-57	58-71	≥ 72
< 103	1	2	3	4
103-105	2	2	3	4
106-119	3	3	3	4
≥ 120	4	4	4	4

Boys - Age 2

Percentile of length = Less than 10 %

Systolic (mm Hg)	Diastolic (mm Hg)			
	<54	54-58	59-71	≥ 72
< 97	1	2	3	4
97-100	2	2	3	4
101-114	3	3	3	4
≥ 115	4	4	4	4

Percentile of length = 10-24 %

Systolic (mm Hg)	Diastolic (mm Hg)			
	<55	55-58	59-72	≥ 73
< 99	1	2	3	4
99-101	2	2	3	4
102-115	3	3	3	4
≥ 116	4	4	4	4

Percentile of length = 25 - 49%

Systolic (mm Hg)	Diastolic (mm Hg)			
	<56	56-69	60-73	≥ 74
< 100	1	2	3	4
100-103	2	2	3	4
104-118	3	3	3	4
≥ 119	4	4	4	4

Percentile of length = 50 - 74%

Systolic (mm Hg)	Diastolic (mm Hg)			
	<57	57-60	61-74	≥ 75
< 102	1	2	3	4
102-105	2	2	3	4
106-118	3	3	3	4
≥ 119	4	4	4	4

Percentile of length = 75 - 89%

Systolic (mm Hg)	Diastolic (mm Hg)			
	58	58-61	61-75	≥ 76
< 104	1	2	3	4
104-107	2	2	3	4
108-120	3	3	3	4
≥ 121	4	4	4	4

Percentile of length = 90 - 94%

Systolic (mm Hg)	Diastolic (mm Hg)			
	<58	58-62	63-76	≥ 77
< 105	1	2	3	4
105-108	2	2	3	4
109-122	3	3	3	4
≥ 123	4	4	4	4

Percentile of length = 95% and higher

Systolic (mm Hg)	Diastolic (mm Hg)			
	<59	59-62	63-76	≥ 77
< 106	1	2	3	4
106-109	2	2	3	4
110-122	3	3	3	4
≥ 123	4	4	4	4

APPENDIX C: MALE LENGTH (AGE 11.5-23.5M) AND HEIGHT (AGE 24M+) PERCENTILES

		Length (Age 11.5 m - 23.5 m) or Height (Age 24 m +) Percentiles					
If age in months is greater than or =	and less than	P10 - P24	P25 - P49	P50 - P74	P75 - P89	P90 - P94	P95 - >
11.0	11.5	N/A	N/A	N/A	N/A	N/A	N/A
11.5	12.5	71.38	73.02	74.92	76.92	78.81	79.99
12.5	13.5	72.50	74.18	76.12	78.15	80.07	81.25
13.5	14.5	73.57	75.28	77.26	79.33	81.27	82.46
14.5	15.5	74.59	76.35	78.37	80.46	82.42	83.63
15.5	16.5	75.58	77.37	79.43	81.56	83.54	84.75
16.5	17.5	76.52	78.36	80.45	82.61	84.61	85.84
17.5	18.5	77.44	79.31	81.44	83.63	85.65	86.89
18.5	19.5	78.32	80.23	82.41	84.63	86.67	87.91
19.5	20.5	79.18	81.13	83.34	85.59	87.65	88.90
20.5	21.5	80.01	82.00	84.25	86.53	88.60	89.86
21.5	22.5	80.82	82.85	85.13	87.44	89.54	90.80
22.5	23.5	81.61	83.68	86.00	88.33	90.44	91.72
23.5	24	82.37	84.48	86.84	89.20	91.33	92.61
24	24.5	81.99	84.10	86.45	88.81	90.93	92.20
24.5	25.5	82.36	84.49	86.86	89.23	91.36	92.63
25.5	26.5	83.11	85.26	87.65	90.06	92.23	93.53
26.5	27.5	83.85	86.01	88.42	90.86	93.08	94.41
27.5	28.5	84.57	86.74	89.18	91.65	93.90	95.26

APPENDIX D: REFERALL LEVELS FOR BLOOD PRESSURE, BOYS 1-2 YEARS

Boys - Age 1

Systolic (mm Hg)	Diastolic (mm Hg)			
	<49	49-53	54-66	≥ 67
< 94	1	2	3	4
94-97	2	2	3	4
98-110	3	3	3	4
≥ 111	4	4	4	4

Boys - Age 2

Systolic (mm Hg)	Diastolic (mm Hg)			
	<54	54-58	59-71	≥ 72
< 97	1	2	3	4
97-100	2	2	3	4
101-114	3	3	3	4
≥ 115	4	4	4	4

APPENDIX E: BLOOD PRESSURE REFERRAL LEVELS BASED ON AGE AND PERCENTILE LENGTH/HEIGHT, GIRLS 1-2 YEARS.

Child Blood Pressure Values
Girls - Age 1

Percentile of length = Less than 10 %

Systolic (mm Hg)	Diastolic (mm Hg)			
	<52	52-55	56-69	≥ 70
< 97	1	2	3	4
97-99	2	2	3	4
100-113	3	3	3	4
≥ 114	4	4	4	4

Percentile of length = 10-24 %

Systolic (mm Hg)	Diastolic (mm Hg)			
	<53	53-56	57 - 69	≥ 70
< 97	1	2	3	4
97-100	2	2	3	4
101-113	3	3	3	4
≥ 114	4	4	4	4

Percentile of length = 25 - 49%

Systolic (mm Hg)	Diastolic (mm Hg)			
	<53	53-56	57-70	≥ 71
< 98	1	2	3	4
98-101	2	2	3	4
102-114	3	3	3	4
≥ 115	4	4	4	4

Percentile of length = 50 - 74%

Systolic (mm Hg)	Diastolic (mm Hg)			
	<54	54-57	58-70	≥ 71
< 100	1	2	3	4
100-103	2	2	3	4
103-116	3	3	3	4
≥ 117	4	4	4	4

Percentile of length = 75 - 89%

Systolic (mm Hg)	Diastolic (mm Hg)			
	<55	55-58	59-71	≥ 72
< 101	1	2	3	4
101-104	2	2	3	4
105-117	3	3	3	4
≥ 118	4	4	4	4

Percentile of length = 90 - 94%

Systolic (mm Hg)	Diastolic (mm Hg)			
	<55	55-58	59-72	≥ 73
< 102	1	2	3	4
102-105	2	2	3	4
106-118	3	3	3	4
≥ 119	4	4	4	4

Percentile of length = 95% and higher

Systolic (mm Hg)	Diastolic (mm Hg)			
	<56	56-59	60-72	≥ 73
< 103	1	2	3	4
103-106	2	2	3	4
107-119	3	3	3	4
≥ 120	4	4	4	4

Girls - Age 2

Percentile of length = Less than 10 %

Systolic (mm Hg)	Diastolic (mm Hg)			
	<57	57-60	61-74	≥ 75
< 98	1	2	3	4
98-101	2	2	3	4
102-114	3	3	3	4
≥ 115	4	4	4	4

Percentile of length = 10-24 %

Systolic (mm Hg)	Diastolic (mm Hg)			
	<58	58-61	62-75	≥ 76
< 99	1	2	3	4
99-102	2	2	3	4
103-115	3	3	3	4
≥ 116	4	4	4	4

Percentile of length = 25 - 49%

Systolic (mm Hg)	Diastolic (mm Hg)			
	<58	58-61	62-75	≥ 76
< 100	1	2	3	4
100-103	2	2	3	4
104-116	3	3	3	4
≥ 117	4	4	4	4

Percentile of length = 50 - 74%

Systolic (mm Hg)	Diastolic (mm Hg)			
	<59	59-62	63-75	≥ 75
< 101	1	2	3	4
101 - 104	2	2	3	4
105-117	3	3	3	4
≥ 118	4	4	4	4

Percentile of length = 75 - 89%

Systolic (mm Hg)	Diastolic (mm Hg)			
	<60	61-63	64-76	≥ 77
< 103	1	2	3	4
103-106	2	2	3	4
107-119	3	3	3	4
≥ 120	4	4	4	4

Percentile of length = 90 - 94%

Systolic (mm Hg)	Diastolic (mm Hg)			
	<61	61-64	65-77	≥ 78
< 104	1	2	3	4
104-107	2	2	3	4
108-120	3	3	3	4
≥ 120	4	4	4	4

Percentile of length = 95% and higher

Systolic (mm Hg)	Diastolic (mm Hg)			
	<61	61-64	65-77	≥ 78
< 105	1	2	3	4
105-108	2	2	3	4
109-121	3	3	3	4
≥ 122	4	4	4	4

APPENDIX F: FEMALE LENGTH (AGE 11.5-23.5M) AND HEIGHT (AGE 24M+) PERCENTILES

	Length (Age 11.5 m - 23.5 m) and Height (Age 24 m +) Percentiles					
If age in months is greater than or =	**and less than**	**P10 - P24**	**P25 - P49**	**P50 - P74**	**P75 - P89**	**P90 - P94**	**P95 - >**
11.0	11.5	N/A	N/A	N/A	N/A	N/A	N/A
11.5	12.5	69.45	71.23	73.19	75.11	76.82	77.84
12.5	13.5	70.59	72.41	74.40	76.36	78.10	79.14
13.5	14.5	71.69	73.53	75.56	77.56	79.33	80.39
14.5	15.5	72.74	74.62	76.68	78.71	80.52	81.59
15.5	16.5	73.76	75.66	77.76	79.83	81.67	82.76
16.5	17.5	74.74	76.68	78.80	80.91	82.78	83.90
17.5	18.5	75.69	77.66	79.81	81.95	83.86	85.00
18.5	19.5	76.62	78.61	80.80	82.97	84.91	86.07
19.5	20.5	77.52	79.53	81.76	83.96	85.94	87.11
20.5	21.5	78.39	80.43	82.69	84.93	86.93	88.13
21.5	22.5	79.24	81.31	83.60	85.87	87.91	89.12
22.5	23.5	80.07	82.17	84.48	86.79	88.86	90.10
23.5	24	80.88	83.00	85.35	87.69	89.79	91.05
24	24.5	80.52	82.64	84.98	87.31	89.41	90.66
24.5	25.5	80.92	83.04	85.40	87.75	89.86	91.13
25.5	26.5	81.74	83.89	86.29	88.68	90.84	92.12
26.5	27.5	82.54	84.73	87.16	89.59	91.77	93.08
27.5	28.5	83.32	85.53	88.00	90.46	92.68	94.01

APPENDIX G: REFERRAL LEVELS FOR BLOOD PRESSURE , GIRLS 1-2 YEARS

Girls - Age 1

Systolic (mm Hg)	Diastolic (mm Hg)			
	<52	52-55	56-69	≥ 70
< 97	1	2	3	4
97-99	2	2	3	4
100-113	3	3	3	4
≥ 114	4	4	4	4

Girls - Age 2

Systolic (mm Hg)	Diastolic (mm Hg)			
	<57	57-60	61-74	≥ 75
< 98	1	2	3	4
98-101	2	2	3	4
102-114	3	3	3	4
≥ 115	4	4	4	4