Microlife Blood Pressure Monitor Calibration

Tech ID: _____ FI Cuff: _____ FI Monitor: _____ Test Date: _____ Cuff: ADULT or LARGE ADULT

Visual Check

- TUBE HAS CRACKING? ..... Y N NO MATCHING TUBING
- TUBE HAS HOLES? ..... Y N NO MATCHING TUBING
- CUFF HAS WORN OUTER CLOTH OR VELCRO? ..... Y N NO MATCHING CUFF
- TUBE LEAKS? ..... Y N NO MATCHING TUBING
- CUFF HAS LEAKAGE OF CUFF BLADDER? ..... Y N NO MATCHING CUFF

- *COMMENTS:* _____

Calibration Check with Pressure-Vacuum Meter

Observed pressure values on the Digimano Pressure-Vacuum Meter and the Microlife from 280 to 20 (± 2) mmHg in approximate decrements of 20 (± 2) mmHg.

MEASUREMENT NUMBER	DIGIMANO	MICROLIFE
1 **(280)**	☐☐☐.☐ mmHg	☐☐☐ mmHg
2 **(260)**	☐☐☐.☐ mmHg	☐☐☐ mmHg
3 **(240)**	☐☐☐.☐ mmHg	☐☐☐ mmHg
4 **(220)**	☐☐☐.☐ mmHg	☐☐☐ mmHg
5 **(200)**	☐☐☐.☐ mmHg	☐☐☐ mmHg
6 **(180)**	☐☐☐.☐ mmHg	☐☐☐ mmHg
7 **(160)**	☐☐☐.☐ mmHg	☐☐☐ mmHg
8 **(140)**	☐☐☐.☐ mmHg	☐☐☐ mmHg
9 **(120)**	☐☐☐.☐ mmHg	☐☐☐ mmHg
10 **(100)**	☐☐☐.☐ mmHg	☐☐☐ mmHg
11 **(80)**	☐☐☐.☐ mmHg	☐☐☐ mmHg
12 **(60)**	☐☐☐.☐ mmHg	☐☐☐ mmHg
13 **(40)**	☐☐☐.☐ mmHg	☐☐☐ mmHg
14 **(20)**	☐☐☐.☐ mmHg	☐☐☐ mmHg

Equipment Required for Blood Pressure Monitor Calibration

DigiMano Digital Pressure/Vacuum Meter, Netech Model 2000 (range: 0-300 mmHg).
Blood Pressure Calibration Kit (syringe; silicone tubing; T adapter; Luer-lock; Velcro tape; valve cap)
Microlife 3MC1-PC_IB Oscillometric Blood Pressure Monitor
ADULT and LARGE ADULT blood pressure cuffs

Testing Protocol

The following sequence of steps details the Microlife accuracy testing protocol.

1. Plug in and connect the AC adapter to the Microlife.

2. Seal the pressure release hole on the back of the Microlife with Velcro tape.

3. Record Tech ID, Field Interviewer number on the cuff package (FI Cuff), Field Interviewer number on the monitor (FI Monitor), and date on the form. The FI cuff number is found on the Ziplock bag and the FI Monitor number is on the back of the monitor. Use the code of 999 if the cuff does not have a FI number.

4. Circle ADULT on the form to indicate that the ADULT cuff is being evaluated.

5. Inspect the ADULT cuff tubing for holes or cracks which would allow air to leak out. Cracking is commonly found around the connection points to the sphygmomanometer and cuff. Answer questions on form about holes and cracking.

6. Inspect the ADULT cuff for signs of wear-and-tear to the outer cloth casing and Velcro fabric. Record your evaluation on the form.

7. Attach ADULT cuff to ADULT PVC pipe and place the pipe vertically on the table. Tightly connect the ADULT cuff tubing to the Microlife. The bottom edge of the cuff should rest 1 inch (black mark) above the end of the PVC pipe. The small white arrow (Artery Mark) on the cuff should be pointing down. You should be able to fit 2 fingers between the pipe and the cuff.

8. Connect the black L adapter on the ADULT cuff to the Microlife.

9. Turn on the Microlife to inflate the ADULT cuff to determine if the bladder within the ADULT cuff is leak-proof. Answer the questions on the form about ADULT cuff damage, air leakage, and tube leakage.

10. Disconnect the ADULT cuff tubing from the Microlife.

11. Remove the black connector from the ADULT cuff tubing and put aside.

12. Holding in the black lead screw on the syringe, screw and pull the grey plunger past the 60 cc mark (to the end of the syringe). Connect the white silicone tubing to the syringe by rotating it to engage the Luer Lock.

13. Snugly connect the black ADULT cuff tubing to the Y adapter on the white silicone tubing.

14. Connect the white silicone tubing to the Microlife with the black L adapter.

15. Turn on the DigiMano. Check for the low battery light and change the battery if necessary.

16. Ensure that the red light below “mmHG” on the DigiMano is flashing, indicating that the correct measurement (millimeters of mercury) is selected.

17. Zero the pressure vacuum meter by pressing the zero button on the front of the DigiMano. The display should read 0.0.

18. Pick up the syringe and then press the ON/OFF START button on the Microlife to start the reading.

19. When the Microlife stops inflating the cuff, while watching the DigiMano, adjust the pressure in the syringe until the *DigiMano* displays a stable value near 280 mmHG (+/- 2 mmHG). If stability is a problem, examine the calibration system, listen for air leaks, and reseal the pressure release hole on the back of the Microlife with the Velcro tape.

20. Slowly release the pressure in 20 mmHG decrements according to the readings on the *DigiMano*. Coarse adjust the pressure by holding in the black lead screw and pulling or pushing the grey plunger, as needed. Fine adjust the pressure by rotating the grey plunger. Carefully record on the form the pressure readings from the DigiMano and Microlife at 20 mmHG decrements, i.e. from 280, to 260, …, to 60, and finally to 20 mmHG.

21. Disconnect the ADULT cuff from the white tubing. Place the black L adapter back in the cuff tubing. Put the ADULT cuff in the Ziplock bag.

22. Disconnect the syringe from the white silicone tubing by rotating it to disengage the Luer Lock.

23. Remove the LARGE ADULT cuff from the Ziplock bag. The LARGE ADULT cuff has a valve that needs to be sealed before taking the measurements. Seal this valve by replacing the stem and the short black tubing with a black plastic cap.

24. Using another form, record Tech ID, Field Interviewer number on the cuff package (FI Cuff), Field Interviewer number on the monitor (FI Monitor), and date on the form. The FI cuff number is found on the Ziplock bag and the FI Monitor number is on the back of the monitor. Use the code of 999 if the cuff does not have a FI number.

25. Circle LARGE ADULT on the form to indicate that the LARGE ADULT cuff is being evaluated.

26. Inspect the LARGE ADULT cuff tubing for holes or cracks which would allow air to leak out. Cracking is commonly found around the connection points to the sphygmomanometer and cuff. Answer questions on form about holes and cracking.

27. Inspect the LARGE ADULT cuff for signs of wear and tear to the outer cloth casing and Velcro fabric. Record your evaluation on the form.

28. Attach LARGE ADULT cuff to LARGE ADULT PVC pipe and place the pipe vertically on the table. Tightly connect the LARGE ADULT cuff tubing to the Microlife. The bottom edge of the cuff should rest 1 inch (black mark) above the end of the PVC pipe. The small white arrow (Artery Mark) on the cuff should be pointing down. You should be able to fit 2 fingers between the pipe and the cuff.

29. Connect the black L adapter on the LARGE ADULT cuff to the Microlife.

30. Turn on the Microlife to inflate the LARGE ADULT cuff to determine if the bladder within the LARGE ADULT cuff is leak proof. Answer the questions on the form about LARGE ADULT cuff damage, air leakage, and tube leakage.

31. Disconnect the LARGE ADULT cuff tubing from the Microlife.

32. Remove the black connector from the LARGE ADULT cuff tubing and put aside.

33. Holding in the black lead screw on the syringe, twist and pull the grey plunger past the 60 cc mark (to the end of the syringe). Connect the white silicone tubing to the syringe by rotating it to engage the Luer Lock.

34. Snugly connect the LARGE ADULT cuff black tubing to the Y adapter on the white silicone tubing.

35. Connect the white silicone tubing to the Microlife with the black L adapter.

36. Turn on the DigiMano. Check for the low battery light and change the battery if necessary.

37. Ensure that the red light below “mmHG” on the DigiMano is flashing, indicating that the correct measurement (millimeters of mercury) is selected.

38. Zero the pressure vacuum meter by pressing the zero button on the front of the DigiMano. The display should read 0.0.

39. Holding the syringe, press the ON/OFF START button on the Microlife to start the reading.

40. When the Microlife stops inflating the cuff, while watching the DigiMano, adjust the pressure in the syringe until the *DigiMano* displays a stable value near 280 mmHG (+/- 2 mmHG). If stability is a problem, examine the calibration system, listen for air leaks, and reseal the pressure release hole on the back of the Microlife with the Velcro tape.

41. Slowly release the pressure in 20 mmHG decrements according to the readings on the *DigiMano*. Coarse adjust the pressure by holding in the black lead screw and pulling or pushing the grey plunger, as needed. Fine adjust the pressure by rotating the grey plunger. Carefully record on the form the pressure readings from the DigiMano and Microlife at 20 mmHG decrements, i.e. from 280, to 260, …, to 60, and finally to 40 mmHG.

42. Disconnect the syringe from the white silicone tubing by rotating it to disengage the Luer Lock.

43. Disconnect the LARGE ADULT cuff from the white tubing. Place the black L adapter back in the cuff tubing.

44. Remove the black plastic cap from the valve on the LARGE ADULT cuff and replace it with the stem and the short black tubing.

45. Put the ADULT cuff in the Ziplock bag.

46. Remove the Velcro tape from the back of the monitor.

47. Return the Microlife to the bag, attach the cuffs, and put them in the box with the tested monitors.

NOTE: If pressure is lost during the calibration process, do the following:

1. Disconnect the syringe from the white silicone tubing by rotating it to disengage the Luer Lock.

2. Holding in the black lead screw on the syringe, twist and pull the grey plunger past the 60 cc mark (to the end of the syringe). Connect the white silicone tubing to the syringe by rotating it to engage the Luer Lock.

3. Ensure that the red light below “mmHG” on the DigiMano is flashing, indicating that the correct measurement (millimeters of mercury) is selected.

4. Zero the pressure vacuum meter by pressing the zero button on the front of the DigiMano. The display should read 0.0.

5. Holding the syringe, press the ON/OFF START button on the Microlife to start the reading.

6. Adjust the DigiMono to next pressure on the list. Continue taking the measurements.