Blood Pressure Measurement: Kent Coda 8 (Tail-Cuff) Version 2

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Abstract

Guidelines

1. Many factors can affect blood pressure (BP) measurements: first-time measurements, temperature, stress, noise and inappropriate handling.

2. Measure a minimum of 3 days and a maximum of 5 consecutive days.

3. Measure at the same time each day because BP varies according to the time of day (circadian rhythm).

Protocol

Step 1.

Turn on warming platforms. Warming platform has 3 levels of temperature control (Level 1 . 32 EC, Level 2 . 35 EC, and Level 3 . 38 EC).

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> temperature may vary. The suggested ideal temperature for the blood pressure analysis is 33 - 35 EC. Use the Infrared Thermometer to check the temperature of mouse tails. If the mouse tail is too cold, BP will not be read. Conversely, if the warming platform is too hot, mice will be stressed, and may lead to severe dehydration or even death.

Step 2.

Animal holders (three different sizes to accommodate mice): Small (10 to 25 g), Medium (25 to 50 g), and Large (50 to 100 g). Select appropriate holders for your mice.

Step 3.

Turn on the Coda 8 BP system and the computer. Open Coda 8 program on computer (Coda 8 v3 icon).

Step 4.

Test both the O-cuffs and VPR-cuffs: Run "TEST RUN" with NO mice Select all channels with test ID # and run a couple cycles. As the machine is measuring, the red (O-cuffs) and blue (VPR-cuffs) lines on each graph should intersect. If they fail to intersect, the cuffs need to be replaced. Pause the machine, change the cuff, and test again.

Load mice

Step 5.

1. Handle mice gently. Pick up mouse by the tail, place into the holder, and carefully attach the end piece as to not pinch the tail or any other body parts.
2. Thread the tail through the O-Cuff first and then through the VPR-cuff. Secure the cuffs by sliding the hose into the notch on top of the mouse holder. Adjust the position of O-Cuff on the tail to be neither too tight nor too loose.
3. Place mice in their designated positions on the warming platform.
4. Be sure to rotate mice each day in order to check the consistence of each channel. For example: On day 1, place mouse 1 on channel 1, mouse 2 on channel 2, mouse 3 on channel 3, mouse 4 on channel 4, and...... On day 2, place mouse 1 on channel 2, mouse 2 on channel 3, mouse 3 on channel 4, mouse 4 on channel 1, and......Continue this pattern f or all the mice. These rotations help to identify potential channel-specific issues.

Step 6.

Let mice stay in the holders with the tail cuffs on for at least 5 minutes. Not performing this step may lead to less successful rate of measurements. Recommend to cover mouse tails with a blanket if the environment is noisy or the temperature does not go up to certain level.

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If a mouse has a wounded or short tail, severe dermatitis, is very sick, or is extremely irritated, do not measure BP on that mouse. An over-irritated mouse (e.g. screaming, moving) may also affect other simultaneously measured mice.

Step 7.

Under Device Manager

- A. Select Coda 8 - Channels 1-8
- B. Select Use these devices
- C. Select File and choose New
- D. Under New select Experiment or Session The option of "Experiment": When you start a new experiment, enter the study name. The option of "Session": When you continue to run a same experiment, enter a session name.
- E. Type in Name of Experiment and select Researcher. Select Next.
- F. Type in Session Name. Set cycles*. Select Next.

- G. Specimen pool. Use Manage specimens to add new mice. Move mouse numbers to active specimen area. Select Next.
- H. Change cuff deflation time to 20 seconds. Select Next.
- I. Session experiment. Select Next.
- J. Experimental configuration. Select Next.
- K. Press the "Finish" button. **This Finish button will begin blood pressure measurements immediately!**

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Set cycles (F): Only measure each mouse for 20 cycles each run (acclimation cycle = 0). Same mice can only be run once (20 cycles) at the same day

During measurements

Step 8.

- A. Do not touch the mice frequently. **Remember**, the more you handle the mouse, the more upset it may be! Never leave the room while mice are on the platform.
- B. Do not touch the mouse during running. If a mouse pulls its tail free from the cuffs, pause the machine analysis and then re-thread the mouse tail. During measurements, the red line (Ocuff) is sloping downward while the blue line (VPR-cuff) line is slowly tilting up (See the Figure). These two lines should intersect. If the red line does not decline or the blue line does not incline, it indicate cuff leakage. Pause the machine, and change the leaking cuff.
- C. A run with 20 regular cycles takes approximately 15 min.

Step 9.

After finishing the run, **immediately release the mice and put them back to the cage before you do anything else.**

Step 10.

Clean mouse holders and warming platform between runs with baby wipes. Clean all areas that the mice have been in contact with. Blood, feces, and urine will upset the next group of mice. Do not use clidox, it degrades cuffs and any plastic items.

For data analysis, generally use systolic BP data

Step 11.

- A. At least 5 accepted systolic BP readings per mouse per day
- B. Standard Deviation # 30 mmHg
- C. Systolic BP measurement must be > 50 mmHg
- Also recommend to check graphs of each accepted run to ensure the measurement is grossly reliable.