Avoiding blood pressure measurement errors

John Dunn - January 01, 2018

My recent heart attack has given me a new-found interest in the topic of blood pressure and its measurement. This is the measurement device I've been using. I don't mean to recommend this one device in particular because it's merely one of several instruments I've tried and they all seem to yield pretty much the same results.
Readings are taken by wrapping the pressure cuff around the upper arm and pressing the "START" button. An air pump inflates the cuff which compresses the upper arm until blood flow is cut off. Then the cuff's air pressure is slowly released.

When the air pressure gets low enough, blood flow resumes but is pulsed with each heartbeat. That sound is detected by a microphone and the pressure threshold of that pulsing is called the "systolic" pressure. As the cuff air pressure continues to get lower, blood flow eventually stops pulsing and becomes continuous. The pulsing sound goes away and that second threshold is called the "diastolic" pressure.

The measurement process in my case has been profoundly noisy. My readings of both systolic and diastolic pressures have varied quite widely. Ergo, I have been trying to ascertain what factors may contribute to measurement error. Speaking strictly from my unassailable credentials as a total layman, I offer the following.
When you are making a measurement, don't speak! The instrument is listening for pulses of sound and if you speak, your voice may interfere with that process.

Sit comfortably in repose and do not cross your legs. I think I have noticed wider reading variations unless I am careful to get comfortable without crossing my legs and to remain still for a few minutes before taking readings.

Be sure to use the pressure cuff over a bare arm or at the most, a very thin sleeve. If you are wearing a heavy sweater or some such garment with a thick sleeve, it may muffle the pulses the instrument is trying to detect. If that happens, measurement errors may occur with the systolic reading going incorrectly lower and the diastolic reading going incorrectly higher as in the following sketch.

![Diagram of measurement process with impact of thick sleeve](image)

**Figure 2** Thick sleeve measurement error

Please share your thoughts or expertise on this subject in the comments below.
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