Name(s)

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Project Number

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Project Title

Comparison of Heart Rate Measurement Accuracy across Multiple Devices

Abstract

Objectives

The study objective was to determine the accuracy of various heart rate measurement devices such as blood pressure cuffs, wrist meters, and wearables compared to the two-finger pulse check.

Methods

Measurements using popular wearables such as the Apple iWatch (Gen. 1), Samsung Galaxy Gear S3 watch, and Fitbit Alta HR, along with the Samsung Galaxy Note 8 smartphone, an arm cuff and wrist cuff blood pressure meters were all used in the comparison. The study involved taking measurements at rest and after exercise for all subjects.

Results

None of the devices performed very consistently in measuring heart rate compared to the two-finger pulse check. The Fitbit Alta HR had the lowest percent difference against the two-finger pulse check in the at rest measurement, while the Galaxy Note 8 smartphone had the closest measurement in the after exercise measurement.

Conclusions

In summary, while these devices are useful to get a quick measurement of heart rate, they should not be relied upon to make decisions critical to health and well-being.

Summary Statement

I compared various off-the-shelf heart rate measurement devices and found that none performed consistently when compared to the two-finger pulse check.

Help Received

I came up with the idea and designed the experiments myself. I received help on understanding percent difference from my Dad.