How can a smartphone be used for haemodynamic monitoring?

The parameters of the Capstesia app are described.

After taking a photo of the arterial waveform on the monitor screen, and cropping it to the signal of interest, the picture is sent to the Capstesia server via a mobile Internet connection. The heart rate and systolic and diastolic arterial pressures are manually entered into the app to determine the cardiac output (CO). After a few seconds, the PPV and CO values (PPVCAP and COCAP) are displayed on the smartphone interface.

1. PPV(%) : across each complete screen, is calculated using the following formula:

   \[ PPV\% = 100 \times \frac{PP_{\text{max}} - PP_{\text{min}}}{(PP_{\text{max}} + PP_{\text{min}})/2}. \]

2. CO (l/min): SV x HR.

   Stroke volume is calculated as the area under the curve from each minima to the start of the following dicrotic notch x constant and taking the mean of the values obtained from all the waves analysed.
The maximum slope of the pressure curve was calculated using the curve formed by 20 points detected from the minimum of one curve (diastolic blood pressure) to the maximum (systolic blood pressure) of the next curve and taking the mean of the values obtained from all the waves analysed.

The Capstesia app has been validated in the following studies:


The Capstesia app is available on the Android store.

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