Introduction:
Capillary Refill time (CRT) is well known as an indicator of peripheral perfusion. However, it has been reported to have an intra-observer variance, partly because of manual compression and naked-eye measurement of the nailbed color change. We hypothesized that a feedback function on a CRT measurement device would lead to an accurate compression.

Methods:
We developed a novel portable CRT measurement device with an OLED display that feedbacks weather the strength of the nailbed compression is enough and counts the time. We settled the target strength and time as 5N and 5seconds according to the study we reported before [1]. 20 examiners measured CRT with and without the feedback function. The pressing strength and time during the measurement were evaluated.

Results:
There was a significant difference among the pressing strength and time between the CRT measurement using the device with and without the feedback function (strength: P<0.001; time: P<0.001). Furthermore, intra-examiner variance was significantly reduced with the feedback function (strength: P<0.001; time: P<0.001). In all measurements without the feedback function, 41% was outside the optimal strength while the measurements with the feedback function 100% achieved the targeted range. Without the feedback function, 12% could not reach the optimal time, while 100% with the feedback function did. In total, 49% of the measurements could not achieve the optimal pressing strength and time.

Conclusion:
The feedback function for CRT measurements, guiding examiners to an optimal pressing strength and time, fulfilled the required measurement conditions and reduced intra-examiner variance. Our novel portable device would assist an accurate CRT measurement regardless of personal work experience.

References: