



Intraosseous pressure readings can be obtained in healthy human volunteers” Salzman et al (2017).

Abstract:

**STUDY OBJECTIVE:** Invasively monitoring blood pressure through the IO device has not been thoroughly demonstrated. This study attempted to establish baseline values of IO pressure in a healthy human population.

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**METHODS:** This was a prospective, healthy volunteer, observational study. Participants had two IO devices placed (humerus and tibia), and participant IO pressures, vital signs, and pain scores were monitored for up to 60 minutes. Participants were contacted at 24-hours and 7 days post-testing to assess for adverse events. Summary statistics were calculated for systolic, diastolic, and mean humeral and tibial IO pressure. The ratio of IO to non-invasive blood pressure was calculated, and Bland Altman plots were created. The slope (linear) of the mean humeral and the tibial IO pressures were also calculated.

**RESULTS:** Fifteen subjects were enrolled between April and July 2015. Fourteen of 15 humeral IOs were placed successfully (93.3%) and all 15 of the tibial IOs were placed successfully.

Mean tibial systolic, diastolic, and mean IO pressure were  $55.8 \pm 27.9$ ,  $49.3 \pm 27.1$ , and  $48.4 \pm 29.4$  mm Hg, respectively. Humeral systolic, diastolic, and mean IO pressure were  $32.9 \pm 16.0$ ,  $27.4 \pm 15.2$ , and  $24.5 \pm 14.3$  mm Hg. The mean tibial IO pressure was  $52.5\% \pm 32.0\%$  of external cuff pressure ratio. The mean humeral IO pressure was  $26.5\% \pm 15.2\%$  of the external mean blood pressure. The Bland Altman plots showed an inconsistent relationship between the systolic and diastolic cuff pressure and the IO pressures. We observed a 1% per minute decrease in IO pressure from the initial placement until the final reading.

**CONCLUSIONS:** Intraosseous pressure readings can be obtained in healthy human volunteers. However, absolute IOP values were not consistent between subjects. Future research may determine how IO pressure can be used to guide therapy in ill and injured patients.

Reference:

Salzman, J.G., Loken, N.M., Wewerka, S.S., Burnett, A.M., Zagar, A.E., Griffith, K.R., Bliss, P.L., Peterson, B.K., Ward, C.J. and Frascione, R.J. (2017) Intraosseous Pressure Monitoring in Healthy Volunteers. Prehospital Emergency Care. April 18th. .

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