



# Evaluation of Pulse Oximetry, Blood Pressure Measurements Based on Sensor Location During Dental Procedures

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## BACKGROUND

- Safe treatment for pediatric patients sometimes requires use of sedation or general anesthesia (GA)<sup>1</sup>
- Proper monitoring is necessary to ensure patient safety during sedation/GA<sup>1,2,3</sup>
  - Pulse oximeters (PO): measures oxygen saturation (SpO<sub>2</sub>)
  - Non-invasive blood pressure (NIBP) cuffs: measures blood pressure
- Monitors may be interchangeably placed:
  - Blood pressure cuffs are placed either on upper arm or lower calf
  - Pulse oximeters are placed on the finger or toe, especially in children<sup>4</sup>
- Studies reporting on data of NIBP measurements taken from upper arm and lower calf in children are contradicting.<sup>5,6,7</sup>
- To our knowledge, there are no other studies comparing oxygen saturation of pulse oximeters placed on index finger and second toe in children.

## METHODS

This study has received IRB approval (11255)

- Inclusion criteria: 3-10 years old, ASA I or II, undergoing dental procedures under GA
- Exclusion criteria: not ASA I or II, taking prescribed or OTC medications, systemic condition affecting BP or SpO<sub>2</sub>, or no local anesthetic administered
- Consent and assent (7+ years) obtained

### Study Devices

- Monitors: Philips IntelliVue MP20, Dinamap Carescape
- BP: right upper arm and right lower calf
  - Proper BP cuff size determined per manufacturer guidelines
- SpO<sub>2</sub>: PO placed on left index finger and left second toe
- Following induction of GA, measurements taken every 5 minutes with patient in supine position

## RESULTS

- 50 patients met inclusion criteria
- Age range: 3-9 years old
- Arm systolic and diastolic BPs were significantly lower than calf BPs (p<.001)
- Finger SpO<sub>2</sub> was significantly lower than second toe SpO<sub>2</sub> (p<.001)
- Agreement between arm/calf and finger/second toe measurements were low, based on both the mean differences and the relatively large differences between the measurements
  - Demonstrated in Figures 1, 2, 3

## FIGURES

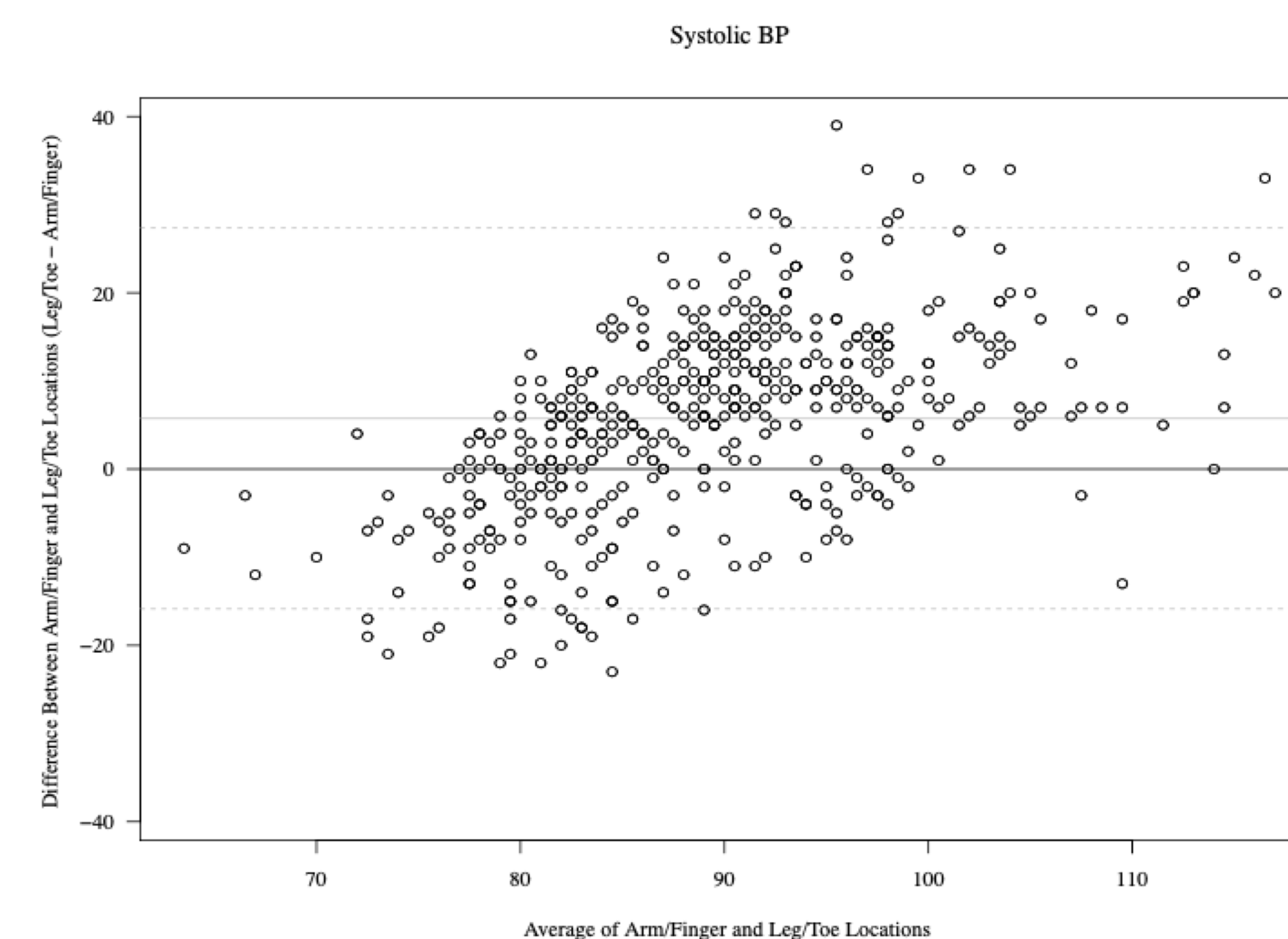


Figure 1. Agreement between Arm and Calf Systolic BP

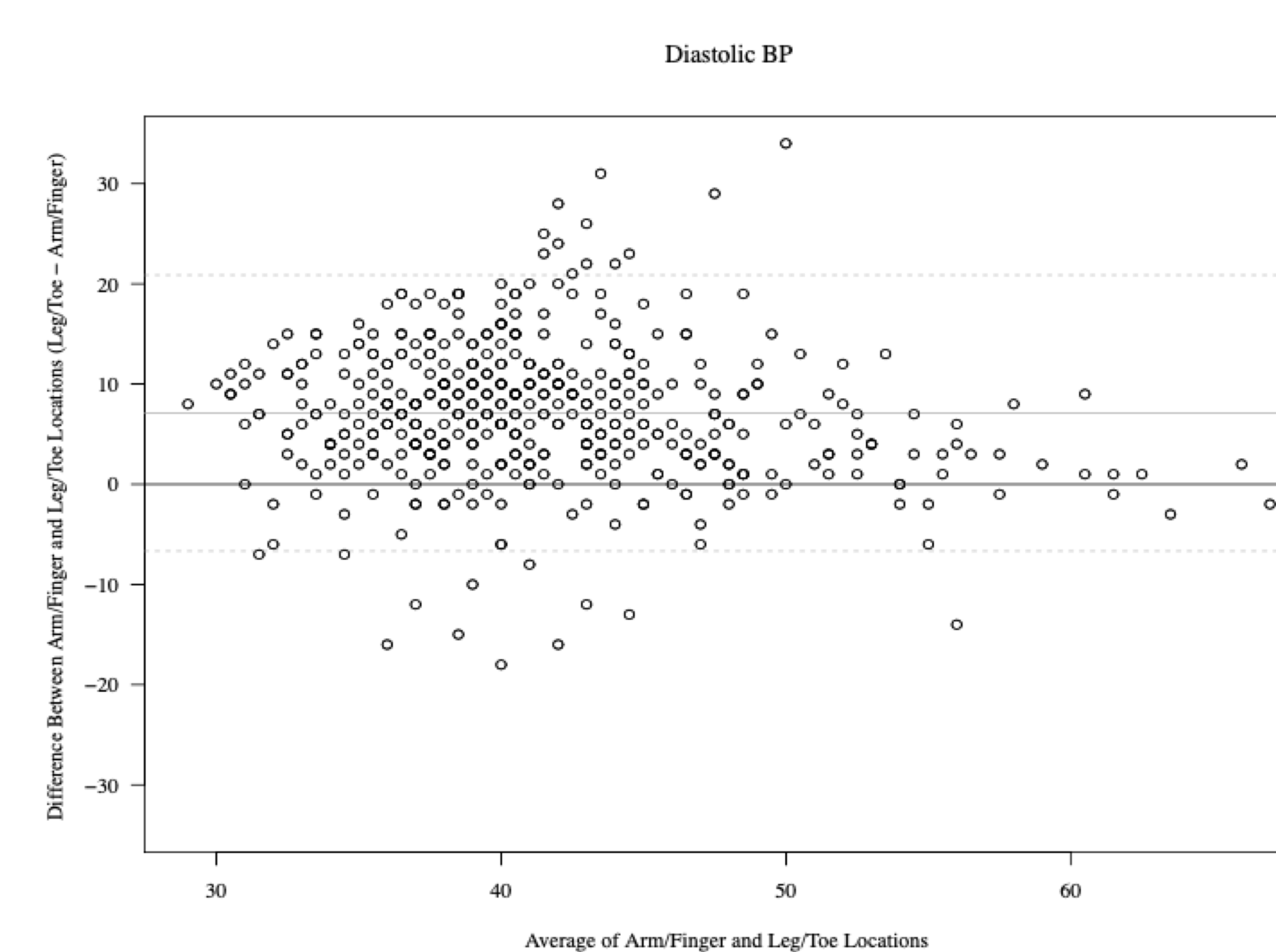


Figure 2. Agreement between Arm and Calf Diastolic BP

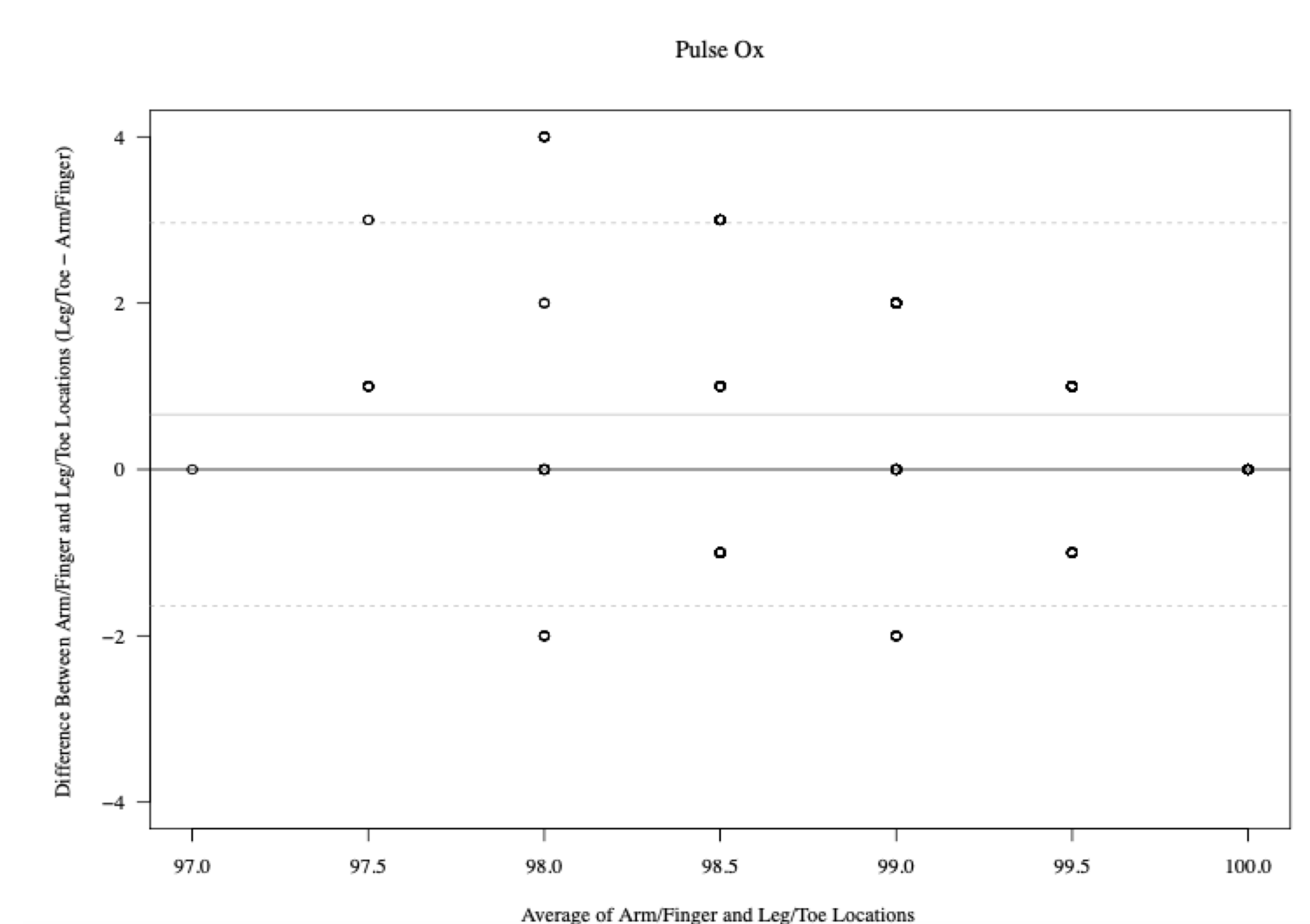


Figure 3. Agreement between index finger and toe oxygen saturation

## CONCLUSION

- Lower systolic and diastolic measurements of the arm were noted when compared to those taken from lower calf (just above ankle bone)
- Oxygen saturation was lower when obtained via pulse oximeter placed on the index finger compared to the second toe

## REFERENCES

