

AbstractID: 7381 Title: Accuracy and reliability of manual vessel sizing measurements among different users and systems.

Purpose: Vessel sizing is an essential component of each vascular intervention. While the focus in the literature has been on sizing the stenosis, we have found that the critical interventional data are the proximal and distal vessel sizes and length of the interventional device, e.g., balloon or stent. We investigated the accuracy and reliability of these data for three clinical systems.

Method and Materials: X-ray images were obtained of cylindrical aluminum rod phantoms with different diameters and of patient angiograms of cardiac arteries with stenoses. The systems were manually calibrated using a wire mesh phantom (phantoms) or marker wire (patient) each having 1 cm spacing. Vessel sizes were measured using the same manual interactions on all three systems, indicating points at the edge of the vessel, proximal and distal to the lesion. The length for the device was measured as the distance from the proximal to distal measurement points. Three users performed calibrations and measurements with and without digital zoom. Measurements were repeated three times.

Results: Accuracy of manual measurements is high (average absolute error = 0.23 ± 0.14 mm). Using zoomed images improves accuracy and reliability (0.15 ± 0.10 mm). The variations across users and systems are comparable for clinical images (~ 0.1 mm (sizes), ~ 0.35 mm (lengths)).

Conclusion: These results indicate that manual measurements of vessel sizes and lengths are accurate and reliable in the clinical arena, although there are variations between users and systems.

Conflict of Interest: This study was supported by NIH Grant # HL052567 and Toshiba Medical Systems Corporation