# [Impact of prospective measurement of outflow tracts in the prediction of coarctation of the aorta.](https://www.ncbi.nlm.nih.gov/pubmed/31875324)

Vigneswaran TV, Zidere V, Chivers S, Charakida M, Akolekar R, Simpson JM.

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**Take Home Points:**

* Prenatal diagnosis of coarctation may be improved with routine measurement of the distal transverse arch and ductus arteriosus from the 3 vessel view
* There is a high incidence of bicuspid aortic valve in patients with suspected, but not proven to have, coarctation.



**Commentary from Dr. Jared Hershenson (Greater Washington DC), section editor of Pediatric Cardiology Journal Watch:** Prenatal diagnosis of coarctation of the aorta (COA) is known to be quite difficult, with frequent false positives. There have been quite a few studies assessing various measurements to try to improve the diagnostic accuracy, but most are retrospective. It is known that prenatal diagnosis will improve morbidity and mortality, but false positives can have a negative psychological effect on the parents as well as prevent the initial infant/maternal bonding after birth.

This study  looked at cases of suspected COA between 15-36 GA who had at least 6 months of postnatal follow up, and who did not have any other major CHD. They used data from the time of the study (with the data set closest to 20 weeks GA to compute z-scores in patients with multiple studies). They measured the aortic and pulmonary valves in diastole at the maximal diameter, and the distal transverse aortic arch diameter (DTAA) and arterial duct (AD) in the 3 vessel view (3VT). They converted all measurements into z-scores that were derived from their own previously published data on 7000 normal fetuses. Of the 149 fetuses included in this study, 52% were confirmed to have COA within 6 months of age (most diagnosed in the neonatal period). Bicuspid aortic valve was identified after birth in 57% of the true COA group and 30% of the false positive group. A VSD was seen in both true and false positive cases. While aortic:pulmonary valve diameter ratio, DTAA diameter, 2nd trimester DTAA:AD ratio, AV z-score, DTAA z-score, and 2nd trimester z-score of the ratio of DTAA:AD were significantly smaller in the true COA group (see Table 1), logistic regression demonstrated that DTAA z-score and AD z-score were the only predictive variables. Table 3 shows the ROC curves for all variables and table 4 shows the sensitivity, specificity, PPV and NPV of the DTAA z-score.

A clear cut-off value for both DTAA z-score and the ratio were not provided, most likely given there is some overlap with a continued reasonably high (but better) false positive rate even when adding these measurements to the other published measurements in suspected COA. While a risk equation calculation was provided, lack of good cut-off values make it difficult for the individual sonographer and cardiologist to make decisions in real time based on their measurements. A few interesting features of the study include only using 3 vessel view measurements and not the sagittal aortic arch view, as well as the high frequency of BAV in the suspected COA group, which should likely affect prenatal counseling and should warrant further study.



