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## Background

Aortic size index (ASI) defined as aortic root size/body surface area (BSA) is used to calculate the risk of aortic dissection in girls with Turner Syndrome. There are multiple formulae for estimating BSA, with no accepted gold standard. The impact of using different formulae for estimation of BSA and therefore on ASI calculation is unknown.

## Aims

Our aims are to

- (1) Evaluate the limits of agreement between estimation of BSA in TS using five commonly used equations compared with Dubois (original equation)
- (2) Evaluate the limits of agreement of ASI in TS when BSA are estimated using five commonly used equations compared with Dubois.

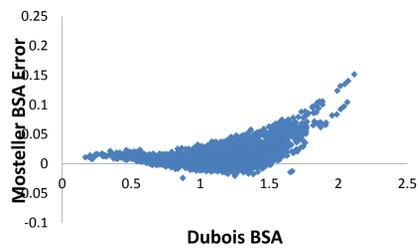
## Methods

114 girls with TS managed in the Glasgow Turner Syndrome clinic (1970-2013) were included in the analysis on agreement of BSA estimation. 130 different girls and women with TS from Brazil with aortic root measurements on echocardiogram were included in the analysis on agreement of ASI.

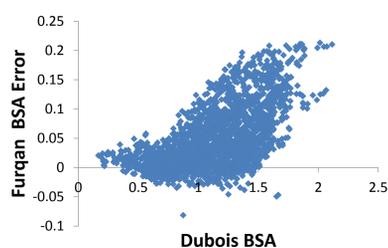
## Agreement of BSA estimation

**All formulae demonstrated good agreement with Dubois**  
**All formulae tended to overestimate BSA especially with increasing BSA.**

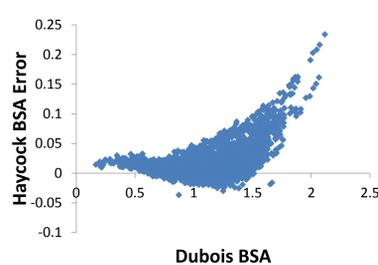
Mosteller BSA Error from Dubois



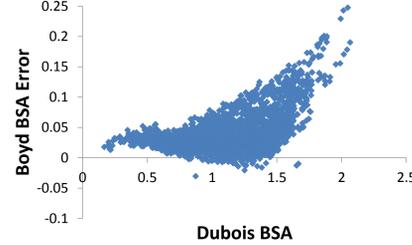
Furqan BSA Error from Dubois



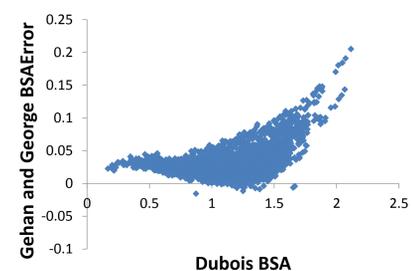
Haycock BSA Error from Dubois



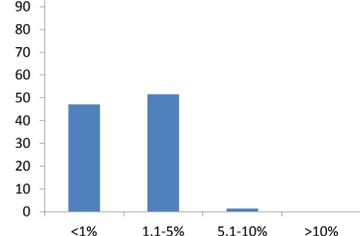
Boyd BSA Error from Dubois



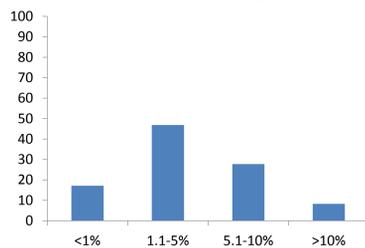
G&G BSA Error from Dubois



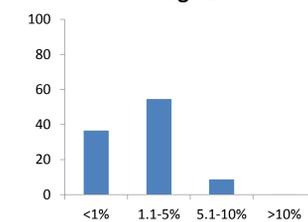
Mosteller BSA Percentage Error



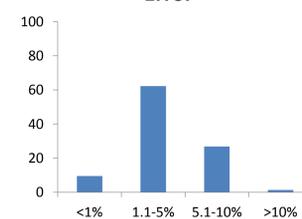
Furqan BSA Percentage Error



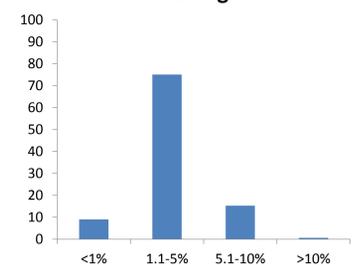
Haycock BSA Percentage Error



Boyd BSA Percentage Error



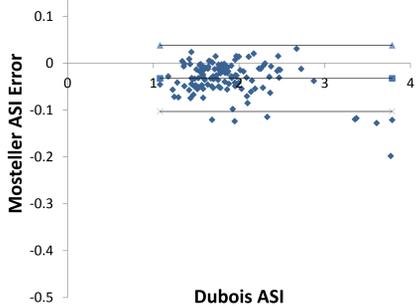
G&G Percentage Error



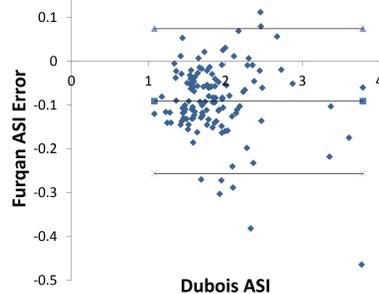
## Agreement of ASI calculation using different BSA estimation

**ASI calculated using all five BSA equations underestimate ASI compared to Dubois.**  
**Up to 2% of TS in the high risk ASI will be re-classified as moderate risk.**  
**Up to 8% of TS in the moderate risk will be re-classified as low risk.**

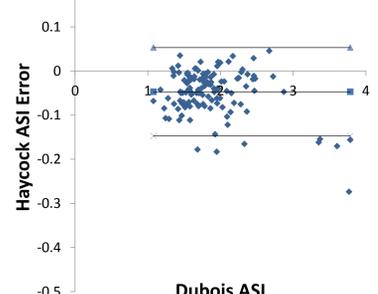
Mosteller ASI Error vs Dubois ASI



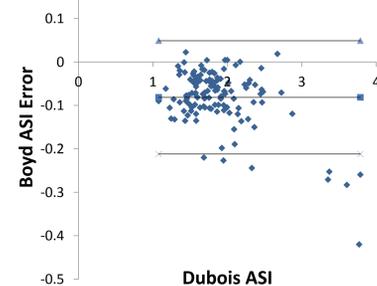
Furqan ASI Error vs Dubois ASI



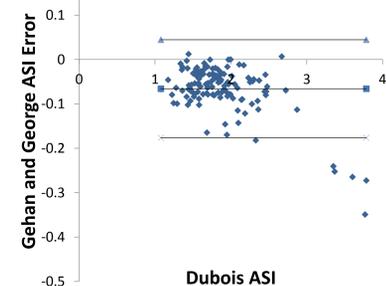
Haycock ASI Error vs Dubois ASI



Boyd ASI Error vs Dubois ASI

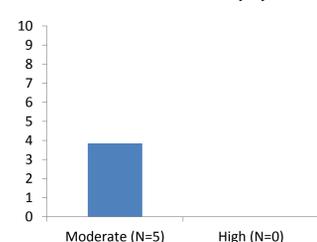


G&G ASI Error vs Dubois ASI

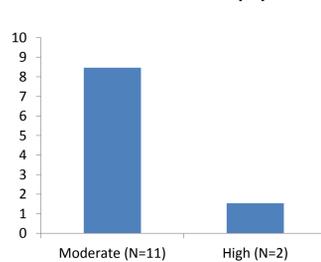


Change in category of ASI (<2 low, 2-2.5 moderate, >2.5 high) as a result of changing from Dubois BSA formulae.

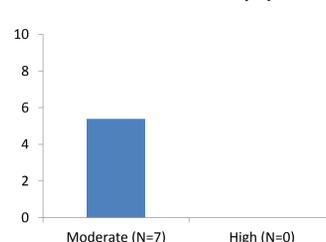
Mosteller Risk Underestimated (%)



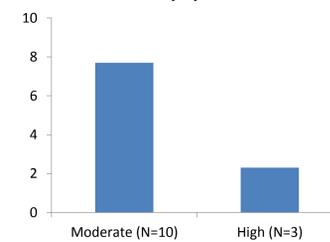
Furqan Risk Underestimated (%)



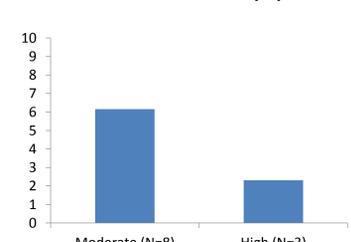
Haycock Risk Underestimated (%)



Boyd Risk Underestimated (%)



Gehan and George Risk Underestimated (%)



## Conclusion

Whilst the limits of agreement between five equations for estimation of BSA compared with Dubois is high, aortic dissection risk (ASI) may be underestimated in some TS girls simply by using the other BSA estimation formulae..