



TCD Protocols: Low Velocities / Asymmetry / ACA

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Data NHR EMSTN:

2 TCD Operators / April 2021-March 2023 / Colour TCD

Low Velocities

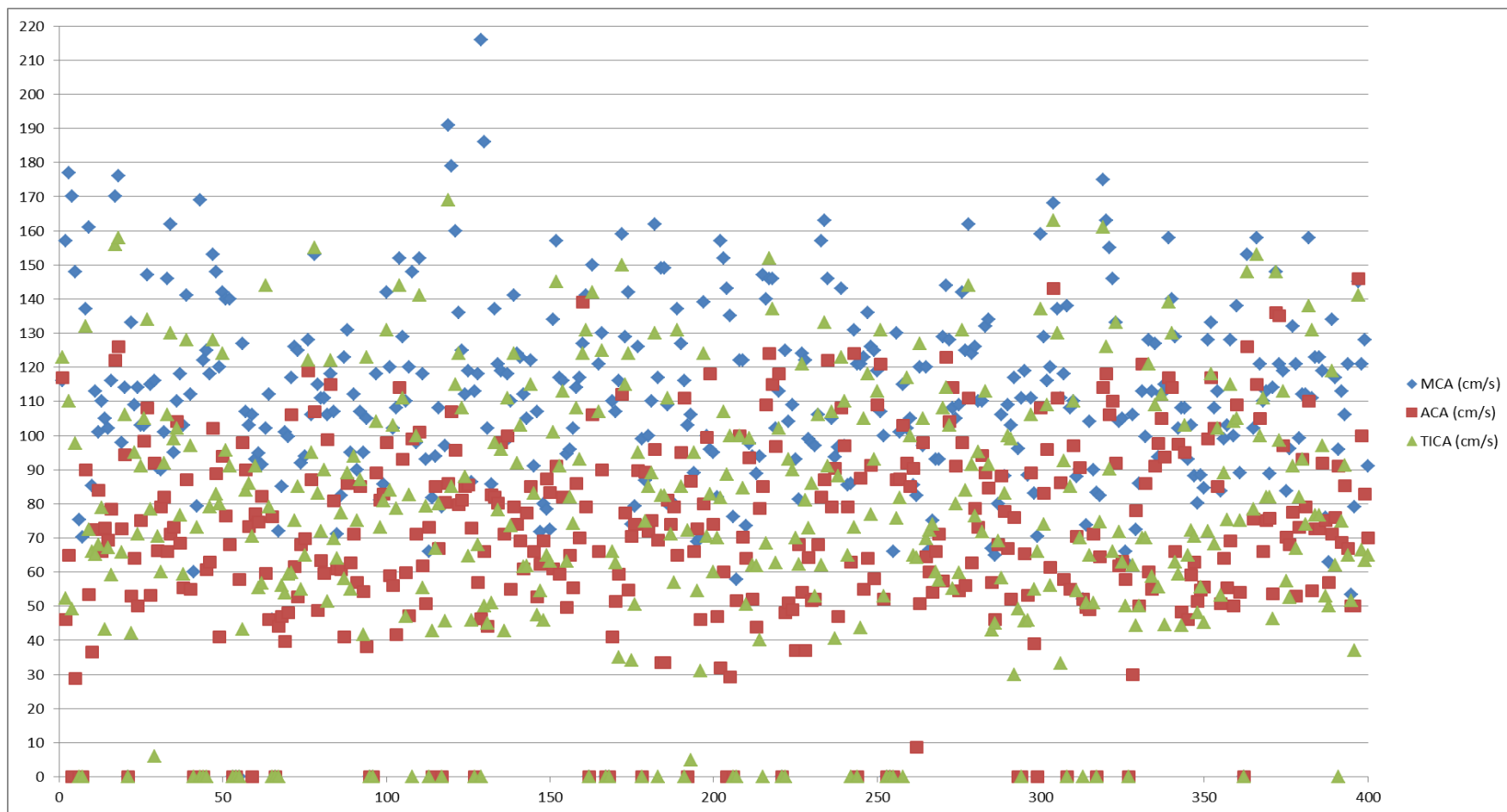
A low velocity is <70 TAMV

1. Which vessels are more likely to show <70 TAMV?
2. How frequently does this occur?

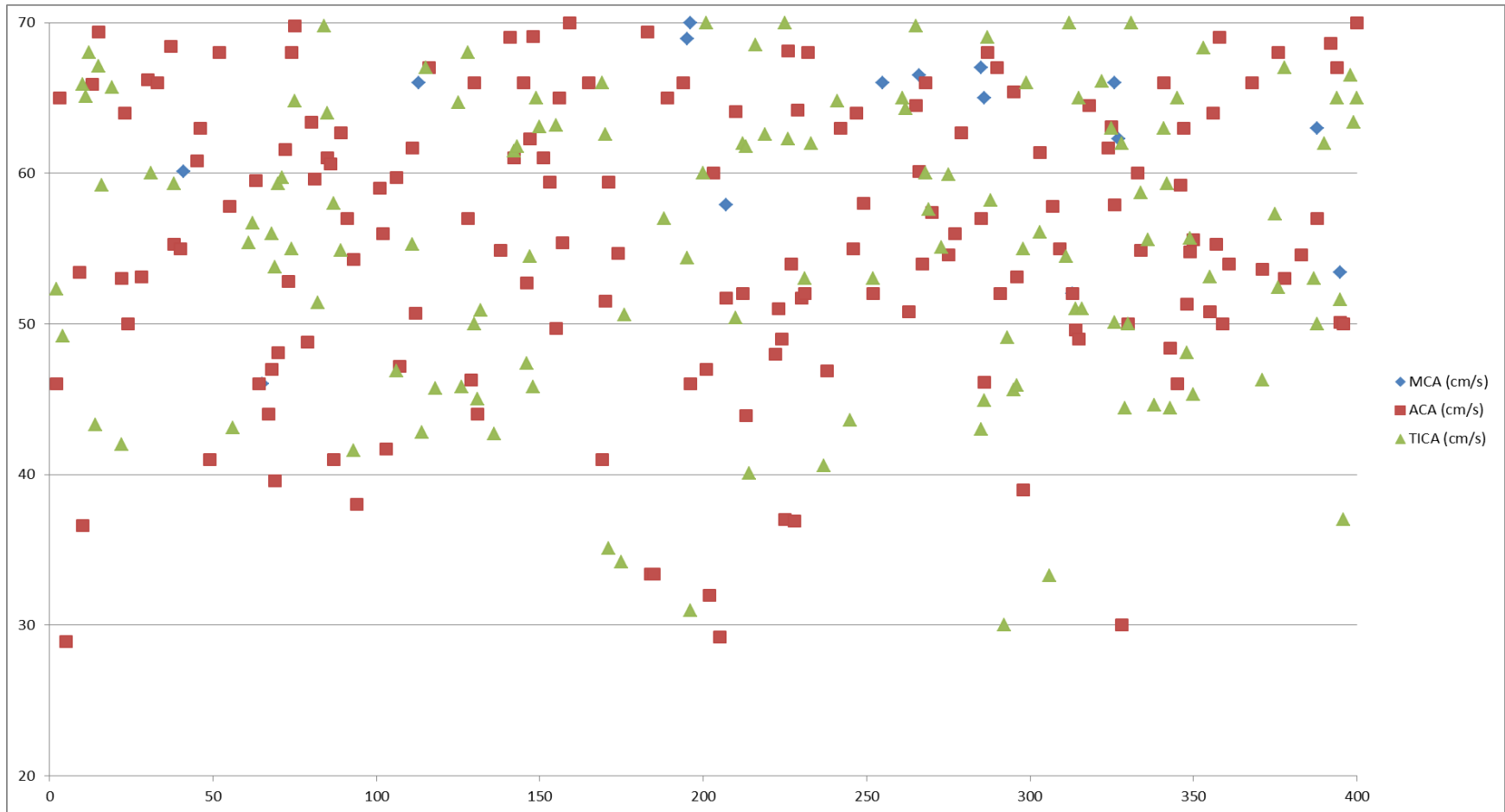
Questions to consider:

- Why does this occur?
- Do clinicians act on the additional findings?
- Why is this cut-off chosen?

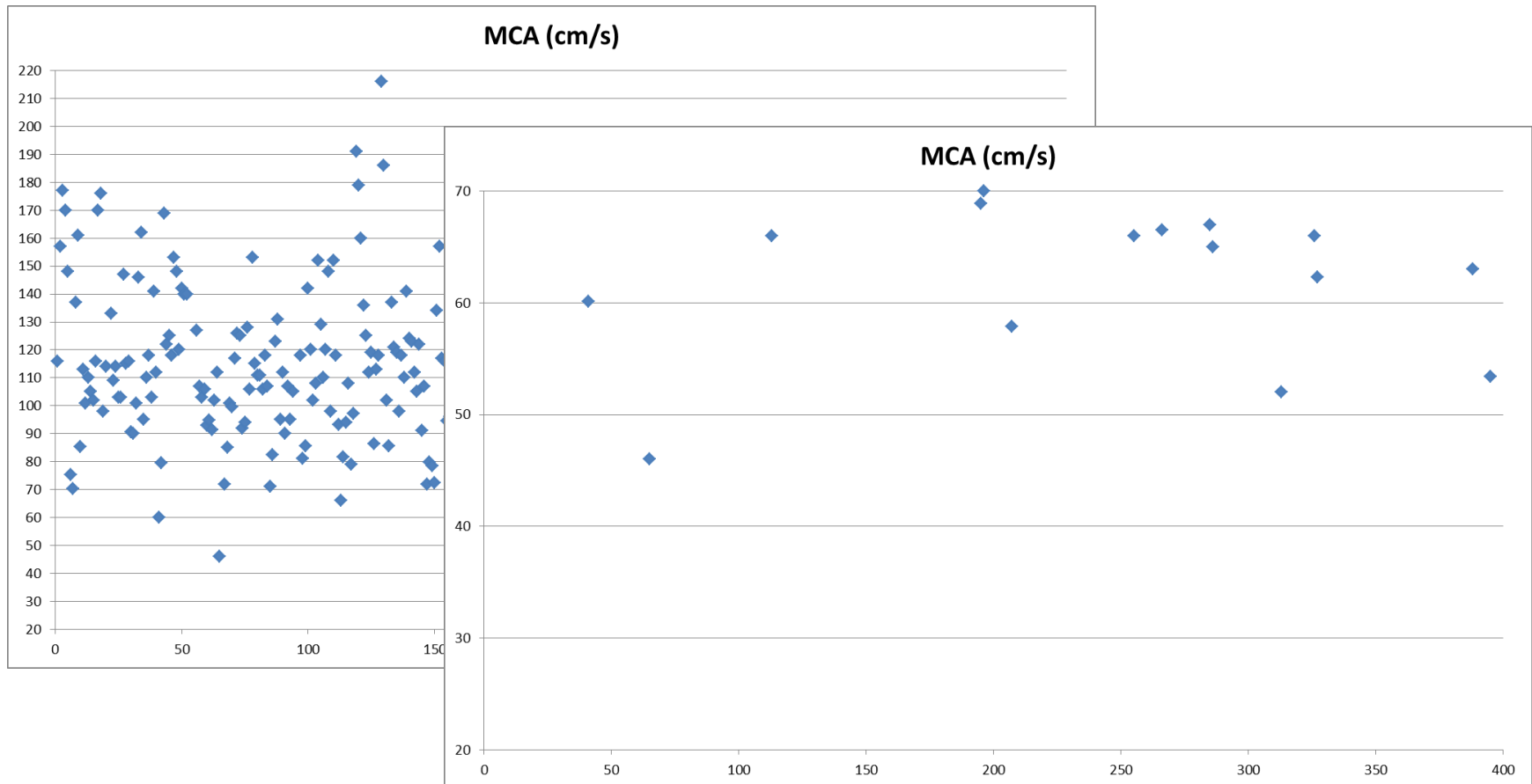
All Velocity Data: (400) MCA ACA TICA



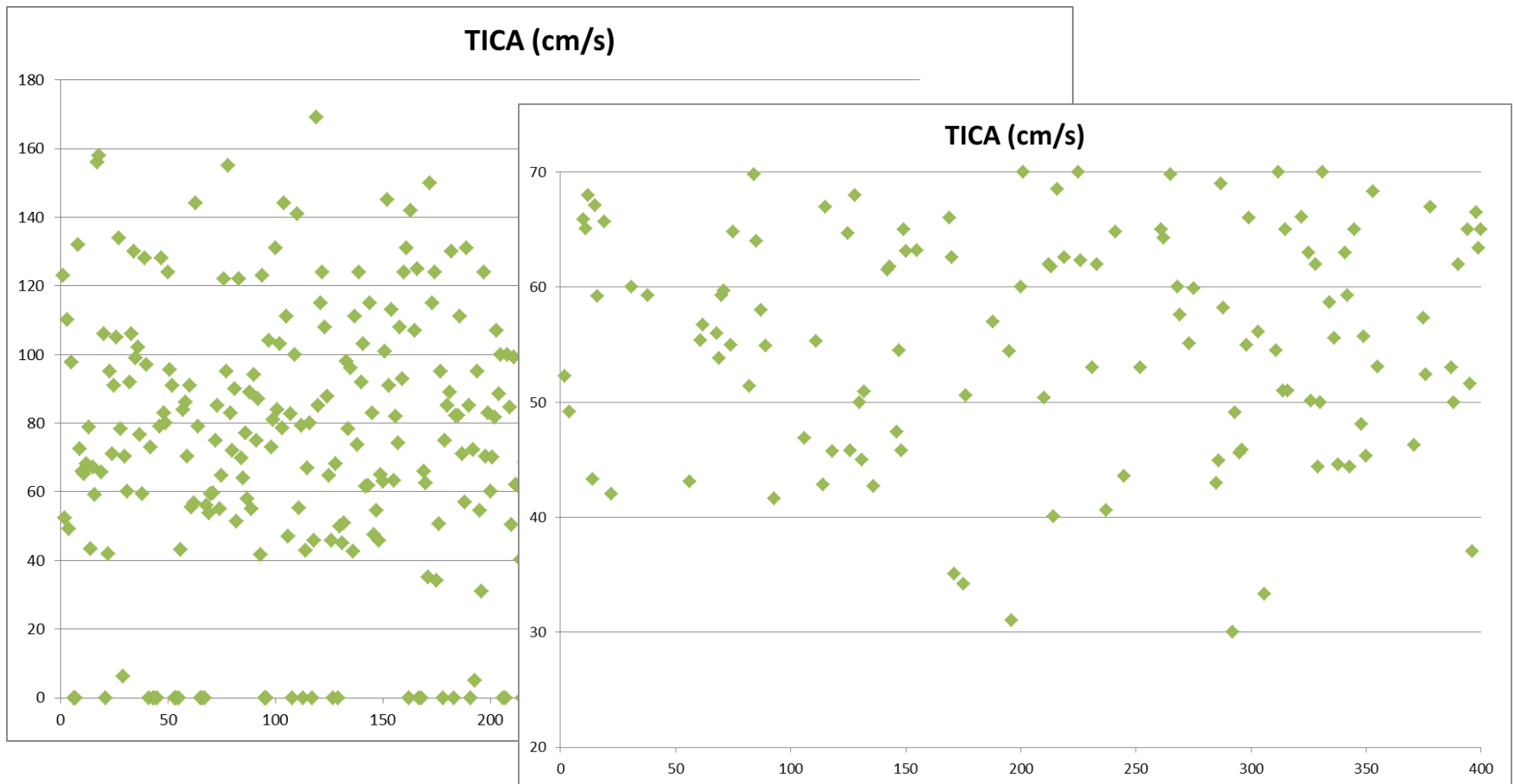
All Low Velocities <70 TAMV: MCA ACA TICA



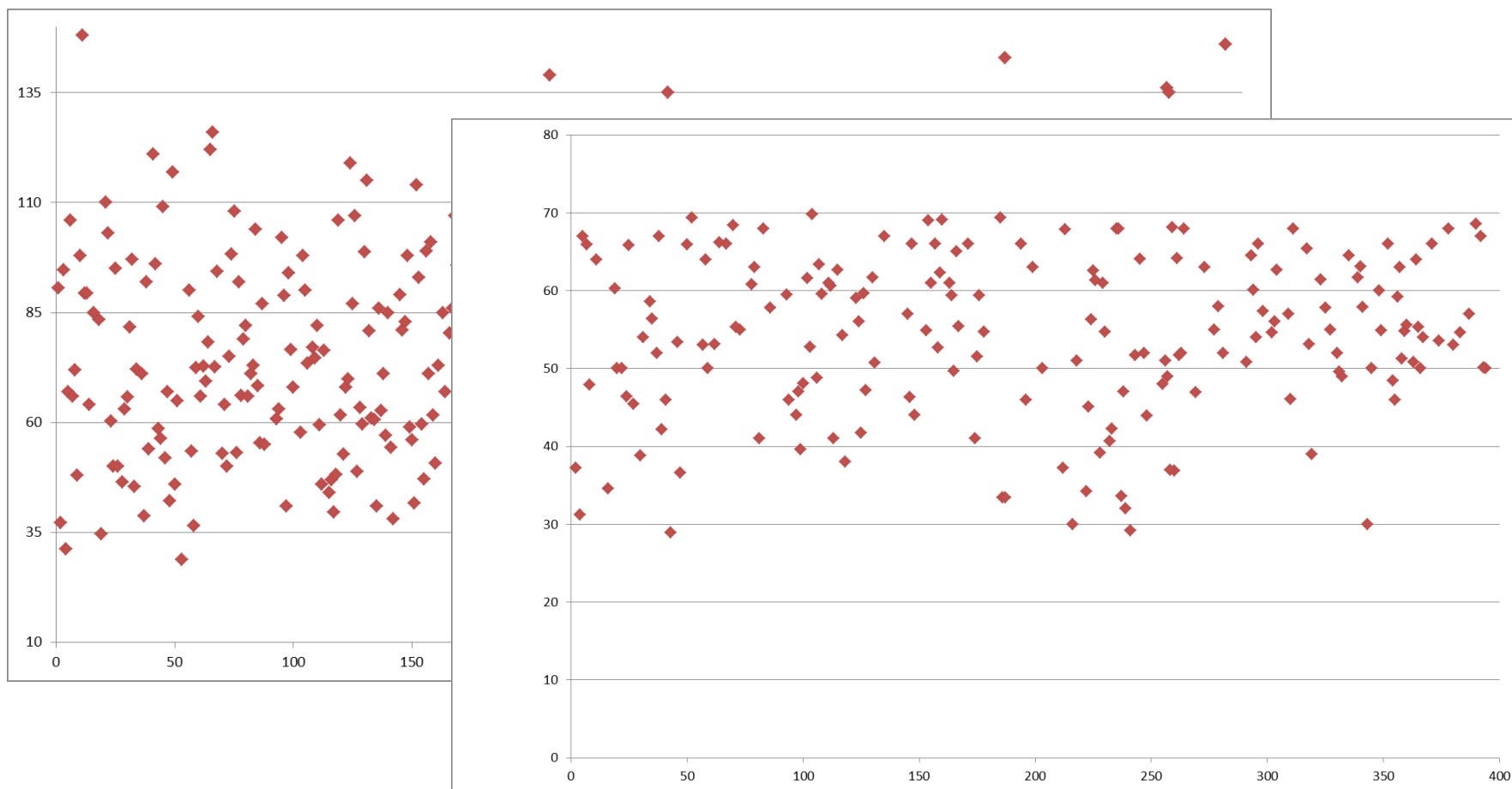
MCA Velocities (4% Low)



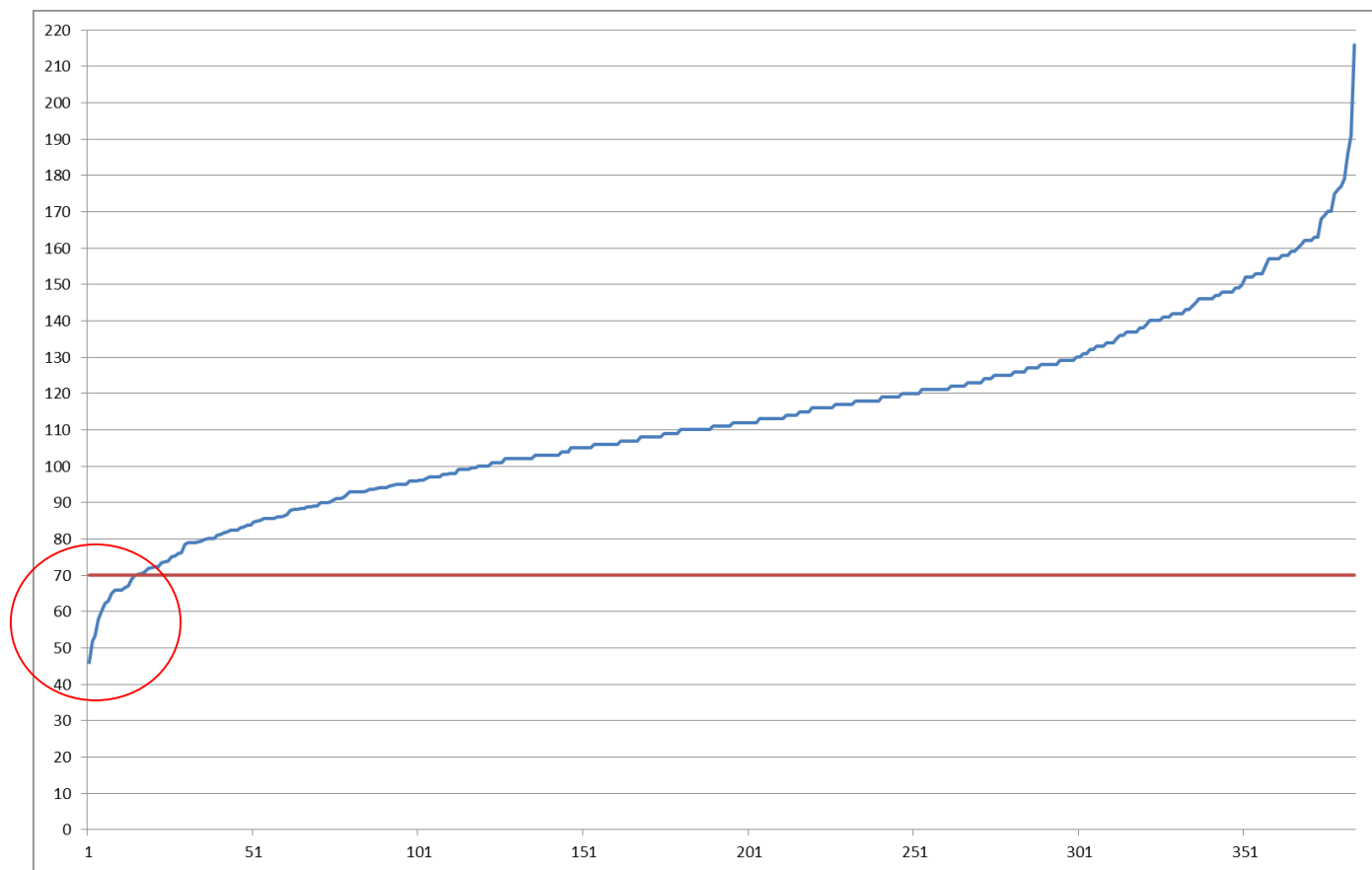
TICA Velocities (35% Low)



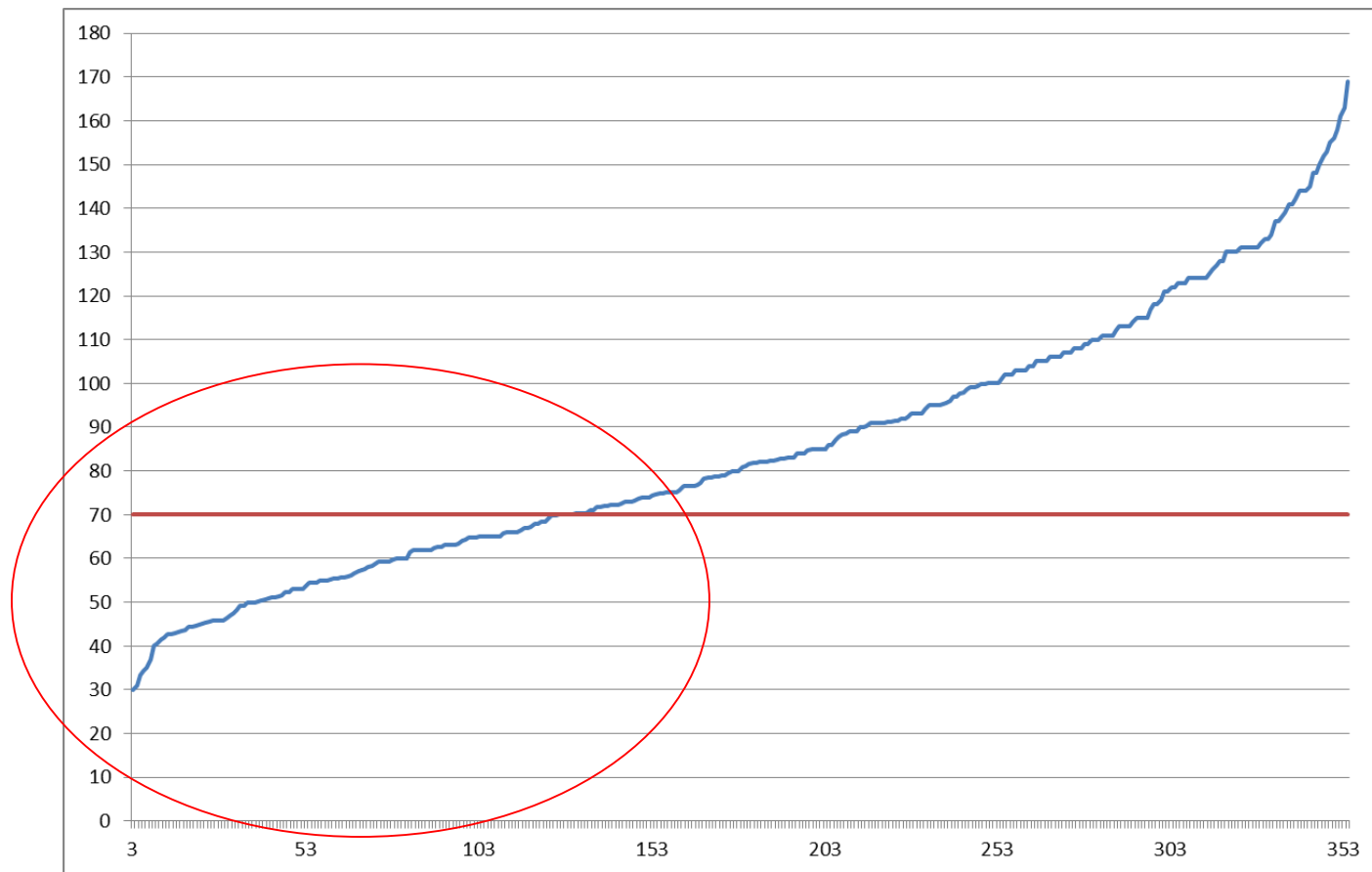
ACA Velocities (53% Low)



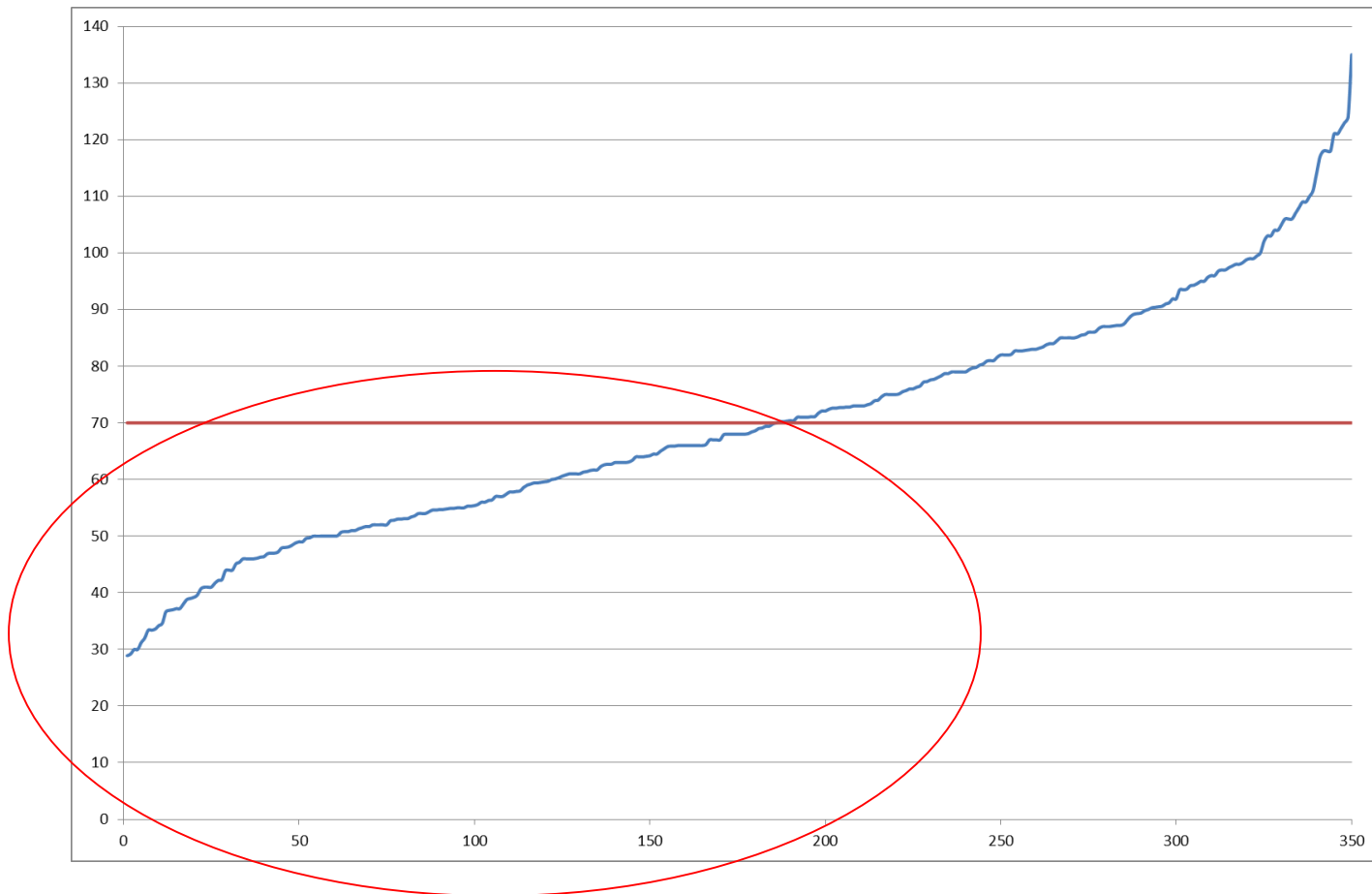
MCA Velocities (384, 4% Low)



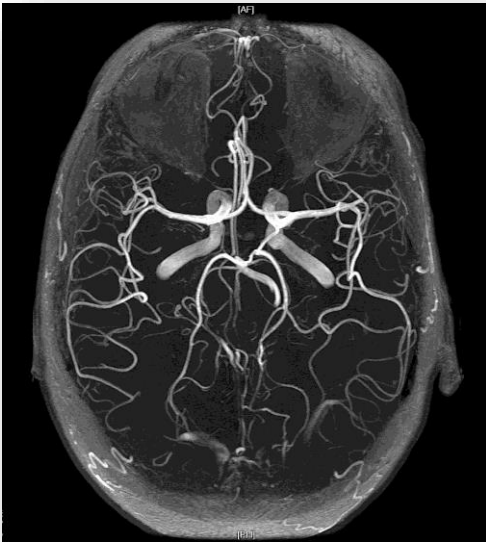
TICA Velocities (354, 35% Low)



ACA Velocities (351, 53% Low)



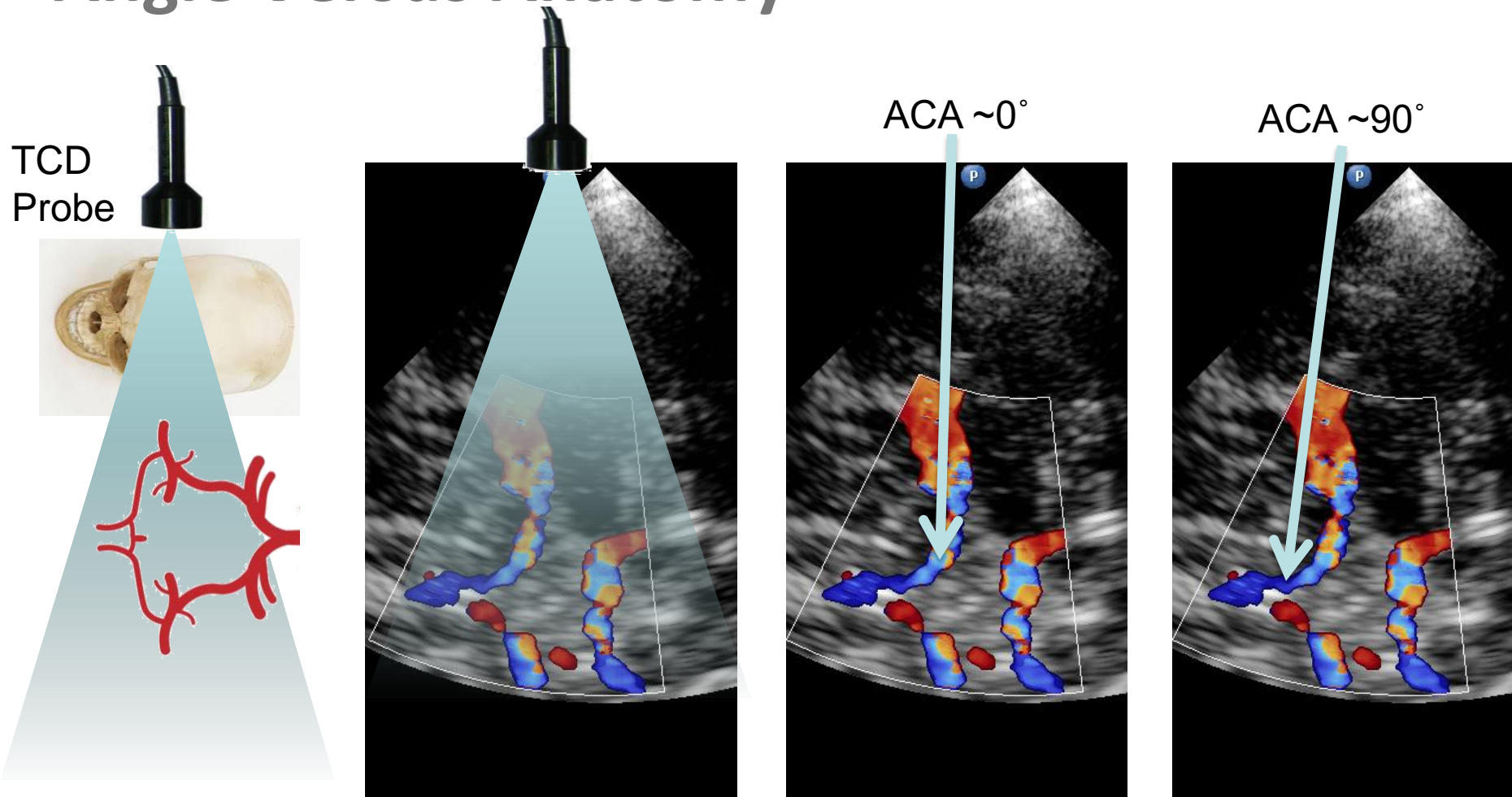
Why Low ACA Velocities?



- Zero angle correction versus vessel anatomy?
- TCD ACA poor imaging technique?
- Equipment generally lower readings overall?
- Less dominant vessel and perfusion region?
- Diseased vessels in our cohort?
- Normal findings? ...

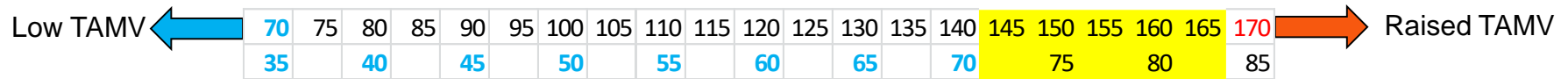


Angle Versus Anatomy



Asymmetry

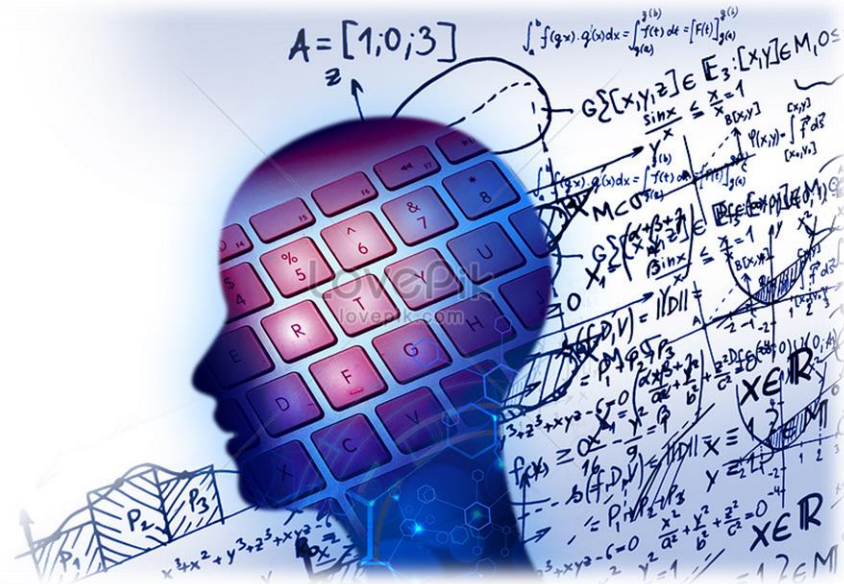
>50% lower than the contralateral side



Consideration:

Would the velocities have triggered anyway?

Eg. abnormally raised TAMV >170
or low TAMV <70 on one side?



Asymmetry – All Vessels/Sides (200 Patients)

10 Asymmetry

MCA (cm/s)		
Left	Right	Asymmetry
216	72.4	66%
186	86	54%
46	120	62%

116 82
149 123
112 97
147 124
103 93
116 82
107 117

ACA (cm/s)		
Left	Right	Asymmetry
46.3	78	
66	50	
76.3	64.5	
117	47	60%
33.4	72.6	54%
46	98	53%
108	54	50%
75	37	51%
117	47	60%
85	76	

117 47 60%
33.4 72.6 54%
46 98 53%
108 54 50%
75 37 51%
117 47 60%

TICA (cm/s)		
Left	Right	Asymmetry
0	44.4	
50	50	
0	69.8	
123	70	
82.3	76.6	
79	105	
134	121	
91	70	
123	70	
87	30	66%

0 44.4
50 50
0 69.8
123 70
82.3 76.6
79 105
134 121
91 70
123 70
87 30 66%

Low Velocity
High/Conditional
Asymmetry >50% Lower

Asymmetry – All Vessels/Sides

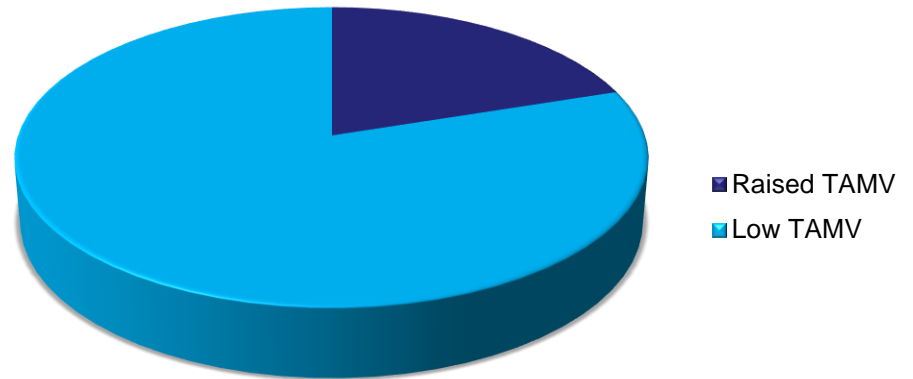
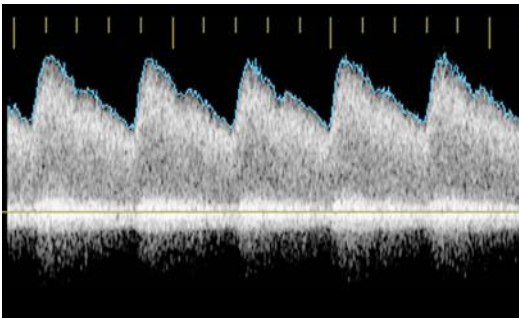
10 Asymmetry

- 1 patient with raised velocities (MCAs) & asymmetry (2 scan events)
- 8 patients with low velocities & asymmetry
- All would have triggered an additional category with either low or raised velocities

Asymmetry Vessels

10 Asymmetry

- 3 MCA
- 6 ACA
- 1 TICA



Future Work?

- Analysis of UK ACA velocity data in NHR
- Analysis of significance of asymmetry versus other parameters (low & high velocities)

Poll:

1. Do you routinely order an MRI for normal STOP but with additional low velocities or asymmetry?
2. Do you do anything else if a report highlights normal STOP but with additional low velocities or asymmetry?



Future Updates?



**Transcranial Doppler Scanning for
Children with Sickle Cell Disease
Standards and Guidance
Second Edition September 2016**

Questions

