

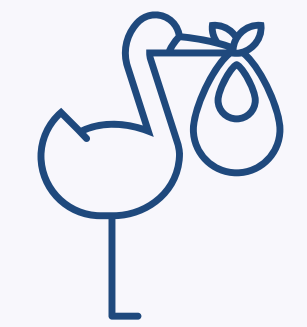
ARE SINGLETON REFERENCE RANGES ADEQUATE FOR MCA DOPPLER IN MONOCHORIONIC TWINS? COMPARISON WITH A TWIN-SPECIFIC MODEL



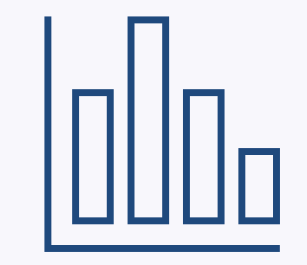
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BACKGROUND



MCA Doppler surveillance in MCDA twins begins as early as **16 weeks**.



Current reference standards are based on singletons and do not provide normative values **before 18 weeks**.



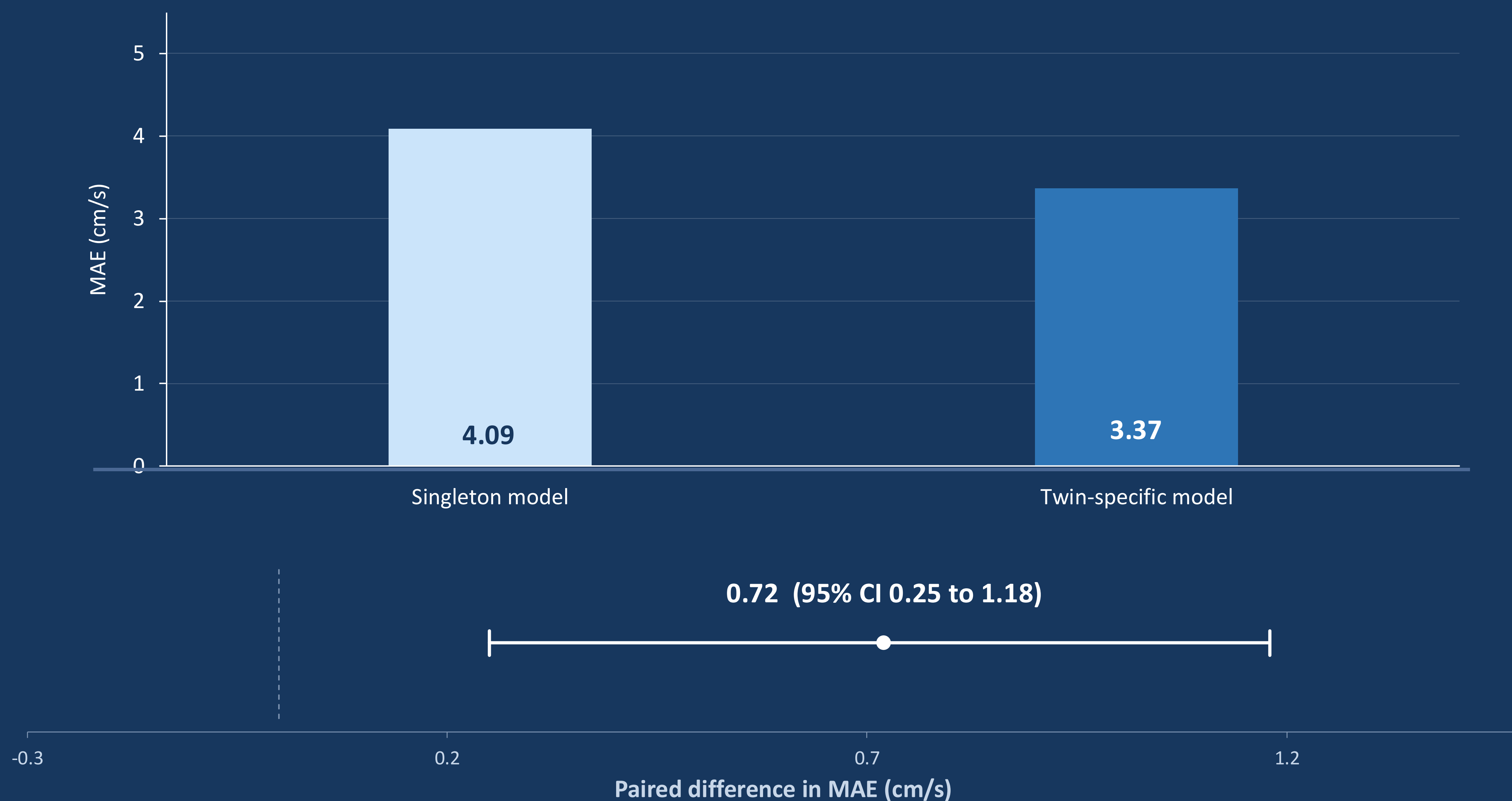
Singleton-derived reference ranges **may limit early detection of complications** such as twin anemia–polycythemia sequence.

METHODS

- Retrospective cohort of uncomplicated MCDA twin pregnancies (2015–2025) with complete delivery/neonatal data.
- First available MCA-PSV for each twin pair analyzed.
- Predicted MCA-PSV calculated using singleton reference model and external twin-specific model (Bartin et al., 2025).
- Mean error (bias) and mean absolute error (MAE) calculated for each twin.
- Within-pregnancy clustering accounted for by averaging twin-specific errors to generate a single pregnancy-level mean error and MAE.

Twin-specific MCA Doppler standards **showed 17.6% lower prediction error** than singleton reference ranges.

FIGURE 1. PREGNANCY-LEVEL MEAN ABSOLUTE ERROR (UPPER) AND PAIRED COMPARISON (LOWER)



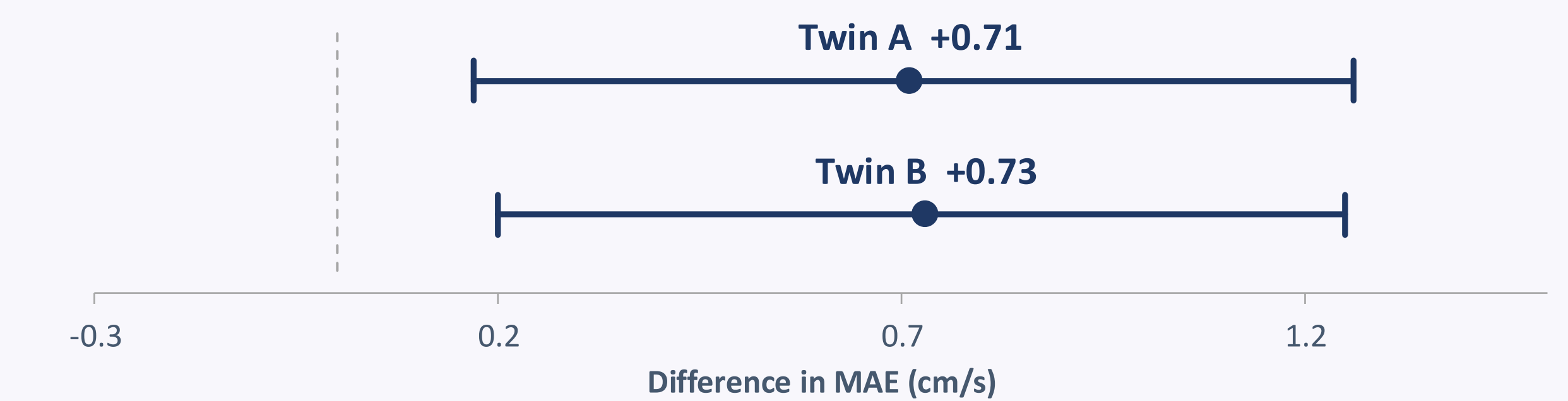
Positive difference in paired comparison favors the twin-specific model.

Paired t-test $p = 0.003$ · Wilcoxon signed-rank $p = 0.004$

RESULTS

- 60 uncomplicated MCDA twin pairs
- First MCA-PSV at median 17.6 weeks (IQR 16.0–19.1)

FIGURE 2. DIFFERENCE IN MAE BY INDIVIDUAL TWIN

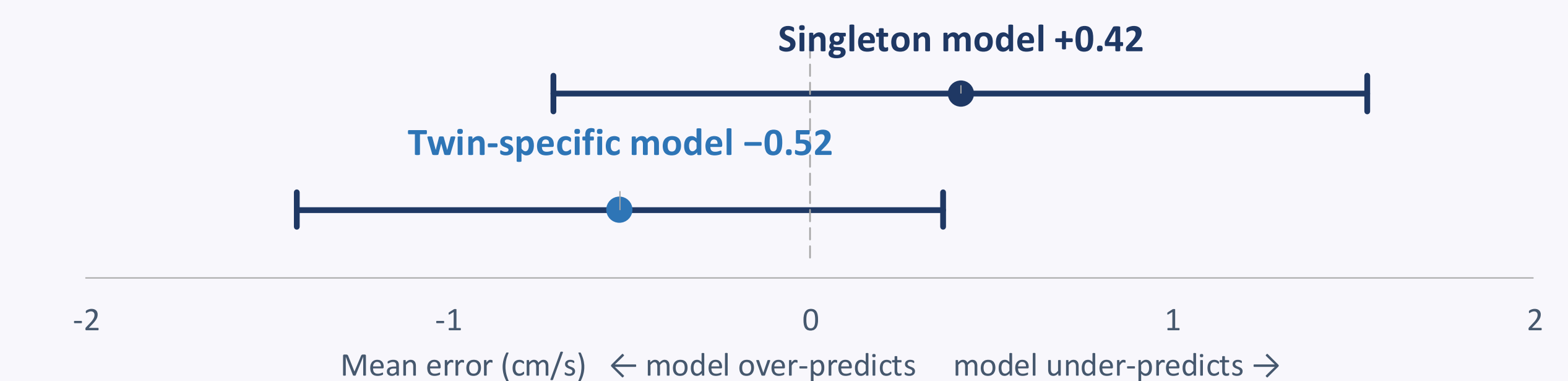


Lower error with the twin-specific model was consistent when analyzing each twin individually.

Error bars = 95% CI

Twin A: 0.71 (0.17 to 1.26), $p = 0.011$ · Twin B: 0.73 (0.20 to 1.25), $p = 0.008$

FIGURE 3. MEAN ERROR (BIAS)



One model underpredicted and the other overpredicted, but neither showed significant systematic bias.

Error bars = 95% CI; Paired-test $p = 0.002$; Wilcoxon signed-rank $p < 0.001$

CONCLUSIONS

Although the twin-specific model showed lower prediction error in MCA-PSV, the magnitude of the difference alone (0.72 cm/s) warrants further investigation but **does not justify replacing** established singleton reference ranges.