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Nov 4, 2023 · 9 tweets · [strain\\_rate/status/1720805710613663919](https://twitter.com/strain_rate/status/1720805710613663919)

📖 New reference values for longitudinal strain from the HUNT4 study, measured by 2D ST from one vendor, but comparing varieties of the proprietary analysis software with different automation (2DS vs AFI) shows small differences.

<https://www.sciencedirect.com/science/article/pii/S1936878X23004163>

2/ Commendable, the authors have compared the 16 and 18 segment ASE models. The 18 segment model is over weighted in favour of the apex, compared to the real amount of myocardium, but the study shows a small, significant difference, but far less than the repetition coefficient.

3/ The reference values were higher (absolute), than in the HUNT3 study (mean ca 20% vs ca 16.5), but there GLS was done by two different methods: segmental longitudinal Tissue Doppler, and linear strain, but not ST.



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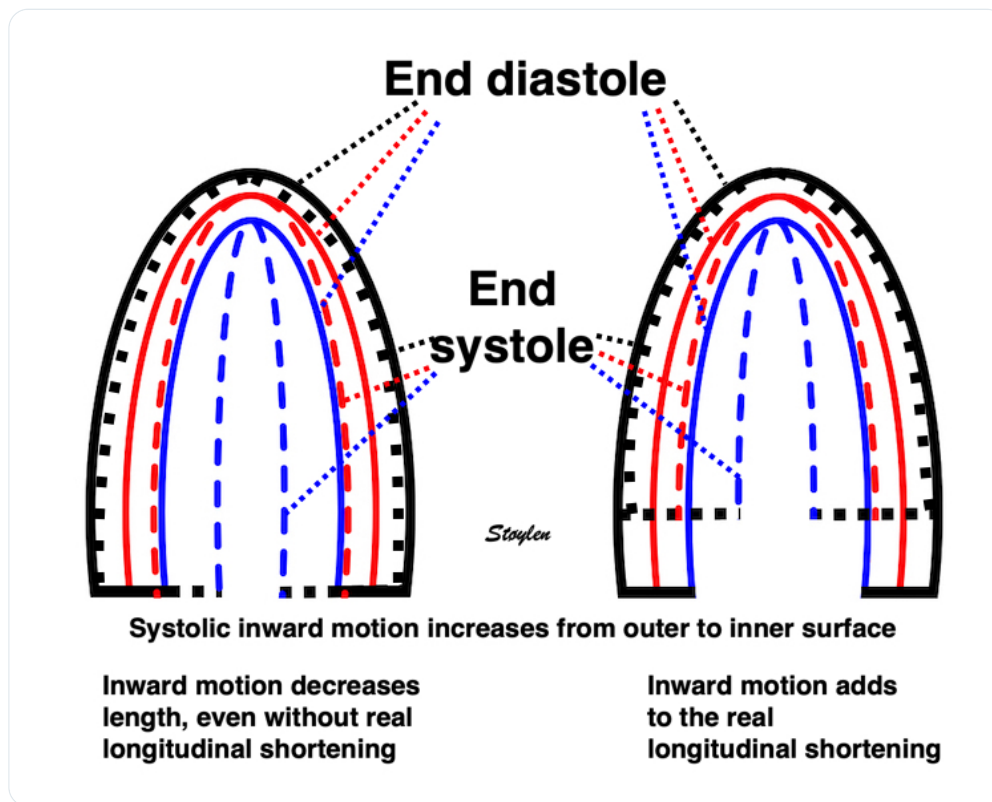
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MAPSE, MAPSEn, and GLS have similar biological variability, which is mainly due to age variation, indicating they are equivalent in normal, and normalizing for BSA will not reduce the variability. No...

<https://pubmed.ncbi.nlm.nih.gov/29399886/>

4/ ST tracks not only longitudinal, but also inward motion, which increases from the outer to the inner contour. Average or midwall strain will thus incorporate an element of shortening in addition to true longitudinal shortening.



5/ Thus, the values from ST is expected to be higher (absolute) than from linear methods. Also, ST analysis software from different vendors may perform differently, as seen by the difference between HUNT4 (GE) and NORRE (GE and Philips hardware, TomTech software).

6/ This still means that GLS is not a universal measurement, but method, application and vendor dependent, and without any "hard" reference standard.

[https://folk.ntnu.no/stoylen/strainrate/Motion%20and%20deformation.html#No\\_gold\\_standard](https://folk.ntnu.no/stoylen/strainrate/Motion%20and%20deformation.html#No_gold_standard)

7/ Still, HUNT4 confirms findings of HUNT3, showing physiological relations, if not measurement values, are valid also with ST.

(Absolute) shortening shows

-decrease with age

-decrease with body size (HUNT4 sex, HUNT3 BSA, is significant, but this depends on the model)

8/ Which again is a function of GLS not taking ventricular diameter into account, only length.

The authors have not related GLS to SV, but HUNT3 did not find any correlation, possibly due to the inverse relation to body size.

[https://folk.ntnu.no/stoylen/strainrate/Basic\\_physiology.html#GLS\\_vs\\_BSA](https://folk.ntnu.no/stoylen/strainrate/Basic_physiology.html#GLS_vs_BSA)



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