



RIGSHOSPITALET

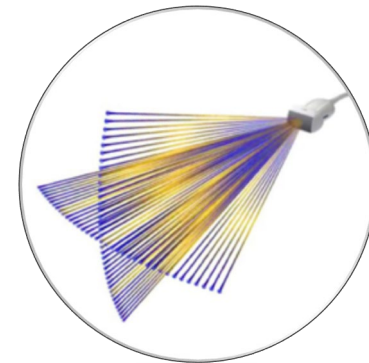
COPENHAGEN | DENMARK

Clinical Validation of 3D-US for AAA

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DISCLOSURE

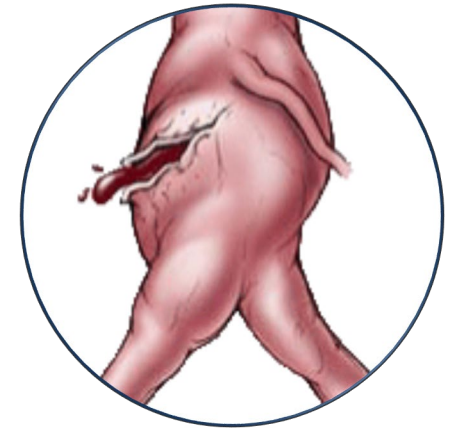
I have the following potential conflicts of interest to report:

- Consulting
 - Employment in industry
 - Stockholder of a healthcare company
 - Owner of a healthcare company
 - Other(s)
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- I do not have any potential conflict of interest

BACKGROUND

CURRENT PRACTICE

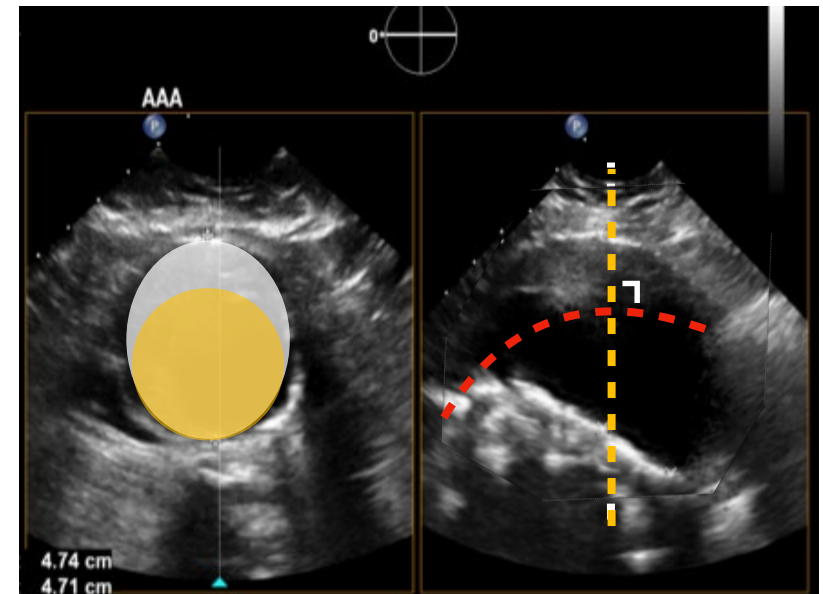
- AAA surveillance is routinely performed using 2D-US
- Indication for treatment is defined by max AP-diameter
- Accuracy and reproducibility is paramount



BACKGROUND

ULTRASOUND DIAMETER

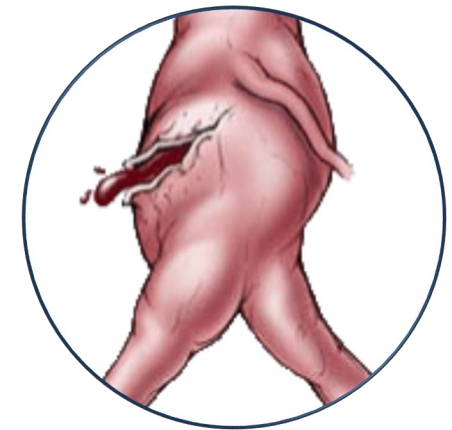
- Subject to variation ($\pm 2\text{mm}$ to $\pm 10\text{mm}$)
- Cardiac cycle ($\pm 2\text{mm}$) *
- Caliper placement ($\pm 6\text{mm}$) **
- Correct Orientation ($\pm 10\text{mm}$) ***



Grøndahl et al. 2011 EJVES* Chiu et al. 2014 EJVES** Bredahl et al. 2016 EJVES***

AIM OF THE STUDY

- 3D-US has good agreement with CTA*
- Can 3D-US provide an improved reproducibility ?



Bredahl et al. 2015 EJVES*

MATERIAL & METHODS

2D-US ACQUISITION

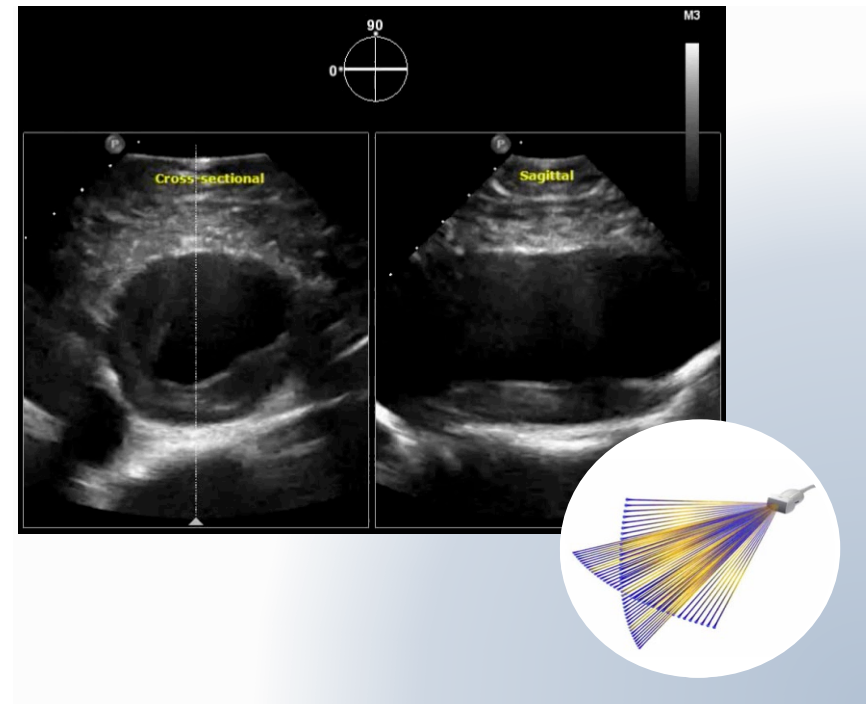
- C5-1 EPIQ 7G-system
- AP-diameter in transverse (LELE)
- On-cart measurement
- Blinded to each others results



MATERIAL & METHODS

3D-US ACQUISITION

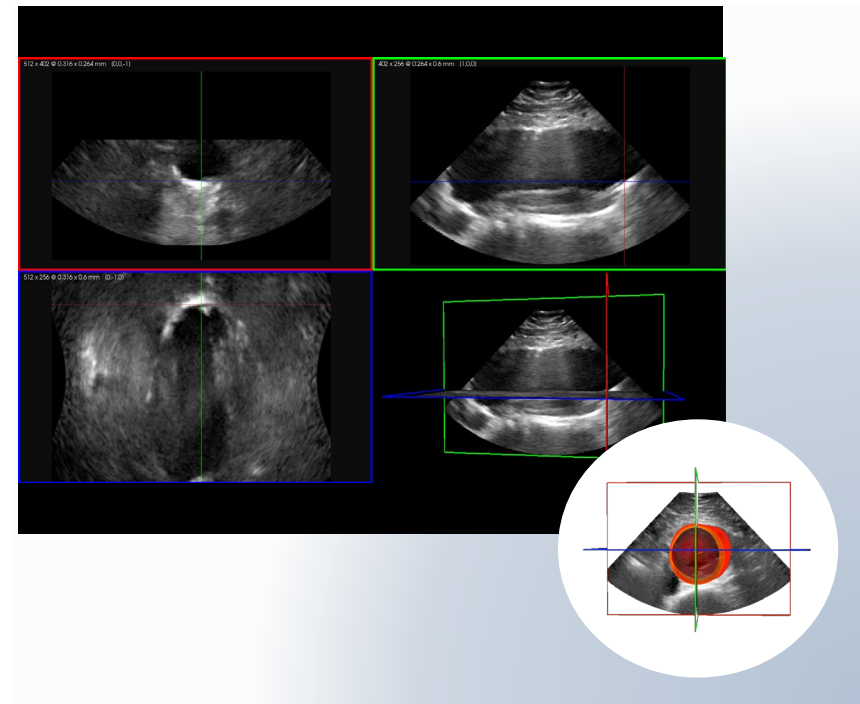
- xMATRIX X6-1, EPIQ 7G-system
- Dual-plane visualisation
- Offline AP-diameter measurement
- Blinded to each others results



MATERIAL & METHODS

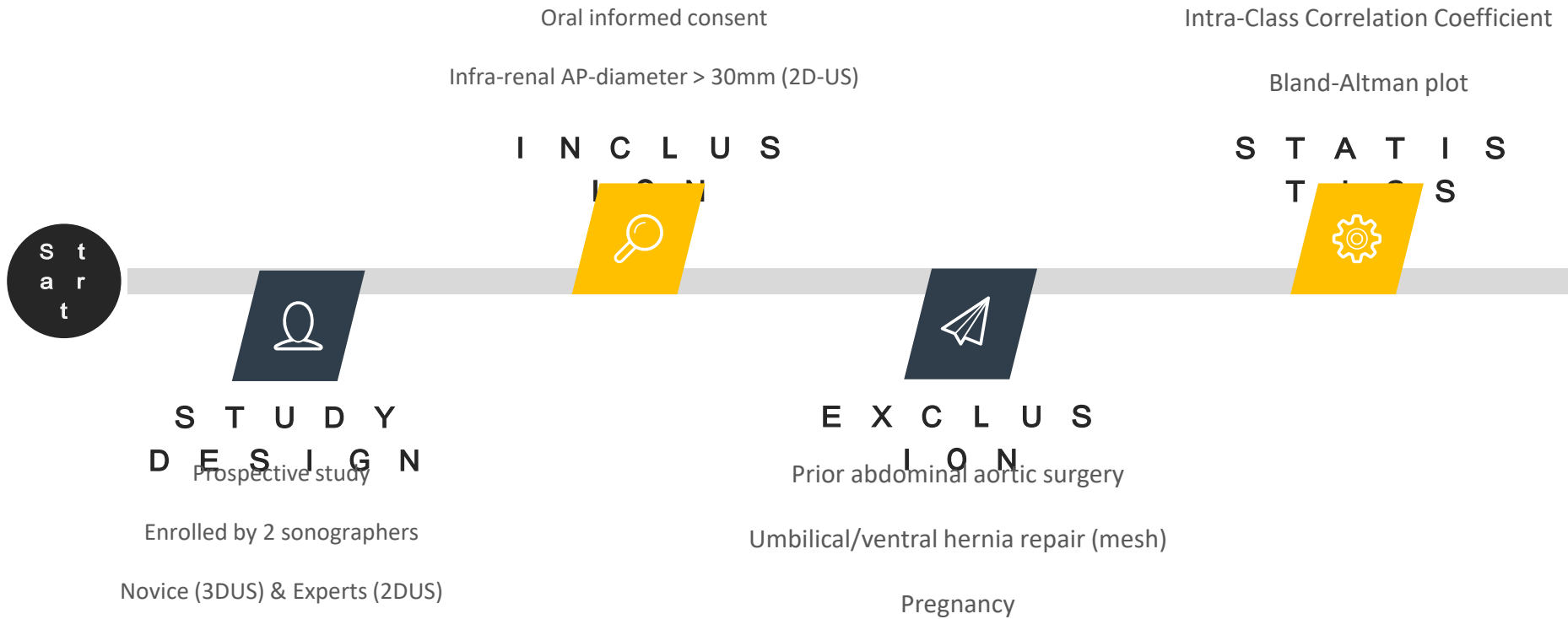
3D-US SEGMENTATION

- Two step procedure
- 1) Automated outlining of vessel wall
- 2) Manual boundary correction – if needed
- Output: Maximum AP-diameter



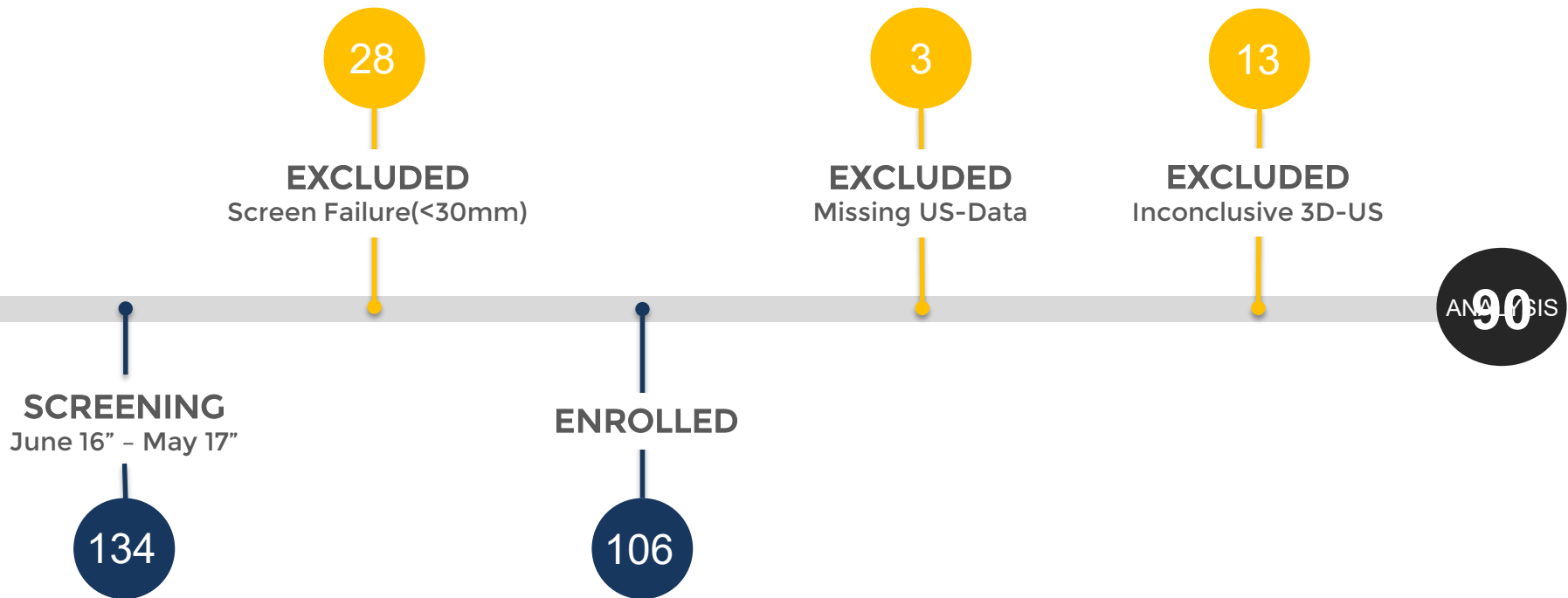
MATERIAL & METHODS

STUDY DESIGN



MATERIAL & METHODS

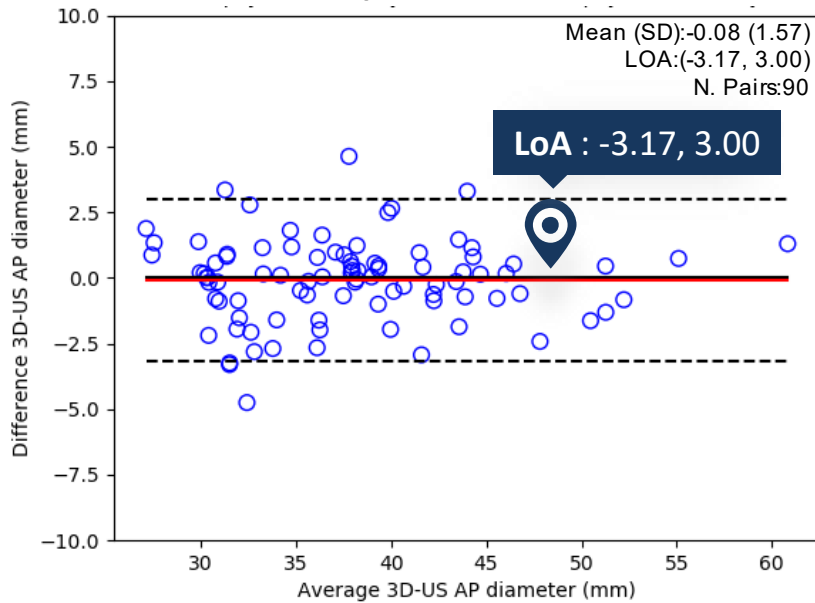
STUDY FLOWCHART



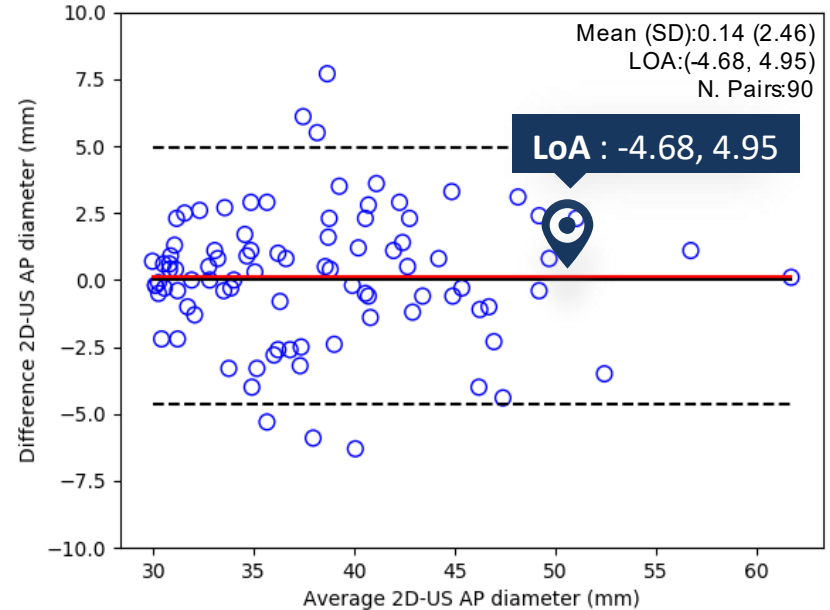
RESULTS

BLAND & ALTMAN PLOTS

Inter-operator 3D-US

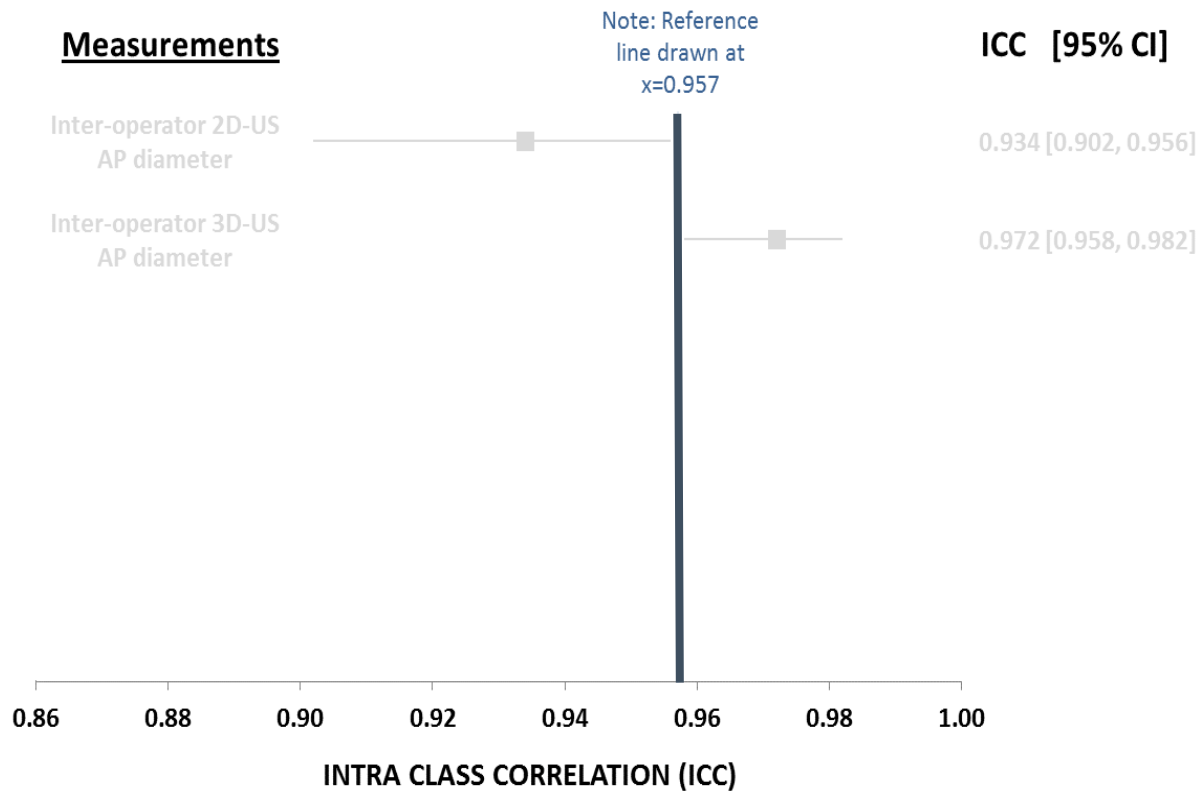


Inter-operator 2D-US



RESULTS

INTRACLASS CORRELATION COEFFICIENT



CONCLUSION

- Both 2D-US and 3D-US provided high reproducibility
- 3D-US showed significantly better reproducibility than 2D-US
- The need for a reproducible, non-invasive AAA imaging modality seems more likely to be fulfilled with 3D-US



THANK YOU

FOR YOUR ATTENTION