



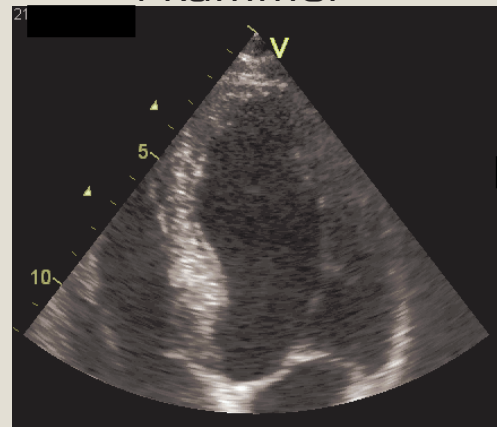
2D Strain in patients with reduced Image Quality: Effect of Microbubble Contrast on Segmental Tracking

JA Ejlersen MD^{1,2}, O May PhD¹

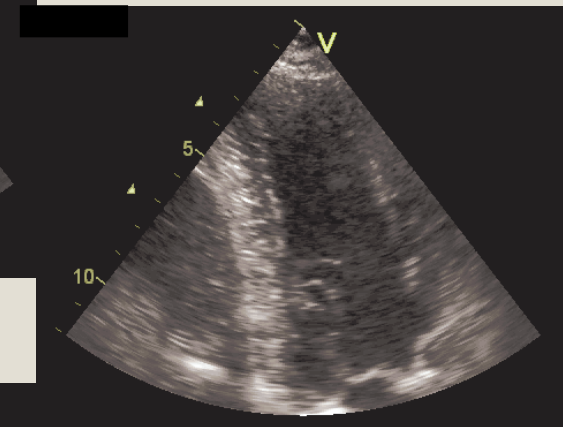
¹Cardiovascular Research Unit and ²Dept. of Nuclear Medicine Herning Regional Hospital,

Ekkokardiografi – apikale projektioner

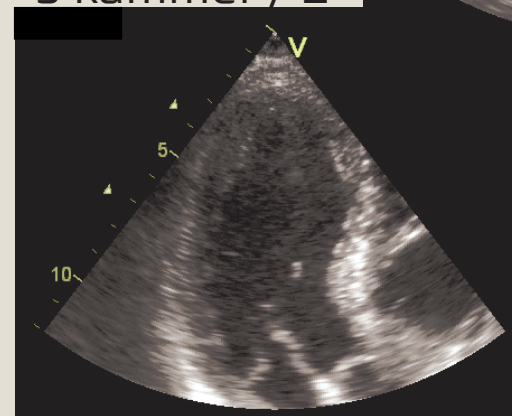
4 kammer



2 kammer

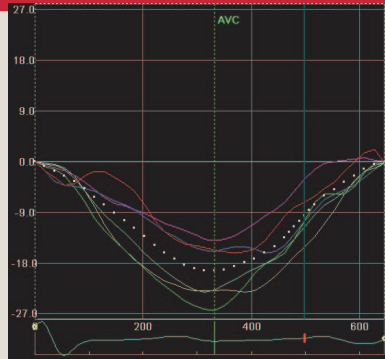


3 kammer / L

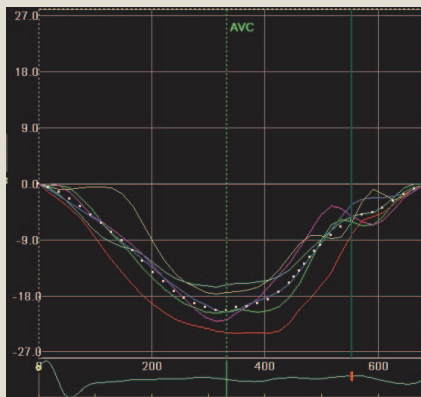
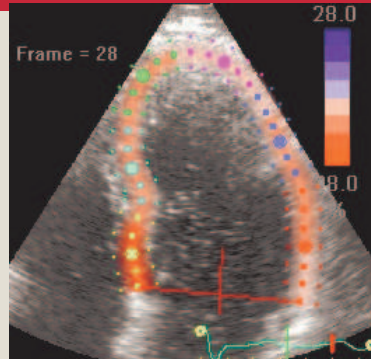


Strain (ϵ): Et mål for vævs-deformering

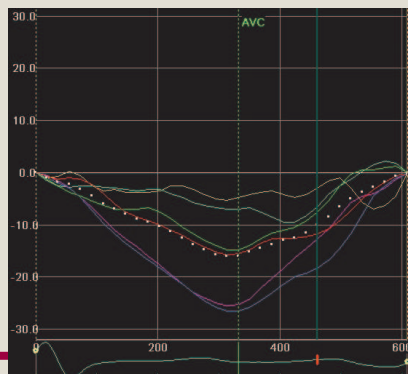
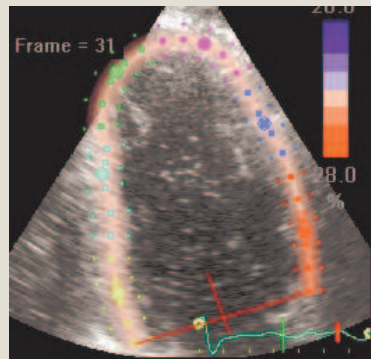
- Surrogatmål for *kontraktilitet*
- Korrelerer med EF
- Afhænger af
 - Muskulens kontraktilitet
 - Elasticitet / stivhed
 - Hjertets volumen
 - Pre/-afterload
- Def.: Positiv / negativ
- Software analyse:
 - VævsDoppler UL
 - **Speckle tracking** på 2D greytone UL



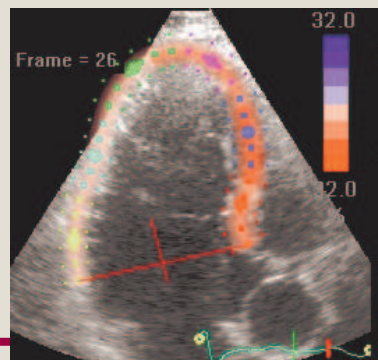
4K



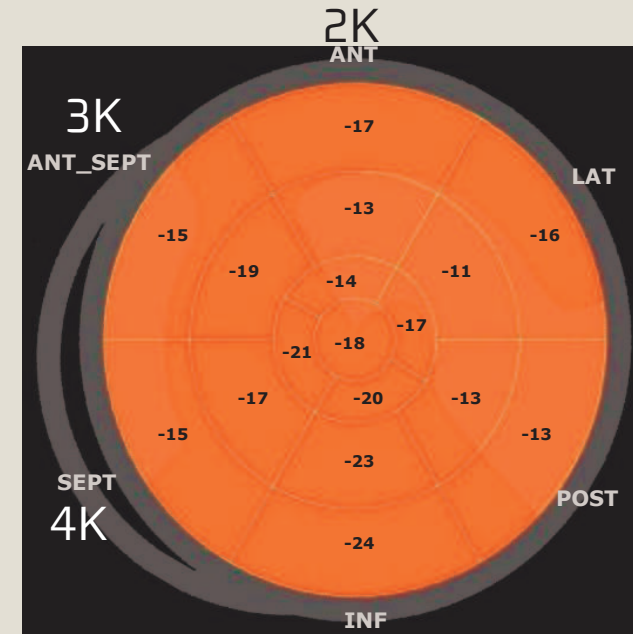
2K



3K



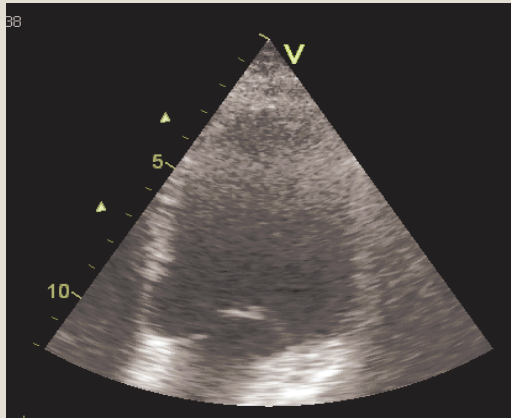
Segmental strain



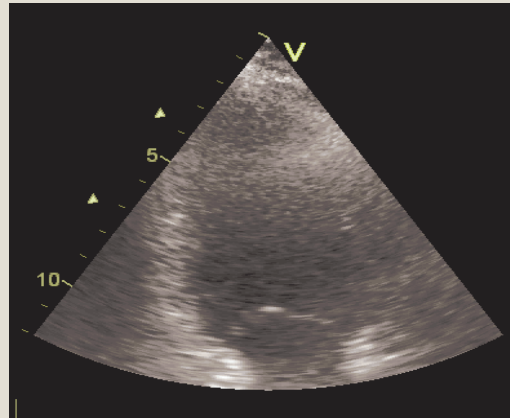
Ulemper:
 Kræver godt indblik
 Ringe reproducerbarhed

Ekkokardiografi +/- mikroboppel kontrast:

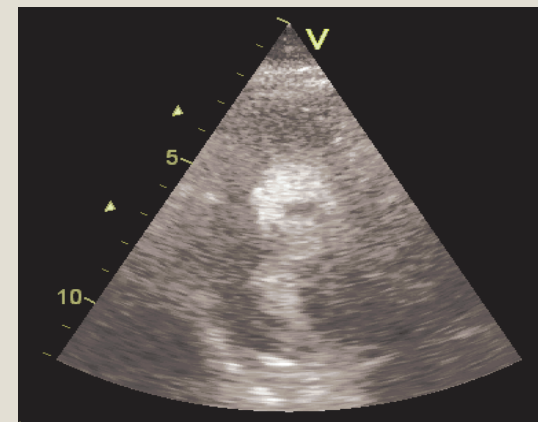
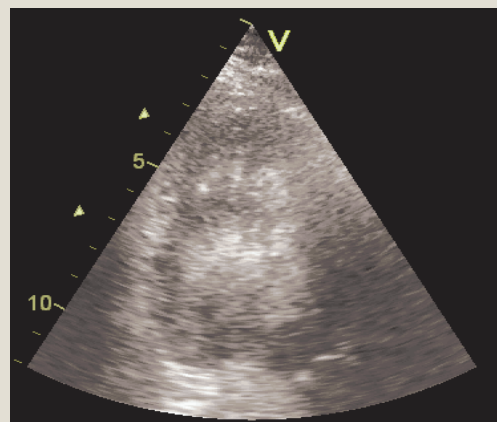
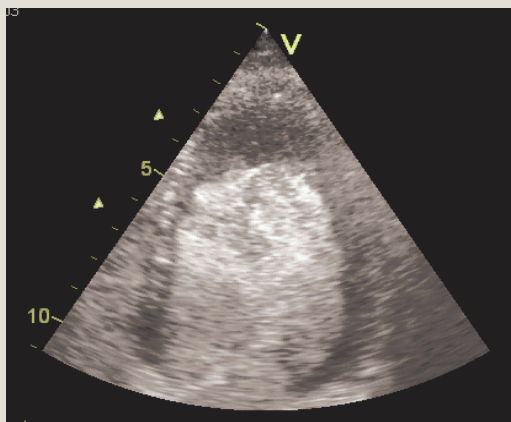
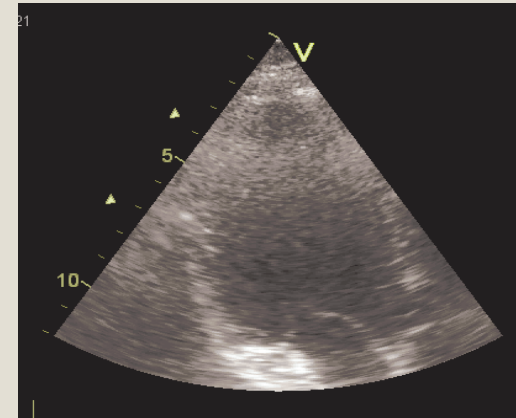
4 kammer



2 kammer



3 kammer / L

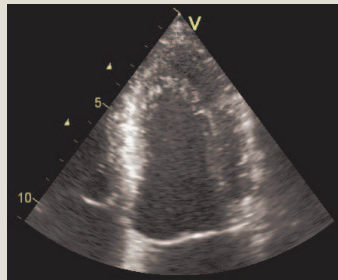


2D strain + mikroboppel kontrast = ?

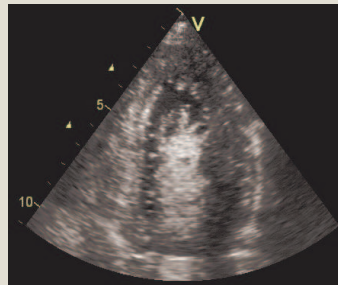
- Sort / hvid farvesammensætningen ændres
 - Ændret speckle mønster i myocardiet
 - God billedkvalitet (> 80% af segmenterne kan analyseres uden kontrast)
- + mikroboppel kontrast:
- Færre segmenter kan analyseres
 - Reproducerbarheden forringes
 - Analysen tager længere tid

4 kammer før / under / efter kontrast

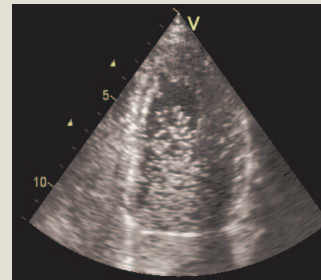
Baseline



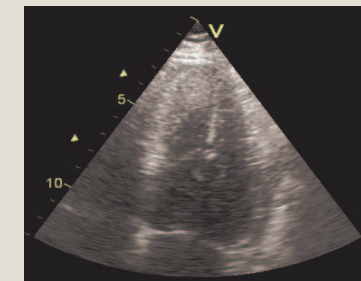
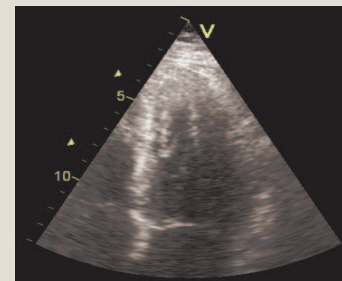
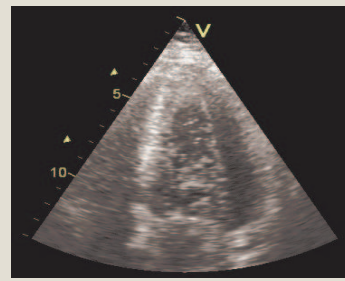
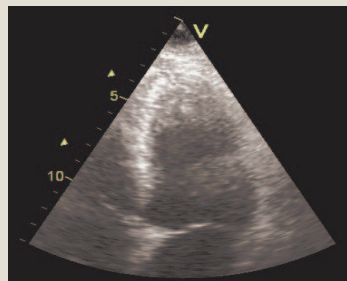
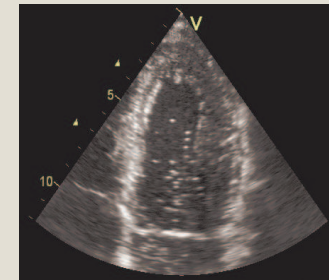
Kontrast



3 min efter kontrast



7 minutter efter kontrast



Formål: Hvordan påvirkes 2D strain analysen af billeder med nedsat kvalitet, hvis der samtidig er mikroboppel kontrast i karbanen?

- **29** konsekutive ptt.
 - Tidl. hjerterasje, henvist til KAG mhp. primær IHD
 - Normal ekkokardiografi

- 4K + 2K + 3K billeder:
 - Baseline
 - Under kontrast
 - 3 minutter efter kontrast
 - 7 minutter efter kontrast

- = 12 optagelser pr. pt. til 2D strain analyse

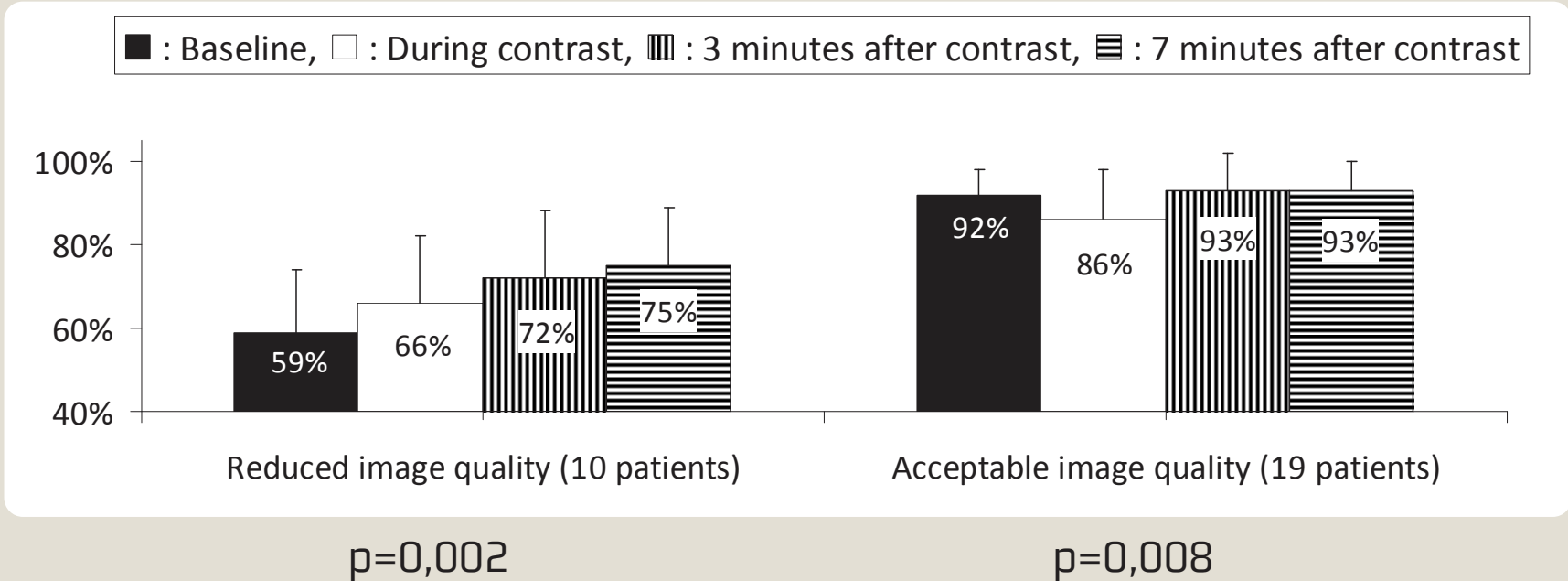
- Dobbeltanalyse af alle 12 x 29 billeder

- Arbitrær inddeling i god / nedsat billedkvalitet
(hhv. >/< 80% af de 18 segmenter kan analyseres ved baseline)

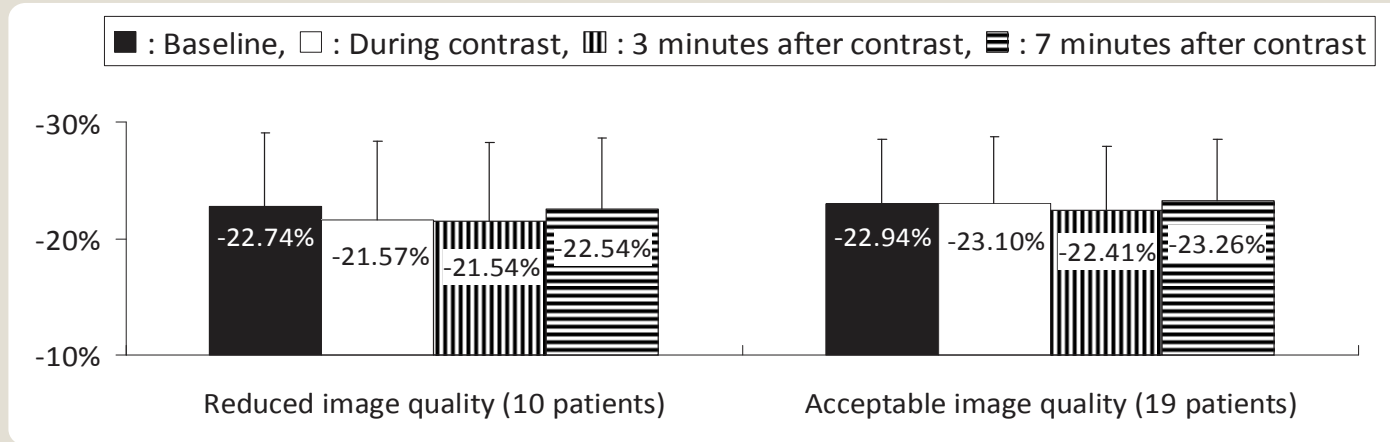
- Statistik: Repeated measurements (univariat ANOVA)
 Reproducerbarhed: Bland Altman (F-test)

	Nedsat billedkvalitet (n=10)	God billedkvalitet (n=19)
Alder, år (mean(sd))	60,5 (7,8)	62,1 (10,4)
Mænd	7 (70%)	12 (63%)
BMI (mean (sd))	29,72 (4,15)	26,22 (3,35)
Diabetes	1 (10%)	6 (31%)
HT	7 (70%)	7 (37%)
Tobak	8 (80%)	12 (63%)

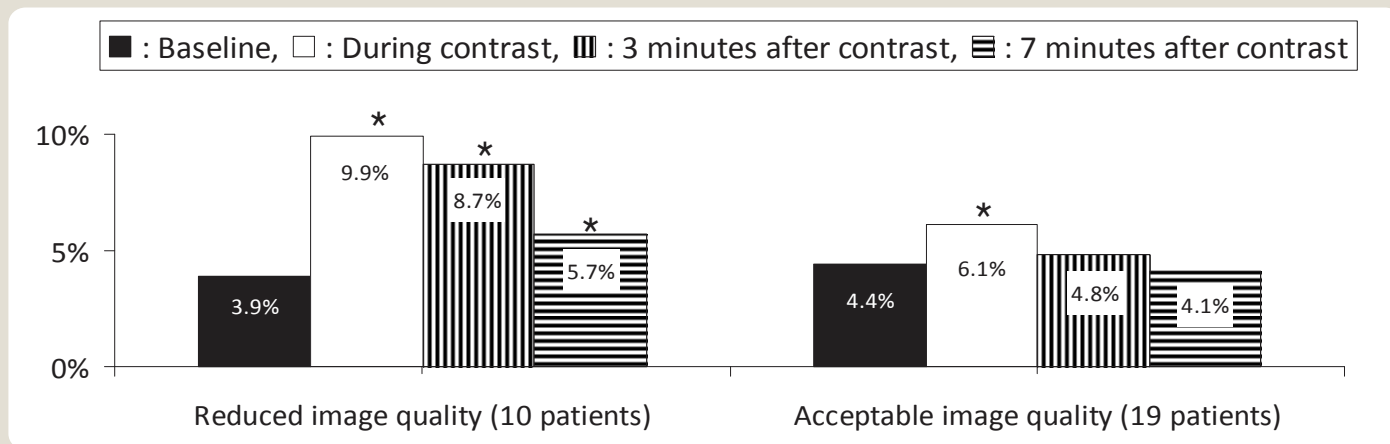
% analyserbare segmenter (gennemsnit af dobbeltanalyserne)



Segment strain



Segment strain: Coefficient of reproducibility (COR)



*p<0,01

Mikroboppel kontrast =>

- Flere segmenter kan analyseres
- Reproducerbarheden forringes v. høje koncentrationer

”Tids-vindue?”