Prostate cancer detection in biopsy-naïve men: A prospective, comparative, ongoing clinical trial of multiparametric MRI- and contrast enhanced ultrasound-targeted biopsy versus systematic biopsy

C.K. Mannaerts1, O.A.P. Lodeizen2, A.W. Postema2, R.J.G. van Sloun2, R.R. Wildeboer2, M. Mischi2, C.D. Savci-Heijink3, M.R.W. Engelbrecht4, T.M. de Reijke5, H. Wijkstra1,2

1Academic Medical Center, Amsterdam, The Netherlands, 2Eindhoven University of Technology, Eindhoven, The Netherlands

INTRODUCTION
Substituting transrectal ultrasound (TRUS)-guided systematic biopsies (SBx) with multiparametric MRI (mpMRI) targeted biopsy (TBx) only remains controversial in the biopsy-naïve setting. Contrast-enhanced ultrasound (CEUS) with quantitative parametric imaging has shown promising results for the detection of prostate cancer (PCa).

AIM
• To compare clinically significant (cs) PCa detection rates of mpMRI- and CEUS-TBx with routine SBx in biopsy-naïve men

MATERIALS & METHODS
Biopsy-naïve men with PCa suspicion: PSA level ≥3.0 and/or abnormal DRE

mpMRI: 3T with T2W + DWI + DCE (PI-RADSv2)
CEUS: 4 prostate-plane recordings with quantification software: Contrast ultrasound dispersion imaging (CUDI).

12-core SBx (all) and TBx biopsy (if necessary): mpMRI-TRUS fusion TBx (PI-RADS ≥3)
CEUS/CUDI TBx (Likert ≥3).

Outcome: csPCa detection of biopsy regimens (different Gleason score (GS) thresholds).

PRELIMINARY RESULTS
Detection rate of the biopsy regimens for csPCa (different GS thresholds). First 115 included patients

SBx (N=109) mpMRI-TBx (N=39) CEUS/CUDI-TBx (N=64)
g≤ GS 4+3=7 29% 16% 28% Insignificant PCa: GS 3+3=6
Insignificant PCa: GS 3+3=6 1% 2%

SBx (N=109) mpMRI-TBx (N=39) CEUS/CUDI-TBx (N=64)
g≥ Gleason 3+4=7 in ≥ 2 cores / tumor core ≥ 50% 35% 21% 26% Insignificant PCa: ≤ Gleason 3+4=7 in 1 core / tumor core < 50%
Insignificant PCa: ≤ Gleason 3+4=7 in 1 core / tumor core < 50% 5% 4%

SBx (N=109) mpMRI-TBx (N=39) CEUS/CUDI-TBx (N=64)
g≥ Gleason 3+4=7 16% 15% 12% Insignificant PCa: ≥ Gleason 3+4=7 43% 17%
Insignificant PCa: ≥ Gleason 3+4=7 13%

STUDY EXAMPLE
66 year old man with a PSA of 5.8 ng/mL and a suspicious DRE on the right

CONCLUSIONS
This ongoing trial is the first to compare mpMRI imaging with CEUS imaging using quantification software for csPCa detection.

mpMRI- and CEUS/CUDI-TBx detect high GS PCa and avoid biopsy in men without PCa or low-grade PCa.

Both imaging modalities miss GS 3+4=7 PCa as compared to SBx.