

Supplementary file

# Improved Left Atrial Function in CRT Responders: A Systematic Review and Meta-Analysis

Ibadete Bytyçi <sup>1,2</sup>, Gani Bajraktari <sup>1,2</sup>, Per Lindqvist <sup>1,3</sup> and Michael Y. Henein <sup>1,4,\*</sup>

<sup>1</sup> Institute of Public Health and Clinical Medicine, Umeå University, 90187 Umeå, Sweden; i.bytyci@hotmail.com (I.B.); gani.bajraktari@umu.se (G.B.); per.lindqvist@umu.se (P.L.)

<sup>2</sup> Clinic of Cardiology, University Clinical Centre of Kosovo, 10000, Prishtina, Kosovo

<sup>3</sup> Faculty of Medicine, Department of Surgical and Perioperative Sciences, Clinical Physiology, Umeå University, 90187 Umeå, Sweden

<sup>4</sup> Molecular and Clinic Research Institute, St George University, and Brunel University, SW17 0QT London, UK

\* Correspondence: michael.henein@umu.se; Tel.: +46-90-785-14-31

## Supplementary data

**Table S1: Supplement 1.** Summary of quality assessment analysis (Quality Assessment of Diagnostic Accuracy Studies-QUADAS 2).

<b>Domain</b>	<b>Questions</b>	<b>Judgments</b>
<b>Risk of bias</b>		
1) Patient selection	<i>Was a consecutive or random sample of patients enrolled?</i>	Yes, No, Unclear
	<i>Was a case-control design avoided?</i>	Yes, No, Unclear
	<i>Did the study avoid inappropriate exclusions?</i>	Yes, No, Unclear
	<i>Could the selection of patients have introduced bias?</i>	Low, High, Unclear
<b>Applicability</b>	<i>Is there concern that the included patients do not match the review questions?</i>	Low, High, Unclear
1) Patient selection		
<b>Risk of bias</b>	<i>Were the index test results interpreted without knowledge of the results of the reference standard?</i>	Yes, No, Unclear
2) Index test	<i>If a threshold was used, was it pre-specified?</i>	Yes, No, Unclear
	<i>Could the conduct or interpretation of the index test have introduced bias?</i>	Low, High, Unclear
<b>Applicability</b>	<i>Is there concern that the index test, its conduct, or interpretation differ from the review question?</i>	Low, High, Unclear
2) Index test		
<b>Risk of bias</b>	<i>Is the reference standard likely to correctly classify the target condition?</i>	Yes, No, Unclear
3) Reference standard	<i>Were the reference standard results interpreted without knowledge of the results of the index test?</i>	Yes, No, Unclear
	<i>Could the reference standard, its conduct, or its interpretation have introduced bias?</i>	Low, High, Unclear
<b>Applicability</b>	<i>Is there concern that the target condition as defined by the reference standard does not match the review question?</i>	Low, High, Unclear
3) Reference standard		
<b>Risk of bias</b>	<i>Was there an appropriate interval between index test(s) and reference standard?</i>	Yes, No, Unclear
4) Flow and timing	<i>Did all patients receive a reference standard?</i>	Yes, No, Unclear
	<i>Did patients receive the same reference standard?</i>	Yes, No, Unclear
	<i>Were all patients included in the analysis?</i>	Yes, No, Unclear
	<i>Could the patient flow have introduced bias?</i>	Low, High, Unclear

**Patients:** Patients undergo CRT; Criteria for CRT.

**Index test:** Relationship between CRT responders and LA function

**Comparator test (if applicable):** Correlations of LA function parameters

**Target condition:** Correlations of LA function on related mean change of LVESV and/or LVEF;

**Reference standard:** Guidelines of heart failure and indications of Cardiac resynchronization therapy in heart failure.

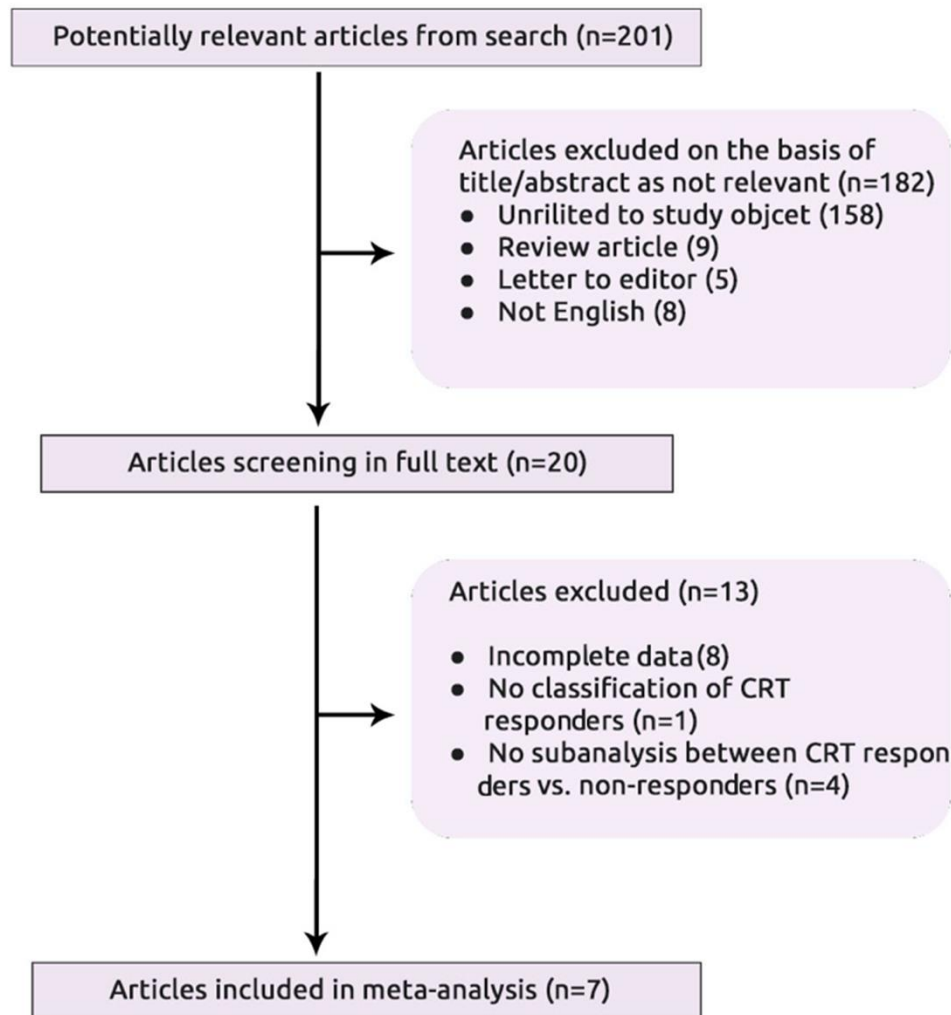
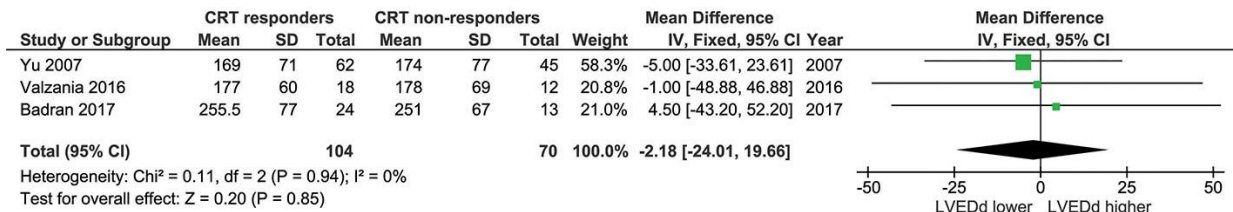


Figure 1. Supplement 2. Flow chart of study section.

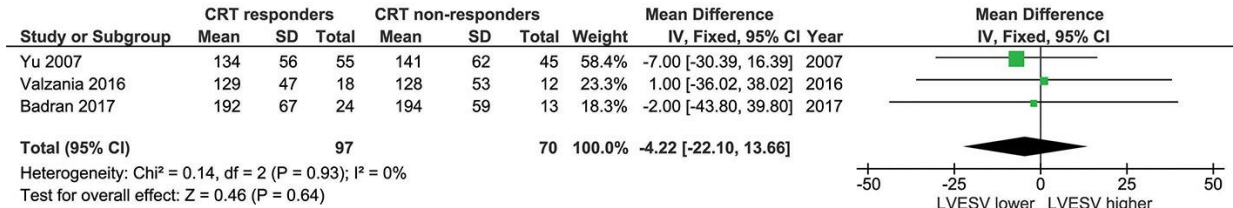
**Table S2: Supplement 3.** Echocardiographic characteristics of LA functional measurements.

Study (Year)	Software	Platform	Probe (MHz)	FR	Gating	Observer	Tissue Tracking	LA function measurements	
								PALS	LA total EF
Yo 2007	GE Vivid 7	EchoPac	NR	NR	R-R	Two blinded	End-myocardial	Peak LA wall strain during LV systole	LAVmax-LAVmin /LAVmax
Marsan 2008	iE33 Philips	QLAB	NR	20–35	-	Single blinded	-	-	LAVmax-LAVmin /LAVmax
Donal 2009	GE Vivid 7	EchoPac	NR	NR	R-R	Two blinded	Endo-epicardial	Peak LA wall strain during LV systole	LAVmax-LAVmin /LAVmax
Fenon 2015	GE Vivid 9	EchoPac	2.5	60–80	R-R	Two blinded	Endocardial	Peak LA wall strain during LV systole	-
Valenzia 2016	GE Vivid 7	EchoPac	3.5	NR	R-R	Single blinded	Endocardial	Peak LA wall strain during LV systole	-
Badran 2017	GE Healthcare	EchoPac	2.5	NR	R-R	Single blinded	Endocardial	Peak LA wall strain during LV systole	LAVmax-LAVmin /LAVmax
Hansen 2017	GE Vivid 9	EchoPac	3–5	NR	-	Single blinded	-	-	LAVmax-LAVmin /LAVmax

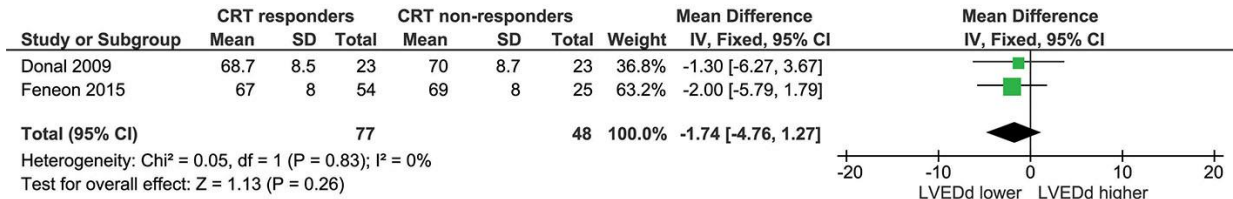
a) Baseline of LVEDV in CRT responders vs. CRT non responders



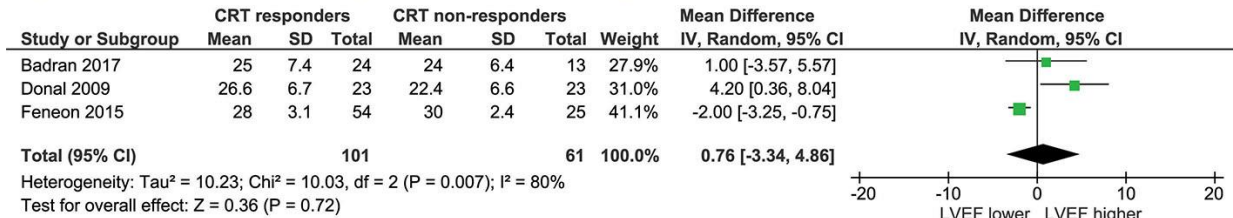
a) Baseline of LVESV in CRT responders vs. CRT non responders



c) Baseline of LVEDd in CRT responders vs. CRT non responders

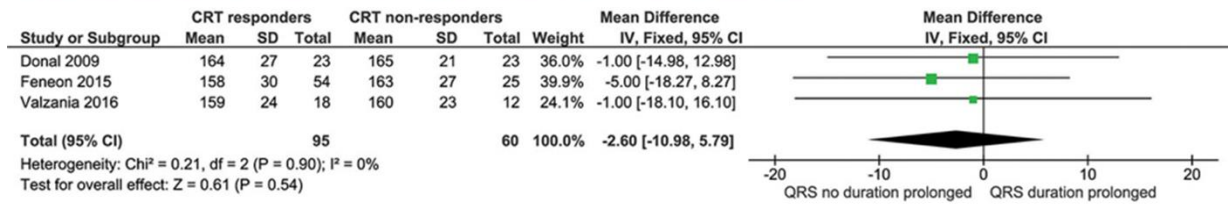


d) Baseline of LVEF in CRT responders vs. CRT non responders

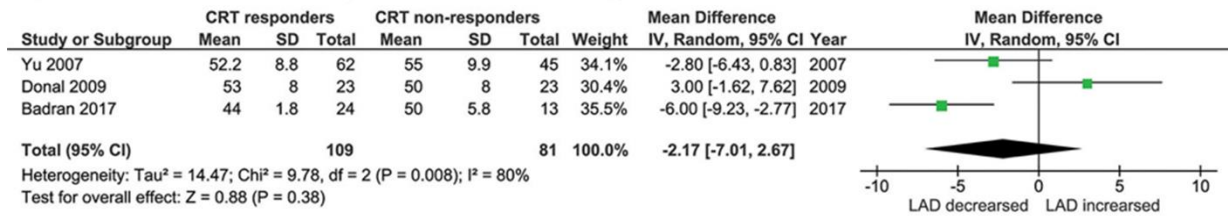


**Figure S2: Supplement 4.** Comparison of baseline LVEDV, LVESV, LVEDd and EF in group of patients with CRT responds vs. CRT non responders.

a) Baseline of QRS duration in CRT responders vs. CRT non responders



a) Baseline of LAD in CRT responders vs. CRT non responders



**Figure S3: Supplement 5.** Comparison of baseline QRS duration and LA dimension in group of patients with CRT responders vs. CRT non responders.

### Correlation between LA strain and LAEF

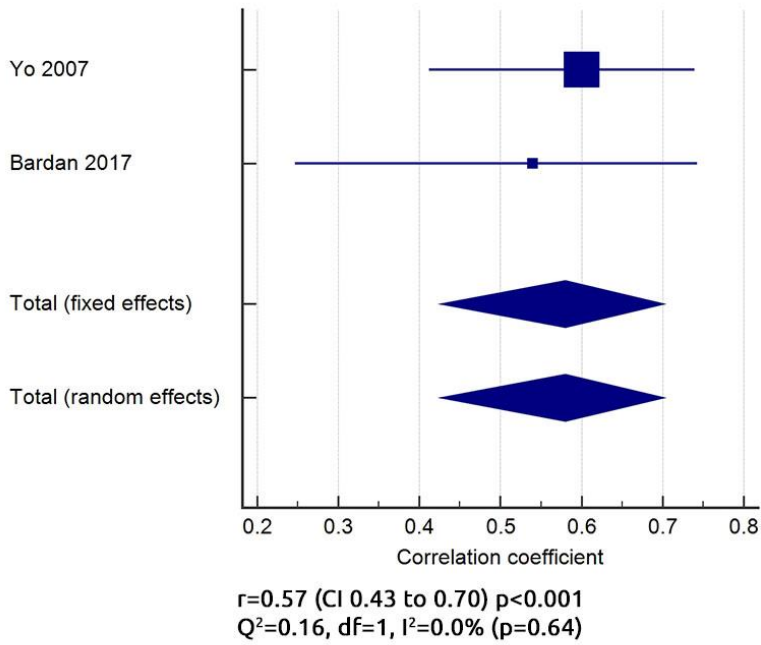


Figure S4: Supplement 6. Weighted summary correlation between LA strain and LAEF.

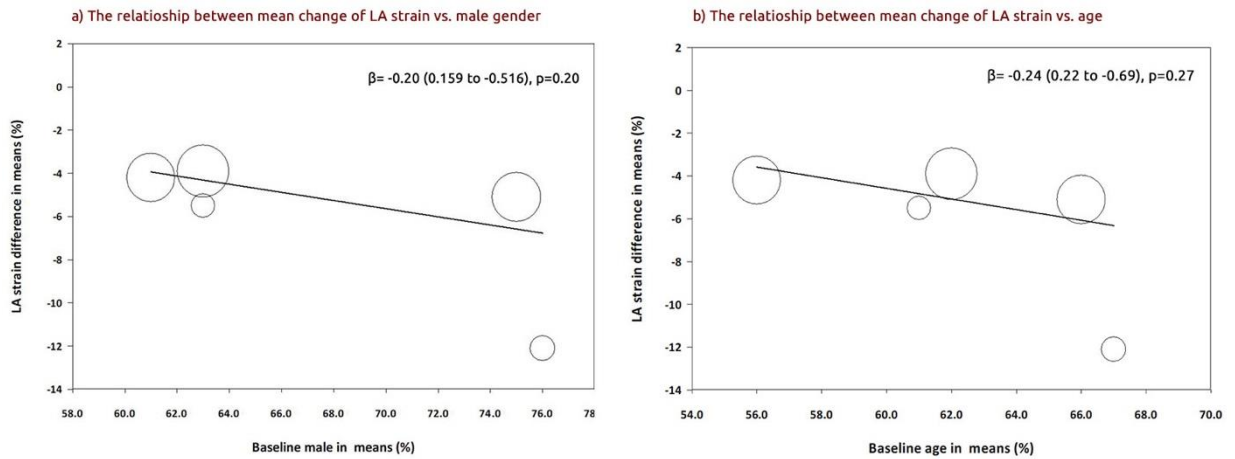


Figure S5: Supplement 7. Relationship between LA strain change and a) male gender; b) age.

Table S3: Supplement 8. Summary of QUADAS-2 Assessment of Selected Studies.

Author (year) reference	Risk of bias				Applicability concerns		
	Patients selection	Index test	Reference standard	Flow and timing	Patients selection	Index test	Reference standard
Yo 2007	Low	Low	Low	Low	Low	Low	Low
Marsan 2008	Low	Low	Low	Low	Low	Low	Low
Donal 2009	Low	Unclear	Low	Low	Low	Unclear	Unclear
Feneon 2015	Low	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear
Valenzia 2016	Low	Low	Low	Low	Low	Low	Low
Badran 2017	Low	Low	Low	Low	Low	Low	Low
Hansen 2017	Unclear	Low	High	High	Unclear	Low	High

QUADAS-2: Quality Assessment of Diagnostic Accuracy Studies-2.

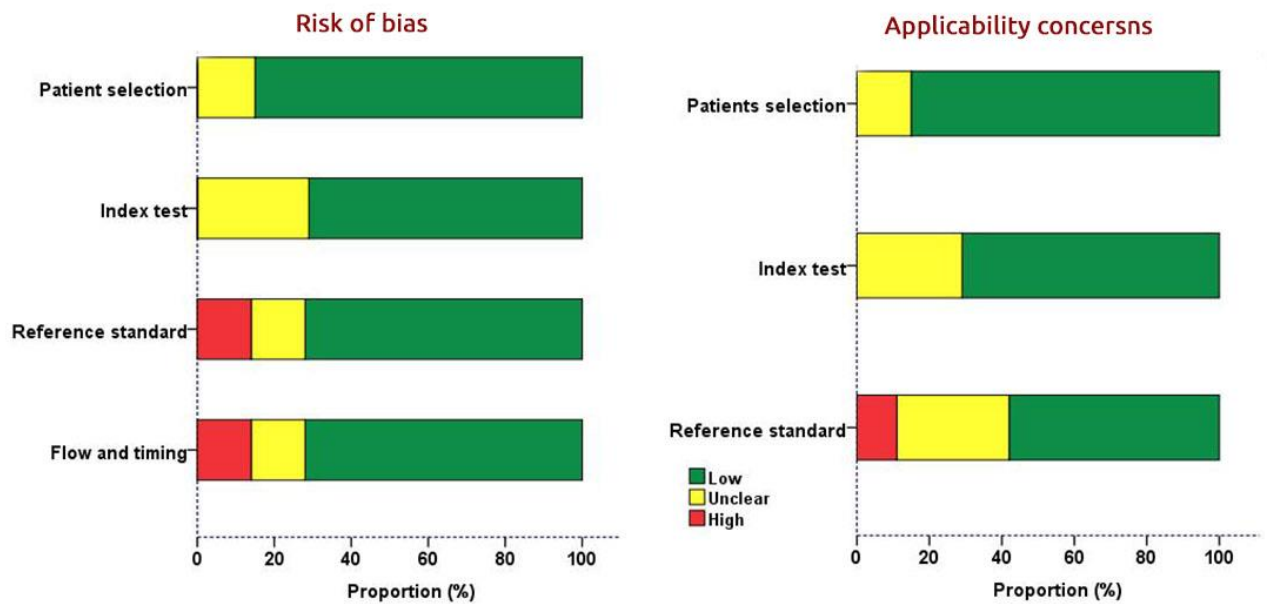


Figure 6. Supplement 9. Summary of QUADAS-2 Assessment of Selected Studies.