Online Supplementary Material

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***Supplementary Appendix, Table S1*. PRISMA checklist**

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	PAGE 1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	PAGE 2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	PAGES 4-5
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	PAGES 4-5
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	PAGES 5-6
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	PAGES 5, 8
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	PAGE 5
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	PAGES 5-6, 8
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	PAGES 6, 8
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	PAGES 5-6
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	PAGE 5
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	PAGE 5
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	PAGE 6
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	PAGE 6-7

Section and Topic	Item #	Checklist item	Location where item is reported
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	PAGE 6-7
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	PAGE 6-7
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	PAGE 6-7
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	PAGE 6-7
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	PAGE 8
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	PAGE 5, Supplementary Appendix Figure S2
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	PAGE 6
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	PAGE 8
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Supplementary Appendix Figure S1
Study characteristics	17	Cite each included study and present its characteristics.	PAGES 8-9
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Supplementary Appendix Table S2, PAGE 14
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	PAGES 8 – 11, Figures 1 – 6, Supplementary Appendix Figure S2
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	PAGES 11 – 14, Supplementary

Section and Topic	Item #	Checklist item	Location where item is reported
			Appendix Table S2
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	PAGES 8 -11
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	PAGES 11 – 14
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	PAGES 10
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Supplementary Appendix Table S2
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	PAGES 8 – 11, Figures 1-6, Supplementary Appendix Figure S2
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	PAGES 11 – 14
	23b	Discuss any limitations of the evidence included in the review.	PAGES 13 – 14
	23c	Discuss any limitations of the review processes used.	PAGE 14
	23d	Discuss implications of the results for practice, policy, and future research.	PAGE 14
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	PAGE 5
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	N/A
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	N/A
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	PAGE 15
Competing interests	26	Declare any competing interests of review authors.	PAGE 15
Availability of data, code and	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	PAGE 6, 8-9

Section and Topic	Item #	Checklist item	Location where item is reported
other materials			

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***Supplementary Appendix, Table S2*. Revised Cochrane risk-of-bias tool for randomised trials (RoB 2).**

Domain	**COMPASS-HF**	**CHAMPION**	**REDUCE-HF**	**LAPTOP-HF**	**GUIDE-HF**
1- Randomisation					
2- Deviations from intended interventions					
3- Missing outcome data					
4- Outcome measurement					
5- Selective reporting					
Overall					

 Low level of concern

 Some concern

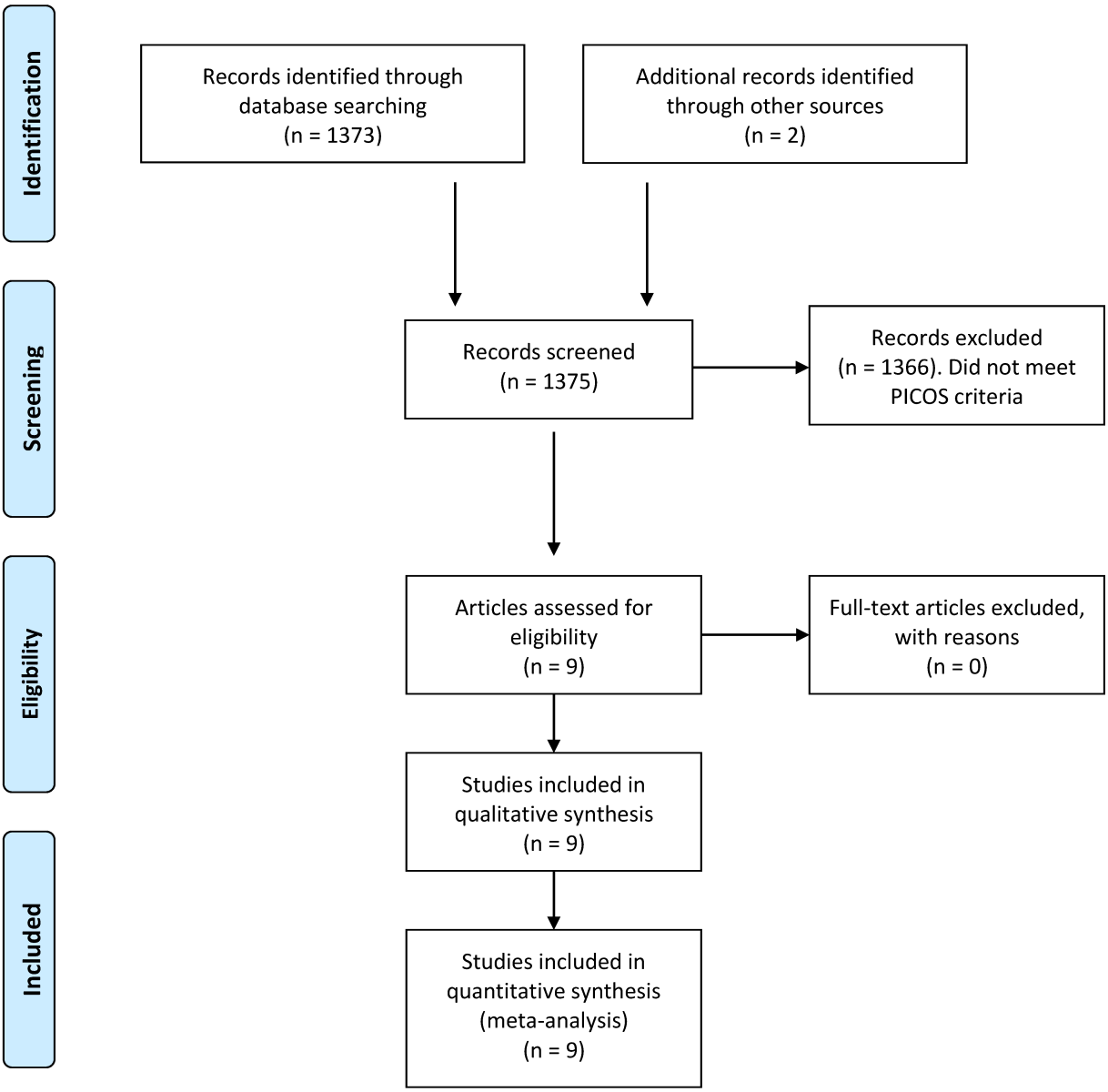
 High level of concern

***Supplementary Appendix, Table S3*. Pre-recruitment and ongoing randomised studies of IHM-guided care compared to standard care**

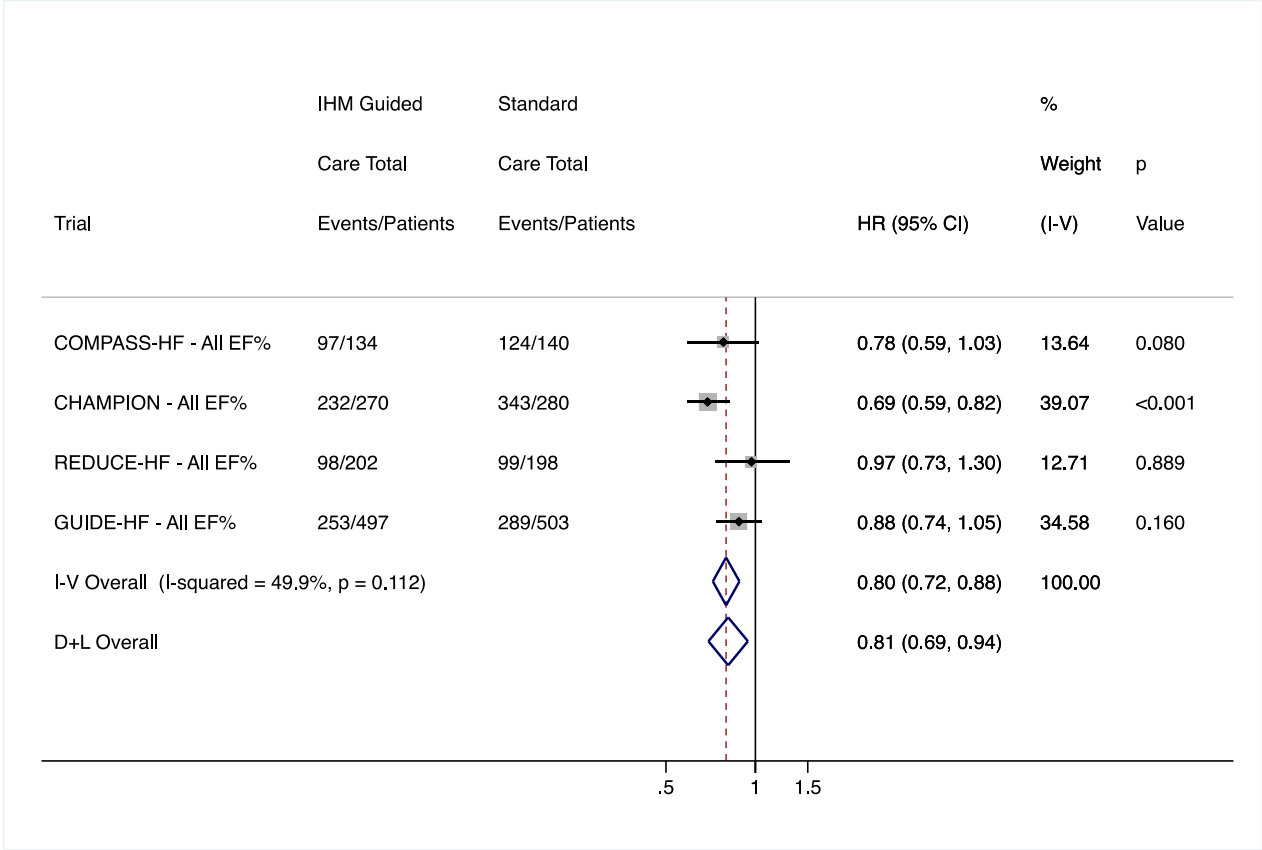
Trial	Intervention	Key inclusion criteria	Design, Country	Primary Efficacy Endpoint	Target recruitment	Follow-up	Trial Identifier
SELFIe-HF	Standard HF care plus CardioMEMS™ Vs standard HF care (no implant)	NYHA: II - ambulatory IV EF: all ranges HFH: <12 months NT-proBNP: >800pg/ml Minimum technological knowledge	Single-centre, prospective, randomised, open-label blinded-endpoint trial. Canada	Composite outcome: first occurrence of HF hospitalization or ED or urgent outpatient clinic visit for IV HF therapy or cardiovascular death	150	12 months	NCT04441203
HALO-Shock	Standard HF care plus CardioMEMS™ Vs standard HF care (no implant)	NYHA: III EF: all ranges HFH: Current admission with cardiogenic shock Natriuretic peptide: No Access to internet	Pilot, prospective randomised unblinded pragmatic trial USA	All-cause death, LVAD, cardiac transplantation), CV hospitalization, change in MLHFQ score, and change in NT-proBNP	40	6 months	NCT04419480
TARGET-LOAD	LVAD plus Standard HF care plus CardioMEMS™ Vs LVAD plus standard HF care	Refractory HF requiring LVAD EF: ≤25% Aetiology: Non-ischaemic HF duration: <5 years BMI: ≤35kg/m^2	Prospective, randomised-controlled, non-blinded multi-centre pilot trial USA	Proportion of subjects meeting LVAD explantation criteria	10	24 months post-LVAD	NCT04977310
Pulmonary Artery Sensor System Pressure Monitoring to Improve Heart Failure (HF) Outcomes	Standard HF care plus CardioMEMS™ Vs standard HF care (no implant)	NYHA: III HFH: <12 months EF: All ranges (on OMT if EF≤40%)	Prospective, randomised, open-label, multi-centre trial Germany	Efficacy: HFH or all-cause death Safety: (i) Rate of device / system related complications (ii) Rate of sensor failures	554	12 months	NCT04398654
TAP-CHF	PHASE 1: AF catheter ablation Vs anti-arrhythmic drug strategy PHASE 2: Optimized rhythm control plus CardioMEMS™ -guided Vs optimized rhythm control without CardioMEMS™ -guided HF care	EF: ≥45% ± structural changes HFH: <12 months AF related hospitalization: <12 months AF: paroxysmal or persistent NT-proBNP: >200pg/ml in sinus or >600pg/ml in AF if hospitalized NT-proBNP: >300pg/ml in sinus or >900pg/ml in AF if not hospitalized	Prospective, pilot study utilizing a randomised comparative sequential evaluation of two therapies in two consecutive phases USA	Time to first HF hospitalization or CV death	360	PHASE 1: 9 months PHASE 2: 9 months	NCT04160000

AF = atrial fibrillation; BMI = body mass index; CV = cardiovascular; ED = emergency department; EF = ejection fraction; HF = heart failure; HFH = heart failure hospitalization; IV = intravenous; LVAD = left ventricular assist device; MLHFQ = Minneasota Living with Heart Failure Questionnaire; NT-proBNP = N-terminal pro-B type natriuretic peptide; NYHA = New York Heart Association; OMT = optimal medical therapy; USA = United States of America

***Supplementary Appendix, Figure S1*. PRISMA flow diagram of source articles for the meta-analysis**



Supplementary Appendix, Figure S2. **All-cause mortality and total worsening HF events (HF hospitalization and ED and urgent clinic visit for IV HF therapy) in all patients regardless of EF**



D+L = DerSimonian & Laird, ED = emergency department, EF = ejection fraction, HF = heart failure, HR = hazard ratio, IHM = implantable haemodynamic monitor, IRR = incidence rate ratio, IV = intravenous, I-V = inverse-variance

*Recurrent event effect estimates include HRs for CHAMPION and GUIDE-HF and IRR for COMPASS-HF and REDUCE-HF

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