Attachment 5 Meta-analysis feasibility assessment

Table S 1 Feasibility assessment for meta-analysis of individual outcomes

Outcome	Number of studies (>3)	Low assessment of quality or of risk of bias (bias in blinding, randomisation, missing outcome data, outcome assessment)	Population, intervention, comparator, outcome(s), time frame, and study design (PICOTS) assessment (clinical and methodological diversity)					Meta-analysis feasibility decision
			Population (eligibility, key demographics)	Intervention and comparator	Outcome (definition and means of reporting)	Study design	Time frame	
Implantable cardiac devices								
Infections	4 studies: Enache *et al.* (2019) [111] Nava *et al.* (2013) [113] Linde *et al.* (1998) [112] Şoşdean *et al.* (2015) [114]	Similar Enache *et al.* (2019): 17/30 Linde *et al.* (1998): 21/30 Nava *et al.* (2013): 24/30 Şoşdean *et al.* (2015): 22/30	Similar eligibility Enache *et al.* (2019): All patients for whom the device was indicated Linde *et al.* (1998): As above, and only patients for whom life expectancy was estimated to be lower than that of the pacemaker received a reprocessed device Nava *et al.* (2013): All patients aged 18 years and over with an indication for pacing Şoşdean *et al.* (2015): Patients requiring implantation with biventricular devices	Similar devices/procedures Enache *et al.* (2019): Implantable cardioverter defibrillators Nava *et al.* (2013): Pacemaker Linde *et al.* (1998): Pacemaker Şoşdean *et al.* (2015): Biventricular devices (pacemakers or defibrillators) Location similar Enache *et al.* (2019): Unclear, likely internal	Similar definitions (except Şoşdean *et al.* (2015)) Enache *et al.* (2019): Infections that required reintervention Linde *et al.* (1998): Infections that required antibiotics and/or reoperations Nava *et al.* (2013): I: Right endocarditis with electrode involvement; II: Sepsis without evidence of involvement of the	Similar designs Enache *et al.* (2019): Retrospective cohort Linde *et al.* (1998): Retrospective case-matched Nava *et al.* (2013): case matched prospective and retrospective Şoşdean *et al.* (2015):	Similar (except Nava *et al.* (2013)) Enache *et al.* (2019): 1–108 months (1 month, 3 months, every 6 months), average 33 months Linde *et al.* (1998): 32 months (±11 months) Nava *et al.* (2013): Not reported	Meets criteria for meta-analysis

Attachment to: McGrath N, Waldron C, Farragher A, Walsh C, Polisena J. Safety, cost and environmental impact of reprocessing high risk single-use medical devices: a systematic review and meta-analysis. GMS Hyg Infect Control. 2025;20:Doc25. DOI: 10.3205/dgkh000554

			Different demographics (Gender only – Enache) Age: Enache *et al.* (2019): 52 years Linde *et al.* (1998): 79 years Nava *et al.* (2013): 60 years Şoşdean *et al.* (2015): 62 years % female: Enache *et al.* (2019): 25% Linde *et al.* (1998): 55% Nava *et al.* (2013): 46% Şoşdean *et al.* (2015): 85%	Linde *et al.* (1998): Internal Nava *et al.* (2013): Internal Şoşdean *et al.* (2015): Likely internal Same number of reprocessing cycles Enache *et al.* (2019): 1 Linde *et al.* (1998): 1 Nava *et al.* (2013): 1 Şoşdean *et al.* (2015): 1	circuit or pocket; III: Infection of the pacemaker pocket; and IV: Extrusion of wires or generator Şoşdean *et al.* (2015): Device-related (not defined) Similar reporting Enache *et al.* (2019): n, %, odds ratio (OR), confidence interval (CI) Linde *et al.* (1998): n, % Nava *et al.* (2013): n, %, risk ratio (RR) (adjusted), CI Şoşdean *et al.* (2015): n, OR (adjusted), CI	Retrospective case-matched	Şoşdean *et al.* (2015): Up to 94 months, median 35 months	
Unexpected battery depletion	4 studies: Enache *et al.* (2019) [111] Nava *et al.* (2013) [113] Linde *et al.* (1998) [112]	Similar Enache *et al.* (2019): 17/30 Linde *et al.* (1998): 21/30 Nava *et al.* (2013): 24/30	Similar eligibility Enache *et al.* (2019): All patients for whom the device was indicated Linde *et al.* (1998): As above, and only patients for whom life expectancy	Similar devices/procedures Enache *et al.* (2019): Implantable cardioverter defibrillators	Broadly similar definitions Enache *et al.* (2019): Replacement due to untimely or	Similar designs Enache *et al.* (2019): Retrospective cohort	Similar Enache *et al.* (2019): 1–108 months (1 month, 3 months, every 6	Meets criteria for meta-analysis

Şoşdean *et al.* (2015) [114]	Şoşdean *et al.* (2015): 22/30	was estimated to be lower than that of the pacemaker received a reprocessed device Nava *et al.* (2013): All patients aged 18 years and over with an indication for pacing Şoşdean *et al.* (2015): Patients requiring implantation with biventricular devices Different demographics Age: Enache *et al.* (2019): 52 years Linde *et al.* (1998): 79 years Nava *et al.* (2013): 60 years Şoşdean *et al.* (2015): 62 years % female: Enache *et al.* (2019): 25% Linde *et al.* (1998): 55% Nava *et al.* (2013): 46% Şoşdean *et al.* (2015): 85%	Nava *et al.* (2013): Pacemaker Linde *et al.* (1998): Pacemaker Şoşdean *et al.* (2015): Biventricular devices (pacemakers or defibrillators) Location Enache *et al.* (2019): Unclear, likely internal Linde *et al.* (1998): Internal Nava *et al.* (2013): Internal Şoşdean *et al.* (2015): Likely internal Same number of reprocessing cycles Enache *et al.* (2019): 1 Linde *et al.* (1998): 1 Nava *et al.* (2013): 1 Şoşdean *et al.* (2015): 1	unexpected battery depletion Linde *et al.* (1998): Replacement due to battery depletion Nava *et al.* (2013): The need to remove or change the device because of unexpected battery depletion. Unexpected battery depletion was defined by study group. For new pacemakers, it was defined as depletion before the 6th year after implantation without relation to high pacing output or abnormal electrode impedances. In reused devices, early battery depletion was defined as	Linde *et al.* (1998): Retrospective case-matched Nava *et al.* (2013): case matched prospective and retrospective Şoşdean *et al.* (2015): Retrospective case-matched	months), average 33 months Linde *et al.* (1998): 32 months (±11 months) Nava *et al.* (2013): Not reported Şoşdean *et al.* (2015): Up to 94 months, median 35 months

					occurring before the 4th year. Şoşdean *et al.* (2015): Early battery depletion – considered as after less than 2 years (24 months) Similar reporting Enache *et al.* (2019): N, OR, 95% CI Linde *et al.* (1998): n Nava *et al.* (2013): n, %, RR, 95% CI Şoşdean *et al.* (2015): n, IQR			
Other device malfunction	2 studies: Nava *et al.* (2013) [113] Linde *et al.* (1998) [112]	Similar Linde *et al.* (1998): 21/30 Nava *et al.* (2013): 24/30	Similar eligibility Linde *et al.* (1998): All patients for whom the device was indicated, and only patients for whom life expectancy was estimated to be lower than that of the pacemaker received a reprocessed device Nava *et al.* (2013): All patients aged 18 years and	Similar devices/procedures Linde *et al.* (1998): Pacemaker Nava *et al.* (2013): Pacemaker Same location Linde *et al.* (1998): Internal Nava *et al.* (2013): Internal	Similar definition Nava *et al.* (2013): Suspicion of pacemaker malfunction described in the file or causing replacement Linde *et al.* (1998): Suspicion of pacemaker malfunction	Similar designs Linde *et al.* (1998): Retrospective case-matched Nava *et al.* (2013): NRCT (prospective and retrospective, matched)	Unclear similarity Nava *et al.* (2013): Not reported	Does not meet criteria – too few studies

			over with an indication for pacing Different demographics Age: Linde *et al.* (1998): 79 years Nava *et al.* (2013): 60 years % female: Linde *et al.* (1998): 55% Nava *et al.* (2013): 46%	Same number of reprocessing cycles Linde *et al.* (1998): 1 Nava *et al.* (2013): 1	described in the file or causing replacement Similar reporting Nava *et al.* (2013): n, % (unadjusted) Linde *et al.* (1998): n, % (unadjusted)			
Cardiac catheter devices								
Minor complications (pyrogen reactions (fever, temperature, white blood cell count), creatine kinase, author-labelled minor complications)	3 studies: Plante *et al*. (1994) [118] Browne *et al*. (1997) [115] Leung *et al*. (2019) [116]	2/3 similar Leung *et al*. (2019): 20/30 Browne *et al*. (1997): 15/30 Plante *et al*. (1994): 23/30	Similar eligibility Plante *et al*. (1994): All patients undergoing coronary angioplasty Browne *et al*. (1997): All patients undergoing coronary angioplasty Leung *et al*. (2019): All patients undergoing elective atrial fibrillation ablation Similar demographics Age: Browne *et al*. (1997): 64 years Plante *et al*. (1994): 60 years	Broadly similar devices/procedures Plante *et al*. (1994): Balloon, no brand/coronary angioplasty Browne *et al*. (1997): Angioplasty balloon catheters Leung *et al*. (2019): Circular mapping catheter/elective AF ablation Different locations Plante *et al*. (1994): Internal	Similar definition Plante *et al*. (1994): Temperature (>38 °C buccal or 38.5 °C rectal), creatine kinase levels Browne *et al*. (1997): Temperature and white blood cell count, obtained before and 24 hours after the procedure (screen for pyrogen reactions)	Similar designs Plante *et al*. (1994): Observational Browne *et al*. (1997): NRCT, case-matched Leung *et al*. (2019): NRCT, case-matched	Different follow-up times Plante *et al*. (1994): Admission to discharge Browne *et al*. (1997): Admission to discharge Leung *et al*. (2019): 3 months	Does not meet criteria – too few studies

			Leung *et al*. (2019): 66 years % female: Plante *et al*. (1994): 28% Browne *et al*. (1997): 44% Leung *et al*. (2019): 32%	Browne *et al*. (1997): External Leung *et al*. (2019): External Unclear similarity for number of reprocessing cycles Plante *et al*. (1994): 1–6 (not reported by cycle) Browne *et al*. (1997): Not reported Leung *et al*. (2019): 1–2	Leung *et al*. (2019): Any pyrexial or infective illness Similar reporting Plante *et al*. (1994): n, % Browne *et al*. (1997): n, % Leung *et al*. (2019): n, %			
Major complications (evidence of subsequent myocardial infarction (MI) or requirement for emergent percutaneous or	4 studies: Plante *et al*. (1994) [118] Browne *et al*. (1997) [115] Leung *et al*. (2019) [116] Unverdorben *et al.* [120]	Similar (except Browne *et al*. (1997)) Leung *et al*. (2019): 20/30 Unverdorben *et al*. (2005): 23/30 Browne *et al*. (1997): 15/30 Plante *et al*. (1994): 23/30	Similar eligibility Plante *et al*. (1994): All patients undergoing coronary angioplasty Browne *et al*. (1997): All patients undergoing coronary angioplasty Unverdorben *et al*. (2005): Coronary angioplasty patients with coronary artery stenosis of ≥70% and <100%, and a visually estimated maximum lesion length of <20 mm in	Broadly similar devices/procedures Plante *et al*. (1994): Balloon, no brand/coronary angioplasty Unverdorben *et al*. (2005): No brand/coronary angioplasty Browne *et al*. (1997): Angioplasty balloon catheters Leung *et al*. (2019): Circular mapping	Broadly similar definitions Plante *et al*. (1994): Angiographically successful angioplasty of all attempted lesions without in-hospital adverse clinical event (defined as death, MI, stroke, emergency angioplasty, or bypass surgery)	Similar designs Plante *et al*. (1994): Observational Browne *et al*. (1997): NRCT, case-matched Unverdorben *et al*. (2005): RCT Leung *et al*. (2019): NRCT, case-matched	Different follow-up times Plante *et al*. (1994): Admission to discharge Browne *et al*. (1997): Admission to discharge Unverdorben *et al*. (2005): 3 months	Does not meet criteria for meta-analysis – too few studies after removal of Browne *et al*. (1997) (poor-quality study) and double zero

surgical revascularisation of the target vessel, death, other complications (thrombus; acute and subacute MI))	association with angina pectoris Leung *et al*. (2019): All patients undergoing elective AF ablation Similar demographics Age: Browne *et al*. (1997): 64 years Plante *et al*. (1994): 60 years Unverdorben *et al*. (2005): 66 years Leung *et al*. (2019): 66 years % female: Plante *et al*. (1994): 28% Browne *et al*. (1997): 44% Unverdorben *et al*. (2005): 23% Leung *et al*. (2019): 32%	catheter/elective AF ablation Different locations Plante *et al*. (1994): Internal Browne *et al*. (1997): External Unverdorben *et al*. (2005): Internal Leung *et al*. (2019): External Unclear similarity for number of reprocessing cycles Plante *et al*. (1994): 1–6 (not reported by cycle) Browne *et al*. (1997): Not reported Unverdorben *et al*. (2005): 1–3 Leung *et al*. (2019): 1–2	Browne *et al*. (1997): Evidence of subsequent MI or requirement for emergent percutaneous or surgical revascularisation of the target vessel, and death Unverdorben *et al*. (2005): Q-wave MI was diagnosed with the occurrence of new Q-waves (>0.04 seconds) and rise of creatine kinase twice the upper limit of normal with significant increase in creatine kinase whereas in non-Q-wave MIs, pathological Q-waves were absent Leung *et al*. (2019): Evidence of complications of the procedure	Leung *et al*. (2019): 3 months	event studies

					Similar reporting Plante *et al*. (1994): n, % Browne *et al*. (1997): n, % Unverdorben *et al*. (2005): n, % Leung *et al*. (2019): n, %			
Procedure time	4 studies: Plante *et al*. (1994) [118] Browne *et al*. (1997) [115] Leung *et al*. (2019) [116] Unverdorben *et al.* [120]	Similar (except Browne *et al*. (1997)) Leung *et al*. (2019): 20/30 Unverdorben *et al*. (2005): 23/30 Browne *et al*. (1997): 15/30 Plante *et al*. (1994): 23/30	Similar eligibility Plante *et al*. (1994): All patients undergoing coronary angioplasty Browne *et al*. (1997): All patients undergoing coronary angioplasty Unverdorben *et al*. (2005): Coronary angioplasty patients with coronary artery stenosis of ≥70% and <100%, and a visually estimated maximum lesion length of <20 mm in association with angina pectoris Leung *et al*. (2019): All patients undergoing elective AF ablation Similar demographics	Broadly similar devices/procedures Plante *et al*. (1994): Balloon, no brand/coronary angioplasty Unverdorben *et al*. (2005): No brand/coronary angioplasty Browne *et al*. (1997): Angioplasty balloon catheters Leung *et al*. (2019): Circular mapping catheter/elective AF ablation Different locations Plante *et al*. (1994): Internal	Same definition Similar reporting (minutes) Plante *et al*. (1994): µ, SD Browne *et al*. (1997): µ, SD Unverdorben *et al*. (2005): µ, SD Leung *et al*. (2019): µ, SD	Similar designs Plante *et al*. (1994): Observational Browne *et al*. (1997): NRCT, case-matched Unverdorben *et al*. (2005): RCT Leung *et al*. (2019): NRCT, case-matched	Same time frame (procedure duration)	Does not meet criteria for meta-analysis – non-normally distributed data

			Age: Browne *et al*. (1997): 64 years Plante *et al*. (1994): 60 years Unverdorben *et al*. (2005): 66 years Leung *et al*. (2019): 66 years % female: Plante *et al*. (1994): 28% Browne *et al*. (1997): 44% Unverdorben *et al*. (2005): 23% Leung *et al*. (2019): 32%	Browne *et al*. (1997): External Unverdorben *et al*. (2005): Internal Leung *et al*. (2019): External Unclear similarity for number of reprocessing cycles Plante *et al*. (1994): 1–6 (not reported by cycle) Browne *et al*. (1997): Not reported Unverdorben *et al*. (2005): 1–3 Leung *et al*. (2019): 1–2			
Fluoroscopy time	4 studies: Plante *et al*. (1994) [118] Browne *et al*. (1997) [115] Leung *et al*. (2019) [116] Unverdorben *et al.* [120]	Similar (except Browne *et al*. (1997)) Leung *et al*. (2019): 20/30 Unverdorben *et al*. (2005): 23/30 Browne *et al*. (1997): 15/30 Plante *et al*. (1994): 23/30	Similar eligibility Plante *et al*. (1994): All patients undergoing coronary angioplasty Browne *et al*. (1997): All patients undergoing coronary angioplasty Unverdorben *et al*. (2005): Coronary angioplasty patients with coronary artery stenosis of ≥70% and <100%, and a visually	Broadly similar devices/procedures Plante *et al*. (1994): Balloon, no brand/coronary angioplasty Unverdorben *et al*. (2005): No brand/coronary angioplasty	Same definition (fluoroscopy time) Same reporting (minutes) Browne *et al*. (1997): μ, SD Plante *et al*. (1994): μ, SD Unverdorben *et al*. (2005): μ, SD	Similar designs Plante *et al*. (1994): Observational Browne *et al*. (1997): NRCT, case-matched Unverdorben *et al*. (2005): RCT	Same time frame (during procedure)	Does not meet criteria for meta-analysis – non-normally distributed data

estimated maximum lesion length of <20 mm in association with angina pectoris Leung *et al*. (2019): All patients undergoing elective AF ablation	Browne *et al*. (1997): Angioplasty balloon catheters Leung *et al*. (2019): Circular mapping catheter/elective AF ablation	Leung *et al*. (2019): μ, SD	Leung *et al*. (2019): NRCT, case-matched
Similar demographics Age: Browne *et al*. (1997): 64 years Plante *et al*. (1994): 60 years Unverdorben *et al*. (2005): 66 years Leung *et al*. (2019): 66 years % female: Plante *et al*. (1994): 28% Browne *et al*. (1997): 44% Unverdorben *et al*. (2005): 23% Leung *et al*. (2019): 32%	Different locations Plante *et al*. (1994): Internal Browne *et al*. (1997): External Unverdorben *et al*. (2005): Internal Leung *et al*. (2019): External Unclear similarity for number of reprocessing cycles Plante *et al*. (1994): 1–6 (not reported by cycle) Browne *et al*. (1997): Not reported Unverdorben *et al*. (2005): 1–3 Leung *et al*. (2019): 1–2		

Contrast used	3 studies: Plante *et al*. (1994) [118] Browne *et al*. (1997) [115] Unverdorben *et al.* [120]	2/3 similar Unverdorben *et al*. (2005): 23/30 Browne *et al*. (1997): 15/30 Plante *et al*. (1994): 23/30	Similar eligibility Plante *et al*. (1994): All patients undergoing coronary angioplasty Browne *et al*. (1997): All patients undergoing coronary angioplasty Unverdorben *et al*. (2005): Coronary angioplasty patients with coronary artery stenosis of ≥70% and <100%, and a visually estimated maximum lesion length of <20 mm in association with angina pectoris Similar demographics Age: Browne *et al*. (1997): 64 years Plante *et al*. (1994): 60 years Unverdorben *et al*. (2005): 66 years % female: Plante *et al*. (1994): 28% Browne *et al*. (1997): 44% Unverdorben *et al*. (2005): 23%	Broadly similar devices/procedures Plante *et al*. (1994): Balloon, no brand/coronary angioplasty Unverdorben *et al*. (2005): No brand/coronary angioplasty Browne *et al*. (1997): Angioplasty balloon catheters Different locations Plante *et al*. (1994): Internal Browne *et al*. (1997): External Unverdorben *et al*. (2005): Internal Unclear similarity for number of reprocessing cycles Plante *et al*. (1994): 1–6 (not reported by cycle) Browne *et al*. (1997): Not reported	Definition Unverdorben *et al*. (2005): Not reported Plante *et al*. (1994): Volume of contrast medium used Browne *et al*. (1997): Dye volume Similar reporting (mL) Unverdorben *et al*. (2005): μ, SD Plante *et al*. (1994): μ, SD Browne *et al*. (1997): μ, SD	Similar designs Plante *et al*. (1994): Observational Browne *et al*. (1997): NRCT, case-matched Unverdorben *et al*. (2005): RCT	Same time frame (during procedure)	Does not meet criteria – too few studies, as Browne *et al*. (1997) is excluded due to poor study quality

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